



SMU

SINGAPORE MANAGEMENT
UNIVERSITY

CS301 : IT Solution Architecture
AY 2019-2020 Term 1

Project Proposal

The Runtime Terrors

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Background and Business Needs

In the education sector, technology can be used to manage previously manual tasks. A Student Management System (SMS) built by vendors for universities can be used to automate some of them. Universities generally follow a standard, GPA-based scoring model, with each calendar year divided into several terms. This application concerns three main actors: students, teachers and administrators. For this project, we will be focusing mainly on the functionalities that are made for students.

Students can use SMS for a suite of different purposes. They can check their academic results, view important school wide notices, check on their enrolled classes, take attendance for their various classes and view information about their teachers and fellow students within the university. Due to the nature of the application, as well as its context, students need to be able to access SMS on a 24/7 basis, so that they can check and receive important notices timely. As SMS contains private and confidential information such as student and teachers' details, users must also be authenticated in order to use its services. As SMS is an application that serves a large number of users in real time: teachers, students and administrators, it has to be performant in terms of delivering its services. This holds especially true during peak periods such as checking of results when they are released.

Stakeholders

Stakeholder	Stakeholder Description
Students	Students of the universities are the primary users of this application. They would use this application frequently to manage their day-to-day academic-related activities, ranging from checking enrolled courses, taking attendances, viewing notices and so on.
Teaching Staff	Teachers are also considered to be the primary users of the application. They would utilise the student portal to disseminate announcements, as well as release component results to the students.
System Administrators	System administrators, the secondary users of SMS, provide administrative support and configuration for all stakeholders, as well as creating semesters, courses and classes.

Key Use Cases

<u>Log in</u>	
Use Case ID	1
Description	Students are required to log in to use SMS, only them and nobody else should be able to log into their own account. This is to ensure confidentiality and privacy of the information that resides within the system.
Actors	Students
Main Flow of events	Student logs in by keying in their student email and password. After authentication, they are automatically brought to the home page of SMS.
Alternative Flow of events	If a student entered invalid credentials, they will be unable to access the school system, and are redirected back into the login page that indicates an error message. The student can either choose to login again, or reset his/her password.
Pre-conditions	The student must be registered by a system administrator in the student portal.
Post-conditions	None

<u>View Enrolled Classes</u>	
Use Case ID	2
Description	<p>This use case allows a student to view the classes that he is currently enrolled in, for the semester. There are a couple of scenarios concerning courses. Each university student typically enroll in courses before the start of the term, and from then till the first few weeks of the term, drop or enroll into courses.</p> <p>Hence, it is common for students to feel disorganized and confused about their current enrolled courses and their timetable. With this feature, it allows them to view and manage their course enrollment.</p>
Actors	Student
Main Flow of events	Having logged into the SMS, the student should be able to navigate to a tab which shows his/her latest and updated list of enrolled courses for the semester.
Alternative Flow of events	Student does not have any enrolled classes, and the system will show the reason, such as vacation and leave of absence.
Pre-conditions	Student must be logged into SMS System Administrator must have enrolled the student in the courses to be up-to-date.
Post-conditions	None

<u>View Results</u>

Use Case ID	3
Description	Post course tests and examinations, teachers will mark students' papers and enter their grades on the platform. Students will then be able to retrieve their results via SMS, within their own accounts.
Actors	Student
Main Flow of events	Having logged in to the system, a student can proceed to click on View Result on the menu. The student then selects a course where he/she can view the results.
Alternative Flow of events	Selection of a course where results have not been published will lead to an empty result page.
Pre-conditions	Teaching staff must be logged in to SMS and enter results in courses that he/she is teaching Student must be logged in and enrolled in the class.
Post-conditions	Student can choose to appeal their results to the teaching staff.

Take Attendance

Use Case ID	4
Description	In each class, students are expected to take their own attendance using SMS, so that other stakeholders can track their attendance in real time.
Actors	Students
Main Flow of events	Student navigates to his course enrollment, clicks on the class that he is currently in, and proceeds to click on the "mark attendance" to mark their attendance.
Alternative Flow of events	If the class session that the student marks attendance is not currently ongoing, the student would not be able to mark attendance successfully, and the relevant error message will be shown.
Pre-conditions	The student must be logged in to SMS and navigate to a particular class, then navigate to the attendance taking page. The class session the student is marking attendance for must be ongoing at the moment.
Post-conditions	The student should see a "attendance successfully marked" message after marking their attendance successfully. The attendance percentage will change according to reflect the student's presence.

View Classlist

Use Case ID	5
Description	Students can view the information of other students in the classes that they are currently enrolled in. This would facilitate use cases such as group discussions and

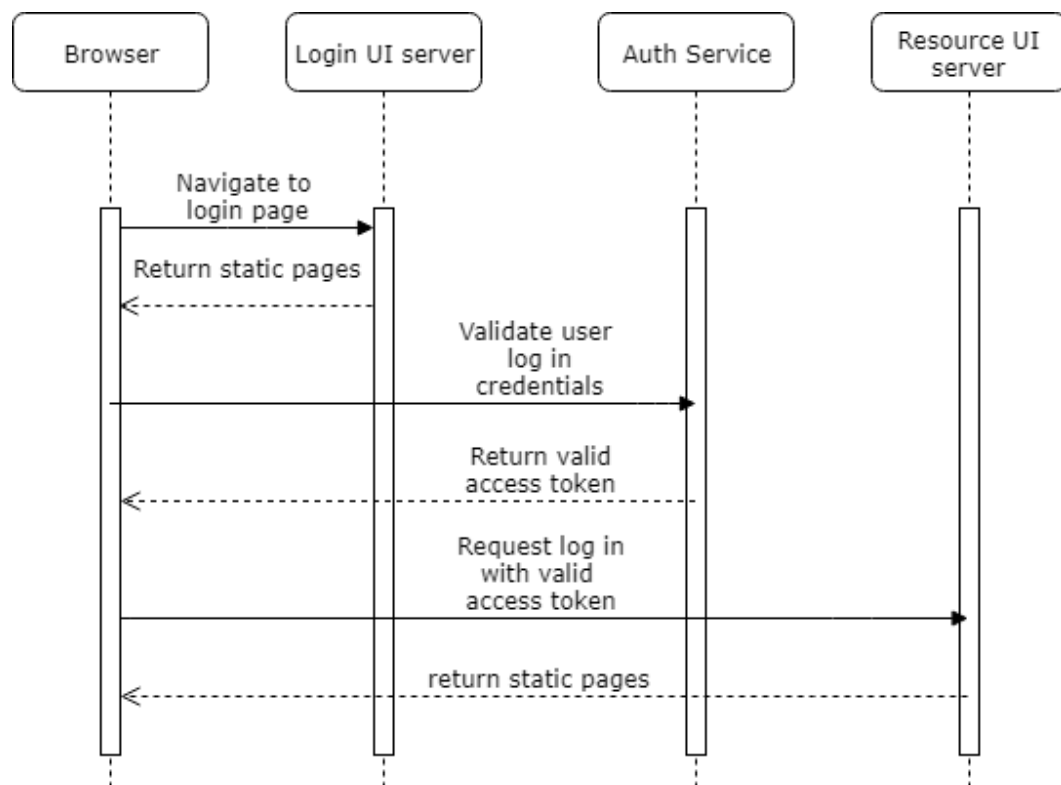
	collaborations, reaching out to peers easily for support, planning for group projects and assignments, and so on.
Actors	Students
Main Flow of events	Having logged in to SMS, a student clicks on the class that they want to view the classlist for. The student then clicks on the “View Classlist” button. The student should be able to see a list of other students and their relevant information displayed in a table.
Alternative Flow of events	None
Pre-conditions	The student must be logged in to SMS and navigate to a particular class. Student must be enrolled in the class to be able to see the classlist.
Post-conditions	Students should be able to see the classlist in table form for the class they want to see.

<u>Pay School Fees</u>	
Use Case ID	6
Description	As school fees are being administered on a semester basis, students are required to pay their school fees on time. Students can pay their school fees for the semester using SMS. The student portal integrates a third party API for this purpose.
Actors	Students
Main Flow of events	The student clicks on “pay school fees”, and is thus redirected to the stripe payment page, after which they will complete the steps and pay through Stripe API.
Alternative Flow of events	If the student has insufficient funds in his bank, the payment will be rejected and an error message will be shown.
Pre-conditions	Student should be logged in to SMS and navigate to the payment page. The student should have sufficient funds in his account prior to payment.
Post-conditions	Students should see a success message stating that their payment was successful.

Views

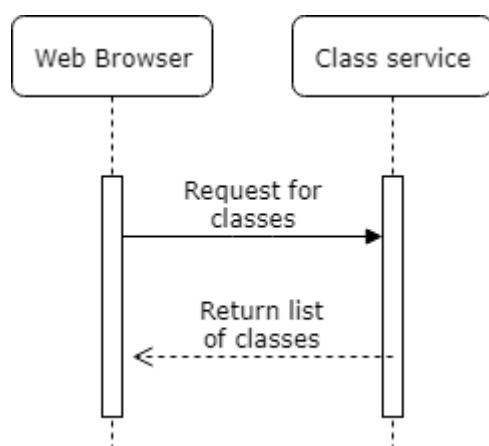
Sequence Diagram

1. Login



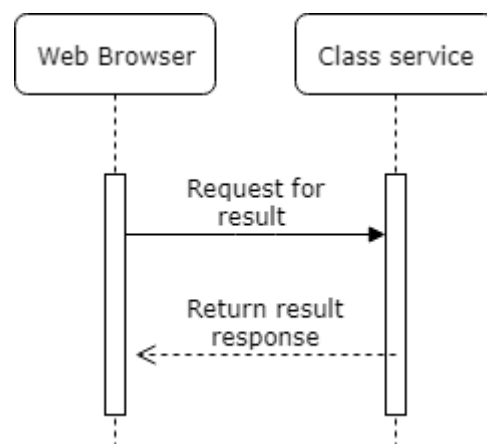
2. View Class Information

Pre-condition: Students have logged in to the portal



3. View Result

Pre-condition: Students have logged in to the portal

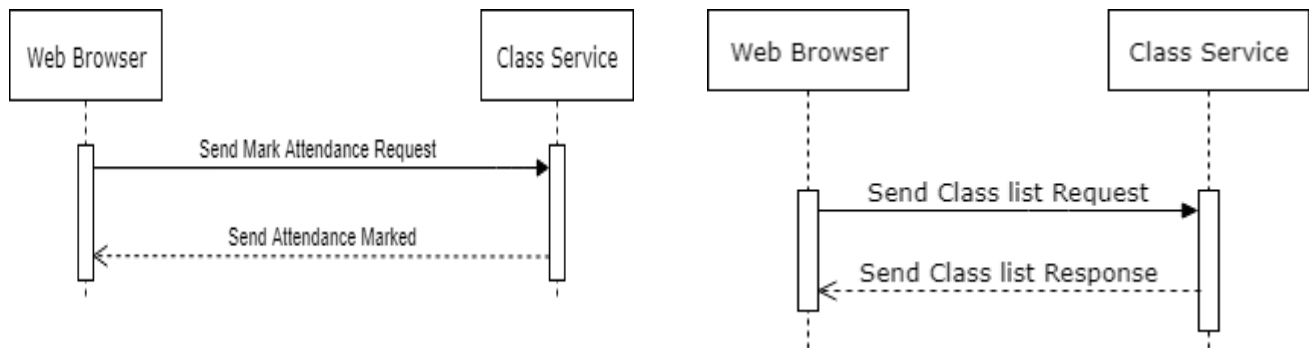


4. Take Attendance

Pre-condition: Students have logged in to the portal and navigate to a particular class. He proceeds to click "Attendance" icon to navigate to the Attendance taking page.

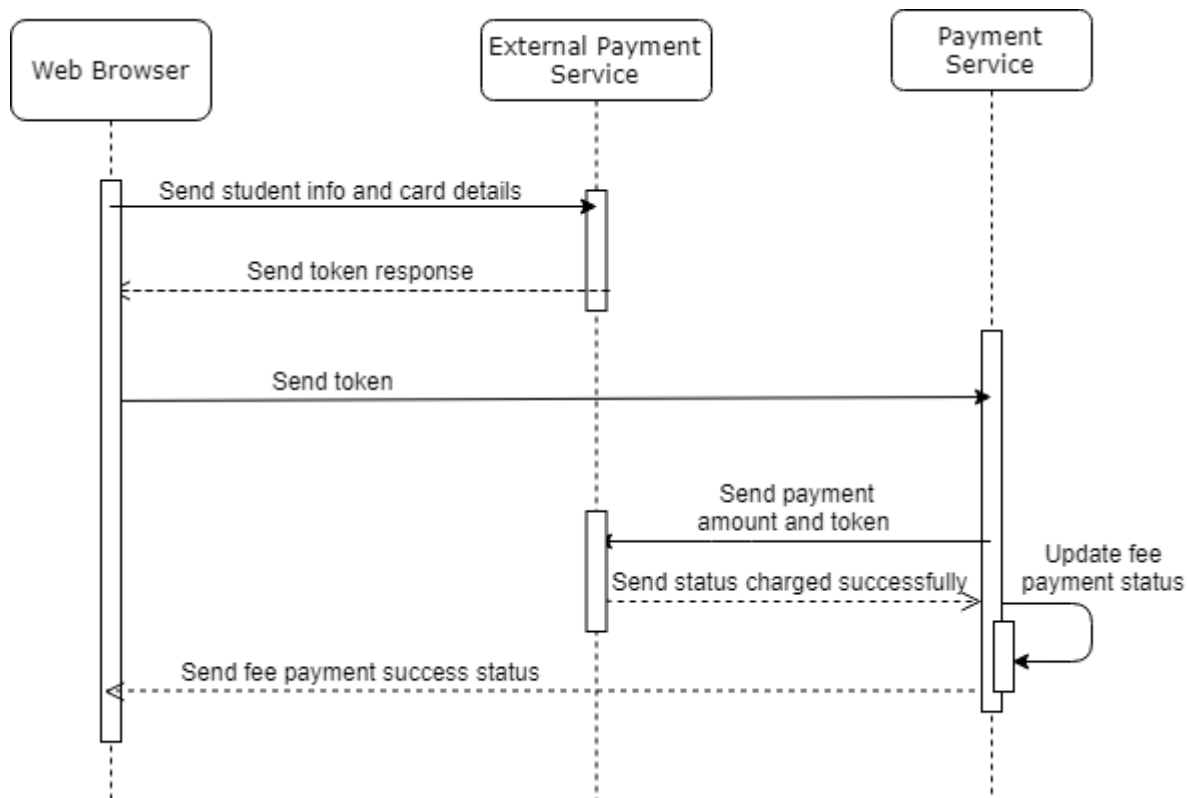
5. View Classlist

Pre-condition: Students have logged in to the portal and navigate to a particular class.

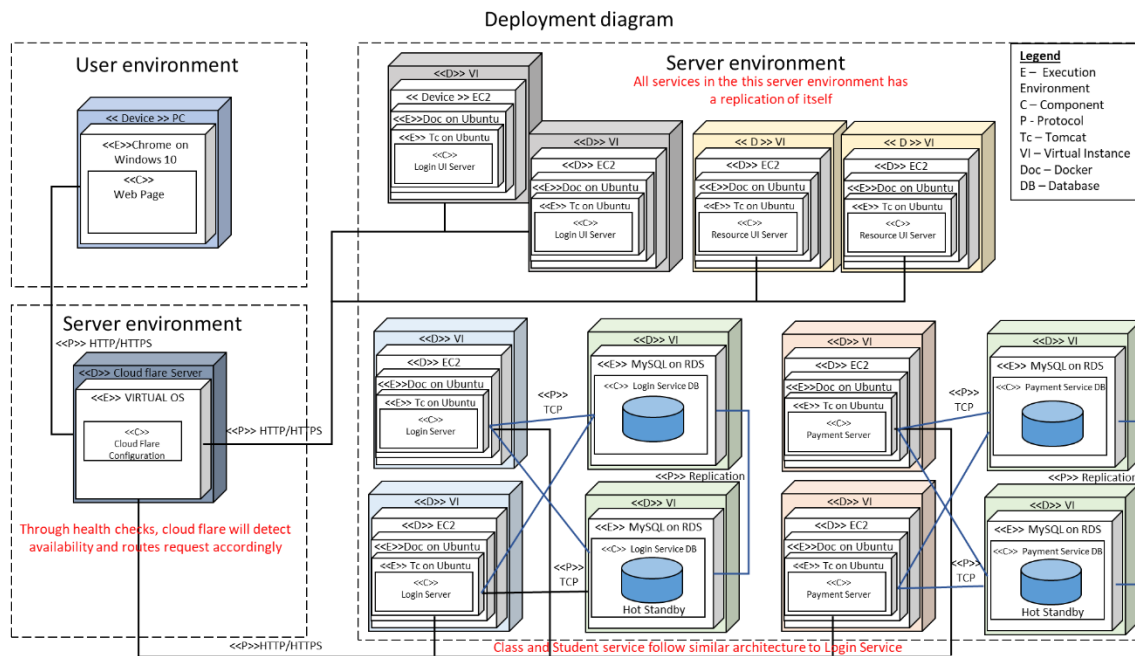


6. Payment of Fees

Pre-condition: Students have logged in to the portal and navigate to the payment page.



Deployment Diagram



Network Diagram

