SmartLib

USE CASE MODEL AND DESCRIPTION
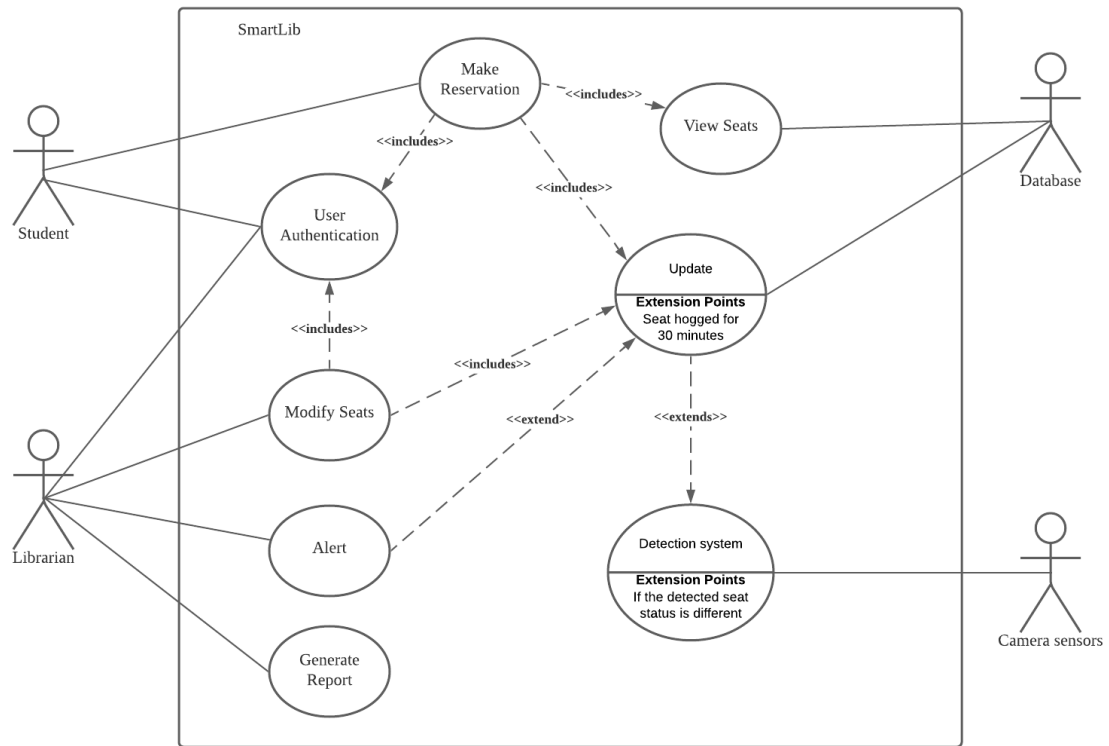
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Team Xeon

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REVISION HISTORY

Version	Date	Author	Description of Changes	Approved by
1.0	02/02/2021	Kenny Voo Tze Rung	Preliminary Version	Kenny Voo Tze Rung
2.0	10/03/2021	Kong Hou Jing, Kenny Voo Tze Rung	Updated use case model and descriptions	Kenny Voo Tze Rung

SmartLib

Use Case Description

Use Case ID:	1		
Use Case Name:	ViewSeats		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	28/1/21	Date Last Updated:	10/3/21

Actor:	Student, Librarian, database
Description:	The user/librarian can check the status of the seats in the library. The status of each seat will be displayed in different colours.
Preconditions:	1. The device must be connected to the internet. 2. The application must be able to retrieve data from the database
Postconditions:	1. The status of each seat in the library is displayed on screen.
Priority:	High.
Frequency of Use:	Two times a day.
Flow of Events:	1. The student/ librarian connect to SmartLib website 2. The map of the library with the status of each seat will be shown on the screen. 3. The status of each seat is retrieved from the database. 4. The status of the seats will be displayed in either orange(occupied) , blue (reserved) ,green (available), red(hogged), grey(unavailable) . 5. By default, the ground floor of the library will be displayed but user/ librarian can check on different floors by selecting the floor level.
Alternative Flows:	NiL
Exceptions:	NIL

Includes:	Nil
Special Requirements:	The application must be able to show the status of the seats in real time.
Assumptions:	NIL
Notes and Issues:	NIL

Use Case ID:	2		
Use Case Name:	MakeReservation		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	28/1/21	Date Last Updated:	10/3/21

Actor:	Student
Description:	The student can reserve an empty seat for 15 minutes.
Preconditions:	1. The student signed into his/her account 2. The student views and chooses the empty seat shown on the map of the library 3. The student clicks on 'book'
Postconditions:	1. The seat is reserved for 15 minutes
Priority:	High.
Frequency of Use:	Two times a day.
Flow of Events:	1. The user uses the included use case UserAuthentication to sign into his/her account. 2. The user uses the included use case ViewSeat to find an empty seat in the library. 3. The user clicks on the empty seat.

	4. After confirmation from the user, the status of the seat is updated in the included use case UpdateSeats and the seat will be reserved for 15 minutes
Alternative Flows:	Nil
Exceptions:	EX1 : The user failed to reach the seat after 15 minutes 1. The reservation will be canceled
Includes:	ViewSeats ,UserAuthentication, UpdateSeats
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	3		
Use Case Name:	DetectSeats		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	28/1/21	Date Last Updated:	10/3/21

Actor:	Camera
Description:	The application will stream the live feed image from the cameras. The application will use a deep learning model to check the status of the seats and update the status to the database via wifi.
Preconditions:	1. The application received the photo from the camera.
Postconditions:	1. The status of each seat is detected and updated if there's changes.
Priority:	High

Frequency of Use:	multiple times a day.
Flow of Events:	1. The application will stream the live feed image from the cameras 2. The application uses Convolutional Neural Network model and algorithm to detect whether the status of each seat with the photo taken. 3. The status of the seats that are occupied by users is "Occupied" while the seats that are hogged with items such as bags or books for 30 minutes is "Hogged" and the status of the seats that are empty is "Available" 4. If there's changes in the status of the seats, the status will be updated in the included use case UpdateSeats.
Alternative Flows:	AF-S4: No changes in the status of the seats 1. No action
Exceptions:	NiL
Includes:	UpdateSeats
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	4		
Use Case Name:	UpdateSeats		
Created By:	Kenny	Last Updated By:	Kenny
Date Created:	28/1/21	Date Last Updated:	1/2/21

Actor:	Database
Description:	The application will update the status or add/remove seats to the database.

Preconditions:	1. The new status of the seat is received. 2. The application is connected to the database
Postconditions:	1. The status of the seats will be updated to the database
Priority:	Medium
Frequency of Use:	multiple times a day.
Flow of Events:	1. The new status of seat is received 2. The application will update the status to the database.
Alternative Flows:	AF-S1: Librarian add/remove seats 1. Seat will be added/remove from the database
Exceptions:	NiL
Includes:	Nil
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	5		
Use Case Name:	Alert		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	28/1/21	Date Last Updated:	10/03/21

Actor:	Librarian
Description:	The application will alert the librarian if there's a seat that is chopped with items for more than 1 hour.
Preconditions:	1. The status of the seats is checked in use case DetectSeats

Postconditions:	1. Alert the librarian
Priority:	Low
Frequency of Use:	Few times a day.
Flow of Events:	1. The application will listen to updates of seats status from included use case Update seat. 2. If the status of a seat is "Hogged", the application alerts the librarian of the hogged seats.
Alternative Flows:	Nil
Exceptions:	Nil
Includes:	Update seat
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	6		
Use Case Name:	UserAuthentication		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	29/1/21	Date Last Updated:	10/3/21

Actor:	Student, Librarian
Description:	The student/ librarian can sign into student or admin account to perform specific task such as reserve seat
Preconditions:	1. SmartLib is connected to internet

Postconditions:	1. The student/librarian signed into their account
Priority:	Medium
Frequency of Use:	Multiple times a day.
Flow of Events:	1. Student/librarian press on the login button 2. System ask for user and password 3. Student/librarian enter his credential 4. If the credential is validated, it will be redirected to student/ admin homepage
Alternative Flows:	AF-S3: Failed to login 1. The system will display "Wrong user/password " 2. Return to step 2
Exceptions:	Nil
Includes:	Nil
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	7		
Use Case Name:	ModifySeats		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	29/1/21	Date Last Updated:	10/3/21

Actor:	Librarian
Description:	The librarian is able to add/remove/modify seats in the system
Preconditions:	1. SmartLib is connected to internet

	2. Librarian signed into the admin account
Postconditions:	1. The seats in the library is updated
Priority:	Low
Frequency of Use:	1 times a day.
Flow of Events:	1. The librarian uses the included use case UserAuthentication to sign into the admin account. 2. The librarian can add, remove or modify seats in the system.
Alternative Flows:	Nil
Exceptions:	Nil
Includes:	Nil
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL

Use Case ID:	8		
Use Case Name:	GenerateReport		
Created By:	Kenny	Last Updated By:	Hou Jing
Date Created:	29/1/21	Date Last Updated:	10/3/21

Actor:	Librarian
Description:	The librarian is able produce the report to show the statistics of seat occupancy in library
Preconditions:	1. SmartLib is connected to internet

	2. Librarian signed into the admin account
Postconditions:	1. The occupancy report is shown to the librarian 2. The librarian can download the report as a pdf for future reference.
Priority:	Low
Frequency of Use:	1 times a day.
Flow of Events:	1. The librarian uses the included use case UserAuthentication to sign into the admin account. 2. The librarian presses the "Generate Report " button. 3. The report is generated
Alternative Flows:	Nil
Exceptions:	Nil
Includes:	UserAuthentication
Special Requirements:	Nil
Assumptions:	Nil
Notes and Issues:	NIL