



## COLLEGE OF COMPUTER AND INFORMATION SCIENCE

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**Academic Year 2021 - 2022**

### **Seat Save: A Seat Reservation System for Malayan Colleges Laguna's Center for Learning and Information Resources**

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## **1. Introduction**

The Center for Learning and Information Resources (CLIR) or the library in Malayan Colleges Laguna (MCL) is one of the central areas of education. It is a place where visitors may spend their time studying, waiting for their next class, or reading reference materials. However, there are two problems with using the CLIR.

First, visitors, which include MCL's students, staff, and faculty members, go to the CLIR but immediately leave because there are no vacant seats. This is a common experience among visitors of the CLIR. It is not only frustrating but is also a waste of time and energy.

Second, with the current COVID-19 pandemic, it has become imperative to avoid crowded places to minimize the spread of the virus. Because of this, the government has set policies to control the operational capacities of certain places (Department of Health, 2021). These policies include a reduction in the operational capacities of libraries. With limited seats available, it becomes harder for visitors to secure seats.

In the developers' previous paper, they have tried to solve these problems by creating a system called Sparse (Lipat et al, 2022). Sparse is a reservation and room occupancy system that uses a computer vision model to count the number of people inside CLIR. Through this, the developers were able to show that the reservation and room occupancy system would be useful for visitors and librarians of the CLIR.

In developing Sparse, one of the developers' focuses was to find novel ways to solve the problems that the CLIR is facing. Because of the developers' focus on novel solutions, if the CLIR were to actually use the system, they would face multiple challenges. (1) While the developers have shown the feasibility of the computer vision based room occupancy system, it is not yet mature enough to support real world deployment.(2) The system was not developed with user interface (UI) and user experience (UX) as a primary concern. Feedback shows that UI and UX must be one of the focuses of the system. (3) Suggestions of end users were not implemented. (4) The system was not fully compatible with the CLIR's reservation system and operations.

There are existing solutions that the CLIR may use. One of these is Microsoft Bookings which CLIR is currently using. Another solution is Springshare LibCal which the CLIR is looking to use. However, as it will be discussed in the system analysis, these solutions do not fully meet the needs of the CLIR. It is for these reasons that we are going to be focusing on creating a reservation system that would be tailored to the CLIR's needs.

### **1.1 Statement of the Problem**

#### **General Problem**

- How to develop a reservation system for the CLIR?

#### **Specific Problem**

- What features should be implemented in the system?
- How should the system be designed to accommodate these features?

- How should the design of the system be implemented?

## **1.2 Objectives of the Project**

### **General Objective**

- To develop a reservation system for the CLIR

### **Specific Objective**

- To identify what features should be implemented
- To design the system to accommodate the identified features
- To implement the design of the system

## **1.3 Scope and Limitations**

The scope of the project includes development of a reservation system for the CLIR. However, this will not include the actual integration and deployment of the system to the processes of the CLIR. The reservation system will also only be developed for the Einstein CLIR as, according to preliminary interviews, the Rizal CLIR will not be available for booking. The developers are also not permitted to go to the MCL campus due to the pandemic. This may limit the testing activities of the developers.

## **2. Planning**

### **2.1 Software Development Methodology**

The methodology that the developers used is the iterative model as shown in Figure 1. It begins with the most basic requirements and focuses on a simple implementation, which then progressively increases in complexity and functionality – known as iteration – until the final system is complete and ready for deployment. Requirement gathering & analysis, design, development, testing, and review are all included in each iteration. Each iteration is evaluated to see if more features are needed or if existing features can be improved. Each iteration ends when the review phase is done. The following set of features is defined based on the results of the last iteration's review. Once the updated requirements have been determined, the next iteration's design and development process begins. (SDLC Iterative Model, 2021).

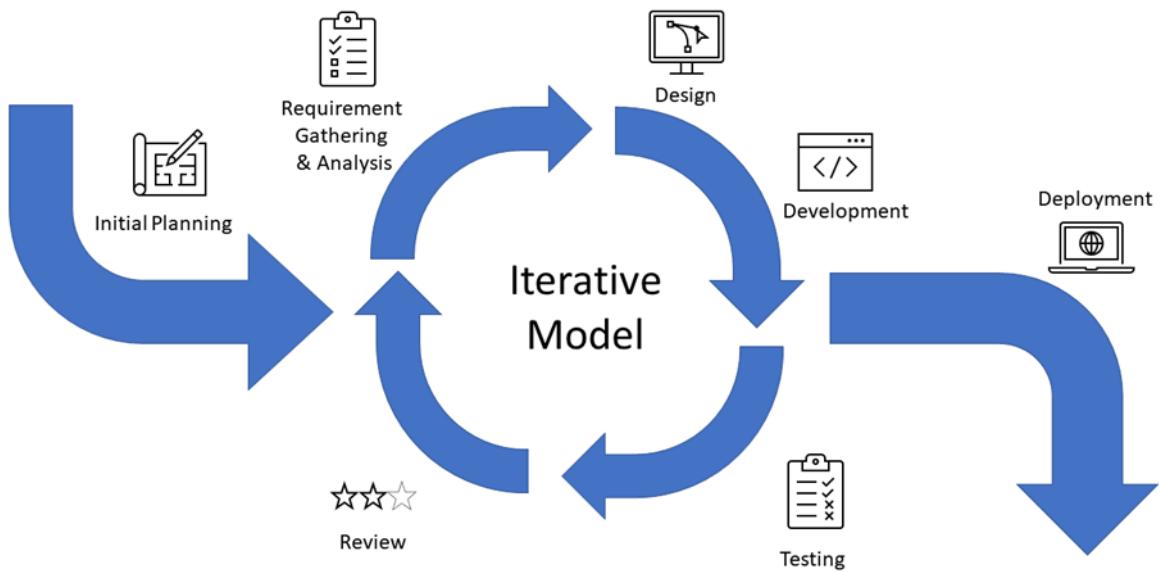


Figure 1. Iterative Model

The developers chose the iterative model for three primary reasons. First, the working system is deployed rapidly and frequently. Second, development is also more manageable as it is easier to test the system and manage risks in smaller iterations. Lastly, this also allows developers to have the ability to quickly adjust to ever-changing needs.

Additionally, the developers decided to borrow techniques from the Scrum methodology. These techniques include sprints, daily scrum, sprint planning, sprint review and sprint retrospective. According to Rehkopf (2018), a sprint is a short and timed period during which a scrum team works to complete a specific amount of work. While daily scrum is a 15-minute meeting that takes place everyday at the same time where it tracks the work of the members and the team as a whole. Meanwhile, sprint planning determines what goals can be accomplished and how they will be done for the next sprint while keeping the product backlog in mind. The scrum team, as a whole, collaborates on sprint planning. On the other hand, sprint review is demonstrating the system to the stakeholders and teammates. While sprint retrospective discusses what processes went well, what needs improvements, and how to improve the said process.

However, due to differences in the developer's schedule, changes were made in the technique adopted in scrum. Daily scrum is changed to daily update. Instead of a meeting, members have to update the team at 10:00 am every day on their group chat. Updates include what the individual did accomplish yesterday, what it plans to do today, and any impediments for the day. There were times that practices were not followed to allow the team to be more flexible on certain times during the development period. Towards the end of the development, daily updates were changed to update as needed. Members will update the group based on the amount of work done. This is due to the differences between the developer's working style and schedule.

## **2.2 Timeline**

Figure 2 shows the schedule for the proposed system. The week shown in the gantt chart is based on the schedule of the said semester. A semester is 12 weeks long. The semester started on March 21, 2022 and ended on June 10, 2022.

To start the development of the system, the team opted to do workshops to learn new processes and tools that will be used for the development of the system. The workshop took three days in week two and three.

The first sprint took place from week three to seven. The main objective of the first sprint is to develop a minimum viable product (MVP). Requirements gathering and sprint planning took place on week three. While the UI design took place from week three to week four. Software design took place in week four. Meanwhile, the development took place from week four to week seven, spanning four weeks. Sprint review and retrospective of sprint one and sprint planning of sprint two took place on one day on week seven.

The second sprint took place from week seven to week nine. The main objective of the second sprint is to add QR code and seat map to the developed system. The UI design and software design took place in week seven. The development spanned three weeks from week seven to week nine. Sprint review and retrospective of sprint two and sprint planning of sprint three took place on one day on week nine.

The third sprint and the documentation took place on week nine and week ten. The main objective of the last sprint is to implement essential features from the feedback on the second sprint and as well as to debug and polish the system.

School Week	WK 2	WK 3	WK 4	WK 5	WK 6	WK 7	WK 8	WK 9	WK 10
Week Start	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23
Week End	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29
Workshops									
<b>Sprint 1</b>									
Requirements Gathering									
Sprint Planning									
User Interface Design									
Software Design									
Software Development									
Sprint Review									
Sprint Retrospective									
<b>Sprint 2</b>									
Sprint Planning									
User Interface Design									
Software Design									
Software Development									
Sprint Review									
Sprint Retrospective									
<b>Sprint 3</b>									
Sprint Planning									
Software Development									
Debugging and Polishing									
Documentation									

Figure 2. Gantt Chart of Seat Save

### 2.3 Areas of Expertise

To ensure the quality of the system, parts of the processes were given a Subject Matter Expert (SME). An SME is a person who offers knowledge and skills in a certain field. They are responsible for developing the procedures for completing tasks, decision-making, process improvement, and serving as the team's "go to" person for questions and problems in their area of expertise. Each member of the team became a subject matter expert.

First is Job Lipat who is the SME of Software Design and Architecture and the Scrum Master. As an SME of Software Design and Architecture, he is responsible for setting the foundation of the system's structure code and the organization of the system. As a Scrum Master, he is responsible for ensuring that the team follows agile values, principles, processes, and practices that the team agreed to use and as well as monitors the team's progress to make sure the project is completed on time.

Second is Mark Anthony Mamarag, SME of Quality Assurance and Testing. He makes sure the system is working according to the requirements.

Third is Madeline Isabel Galang, SME of User Requirements and the Product Owner. She is responsible for maximizing the value of the product, communication with the resource person, and gathering, prioritizing and clarifying the product backlog.

Lastly, Charmaine Eunice Rabano, SME of User Interface and User Experience. She is responsible for improving user comfort and experience and as well as providing valuable insights for the best designs for users.

## 2.4 Tools

The developers used various tools for managing the development of the system.

First is Jira, which is a known agile project management software. The team used Jira for listing down user stories and tasks, grouping user stories into epics, prioritizing and estimating story point of the user story, tracking the progress, creating and linking of subtasks, listing of bugs found and linking the user story to GitHub for keeping track of its development.

Second is Confluence, a collaboration wiki platform that enables teams to efficiently collaborate and share knowledge. The team used it for documentation purposes and Jira integrations such as meeting notes, sharing of resources, reminders, and linking of notes to Jira's story, subtask, or bugs.

Third is Messenger, a known instant messaging platform. The team used this for the daily update which was mentioned earlier in 2.1 Software Development Methodology. It is also used for communication to the whole group and as one on one between members for a variety of reasons such as asking questions, setting meetings, and notifying each other.

Last is Microsoft Teams, a known business communication platform. The team used it for meetings that involved video call or sharing of screens. It is also used in Sprint Reviews which is the interview with the resource person.

The development management tools described above were chosen based on the developers' familiarity with them – for Messenger and Microsoft Teams – and known and used in the IT industry – for Jira and Confluence. Furthermore, because the project has no funding, the developers prefer free tools.

### **3. System Analysis**

#### **3.1 Requirements Gathering**

At the start of the project, requirements gathering is done in order to determine the initial backlog items. The developers reviewed reference websites and feedback of Sparse in order to determine the requirements of the system.

First reference website is Book-A-Seat (MCL CLIR, n.d.) which is the current system used by the CLIR. Seat Save's seat, date and period selection, seat type, and visitor information were adapted from this. However, there are three problems with Book-A-Seat. First problem is that there is no seat map, there's no way to know where the seat is located. Second is the duration of the period. The period in the system has a duration of 2 hours, which is not in line with MCL's schedule period which is 1 hour and 30 minutes. Third problem is that the visitor has to fill up the information every time he/she books a seat.

Second reference website is Springshare LibCal which is the main competitor since CLIR intends to use it in the upcoming academic school year. The team looked at and reviewed De La Salle University's LibCal (DLSU, n.d.) and Mapúa University's LibCal (Mapúa University, n.d.). Seat Save's booking details and booking expiration was adapted from this. The selection of the color-coded selection of time was also adapted, but instead was used in Seat Save's seat map. However, the problem with it is that it doesn't have a seat map and the visitor, on Mapua's LibCal, has to fill up the information every time he/she books a seat.

Another reference of this system is the previous system that the team have created, which is Sparse (Lipat et al, 2022) . It also includes the resource persons' feedback from the interview and as well as the visitors' feedback. The resource persons and visitors found the reservation system useful. However, most commented that the reservation details should be shown, a seat map and seat reservation would be better, and as well to improve the UI and UX of the website.

The developers decided to implement the methodology mentioned earlier, thus the output of the first sprint will only be a minimum viable product (MVP). MVP is the version of the product that contains just enough features to be usable by the end users.

For the rest of the sprint, the requirements of the system were determined during the sprint review. The developers have consulted one resource person who is a third-year IT student who frequently uses the CLIR. Unfortunately, the CLIR Staff has been unresponsive, and the team was not able to get any feedback from CLIR. However, the student resource person was willing to review the librarian side of the system.

In the sprint review, the developers explained the system and the resource person is free to explore the features. After each feature, the developers solicited feedback on the features and as well as suggestions for additional features. Then, these features were implemented in the next sprint.

### **3.2 User Stories**

From the requirements gathering and sprint reviews, the developers have identified the user stories of the system. There are three users of the system, namely the librarian, head librarian and the visitor. The visitor has three different types of users, namely staff, faculty and student. The user stories that were identified for the three types of users are summarized in Table 1, Table 2, and Table 3. The full user stories in the form of “As a, I want to, so that” could be seen in Appendix A.

Table 1. The Summary of User Stories of Librarians

<b>Issue key</b>	<b>User Story Summary</b>
HL-32	Login
HL-26	Booking Check In & Check Out
HL-148	Scan Visitor's QR code to Check In
HL-49	View Bookings
HL-120	Seat Map for Date and Period (View Bookings)
HL-36	Seat Map Occupancy Color Coded
HL-8	Reports

Table 2. The Summary of User Stories of Head Librarians

<b>Issue key</b>	<b>User Story Summary</b>
HL-170	Login
HL-50	Add Seat
HL-18	Edit Seat
HL-51	Delete Seat
HL-23	Activate and Deactivate Seat
HL-44	Customizable Seat Map
HL-29	Specify Booking Day (Regular) & Time
HL-89	Specify Booking Day (Override) & Time

Table 3. The Summary of User Stories of Visitors

Issue key	User Story Summary
HL-42	Register Account
HL-41	Login
HL-11	Seat Booking
HL-9	Specify Booking Details
HL-13	Seat Availability
HL-30	Booking QR Code
HL-28	Booking Proof Email
HL-75	Booking Expiration
HL-16	View Booking Details
HL-40	Checkout Booking
HL-34	Cancel Booking
HL-119	Seat Map
HL-33	Seat Map Occupancy Color-Coded

## 4. System Design

### 4.1 Interface Design

In each iteration, the developers started the system design by designing the user interface of the system. This is done so that the developers could get immediate feedback from the end users.

In designing the user interface, the developers first create a moodboard. According to Guerra (2020), the moodboard is a collection of visual references that is used to guide the designers in making creative decisions. This was used as a reference on how the user interface should look and feel. Then, the developers created wireframes based on the user stories that the developers have selected for the current sprint. Wireframes are low fidelity user interface designs whose purpose is to communicate the structure of the interface (Usability Gov, 2013).The developers then met up to discuss the wireframes and select which parts of the wireframes will be part of the mockup. According to UXPin (2022), mockups are an accurate representation of the user interface which will be implemented in the current sprint. The mockup is created by the UI/UX SME using the ideas gathered from the wireframes.

The tool that was used to create the moodboard, wireframes and mockups is Figma. To keep the documentation readable, the pictures of the figma designs of the moodboard, wireframes and mockups could be seen in Appendix B, Appendix C, and Appendix D respectively.

## 4.2 System Diagram

Figure 3 shows the different components of the system and their interactions with each other. Outside the system, are visitors and librarians who are the end users of the system. These users access the system through the client application that is hosted in Vercel. In order to perform the tasks of the end users, the client application creates requests to the Seat Save API which is hosted on an Azure web application service. The API contains the application, domain and data access logic of the system. To store data, the API uses an SQL Server database which is also hosted in Azure. Lastly, for tasks that need to be scheduled, the system uses an Azure Function that creates a request to the API.

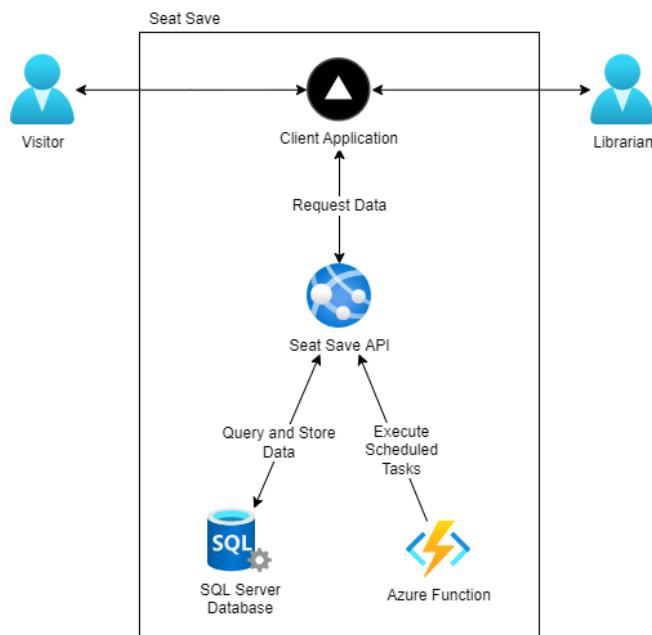


Figure 3. The System Diagram of Seat Save

## 4.3 System Architecture

As seen in Figure 4, the system uses a 4 layer architecture. The top most layer is the user interface. The user interface contains all the logic for displaying information to the user. It uses HTTP requests to communicate with the API Interface or presentation layer. The API interface or presentation layer contains the logic on handling user interactions with the system. Below the presentation layer is the domain layer. The domain layer contains the business logic of the application. In order to persist the changes in the domain classes, the domain layer uses the data access layer.

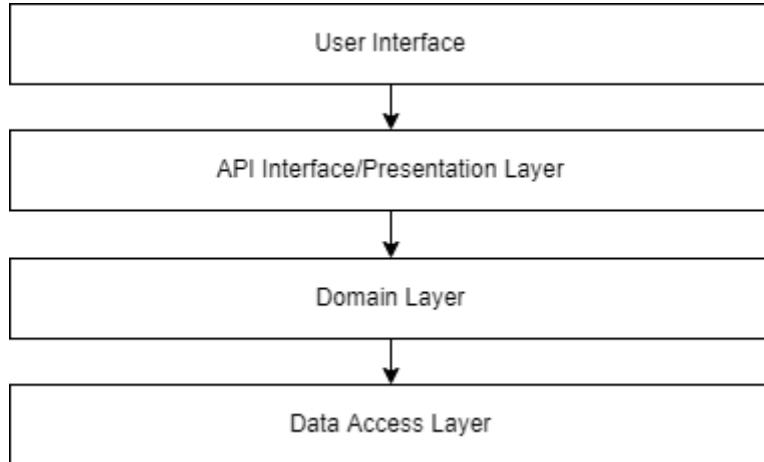


Figure 4. The System Architecture of Seat Save

#### 4.4 Analysis Models

In order to better understand the requirements, the developers created different analysis models of the system in the first sprint. The analysis diagrams that the developers created were use case diagrams, data flow diagrams (DFD) and activity diagrams. These models were only used in the first sprint as they understood the system better by the second sprint.

##### A. Use Case Diagram

Figure 5 shows the use case diagram of the system. It could be seen that there are 4 primary types of users in the system. There are visitors, guests, librarians and head librarians. Students, Faculty Members and Staff are subtypes of visitors. Guests could register an account and could login. Once logged in, visitors could create, cancel, view and checkout bookings. Librarians, on the other hand, can check in, check out, search and view bookings. The head librarian can manage seats, set the schedule of when visitors could book the CLIR, and override days when visitors could book seats in the CLIR.

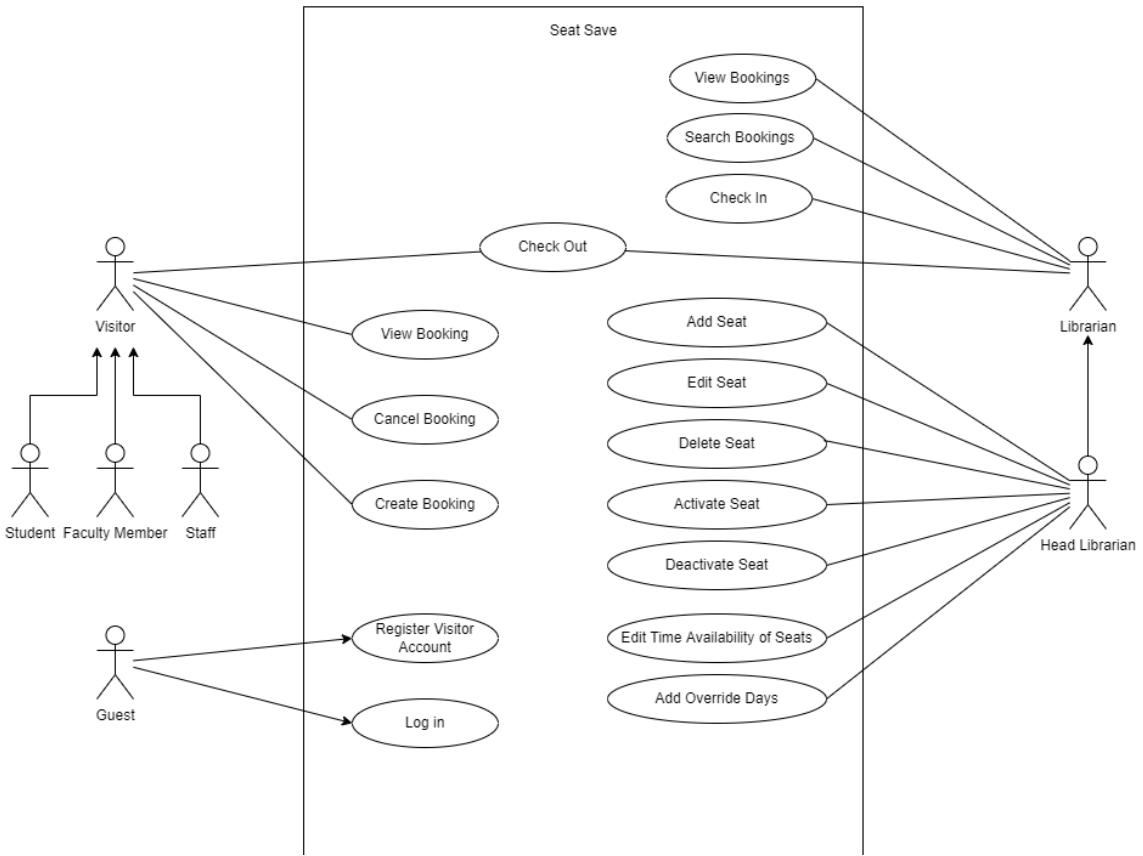


Figure 5. The Use Case Diagram of Seat Save

#### B. Data Flow Diagram

Figure 6 shows the context diagram of the system. The context diagram shows the system as one process that different entities interact with. The entities that interact with the system are the visitors, librarians, and head librarians. Between the entities and the system are arrows that show the interactions of the entities and the system. These interactions are from the use case diagram in Figure 5.

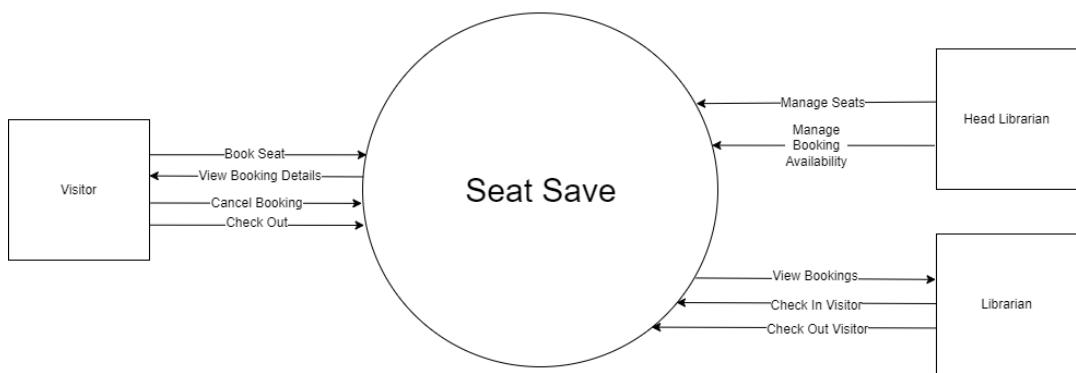


Figure 6. Context Diagram of Seat Save

Once the context diagram of the system was created, it was broken down into the level 1 DFD. The level 1 DFD shows how the system works in greater detail. As it could be

seen in Figure 7, the interactions between the system and the entities in the context diagram have been converted into processes. Moreover, arrows that denote data flow and data store symbols have been added to the diagram.

Converting the context diagram to a level 1 data flow diagram, we are able to see what data is needed by a process, where data comes from, what data a process produces, and where data ends up.

The processes in the diagram include manage seats, manage booking availability, create booking, view bookings, cancel booking, check in booking and check out. The data stores that have been added include seats, booking availability, and bookings

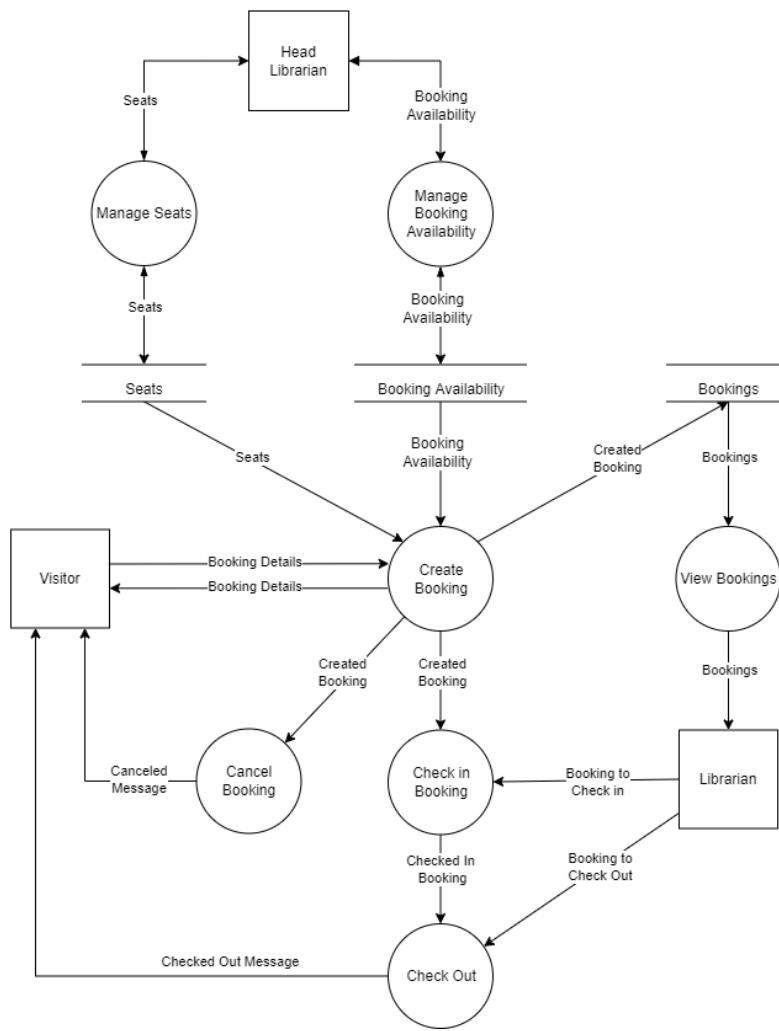


Figure 7. Level 1 Data Flow Diagram of the system

### C. Activity Diagram

The activity diagram goes into more detail on how each use case of the system is achieved. It shows where the process starts and ends, the step by step process to complete the use case, and who is responsible for accomplishing each step. The activity diagram of

the system could be seen in Appendix E. The diagram was moved to the appendix to make the document more readable.

## 4.5 Software Design

### A. Design Approach

The design approach that the developers used is the “just enough design up front” approach. This means that only the necessary parts of the system will be designed before development. This allows the developers to be more agile when requirements change and allows developers to waste less time on implementation details while still having a common idea on the software design. Adhering to this approach, the developers only designed the domain layer as all other layers depend on the domain layer.

To design the domain layer, the developers used domain driven design. Domain driven design was proposed by Evans (2003) and it focuses on creating a domain model based on the realities of the problem domain as relevant to the use cases (Microsoft, 2022). The developers chose this design approach to allow the developers to discuss, and implement the system in a way that could be understood by all developers and end users.

### B. High Level Design

The high level design of the domain layer could be seen in Figure 8. It could be seen that the packages of the domain layer include the reports, booking, schedule, seat and user packages. The booking package has dependencies on the schedule, seat and user packages and the reports package is dependent on the booking package.

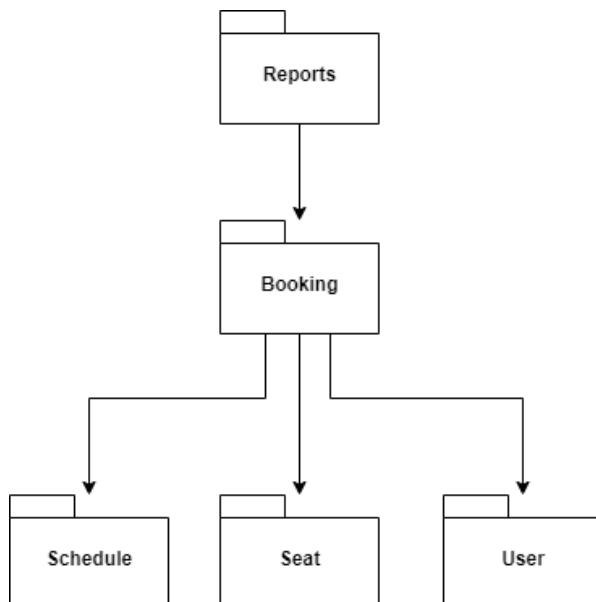


Figure 8. Packages in the Domain Layer

### C. Component Design

The component design specifies how each package in the high level design is implemented. A complete picture of the component design could be seen in Appendix F.

Figure 9 shows the component design of the schedule package. One of the classes in the package is the schedule class. The schedule class is responsible for determining the available days and periods given the availability that the user has specified. To determine these, the schedule class uses the RegularWeeklyAvailability class and SpecificDayAvailability class. The RegularWeeklyAvailability class tells the schedule on which periods the visitors could book on a day of week. On the other hand the SpecificDayAvailability class tells the schedule class the availability of booking on a specific date. The SpecificDayAvailability also takes precedence over RegularWeeklyAvailability. Both SpecificDayAvailability and RegularWeeklyAvailability use the Periods class which denotes a range time when the library could be booked.

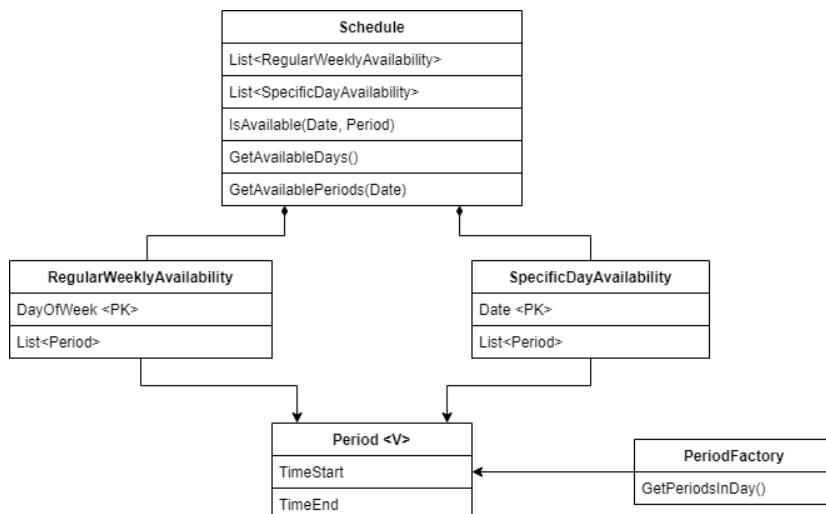


Figure 9. Classes in the Schedule Package

Figure 10 shows the classes for the user package. The user package models the users of the system as shown in the use case diagram. It could be seen that the base class of all other classes is the **User** class which contains information about the user. Under the **User** class is the **visitor** and the **librarian**. The **visitor** also has **Student**, **Faculty** and **Staff** subtypes.

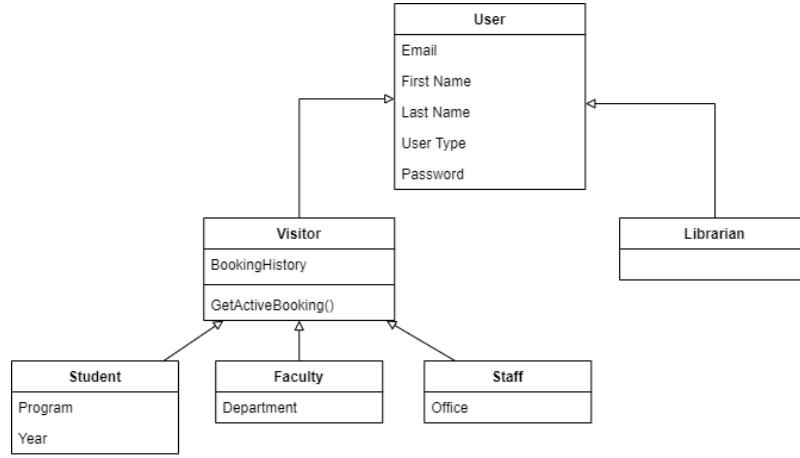


Figure 10. Classes in the User Package

Figure 11 shows the classes in the Seat package. One of the classes in the package is the **SeatMapItem** class. This class denotes an item that could be displayed in the seat map. Inheriting the **SeatMapItem** is the **Table** and **Seat** classes.

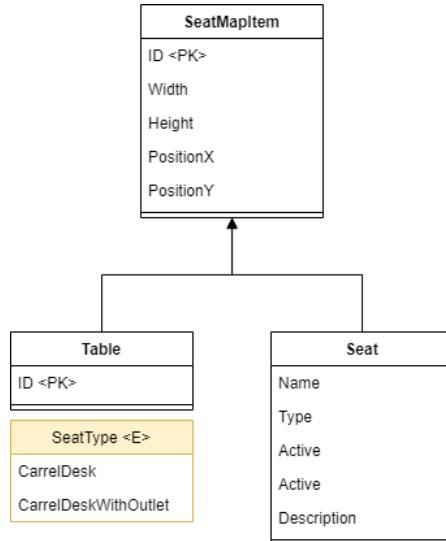


Figure 11. Classes in the Seat Package

Figure 12 shows the classes in the booking page. The package contains two primary classes. The first is the booking class which contains the details of the booking and the logic of the different operations that could be performed on a booking. The second is the **BookingService** class which is a domain service that handles the logic for making bookings and making sure bookings are valid.

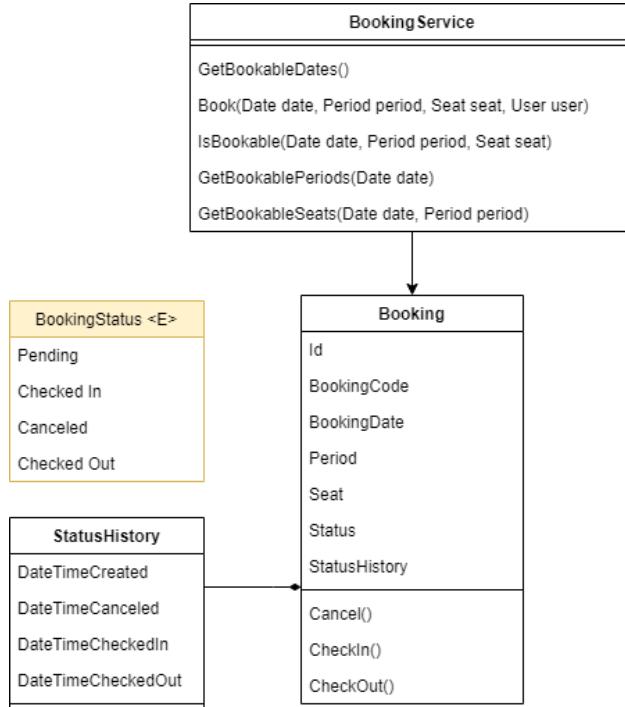


Figure 12. Classes in the Booking Package

Figure 13 shows the class in the reports package. The reports package only contains one class which is the **StudentReportsService**. The **StudentReportsService** class is responsible for the logic for generating reports about students who book seats in the CLIR.

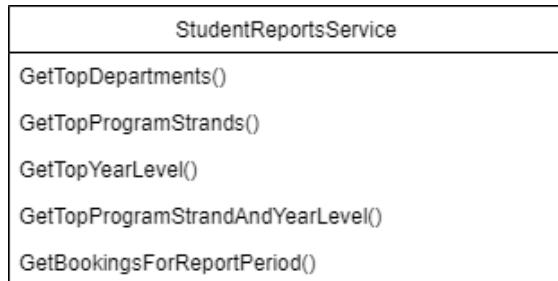


Figure 13. Class in the Reports Package

## 5 System Implementation

### 5.1 Tools, Libraries and Frameworks

The developers use various tools for managing code, developing the front and for developing the back end. These tools are summarized in Table 4, Table 5, and Table 6.

Table 4. The Tools that the Developers for Managing Code

Name	Type	Purpose
Visual Studio 2022	IDE	For editing the source code
Visual Studio Code	Code Editor	For editing the source code
Github	Repository	To share code among the developers. For continuous integration and delivery

Table 5. The Tools that the Developers Used for the Front End

Name	Type	Purpose
React	Front end framework	For creating the user interface of the system
NextJs	React Framework	To help with creating the user interface of the system
TailwindCSS	React Library	To help with styling the user interface
KonvaJs	React Library	For implementing the Seat Map feature
ApexCharts	React Library	For charts in the reports feature
React QR Code	React Library	To generate QR code
React QR Reader	React Library	To scan the generated QR code in the librarian check in feature
React XLS	React Library	To export the generated reports into Excel format
Formik	React Library	To help with forms
Yup	React Library	To help with validating fields of forms.

Table 6. The Tools that the Developers Used for the Back End

Name	Type	Purpose
ASP.NET WebApi	API Framework	For creating the API of the system
Entity Framework Core	Object-relational mapping Framework	To make it easier to retrieve and store entities
Mailkit	Email Library	For the booking confirmation email feature
Identity Framework	Authentication and Authorization Framework	For authenticating and authorizing end users.
Azure Functions	Serverless Compute Service	For triggering scheduled tasks like booking expirations.
XUnit	Backend Testing Framework	For writing and executing test cases.

## 5.2 Implementation Workflow

The workflow of how the developers implement the system has evolved throughout the different sprints. On the first sprint, the developers practiced daily updates, daily branches and daily reviews. Daily updates, as discussed previously, is the team's replacement for the daily scrum. Before posting the daily update, the developers select user stories or tasks in Jira that they are going to do for the day. Then, they must post their daily update in the team's messenger group at 10:00 am. After this, the developers are going to create a daily branch and work on the branch until the end of the day. At the end of the day, the developers must create a pull request and update Jira as needed. The next day, the developers must review and merge their partner's daily branch before the developers post their daily update again at 10:00am.

For the first week of the second sprint, the developers have the same workflow as the previous sprint. However, in the second week of the second sprint, the developers agreed to pause the daily practices because they became busy with their personal lives. During this period, the developers only updated when needed.

On the third sprint, the developers thought of a new workflow. The team figured out that the problem that they were having was that they could not focus on the project because they still had tasks for their other subjects. Because of this, the developers thought that, instead of the daily practices, the team should be allowed to focus on other subjects on the first few days of the sprint. Then after a few days, the developers must start on their tasks for the sprint. This time, however, the members will create pull requests and updates for every major task accomplished instead of every day.

## 5.3 System Features

### Visitor Features

#### Registration

Figure 14 shows the registration page of the mobile version. For the desktop version, see Appendix G. For the first part, the visitor must enter their first name, last name, email and password. All fields are required. Email domain must be either @mcl.edu.ph or @live.mcl.edu.ph. Passwords should be at least 5 characters. The user must click the continue button to move to the next part. For the second part, the visitor should select what type of visitor he/she is. There are three types of visitors namely student, faculty and staff. Students must select their department, program/strand and year/grade level. While faculty and staff must select their office. If the user already has an account, the user may click the 'LOG IN' where they will be redirected to the login page shown in Figure 15.

The figure displays two screenshots of a mobile registration form. The top screenshot shows the header 'Create Your Account' and several input fields: 'First Name' (placeholder 'First Name'), 'Last Name' (placeholder 'Last Name'), 'Email' (placeholder 'student@live.mcl.edu.ph'), and 'Password' (placeholder '\*\*\*\*\*'). Below these is a blue 'CONTINUE' button. The bottom screenshot shows the continuation of the form with a 'Type of Visitor' dropdown set to 'Staff', an 'Office' dropdown labeled 'Select Office' with a red note 'This field is required', and a large blue 'CREATE ACCOUNT' button. At the bottom of both screenshots is a link 'Already have an account? [LOG IN](#)'.

**Create Your Account**

First Name  
First Name

Last Name  
Last Name

Email  
student@live.mcl.edu.ph

Password  
\*\*\*\*\*

CONTINUE

Already have an account? [LOG IN](#)

Type of Visitor  
Staff

Office  
Select Office

This field is required

CREATE ACCOUNT

Links  
[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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Figure 14. Registration (Mobile)

### *Login*

Figure 15 shows the login page mobile version. For the desktop version, see Appendix G. In this page, the user must enter their email and password. If the user has entered valid user credentials they will be redirected to the View Booking Details page. If the user doesn't have an account, the user can create an account by pressing on the "Create" text button found on the bottom part of the form. After that the user will be redirected to the register page shown in Figure 14.

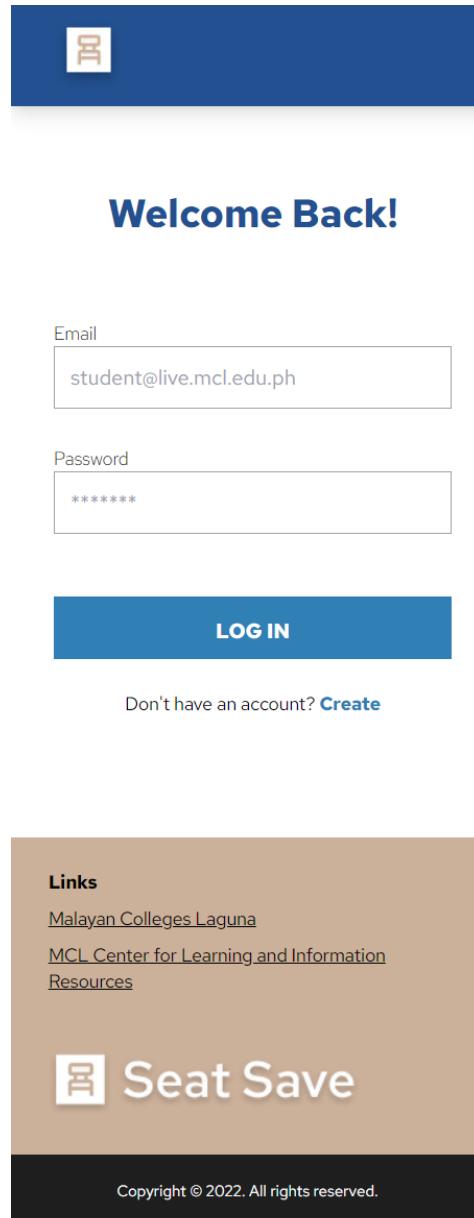


Figure 15. Login Page (Mobile)

## *Book a Seat*

Figure 16 shows the book a seat page mobile version. For the desktop version, see Appendix G. The user must select a date first for the time to show up. After clicking a time, the seat map will be shown and the user may now book a seat that is available. The user may hover their cursor on the seats to view the seat ID. If a seat is selected, its seat ID, name and description will be shown. If an available seat is selected a blue box will appear around the selected seat as an indicator. The “Book Seat” button will also be shown when an available seat is clicked. Otherwise, the indicator and the button will disappear. The users may also pan the seat map. When a booking is successful, the page will be redirected to View Booking Details (Pending page).

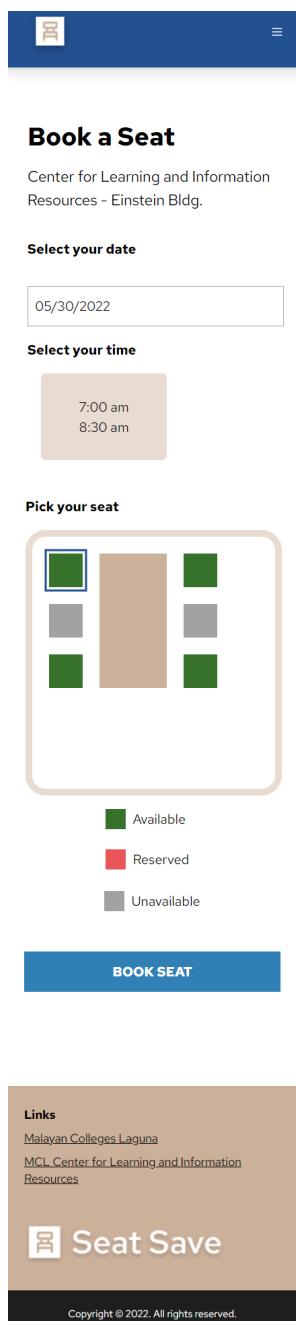


Figure 16. Book a Seat (Mobile)

### *Booking Proof Email*

Figure 17 shows a booking proof email that the users will receive after a successful booking. Booking details include code, date, period and seat information.

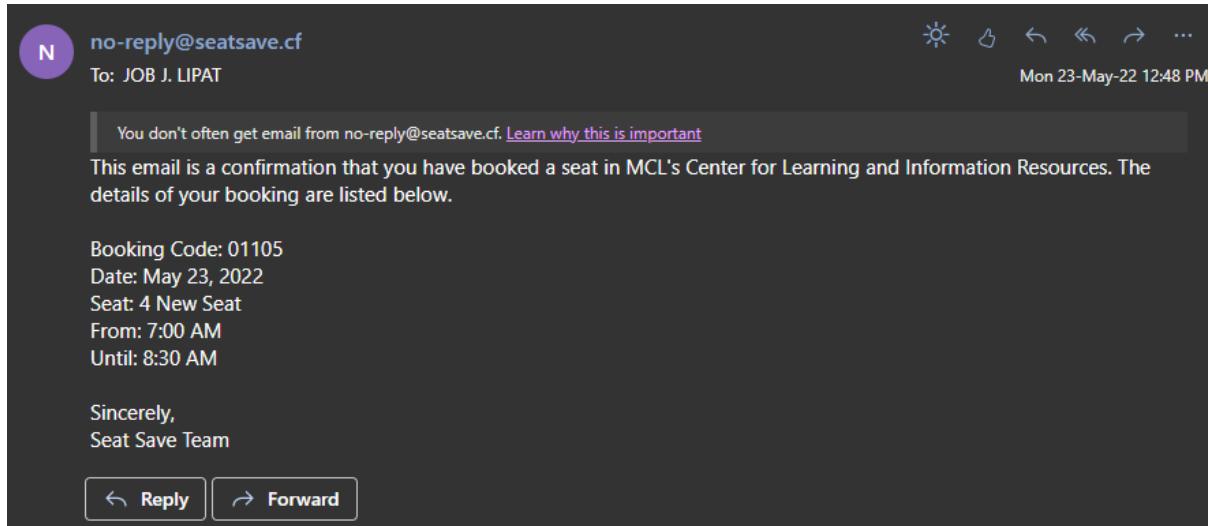


Figure 17. Booking Proof Email

### *View Booking Details (Pending)*

Figure 18 shows the view booking details (pending) page mobile version. For the desktop version, see Appendix G. This page loads after a successful booking and before check in. The user can see current booking details such as date, period, selected seat information, availability of all seats during the booking time, QR code, and booking code. When the user arrives at the CLIR, the librarian will scan the QR to confirm the booking. If there is something wrong with the QR scanner, the librarian may ask for the booking code for the confirmation. If the visitor changed his/her mind, they may opt to cancel the booking by clicking the "CANCEL BOOKING". Also, the user may pan the seat map.



Your booking is at May  
23, 2022 (7:00 am)



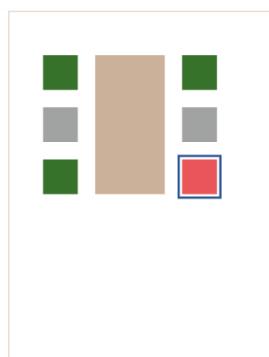
Present this code to the librarian to  
confirm your booking.

A **proof of booking** has also been  
sent to your email address.

#### Booking Details

**Date** May 23, 2022      **Time** 7:00 am to 8:30 am

**Seat**  
6 - Carrel Desk with Outlet



[Green square] Available

[Red square] Reserved

[Grey square] Unavailable

**CANCEL BOOKING**

**Links**  
[Malayan Colleges Laguna](#)  
[MCL\\_Center for Learning and Information Resources](#)

**Seat Save**

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Figure 18. View Booking Details (Pending) (Mobile)

### *View Booking Details (Checked In)*

Figure 19 shows the view booking details (checked in) page mobile version. For the desktop version, see Appendix G. This page loads after the user has successfully checked in. The user can also see current booking details such as date, time, seat information and availability of all seats during the booking time. If the user is about to leave the CLIR premises, they should manually check out.

The screenshot displays the mobile version of the 'View Booking Details (Checked In)' page. At the top, there is a blue header bar with a logo and a menu icon. Below the header, a message states 'Your booking is until 2:30 pm'. The main content area is titled 'Booking Details' and includes a table for 'Date' and 'Time' (May 23, 1:00 pm to 2:30 pm). A 'Seat' section indicates '2 - Carrel Desk with Outlet'. Below this is a 3x3 grid representing seat availability, with a legend at the bottom:

Available	Reserved	Unavailable
Available	Reserved	Unavailable
Available	Reserved	Unavailable

The legend defines the colors: dark green for Available, red for Reserved, and light gray for Unavailable. A red-bordered box highlights the first seat in the bottom-left corner. At the bottom, a question 'Are you leaving CLIR?' is followed by a blue 'CHECK OUT' button. The footer contains links to 'Malayan Colleges Laguna' and 'MCL\_Center for Learning and Information Resources', along with a 'Seat Save' button and a copyright notice.

Your booking is until 2:30 pm

Booking Details

Date	Time
May 23, 2022	1:00 pm to 2:30 pm

Seat

2 - Carrel Desk with Outlet

Available	Reserved	Unavailable
Available	Reserved	Unavailable
Available	Reserved	Unavailable

Available

Reserved

Unavailable

Are you leaving CLIR?

CHECK OUT

Links

[Malayan Colleges Laguna](#)

[MCL\\_Center for Learning and Information Resources](#)

Seat Save

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Figure 19. View Booking Details (Checked In) (Mobile)

### *Booking Expiration*

Figure 20 shows the modal that pop ups on view booking details (checked in) page mobile version. For the desktop version, see Appendix G. The system will automatically notify the user and check out the booking that has expired. The modal pop ups to tell that the time is up.

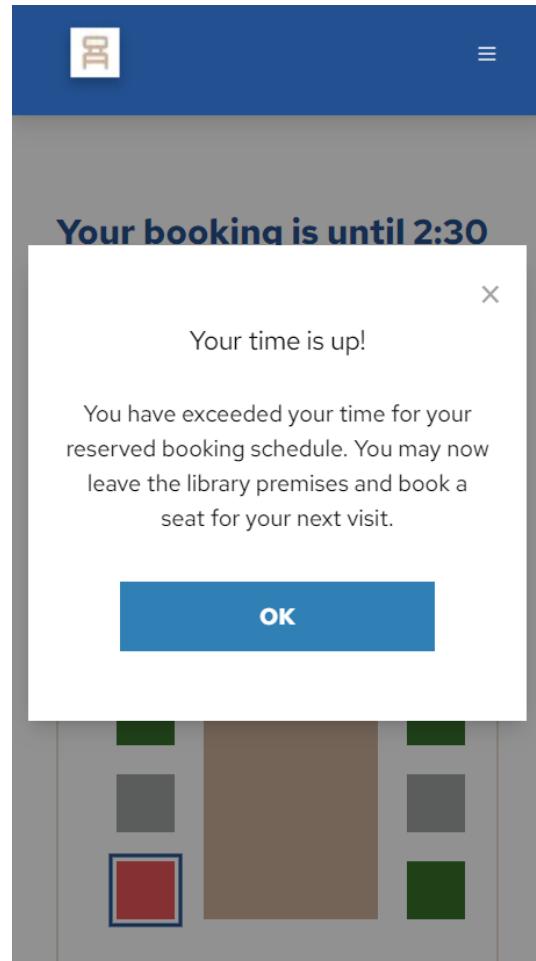


Figure 20. Booking Expiration (Mobile)

## Librarian Features

### Login

Figure 21 shows the login page desktop version. For the mobile version, see Appendix H. In this page, the user must enter their email and password. If the user has entered valid user credentials they will be redirected to the Check In/Out page. If not, error messages will be shown.

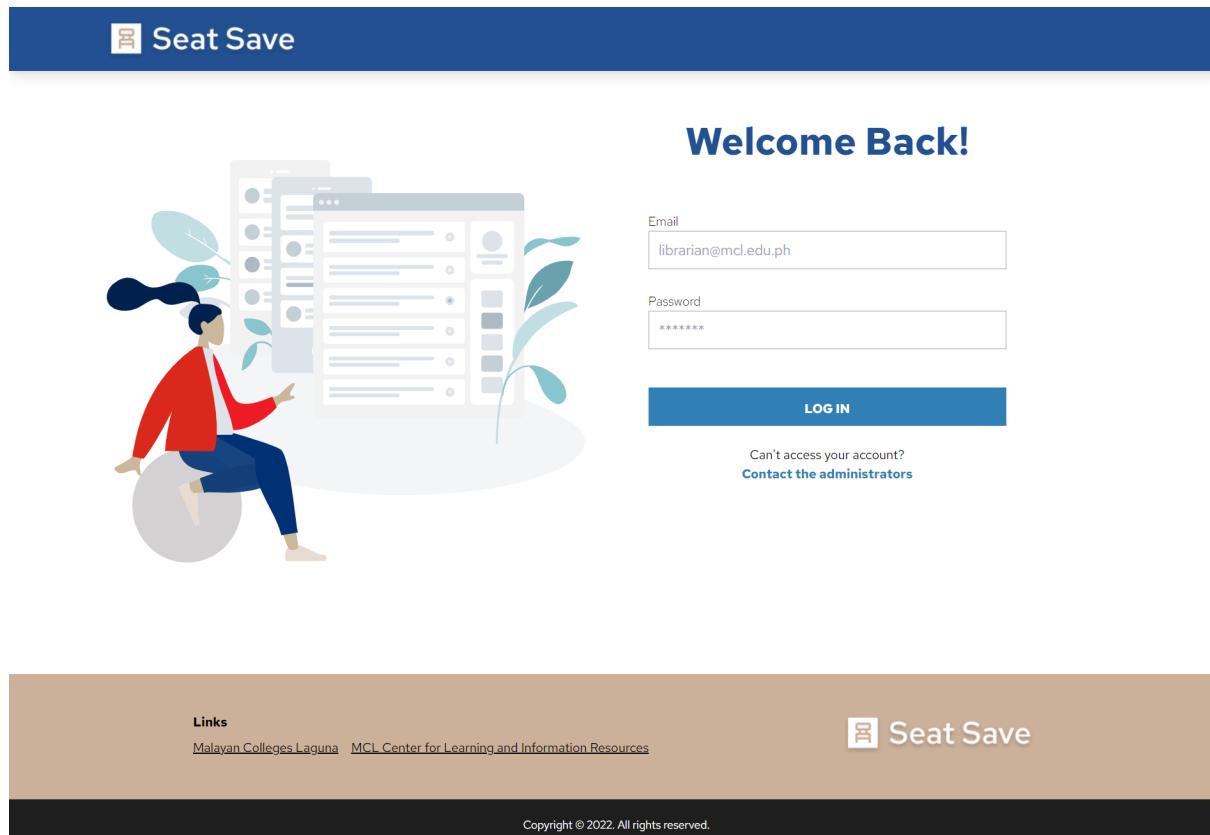


Figure 21. Librarian Login (Desktop)

## *Check In/Out via QR*

Figure 22 shows the check in/out page desktop version where the QR option is selected. For the mobile version, see Appendix H. In this page, the librarian uses the camera to scan QR codes to check in/out the visitor's booking. For the mobile version, the details will only be shown once a QR code has been scanned.

The screenshot displays the 'Seat Save' application interface for 'Check In / Out'. At the top, there is a navigation bar with links for 'View Bookings', 'Generate Reports', 'Manage Seats', 'Manage Date & Time', and a user profile icon. Below the navigation bar, the main title 'Check In / Out' is centered. Underneath the title are two buttons: 'SCAN QR CODE' (in a brown box) and 'SEARCH' (in a grey box). A blue button labeled 'OPEN/CLOSE CAMERA' is positioned above a camera preview window. The preview window shows a QR code with the number '79019' at the bottom. To the right of the preview window is a 'Booking Details' panel containing the following information:

<b>Code</b>	79019
<b>Seat</b>	ABC - Carrel Desk
<b>Visitor</b>	qwe qwe qwe@mc.edu.ph
<b>Date</b>	May 30, 2022
<b>Period</b>	7:00 am to 8:30 am
<b>Status</b>	Pending

A large blue 'CHECK IN' button is located at the bottom of the 'Booking Details' panel. At the very bottom of the page, there is a footer section with 'Links' and copyright information.

Figure 22. Check In/Out via QR (Desktop)

*Check In/Out via Booking Code:*

Figure 23 shows the check in/ out page desktop version where the booking code option is selected. For the mobile version, see Appendix H. In this page, the librarian searches for the booking code, which also works as a partial match query, to check in/ out the visitor's booking. For the mobile version, the details will only be shown once a booking has been clicked from the table.

The screenshot displays the 'Seat Save' application interface. At the top, there is a navigation bar with links for 'View Bookings', 'Generate Reports', 'Manage Seats', 'Manage Date & Time', and a user profile icon. Below the navigation bar, the main title 'Check In / Out' is centered. On the left side, there are two buttons: 'SCAN QR CODE' and 'SEARCH'. A search input field contains the value '5', and a blue 'SEARCH' button is adjacent to it. To the right of the search area, a table titled 'Search Results' lists three bookings. The columns are labeled 'Code', 'Seat', 'Visitor', 'Date & Time', and 'Status'. The first booking is for Code 65498, Seat DEF, Visitor Text Account, Date May 23 - 1:00 pm, and Status Checked In. The second booking is for Code 34531, Seat DEF, Visitor Text Account, Date April 29 - 1:00 pm, and Status Checked In. The third booking is for Code 5678, Seat DEF, Visitor Text Account, Date April 29 - 1:00 pm, and Status Pending. Below the table are navigation arrows and a page number indicator '1'. To the right of the table, a modal window titled 'Booking Details' provides specific information about the first booking. It includes fields for 'Code' (65498), 'Seat' (DEF - Carrel Desk with Outlet), 'Visitor' (Text Account, student3@gmail.com), 'Date' (May 23, 2022), 'Period' (1:00 pm to 2:30 pm), and 'Status' (Checked In). A large blue 'CHECK OUT' button is located at the bottom of the modal. At the bottom of the page, there is a footer section with 'Links' (Malayan Colleges Laguna, MCL Center for Learning and Information Resources) and the 'Seat Save' logo. The footer also includes a copyright notice: 'Copyright © 2022. All rights reserved.'

Figure 23. Check In/Out via Booking Code (Desktop)

## *View Bookings*

Figure 24 shows the view bookings page desktop version. For the mobile version, see Appendix H. In this page the librarian may view specific booking details along with the seat map by selecting the date and period. They can also view all bookings or search by booking code, status, booking date, or/and visitor's email which can then be viewed on the table.

**Seat Save** CHECK IN / OUT View Bookings Generate Reports Manage Seats Manage Date & Time g ▾

## View Bookings

Seat Map

05/30/2022 7:00 am - 8:30 am ▾

Booking Details

**Code** 79019  
**Seat** 1 - Carrel Desk  
**Visitor** Fname Lname  
**Date** May 30, 2022  
**Time** 7:00 am to 8:30 am

All Bookings

Booking Code Status Booking Date Visitor Email **SEARCH**

Enter Booking Code Checked In dd/mm/yyyy Enter Visitor Email

[View All Bookings](#)

Booking ID	Code	Seat	Visitor	Booking Period	Status	Check In / Out
4	65498	DEF	Text Account student3@gmail.com	1:00 pm - May 23, 2022 2:30 pm - May 23, 2022	Checked In	11:10 am - April 28, 2022
3	34531	DEF	Text Account student2@gmail.com	1:00 pm - April 29, 2022 2:30 pm - April 29, 2022	Checked In	11:10 am - April 28, 2022

Links  
[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

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Figure 24. View Bookings (Desktop)

## Generate Reports

Figure 25 shows the Generate Reports page desktop version. For the mobile version, see Appendix H. There are 4 sections of this report, Top Departments of Student Visitors, Top Programs/Strands of Student Visitors, Top Year Levels of Student Visitors and Top Programs/Strands and Year Levels of Student Visitors. The user may also generate reports within specific dates only. They may also filter the charts, which is helpful for mobile users.

The screenshot displays the 'Generate Reports' section of the Seat Save application. At the top, there is a navigation bar with links for 'CHECK IN / OUT', 'View Bookings', 'Generate Reports' (which is the active tab), 'Manage Seats', and 'Manage Date & Time'. A dropdown menu is also present. Below the navigation bar, the title 'Generate Reports' is centered. On the left, a 'Visitor Data' section includes date range inputs ('From: 01/03/2022' and 'To: 22/05/2022'), a chart type selector ('Chart: All'), and a checkbox for 'Count each visitor once'. To the right of this is a large blue button labeled 'DOWNLOAD ALL REPORTS'. The main area contains four horizontal bar charts arranged in a 2x2 grid. The top row shows 'Top Departments of Student Visitors' (SHS) and 'Top Programs/Strands of Student Visitors' (STEM). The bottom row shows 'Top Year Levels of Student Visitors' (Grade 11) and 'Top Programs/Strands and Year Levels of Student Visitors' (STEM - Grade 11). Each chart has a dark blue background with a single white bar labeled '1'. The x-axis for each chart ranges from 0.0 to 1.0. The bottom of the page features a brown footer bar with 'Links' and 'Malayan Colleges Laguna MCL Center for Learning and Information Resources' on the left, and the 'Seat Save' logo on the right. A black footer bar at the very bottom contains the copyright notice 'Copyright © 2022. All rights reserved.'

Figure 25. Generate Reports (Desktop)

The user may also opt to download all reports into one excel file as shown in Figure 26.

Figure 26. Downloaded All Section's Reports

The user may also opt to download a selected section only as shown in Figure 27. The user may download the report in svg, png, or csv format.

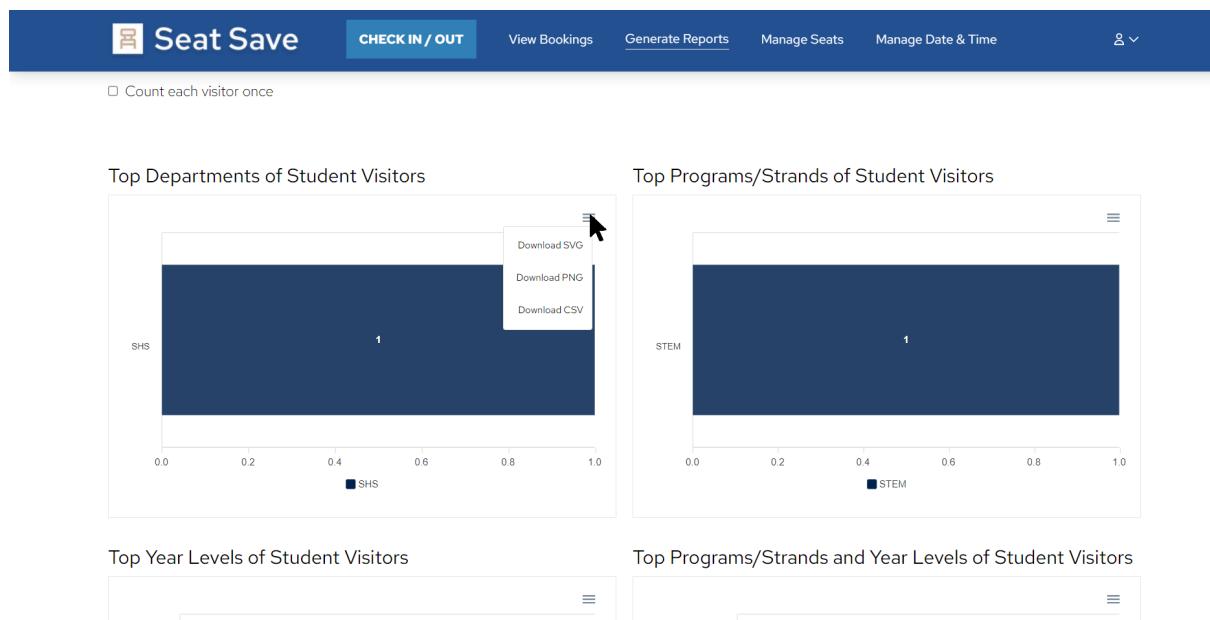


Figure 27. Download A Section's Report

The user may also opt to count each visitor once as shown in Figure 28.

The screenshot shows the 'Generate Reports' section of the Seat Save application. At the top, there's a navigation bar with links for 'View Bookings', 'Generate Reports' (which is underlined, indicating it's the active page), 'Manage Seats', 'Manage Date & Time', and a user icon. Below the navigation is a title 'Generate Reports'. On the left, there's a 'Visitor Data' section with date range filters ('From' set to '01/02/2022' and 'To' set to '23/05/2022') and a dropdown for 'Chart' type ('Top Departments'). A checkbox labeled 'Count each visitor once' is checked. To the right of these filters is a large blue button labeled 'DOWNLOAD ALL REPORTS'. Below the filters is a section titled 'Top Departments of Student Visitors' which contains a dark blue rectangular placeholder area with the text 'SHS' in the bottom-left corner.

*Figure 28. Count Each Visitor Once*

### Manage Seats

Figure 29 shows the Manage Seats page desktop version. For the mobile version, see Appendix H. In Figure 29, the left panel is the editable seat map. The librarian may resize the table and may drag the seats and the table to change its layout. The labeled seat and table on the bottom left of the panel allows the librarian to add a seat and a table. If the table or seat should be deleted, it should be dragged to the trash icon on the bottom right of the panel. The user may hover their cursor on the seats to view the seat ID and may also pan the seat map. While the right panel is the list of the seats. The librarian may also add a seat using the add button on the bottom right of the panel. Once a seat has been selected, either via clicking it on the seat map or from the list, its seat information will be shown, as seen in Figure 30. The librarian may now edit the seat information and as well as delete the seats.

## Manage Seats

**Available Seats**

ABC	1
DEF	2
GHI	3
JKL	4
LMNO	5
PQRST	6

**+**

**Links**  
[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

**Seat Save**

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Figure 29. Manage Seats (Desktop)

## Manage Seats

**Seat Information** ×

Seat ID	Active
2	<input checked="" type="checkbox"/>
Name	DEF
Type	Carrel Desk with Outlet
Description	description2

**SAVE** **DELETE**

**Links**  
[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

**Seat Save**

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Figure 30. Manage Seats Part 2 (Desktop)

## Manage Date & Time

Figure 31 and Figure 32 shows the Manage Date & Time page desktop version. For the mobile version, see Appendix H. Figure 31 shows when the Regular Hours is selected. Figure 32 shows when the Override Days is selected. The librarian may add a date by clicking the add button on the bottom right of the panel.

After a day of the week, for Regular Hours, or a date, for Override Days, is selected the Period panel will now show up. The librarian now may check or uncheck the checkbox to allow or prevent bookings for that period on the selected day or date.

The screenshot shows the 'Manage Date & Time' page. At the top, there is a navigation bar with links for 'CHECK IN / OUT', 'View Bookings', 'Generate Reports', 'Manage Seats', and 'Manage Date & Time'. Below the navigation bar, the main title 'Manage Date & Time' is displayed. On the left, there are two tabs: 'Regular Hours' (selected) and 'Override Days'. Under 'Regular Hours', a list of days of the week is shown: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. To the right, under the heading 'Periods for Sunday', there is a list of time intervals with checkboxes next to them. The intervals are: 7:00 am to 8:30 am, 8:30 am to 10:00 am, 10:00 am to 11:30 am, 11:30 am to 1:00 pm, 1:00 pm to 2:30 pm, 2:30 pm to 4:00 pm, and 4:00 pm to 5:30 pm. A 'SAVE' button is located at the bottom right of this section. At the bottom of the page, there is a footer with 'Links' and 'Malayan Colleges Laguna MCL Center for Learning and Information Resources'. The 'Seat Save' logo is also present in the footer.

Figure 31. Manage Date & Time Regular Hours (Desktop)

Figure 32. Manage Date & Time Override Days (Desktop)

## 6. System Testing

To ensure that the system is working as intended, the developers performed three testing activities. These include backend testing, front end testing, and system evaluation.

### 6.1 Back End Testing

To test the backend, the developers created automated unit and integration tests. These tests only covered the domain layer as it contains the essential business logic. Other parts of the system that perform trivial tasks, such as simple CRUD operations, were not tested. These tests were created using the XUnit testing framework for .NET Core. The results of the tests could be seen in Figure 33, 34, 35, 36, and 37.

## Test run details

Total tests 45	Passed : 45 Failed : 0 Skipped : 0	Pass percentage 100 %	Run duration 4s 736ms
-------------------	--	--------------------------	--------------------------

### All Results

D:\Code\Drafts\SeatSave\SeatSave.Test\bin\Debug\net6.0\SeatSave.Test.dll

### Informational messages

```
[xUnit.net 00:00:00.00] xUnit.net VSTest Adapter v2.4.3+1b45f5407b (64-bit .NET 6.0.4)
[xUnit.net 00:00:01.34] Discovering: SeatSave.Test
[xUnit.net 00:00:01.38] Discovered: SeatSave.Test
[xUnit.net 00:00:01.38] Starting: SeatSave.Test
[xUnit.net 00:00:02.70] Finished: SeatSave.Test
```

Figure 33. The summary of the results of all automated tests

▲ ✓ AuthenticationTest (10)	176 ms
✓ FacultyCanLogin	2 ms
✓ LibrarianCanLogin	2 ms
✓ LoginWithIncorrectPasswordFails	1 ms
✓ LoginWithMissingEmailFails	1 ms
✓ LoginWithMissingPasswordFails	161 ms
✓ LoginWithUnregisteredEmailFails	1 ms
✓ LoginWithValidCredentialsSucc...	5 ms
✓ StaffCanLogin	1 ms
✓ StudentCanLogin	1 ms
✓ VisitorLoginAsLibrarianFails	1 ms

Figure 34. Automated tests for the authentication module

▲ ✓ BookingTest (11)	7 ms
✓ CanCancelBooking	< 1 ms
✓ CanCheckInBooking	< 1 ms
✓ CanCheckoutBooking	2 ms
✓ CannotCancelCanceledBooking	< 1 ms
✓ CannotCancelCheckedInBooking	1 ms
✓ CannotCheckInBookingEarly	1 ms
✓ CannotCheckInCanceledBooking	< 1 ms
✓ CannotCheckInCheckedInBooki...	< 1 ms
✓ CannotCheckOutBookingEarly	< 1 ms
✓ CannotCheckoutCanceledBooki...	< 1 ms
✓ CannotCheckoutPendingBooking	3 ms

Figure 35. Automated tests for the booking module

▲ ✓ RegisterTest (11)	154 ms
✓ CannotRegisterFacultyWithInval...	< 1 ms
✓ CannotRegisterFacultyWithMiss...	< 1 ms
✓ CannotRegisterStaffWithInvalidl...	1 ms
✓ CannotRegisterStaffWithMissin...	< 1 ms
✓ CannotRegisterStudentWithInv...	< 1 ms
✓ CannotRegisterStudentWithMis...	< 1 ms
✓ CannotRegisterUsedEmail	1 ms
✓ CannotRegisterWithShortPassw...	< 1 ms
✓ CanRegisterFacultySuccessfully	152 ms
✓ CanRegisterStaffSuccessfully	< 1 ms
✓ CanRegisterStudentSuccessfully	< 1 ms

Figure 36. Automated tests for the registration module

▲ ✓ ScheduleTest (12)	248 ms
✓ AvailablePeriodOnAvailableReg...	< 1 ms
✓ AvailablePeriodOnAvailableSpe...	< 1 ms
✓ BookingPeriodInScheduleIsAvai...	< 1 ms
✓ BookingPeriodNotInScheduleIs...	< 1 ms
✓ CannotBookAvailableDateButN...	< 1 ms
✓ CannotBookAvailablePeriodBut...	< 1 ms
✓ GetAvailableDaysGeneratesCorr...	244 ms
✓ GetAvailablePeriodsOnRegular...	4 ms
✓ GetAvailablePeriodsOnSpecific...	< 1 ms
✓ UnavailablePeriodOnAvailableR...	< 1 ms
✓ UnavailablePeriodOnAvailableS...	< 1 ms
✓ UnavailableSpecificDatelIsUnava...	< 1 ms

Figure 37. Automated tests for the schedule module

## 6.2 Front End Testing

As it is harder to create automated tests for user interfaces, the developers opted to manually test the interface. To facilitate this, the developers created a system testing document template. The template could be found in appendix I. Each test case contains preconditions, testing steps, and postconditions. If all expected system responses and postconditions were met, the test case will be considered as successful. Additionally, the test case also contains information about who has tested the system and when the test was executed.

Then, the developers executed the test cases they have created for each feature of the system. While executing each test case, the developer found bugs in the system. Whenever these bugs were found, the developer patched the bug and reran the test. At the end, the developers were successful in passing all test cases as shown in Table 7. The full details of the test cases could be seen in appendix J.

Table 7. Summary of the results of manual testing

Test Case Name	Remarks	Test Case Name	Remarks
Visitor User Authentication	Pass	Booking Proof Email	Pass
User Registration	Pass	Librarian Check In / Out	Pass
Librarian User Authentication	Pass	Librarian Generate Reports	Pass
Visitor View Booking Details	Pass	Manage Seats	Pass
Book-A-Seat	Pass	Manage Date and Time for Regular Hours and Override Hours	Pass
Booking Expiration	Pass		

### 6.3 System Evaluation

The system was evaluated by the end users during sprint reviews. During sprint reviews, the developers let the end user try out the new features of the system. After trying out the system, the end user may suggest new user stories or ways to enhance the current features.

## 7. System Deployment

In line with the general objective of the study, the developers want to deploy the system into actual use. However, the developers will not be able accomplish this because of limitations set by the course. So, instead of deploying the system to actual use, the developers are going to list down what is needed for the system to be deployed.

### 7.1 Librarian Setup

For librarians, the only requirement is just a device with a browser and an internet connection. However, the recommended setup is a laptop with an external camera. A camera is recommended so that they could scan the QR code of visitors. The camera is preferably external so that the librarian could reposition the scanning angle as they prefer.

## **7.2 Visitor Setup**

For visitors, the only requirement is also just a device with a browser and an internet connection. However, the recommended setup is a mobile phone. This is preferable so that visitors could easily present the QR code of their booking to the librarians.

## **7.3 Continuous Integration and Continuous Delivery**

In order for bugs to be easily fixed and for new features to be easily added to the system after it has been deployed, the system needs continuous integration and continuous delivery. Because of this, the current system uses github actions and vercel to automatically build and deploy the system to the production environment. For the API and the Azure Function, the github action workflow deploys the system to an Azure Web Application Service. For the NextJs application, Vercel automatically deploys the application whenever there is a change in the front end code.

## **8. Conclusion**

In this paper, the developers sought out to create a reservation system for Malayan Colleges Laguna's Center for Learning and Information Resources. In order to do this, the developers had to identify the features that had to be implemented (research objective 1), then the developers had to design the system to accommodate these features (research objective 2), and lastly the developers had to implement these features based on the design,

To identify the features that need to be implemented (objective 1), the developers reviewed reference websites, reviewed feedback gathered from Sparse, and gathered feedback from the end users during sprint reviews. From these, the developers formulated the user stories of the system. The user stories that were formulated could be found in Appendix A.

After this, the developers designed the system to accommodate the features that need to be implemented (objective 2). To accomplish this, the developers first designed the user interface by creating moodboards, wireframes and mockups. These could be seen in Appendix B, C and D. Then the developers created the system diagram, system architecture and analysis models. The system diagram could be seen in Figure 3 and it shows the different components in the system. The system architecture could be seen in Figure 4 and it shows how the system is logically organized. Then the developers created analysis models to better understand how the user stories could be designed in the software design section. The analysis models that the developers created include a use case diagram, data flow diagram, and activity diagram which could be seen in Figure 5, Figure 7 and Appendix E respectively. Lastly, the developers created the software design of the system. The design approach that the developers used in designing the system was “just enough design up front” and domain driven design. The high level design and component design could be seen in figure 8 and appendix F.

Then, the developers implemented the design which is done in three parts (objective 3). The first part of implementation is the implementation of the features of the system. To

implement the features of the system, the developers used NextJs, ASP.NET Core and other libraries and frameworks. These tools are discussed in more detail in section 5.1. Then, the system that has been implemented is discussed in section 5.3. The second part of the implementation is testing whether or not the system works as intended. To accomplish this, the developers performed back end testing, front end testing and system evaluation. These are discussed in more detail in sections 6.1, 6.2 and 6.3 respectively. Finally, the last part of implementation is the deployment of the system. The developers were not actually able to deploy the system into use due to the limitations set by the course. So, instead, the developers listed down what is needed to deploy the system. These are discussed in more detail in section 7.

By accomplishing these activities, the developers were able to create a booking system called Seat Save. Using the booking feature of the system, visitors of the CLIR would not have to worry about whether or not they are going to find a seat in the CLIR. The interface was also designed such that visitors could easily find information about their booking. Included in this is a seat map feature that allows visitors to easily find their seats. For librarians, checking in and checking out a visitor's booking is simple. They only need to scan the visitors QR code or enter their booking code. They may also find more information about bookings in the view bookings and generate reports page. If ever the physical layout of the CLIR changes, librarians could easily change the layout of the seat map in the manage seats page. Librarians could also specify the regular weekly booking availability of the CLIR in the manage date and time page. The manage date and time page also allows librarians to set the booking availability for a specific date. With all these features implemented, the developers were able to achieve their objective of developing a reservation system that is tailor made for the CLIR

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## APPENDIX A

### User Stories

#### HL-32 Login

As a librarian

I want to be able to log in to the system

So that only librarians could do librarian functions in the system

#### HL-26 Booking Check In & Check Out

As a librarian,

I want to be able to check in and check out a booking of a visitor,

So that we could allow them to enter the library and let the system know if they left

#### HL-148 Scan Visitor's QR code to Check In

As a librarian,

I want to be able to scan the booking QR Code on visitor's check in,

So that the process of allowing them to enter is faster

#### HL-49 View Bookings

As a librarian,

I want to be able to see the bookings made by visitors all in a list or by searching

So I can select which one to check in and to check out

#### HL-120 Seat Map for Date and Period (View Bookings)

As a librarian,

I want to be able to see the booking information and seat map occupancy on specific date and period,

So that I can see the booking details as needed

#### HL-36 Seat Map Occupancy Color Coded

As a librarian

I want to see the seat map occupancy of the CLIR color-coded

So that I know the current occupancy at a glance

#### HL-8 Reports

As the librarian,

I want to be able to create reports about the visitors who use the CLIR

So that I can determine what department, year, and program use the CLIR the most

#### HL-170 Login

As a head librarian,

I want to be able to log in to the system,

So that only head librarians could do head librarian functions in the system

#### HL-50 Add Seat

As a head Librarian,

I want to be able to add a seat

So that if we had new seats in the library or the room occupancy(covid19 protocols) is increased, visitors could book them

#### HL-18 Edit Seat

As the head librarian,

I want to be able to edit the seat's information

So that we can change its information when it is wrong or when its information changes

#### HL-51 Delete Seat

As a head librarian,

I want to be able to delete a seat

So we could prevent visitors from reserving a seat that is not there

#### HL-23 Activate and Deactivate Seat

As the head librarian,

I want to be able to activate and deactivate seats

So that we could stop visitors from reserving a specific seat

#### HL-44 Customizable Seat Map

As the head librarian,

I want to be able to customize the seat map

So that we can change the layout depending on the room occupancy health protocols

#### HL-29 Specify Booking Day (Regular) & Time

As the head librarian,

I want to be able to specify what time and day visitors could reserve the library on specific days of the week

So that visitors can only book a seat during our operational days

#### HL-89 Specify Booking Day (Override) & Time

As a head librarian,

I want to be able to override days from the regular days

So that visitors can only book a seat during our operational days

#### HL-42 Register Account

As a visitor,

I want to be able to register an account

So that I won't have to enter my information every time I reserve a seat

#### HL-41 Login

As a visitor,

I want to be able to log in

So that I won't have to enter my information every time I reserve a seat

#### HL-11 Seat Booking

As a visitor,

I want to be able to select which seat I want to book,

So that I could use that seat when I book

#### HL-9 Specify Booking Details

As a visitor,

I want to be able to specify what time and day I want to make my booking,

So that I could use the library for that time and day

#### HL-13 Seat Availability

As a visitor,

I want to be able to know which seats are available for a specific time and day,

So that I would know which seats I can and cannot book

#### HL-30 Booking QR Code

As a visitor,

I want to be able to get a QR code of my booking,

So that I could claim my reservation

#### HL-28 Booking Proof Email

As a visitor,

I want the information about my booking to be sent to my email,

So that I have a proof that I have made a booking

#### HL-16 View Booking Details

As a visitor

I want to see my booking details

So that I know if I reserved at the right date, time, and seat, and can remember my booking

#### HL-40 Checkout Booking

As a visitor,

I want to be able to check out once I want to leave the library

So that the librarians will know the current seat occupancy

#### HL-75 Booking Expiration

As a visitor,

I want to get notified when my booking expires automatically,

So that I know when it's time to leave the CLIR and I won't have to manually checkout

#### HL-34 Cancel Booking

As a visitor,

I want to be able to cancel my booking,

So that other visitors could use my seat when I have changes in plans

#### HL-119 Seat Map

As a Visitor,

I want to be able to see where the seats are located,

So that I can pick the best spot

## HL-33 Seat Map Occupancy Color-Coded

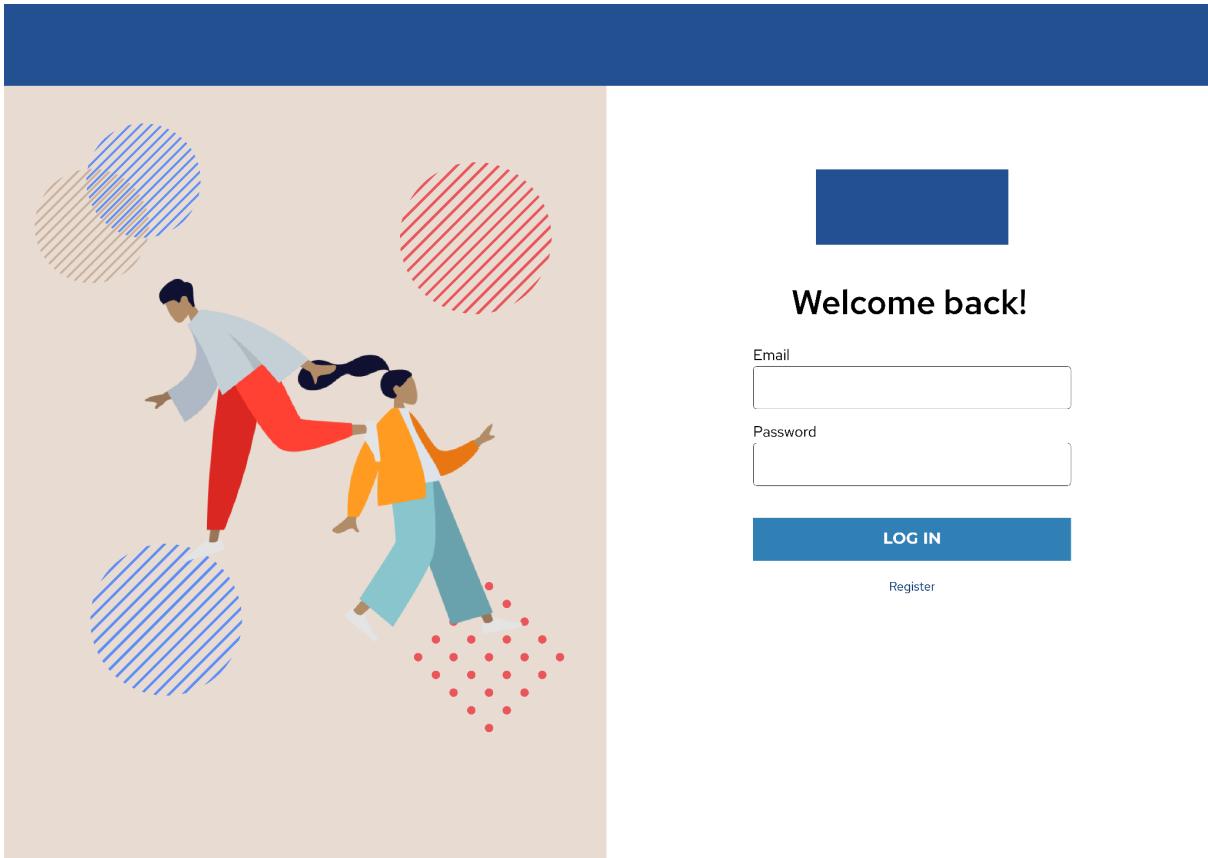
As a visitor

I want to see the seat map occupancy of the CLIR color-coded

So that I know the seat occupancy at a glance

## APPENDIX B

### Moodboard



Sample Page

# **Heading 1 - 48px**

## **Heading 2 - 36px**

Heading 3 - 30px

Heading 4 - 24px

Body - 18px

Body small - 16px

Typography - Desktop

# **Heading 1 - 30px**

## **Heading 2 - 24px**

Heading 3 - 20px

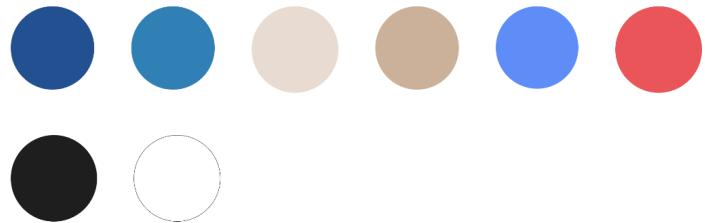
Heading 4 - 18px

Body - 16px

Body small - 14px

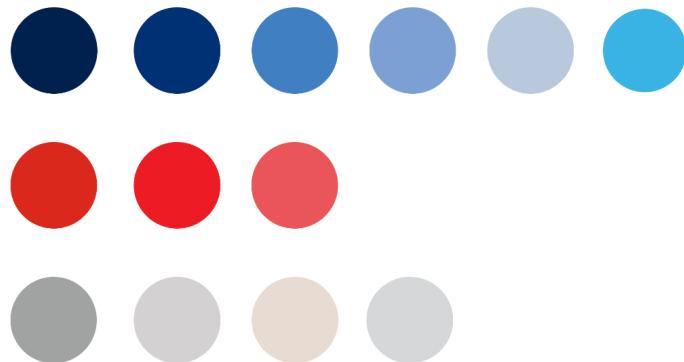
Typography - Mobile

# Primary



# Secondary

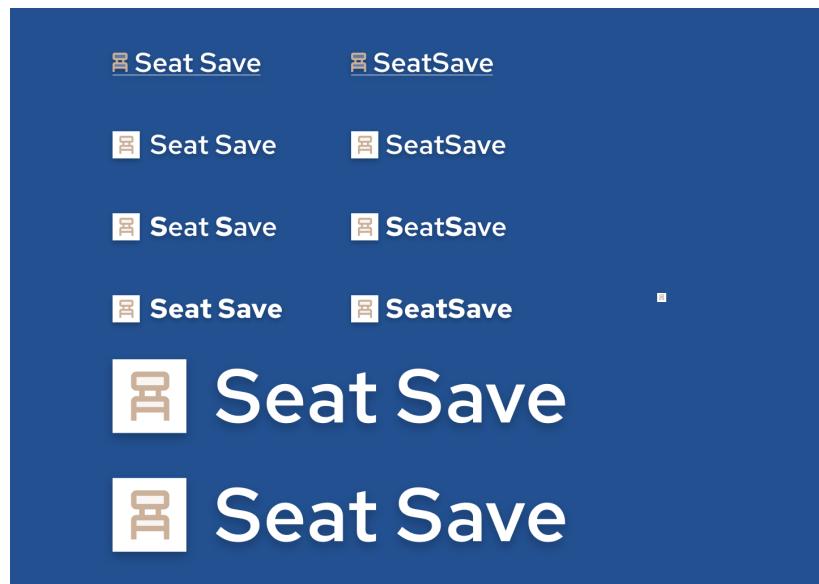
for backgrounds  
or humaaans illustrations



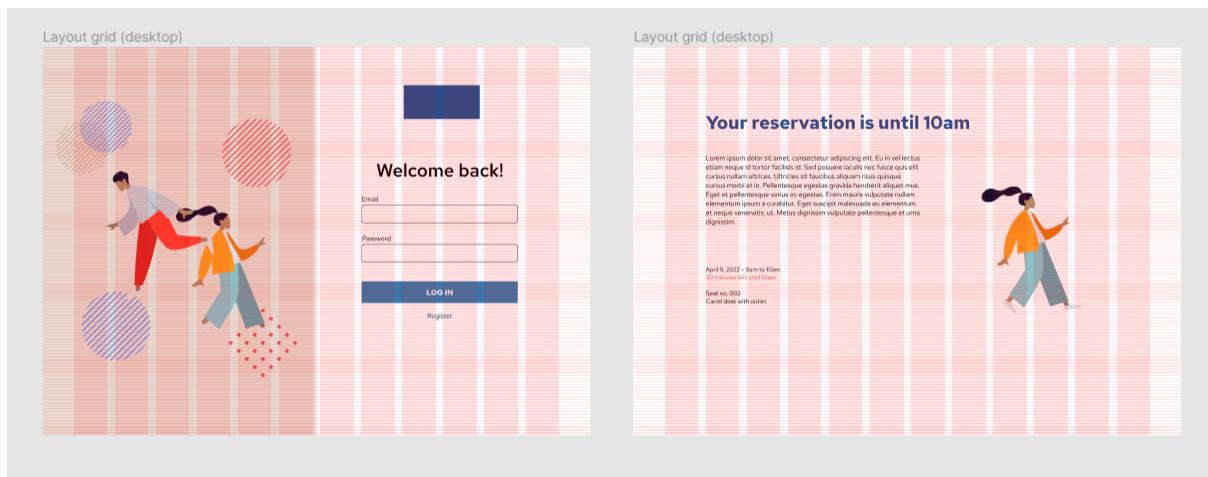
# Status



Color Palette



Logos

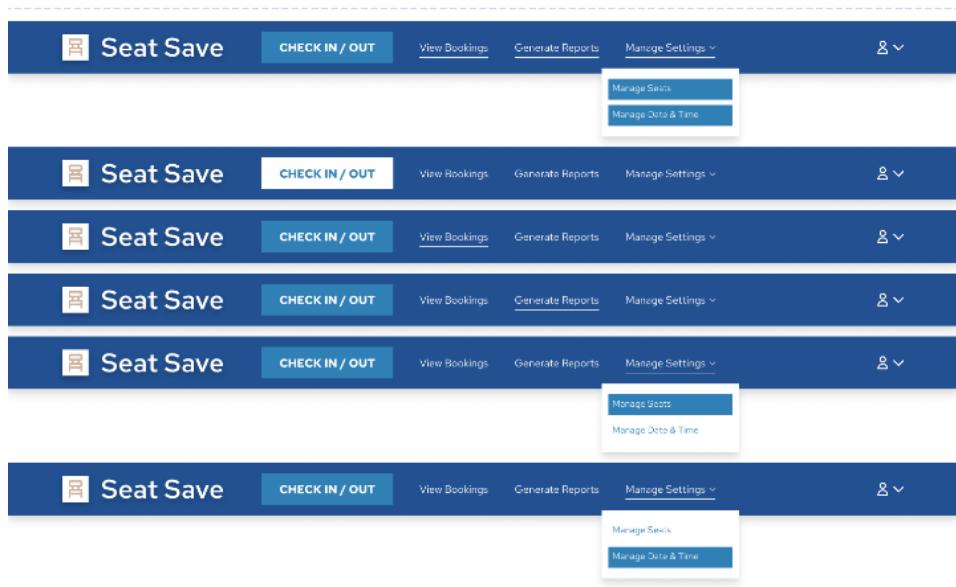


Layout Grid

Visitor Navbar - Desktop



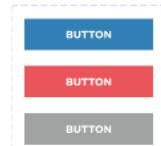
Librarian Navbar - Desktop



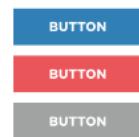
Login Navbar - Desktop



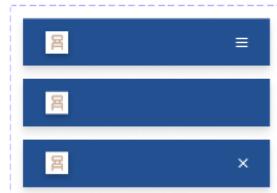
Button



Old Button



Navbar - Mobile



Logo



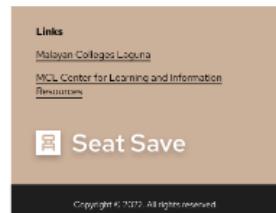
### Input

Placeholder	Placeholder	Placeholder	Placeholder
Title Placeholder		Title Placeholder	Title Placeholder
Title Placeholder			
Placeholder	Placeholder	Placeholder	Placeholder
Title Placeholder		Title Placeholder	Title Placeholder
Title Placeholder			

### Time Checkbox

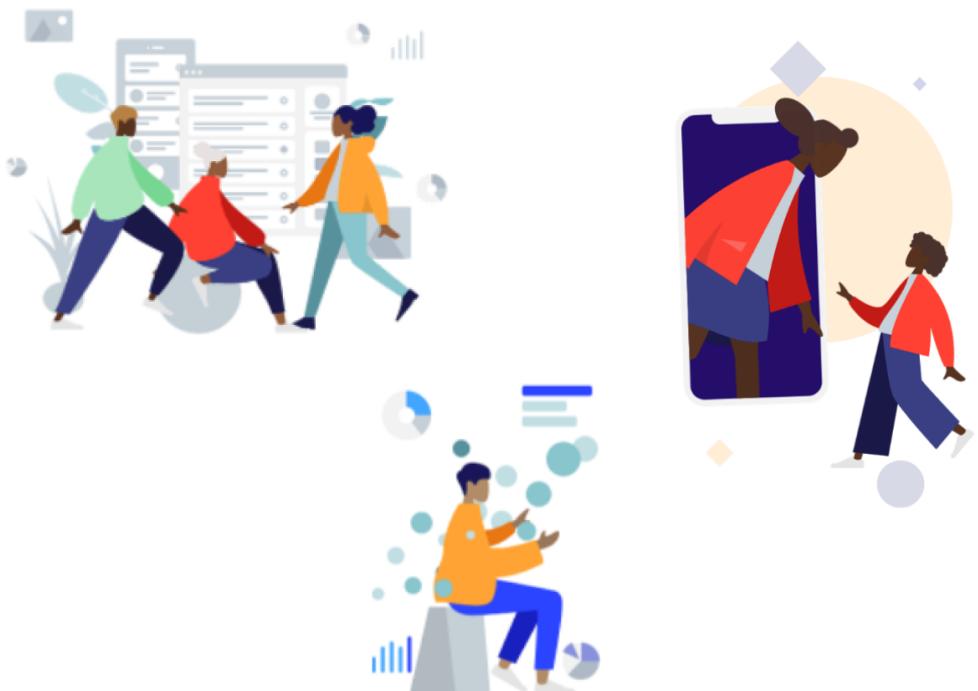
<input type="checkbox"/> 7:00 am to 8:00 am	<input type="checkbox"/> 7:00 am to 8:00 am
<input checked="" type="checkbox"/> 7:00 am to 8:00 am	<input checked="" type="checkbox"/> 7:00 am to 8:00 am

### Footer - Mobile



### Footer - Desktop





**Safety Reminders in Visiting CLIR**

- Facemask should be worn at all times.
- Maintain 1.5 meters social distancing.
- Keep your hands sanitized.

**Be prepared for LF2F Classes! Check out the MCL Campus Map:**

**CLIR NATIONAL BOOK WEEK**

**Media Partner**  
SINGAPORE | Indonesia | Thailand | Philippines

**Guidelines for CLIR Users Participating in Limited Face-to-Face Classes**

**CCIS College of Computer and Information Science**

**B.A. Communication**

Pursue a career in the fields of **media, advertising, public relations, and similar industries.**

**Wednesday DATABASE**

**Calendar of Activities for College Students**  
AY. 2021-2022

MARCH 2022		APRIL 2022	
10 THU	Start of Classes (Week 1)	14 FRI	LENTEN BREAK
12 SAT	Courses Starting (Week 1)	16 SAT	MAY 2022
14 MON	Courses Starting (Week 1)	18 MON	Classes for Drop-off of Courses
15 TUE	Courses Starting (Week 1)	19 TUE	Classes for Drop-off of Courses
16 WED	Courses Starting (Week 1)	20 WED	Classes for Drop-off of Courses
17 THU	Courses Starting (Week 1)	21 THU	LAST DAY OF REGULAR CLASSES
18 FRI	Courses Starting (Week 1)	22 FRI	Last Day for Submission of Courses
19 SAT	Transition of Classes (Week 1)	23 SAT	Final Day / Pick-up Classes / Interviews
20 SUN	Transition of Classes (Week 1)	24 SUN	Final Day / Pick-up Classes / Interviews
21 MON	START OF CLASSES	25 MON	Final Day / Pick-up Classes / Interviews
22 TUE	Classes for Drop-off of Courses	26 TUE	Final Day / Pick-up Classes / Interviews
23 WED	Classes for Drop-off of Courses	27 WED	Final Day / Pick-up Classes / Interviews
24 THU	Classes for Drop-off of Courses	28 THU	Final Day / Pick-up Classes / Interviews
25 FRI	Classes for Drop-off of Courses	29 FRI	Final Day / Pick-up Classes / Interviews
26 SAT	Transition of Classes (Week 2)	30 SAT	Final Day / Pick-up Classes / Interviews
27 SUN	Transition of Classes (Week 2)	31 SUN	Final Day / Pick-up Classes / Interviews
28 MON	START OF CLASSES	30 MON	Final Day / Pick-up Classes / Interviews
29 TUE	Classes for Drop-off of Courses	31 TUE	Final Day / Pick-up Classes / Interviews
30 WED	Classes for Drop-off of Courses	31 WED	Final Day / Pick-up Classes / Interviews
31 THU	Classes for Drop-off of Courses	31 THU	Final Day / Pick-up Classes / Interviews
31 FRI	Classes for Drop-off of Courses	31 FRI	Final Day / Pick-up Classes / Interviews

**Apply for Admission in 5 Easy Steps**

**A.Y. 2022-2023**

**Humanities and Social Sciences (HUMSS)**  
Understanding People in **Real Life Situations**

The HUMSS strand is best suited for those pursuing their passion and aspiration of arts and humanities.

**PRESIDENT'S LIST RECOGNITION CEREMONY**  
ACADEMIC YEAR 2020-2021

August 26, 2021 (Thursday)  
2:00 PM

Video premiere on [MalayanColleges](#)

**MCL Building Professionals**  
Malayan Colleges Laguna A MAPUA School

**LINKS**  
Helplines | Advisories | Counseling | Consultations

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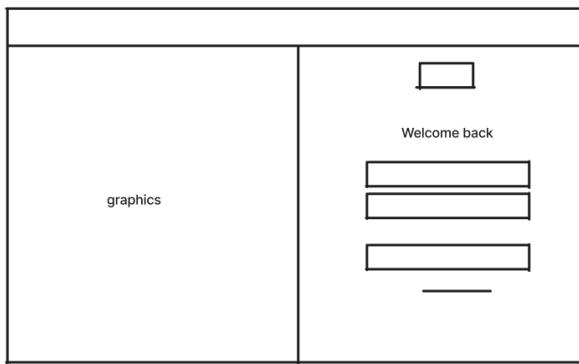
**CCIS**  
Developed by the MCL College of Computer and Information Science alumni, students, and professors.  
Email: [ccis.yan.dormans@jennyvalenzuela5@gmail.com](mailto:ccis.yan.dormans@jennyvalenzuela5@gmail.com)

## APPENDIX C

### Wireframes

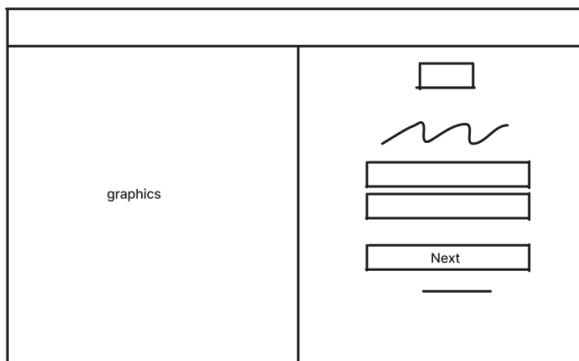
#### Login

hp

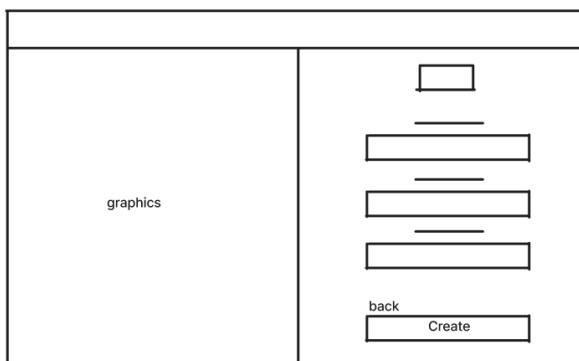


A wireframe diagram of a login screen. It features a large rectangular area on the left labeled "graphics". On the right side, there is a smaller rectangular area containing a logo (a square with a smaller square inside), the text "Welcome back", three horizontal input fields, and a "Next" button at the bottom.

#### Register



A wireframe diagram of a register screen. It features a large rectangular area on the left labeled "graphics". On the right side, there is a smaller rectangular area containing a logo (a wavy line), three horizontal input fields, and a "Next" button at the bottom.



A wireframe diagram of a register screen. It features a large rectangular area on the left labeled "graphics". On the right side, there is a smaller rectangular area containing three horizontal input fields, a "back" button on the left, and a "Create" button on the right.



Scrollable left and right

# CLIR Einstein

#2

**Pick a Date**

March 20	March 21	March 22	March 23	March 24	March 25
----------	----------	----------	----------	----------	----------

**Pick a Time**

2:00pm 3:00pm	2:00pm 3:00pm	2:00pm 3:00pm
------------------	------------------	------------------

**Pick a Seat**

Einstein-1	Einstein-2	Einstein-3	w/o seat map
Einstein-4	Einstein-5	Einstein-6	charmaine rabano

Book Einstein-5 on March 22, 2022 at 2:00pm to 3:00pm

**Create Reservation**

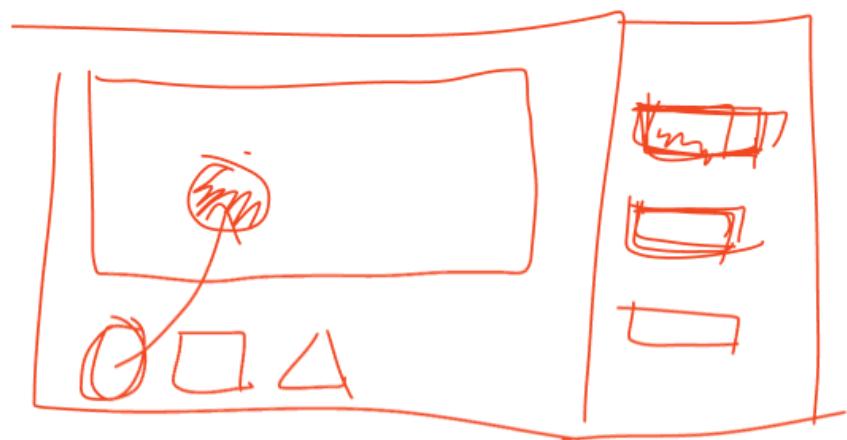
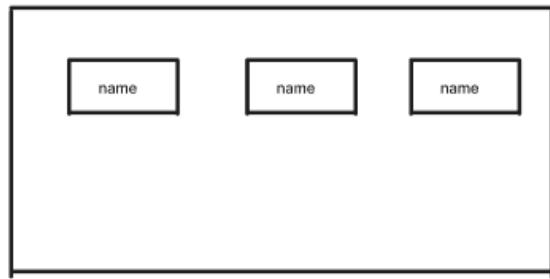
Confirm A Reservation View Reservations Edit Library Settings

Side Menu:  
Modify Day & Time  
Modify Seats  
  
\*\*may change wordings  
charmaine rabano

Are you sure you want to  
delete this seat?  
Cancel Delete

seat name  
seat type  
description  
available/unavailable  
add/delete  
charmaine rabano

display: code  
hover: seat name  
click: show description  
  
charmaine rabano



## Add Seat

Name

Type

Dropdown item

Seat Quantity

Single Seat

**Active:** Shown to the public and is bookable

**Inactive:** Hidden from public view and statics are retained.  
Any future bookings will not be canceled

Multiple Seats

Active Seats Quantity

Inactive Seats Quantity

Description

No multiple seats

Job Lipat

Cancel

Save

edit dates & time

NAME 

add regular hours  
monday  
tuesday...

**ADD**

Madeline Galang

APR 1, 2022   
APR 5, 2022   
APR 9, 2022 

2 screens/interface:  

- for regular hours
- for override days

charmaine rabano

7:00-7:15      7:00-7:15  
 7:15-7:30      7:15-7:30  
 7:00-7:15      7:00-7:15  
 7:15-7:30      7:15-7:30  
 7:00-7:15      7:00-7:15  
 7:15-7:30      7:15-7:30

change reservation duration

Job Lipat

helpline

 Confirm A Reservation View Reservations Edit Library Settings 

Camera

Instructions first then after scanning QR, reservation details

charmaine rabano

**Check In Booking**  
<https://berkeley.libcal.com/checkin>

Check In Code  Search

Booking Id	Status	Seat Type	Visitor Email
mrrmp5007h3m	Dropdown Item	Dropdown Item	
mrrmp5007h3m	Dropdown Item	Dropdown Item	
mrrmp5007h3m	Dropdown Item	Dropdown Item	
mrrmp5007h3m	Dropdown Item	Dropdown Item	

**Reservations for CLR Einstein Building**

Booking Id	Seat	Visitor	Reservation Period	Status	Check In/Out
mrrmp5007h3m	Einstein-2 (#48)	Job Lipat lipat@live.mci.edu.ph	10:00 am April 7, 2021 2:30pm April 7, 2021	Complete	-  1:00 am April 7, 2021  1:00 pm April 7, 2021
mrrmp5007h3m	Einstein-2 (#48)	Job Lipat lipat@live.mci.edu.ph	10:00 am April 7, 2021 2:30pm April 7, 2021	Canceled	
mrrmp5007h3m	Einstein-2 (#48)	Job Lipat lipat@live.mci.edu.ph	10:00 am April 7, 2021 2:30pm April 7, 2021	Pending	
mrrmp5007h3m	Einstein-2 (#48)	Job Lipat lipat@live.mci.edu.ph	10:00 am April 7, 2021 2:30pm April 7, 2021	Checked In	-  1:00 am April 7, 2021

First | 1 | 2 | 3 | 4 | Last

**Reservation Details**

Date: April 7, 2021  
 Period: 1:00 am to 2:30 pm  
 Seat: Einstein-1

Check In  
 Check Out  
 Cancel

Reports

**Seat Save**

CHECK IN / OUT View Bookings Edit Library Settings

Generate Reports

Visitor Data Reports Seat Occupancy

From Select date To Select date Download Reports

charmaine rabano

tab navigation if seat occupancy will be included

Top Departments of Student Visitors

label

label

label

label

label

label

Download report

Top Programs/Strands of Student Visitors

label

label

label

label

label

label

Download report

prioritize download excel for all reports

charmaine rabano

Top Year Levels of Student Visitors

label

label

label

label

label

label

Download report

Top Programs/Strands and Year Levels of Student Visitors

label

label

label

label

label

label

Download report

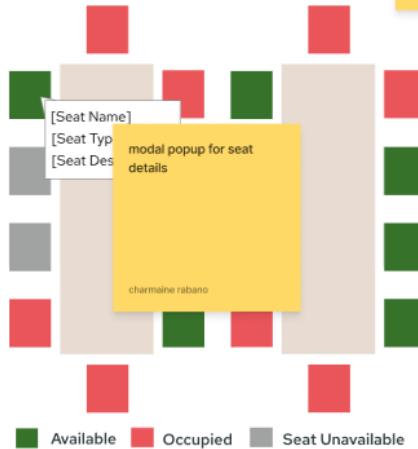
charmaine rabano



# Book A Seat

Center for Learning and Information Resources Building

## Pick your seat



switch panels

charmaine rabano

## Date & Time

Select Date

Select Date

try if old layout looks good here

7:00-8:30AM 15/70

7:00-8:30AM 50/70

7:00-8:30AM 50/70

7:00-8:30AM 50/70

7:00-8:30AM 50/70

7:00-8:30AM 50/70

remove occupancy

BOOK

charmaine rabano

## Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

Seat Save

**Your booking has expired.**

You will now be redirected to  
the home page.

OK



[View Booking Details](#)

[Book A Seat](#)

dropdown icon

## Your booking is at 10:00 am



Code **5155717**

Present this to the librarian to confirm your booking.

A **proof of booking** has also been sent to your email address.

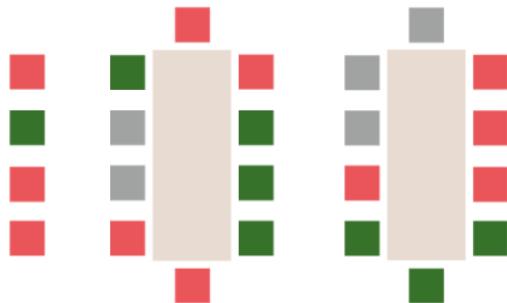
[CANCEL BOOKING](#)

### Booking Details

**Date**  
April 12, 2022

**Time**  
10:00 am to 11:00 am

**Sea**  
S01 - carrel desk (with outlet)



### Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)



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## Check In / Out

**SEARCH**

### Search Results

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	
5155717	R01	John Doe	April 12 - 10:00 am	

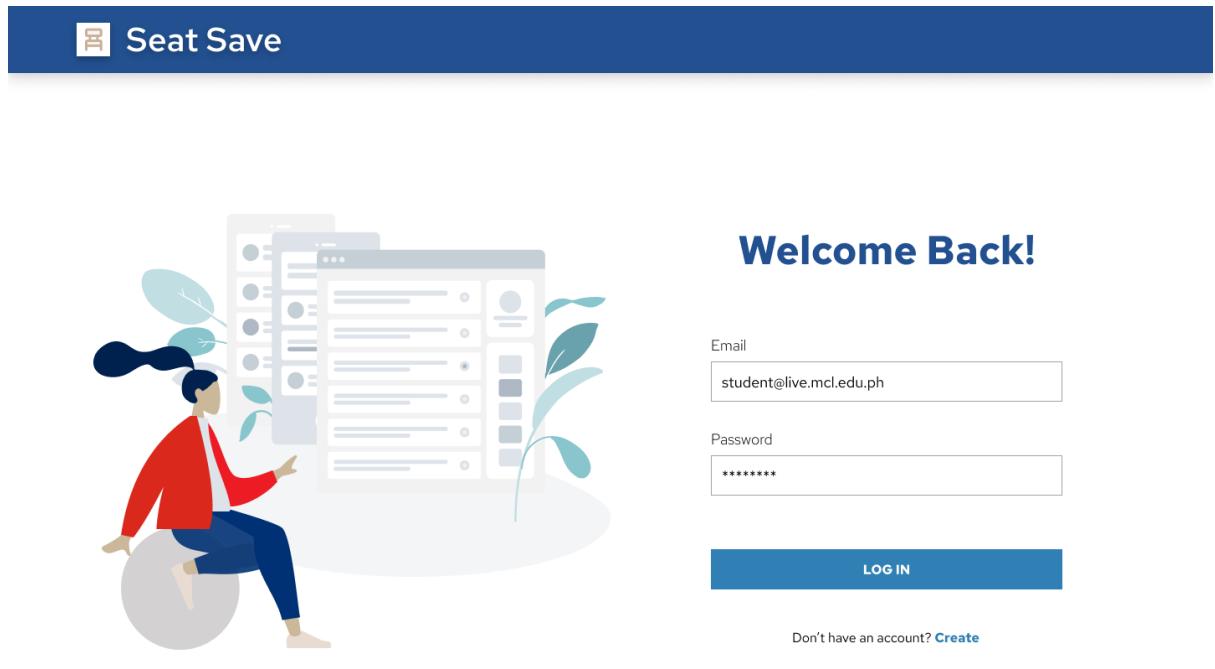
### Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Status
5155717	R01	John Doe	Pending
5155717	R01	John Doe	Pending
5155717	R01	John Doe	Checked In
5155717	R01	John Doe	Checked In

**Links**[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

## APPENDIX D

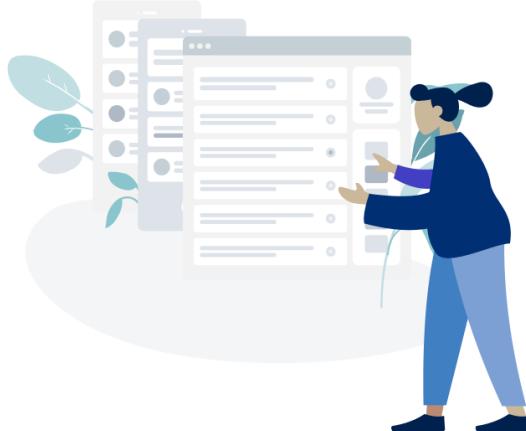
### Mockups



The image shows a digital login interface for 'Seat Save'. At the top left is a logo consisting of a blue square with a white chair icon followed by the text 'Seat Save'. To the right, the text 'Welcome Back!' is displayed in a large, bold, dark blue font. Below this, there are two input fields: 'Email' containing 'student@live.mcl.edu.ph' and 'Password' containing '\*\*\*\*\*'. A blue 'LOG IN' button is positioned below the password field. At the bottom right, a link reads 'Don't have an account? [Create](#)'. On the left side of the page, there is a decorative illustration of a person sitting on a large grey sphere, with a computer monitor displaying a grid of icons or data in the background, surrounded by stylized green leaves.



The image shows a website footer for 'Seat Save'. On the left, under the heading 'Links', are two links: 'Malayan Colleges Laguna' and 'MCL Center for Learning and Information Resources'. On the right, the 'Seat Save' logo is displayed. At the bottom, a black bar contains the copyright notice 'Copyright © 2022. All rights reserved.'



## Create an Account

First Name  Last Name

Email

Password

**CONTINUE**

Already have an account? [LOG IN](#)

**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

 Seat Save

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# Seat Save



Type of Visitor

Office

Department

Program/Strand

Year

**CREATE ACCOUNT**

## Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

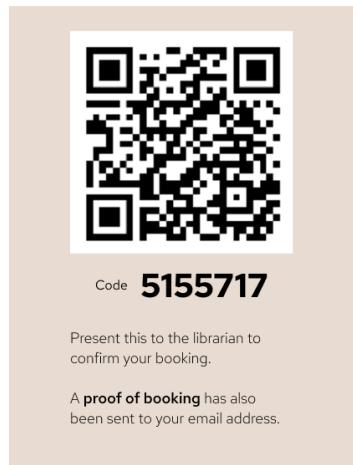
 **Seat Save**

Copyright © 2022. All rights reserved.

You have no booking  
at the moment...

[BOOK A SEAT](#)**Links**[Malayan Colleges Laguna](#) | [MCL Center for Learning and Information Resources](#)

## Your booking is at April 12 (10:00 am)

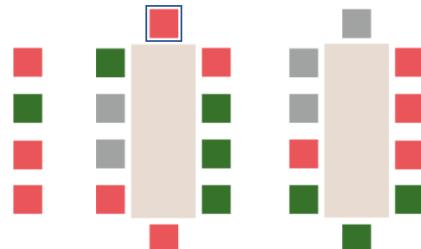


### Booking Details

**Date**  
April 12, 2022

**Time**  
10:00 am to 11:00 am

**Seat**  
R01 - carrel desk (with outlet)



[CANCEL BOOKING](#)

### Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

 Seat Save

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×

Are you sure you want to cancel  
your booking?

[YES](#)

[NO](#)

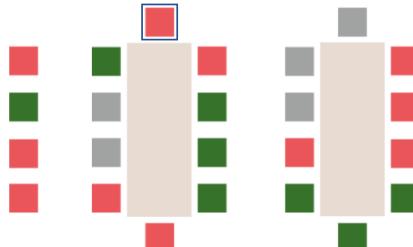
## Your booking is until 11:00 am

### Booking Details

**Date**  
April 12, 2022

**Time**  
10:00 am to 11:00 am

**Seat**  
R01 - carrel desk (with outlet)



Are you leaving CLIR?

[CHECK OUT](#)

### Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

 Seat Save

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## Your booking has expired

You were automatically checked out of your  
April 12, 2022 booking.

[OK](#)

X

See you next time!

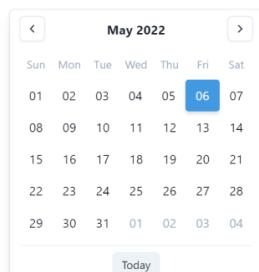
You have checked out of your booking. You  
can now book a seat for your next visit.

OK

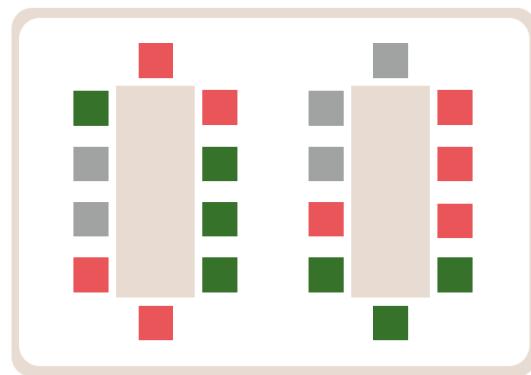
## Book A Seat

Center for Learning and Information Resources - Einstein Building

### Select your date



### Pick your seat



### Select your time



 Available     Occupied

 Seat Unavailable

**BOOK SEAT**

### Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

 **Seat Save**

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X

[SeatName]

[Description]

**OK**

X

## Successfully Booked!

A [proof of your booking](#) has been sent to your email. You may proceed to view the instructions to be followed.

[VIEW BOOKING DETAILS](#)



## Sorry, you can't book at the moment...

You still have a pending booking and you are only allowed to have one booking at a time.

[VIEW BOOKING DETAILS](#)





## Welcome Back!

Email

student@live.mcl.edu.ph

Password

\*\*\*\*\*

**LOG IN**

Don't have an account? [Create](#)

### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)



**Seat Save**

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## Create an Account

First Name

Last Name

Email

Password

Already a user? [LOG IN](#)

←

Type of Visitor

Select Type

Office

Select Office

Department

Select Department

Program/Strand

Select Program/Strand

Year

Select Year

**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)


Seat Save

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**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)


Seat Save

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≡

You have no booking  
at the moment...

BOOK A SEAT



**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

 **Seat Save**

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Your booking is at  
April 12 (10:00 am)



Code **5155717**

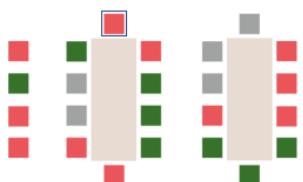
Present this to the librarian to  
confirm your booking.

A **proof of booking** has also  
been sent to your email  
address.

#### Booking Details

**Date** April 12, 2022      **Time** 10:00 am to 11:00 am

**Seat**  
R01 - carrel desk (with outlet)



**CANCEL BOOKING**

×

Are you sure you want to  
cancel your booking?

**YES**

**NO**



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## Your booking is until 11:00 am

### Booking Details

**Date**

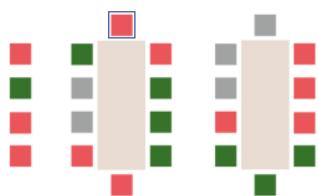
April 12, 2022

**Time**

10:00 am to 11:00 am

**Seat**

R01 - carrel desk (with outlet)



Are you leaving CLIR?

**CHECK OUT****See you next time!**

You have checked out of your booking. You can now book a seat for your next visit.

**OK**

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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## Sorry, you can't book at the moment...

You still have a pending booking and you are only allowed to have one booking at a time.

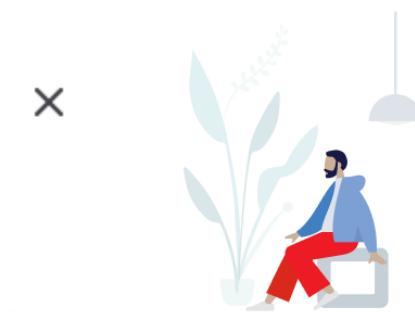
[VIEW BOOKING DETAILS](#)



Your booking has  
expired

You were automatically checked  
out of your April 12, 2022  
booking.

[OK](#)



### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information  
Resources](#)

 [Seat Save](#)

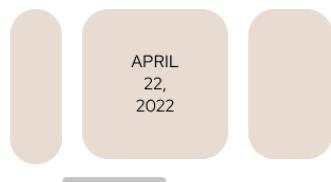
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## Book A Seat

Center for Learning and  
Information Resources - Einstein  
Building

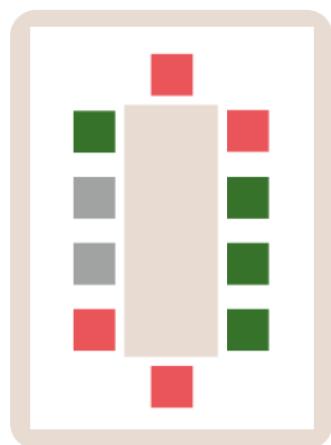
Select your date



Select your time



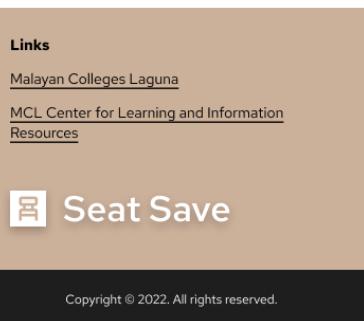
Pick your seat



×

[SeatName]

[Description]



Successfully Booked!

A [proof of booking](#) has been sent to your email. You may proceed to view the instructions to be followed.

[VIEW BOOKING DETAILS](#)

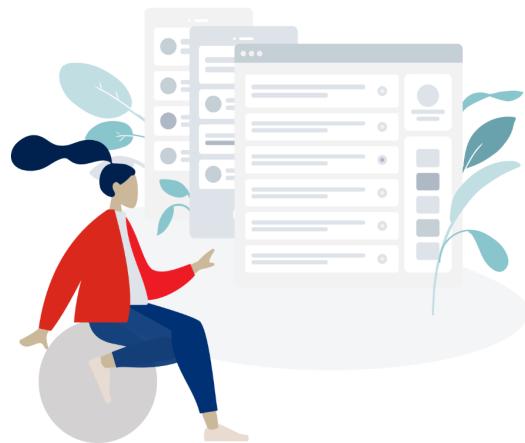
[View Booking Details](#)

[Book A Seat](#)

...

Log out





## Welcome Back!

Email

Password

**LOG IN**

Can't access your account?  
[Contact the administrators](#)

**Links**

[Malayan Colleges Laguna](#) | [MCL Center for Learning and Information Resources](#)

## Check In / Out

ScanSearch

SEARCH

Search Results

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending



Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Checked In
5155717	R01	John Doe	April 12 - 10:00 am	Checked In

### Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

## Check In / Out

Scan Search

Enter Code SEARCH

Search Results

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending

Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Checked In
5155717	R01	John Doe	April 12 - 10:00 am	Checked In

X

Booking Details

**Code**  
5155717

**Seat**  
R01 - carrel desk (with outlet)

**Visitor**  
John Doe

**Date**  
April 12, 2022

**Time**  
10:00 am to 11:00 am

CHECK IN

## Check In / Out

Scan

Search

Ready to Scan?

START SCANNING

Camera is Disabled



Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Checked In
5155717	R01	John Doe	April 12 - 10:00 am	Checked In

Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

## Check In / Out

Scan Search

Align the QR Code within the frame to scan

STOP SCANNING

Camera feed

Scan Result

Booking Code: 5155717

Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date & Time	Status
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Pending
5155717	R01	John Doe	April 12 - 10:00 am	Checked In
5155717	R01	John Doe	April 12 - 10:00 am	Checked In

### Booking Details

**Code**

5155717

**Seat**

R01 - carrel desk (with outlet)

**Visitor**

John Doe

**Date**

April 12, 2022

**Time**

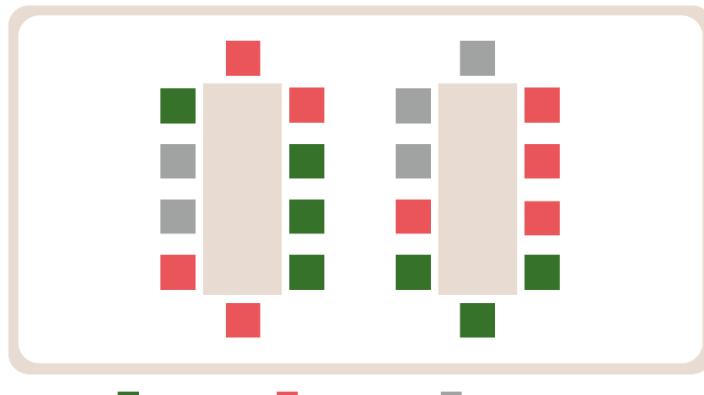
10:00 am to 11:00 am

**CHECK IN****Links**

Malayan Colleges Laguna | MCL Center for Learning and Information Resources

## View Bookings

Seat Map

### Booking Details

**Code**

5155717

**Seat**

R01 - carrel desk (with outlet)

**Visitor**

John Doe

**Date**

April 12, 2022

**Time**

10:00 am to 11:00 am

### All Bookings

Booking ID	Status	Booking Date	Visitor Email	
<input type="text" value="Enter Booking ID"/>	<input type="button" value="Select Status"/>	<input type="text" value="Enter Date"/> <input type="button" value="Select Date"/>	<input type="text" value="Enter Visitor Email"/>	<input type="button" value="SEARCH"/>

Booking ID	Seat	Visitor	Booking Period	Status	Check In / Out
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Completed	10:02 am April 12, 2022 10:50 am April 12, 2022
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Pending	
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Cancelled	
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Checked In	10:02 am April 12, 2022

< 1 2 3 >

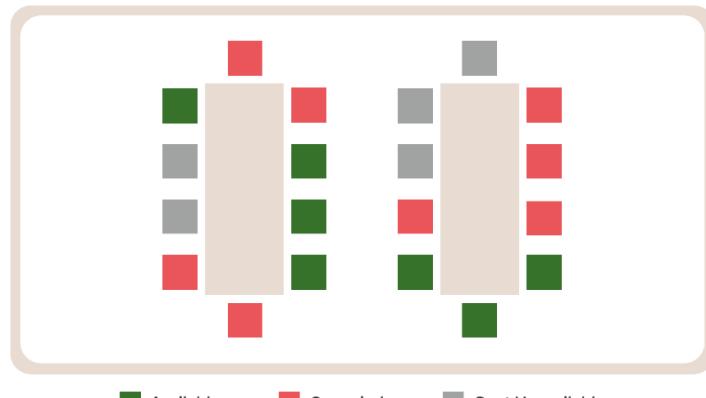
**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

Seat Save

## View Bookings

Seat Map

### Booking Details

**Code**

5155717

**Seat**

R01 - carrel desk (with outlet)

**Visitor**

John Doe

**Date**

April 12, 2022

**Time**

10:00 am to 11:00 am

### All Bookings

Booking ID	Status	Booking Date	Visitor Email	
<input type="text" value="Enter Booking ID"/>	<input type="button" value="Select Status"/>	<input type="text" value="Enter Date"/> <input type="button" value="Select Date"/>	<input type="text" value="Enter Visitor Email"/>	<input type="button" value="SEARCH"/>

Booking ID	Seat	Visitor	Booking Period	Status	Check In / Out
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Completed	10:02 am April 12, 2022 10:50 am April 12, 2022
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Pending	
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Cancelled	
XkeRvmSi0V	R01	John Doe <a href="mailto:johndoe@live.mcl.edu.ph">johndoe@live.mcl.edu.ph</a>	10:00 am April 12, 2022 11:00 am April 12, 2022	Checked In	10:02 am April 12, 2022

< 1 2 3 >

**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

Seat Save

**Seat Save**

CHECK IN / OUT

View Bookings

Generate Reports

Manage Settings

Profile

Manage Seats

Manage Date & Time

## Manage Seats

Add Seat:

Available Seats

Einstein-1	E-1

**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

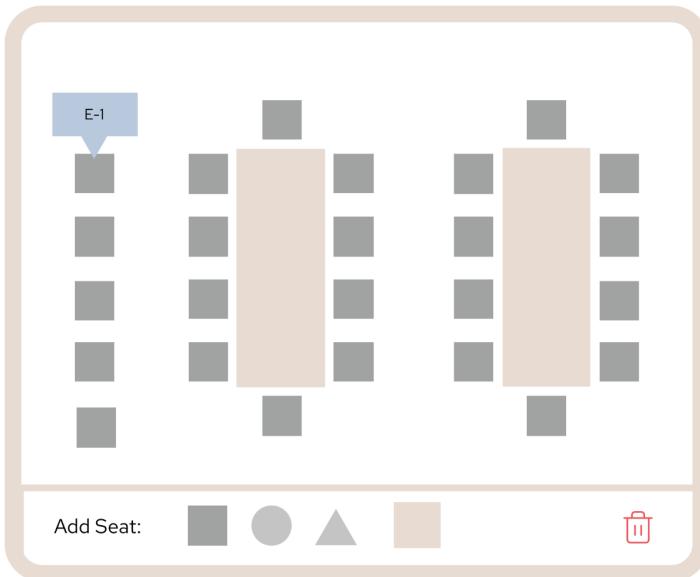
Copyright © 2022. All rights reserved.

**Seat Save**

Manage Seats

Manage Date &amp; Time

## Manage Seats



**Seat Information**

Seat ID	<input type="text" value="Text"/>
Name	<input type="text" value="Enter Seat Name"/>
Type	<input type="button" value="Select Seat Type"/>
Description	<input type="text" value="Enter Seat Description"/>

Activate Seat

**SAVE**

**Links**[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

×

Are you sure you want to delete  
this seat?

YES

NO

×

Seat Added!

You have successfully added a new seat:  
Einstein-1

OK

**Seat Save**

CHECK IN / OUT

View Bookings   Generate Reports   Manage Settings ▾

Manage Seats

Manage Date & Time

## Manage Date & Time

Regular Hours	Override Days
Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

Time	
<input type="checkbox"/> 7:00 am to 8:00 am	<input checked="" type="checkbox"/> 3:00 pm to 4:00 pm
<input type="checkbox"/> 8:00 am to 9:00 am	<input checked="" type="checkbox"/> 4:00 pm to 5:00 pm
<input checked="" type="checkbox"/> 9:00 am to 10:00 am	<input checked="" type="checkbox"/> 5:00 pm to 6:00 pm
<input checked="" type="checkbox"/> 10:00 am to 11:00 am	<input type="checkbox"/> 6:00 pm to 7:00 pm
<input checked="" type="checkbox"/> 11:00 am to 12:00 pm	<input type="checkbox"/> 7:00 pm to 8:00 pm
<input type="checkbox"/> 12:00 pm to 1:00 pm	<input type="checkbox"/> 8:00 pm to 9:00 pm
<input type="checkbox"/> 1:00 pm to 2:00 pm	<input type="checkbox"/> 9:00 pm to 10:00 pm
<input type="checkbox"/> 2:00 pm to 3:00 pm	

**SAVE**

**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

**Seat Save**

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**Seat Save**

CHECK IN / OUT

View Bookings

Generate Reports

Manage Settings

Manage Seats

Manage Date & Time

## Manage Date & Time

Regular Hours	Override Days	Time																																																	
<p>&lt; February 2022 &gt;</p> <table><tr><td>Mo</td><td>Tu</td><td>We</td><td>Th</td><td>Fr</td><td>Sat</td><td>Su</td></tr><tr><td>30</td><td>31</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr><tr><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td></tr><tr><td>20</td><td>21</td><td>22*</td><td>23</td><td>24</td><td>25</td><td>26</td></tr><tr><td>27</td><td>28</td><td>1</td><td>2</td><td>3</td><td>4*</td><td>5</td></tr><tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr></table>	Mo	Tu	We	Th	Fr	Sat	Su	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22*	23	24	25	26	27	28	1	2	3	4*	5	6	7	8	9	10	11	12		<p><input type="checkbox"/> 7:00 am to 8:00 am      <input checked="" type="checkbox"/> 3:00 pm to 4:00 pm</p> <p><input type="checkbox"/> 8:00 am to 9:00 am      <input checked="" type="checkbox"/> 4:00 pm to 5:00 pm</p> <p><input checked="" type="checkbox"/> 9:00 am to 10:00 am      <input checked="" type="checkbox"/> 5:00 pm to 6:00 pm</p> <p><input checked="" type="checkbox"/> 10:00 am to 11:00 am      <input type="checkbox"/> 6:00 pm to 7:00 pm</p> <p><input checked="" type="checkbox"/> 11:00 am to 12:00 pm      <input type="checkbox"/> 7:00 pm to 8:00 pm</p> <p><input type="checkbox"/> 12:00 pm to 1:00 pm      <input type="checkbox"/> 8:00 pm to 9:00 pm</p> <p><input type="checkbox"/> 1:00 pm to 2:00 pm      <input type="checkbox"/> 9:00 pm to 10:00 pm</p> <p><input type="checkbox"/> 2:00 pm to 3:00 pm</p>
Mo	Tu	We	Th	Fr	Sat	Su																																													
30	31	1	2	3	4	5																																													
6	7	8	9	10	11	12																																													
13	14	15	16	17	18	19																																													
20	21	22*	23	24	25	26																																													
27	28	1	2	3	4*	5																																													
6	7	8	9	10	11	12																																													

**DELETE**    **SAVE**

**Links**

[Malayan Colleges Laguna](#)   [MCL Center for Learning and Information Resources](#)

**Seat Save**

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## Welcome Back!

Email

librarian@mcl.edu.ph

Password

\*\*\*\*\*

**LOG IN**

Can't access your account?

**Contact the administrators**

### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)



**Seat Save**

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## Check In / Out

Scan	Search		
<input type="text" value="Enter Code"/>			
<b>SEARCH</b>			
Search Results			
Code	Seat	Visitor	Date
515717	R01	John Doe	April 12, 2022
515717	R01	John Doe	April 12, 2022

Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date
515717	R01	John Doe	April 12, 2022
515717	R01	John Doe	April 12, 2022
515717	R01	John Doe	April 12, 2022
515717	R01	John Doe	April 12, 2022



## Check In / Out

X

### Booking Details

**Code**  
5155717

**Seat**  
R01 - carrel desk (with outlet)

**Visitor**  
John Doe

**Date**  
April 12, 2022

**Time**  
10:00 am to 11:00 am

**CHECK IN**

**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

**Seat Save**

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**Links**

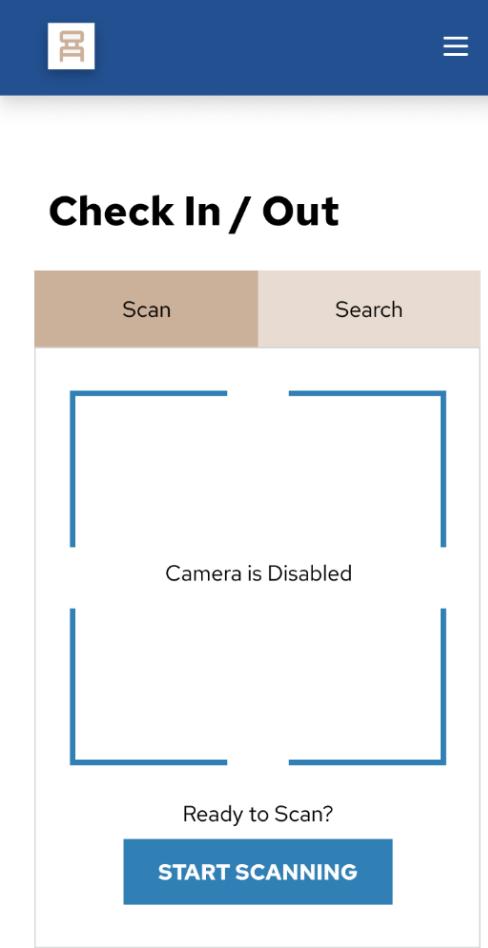
[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

**Seat Save**

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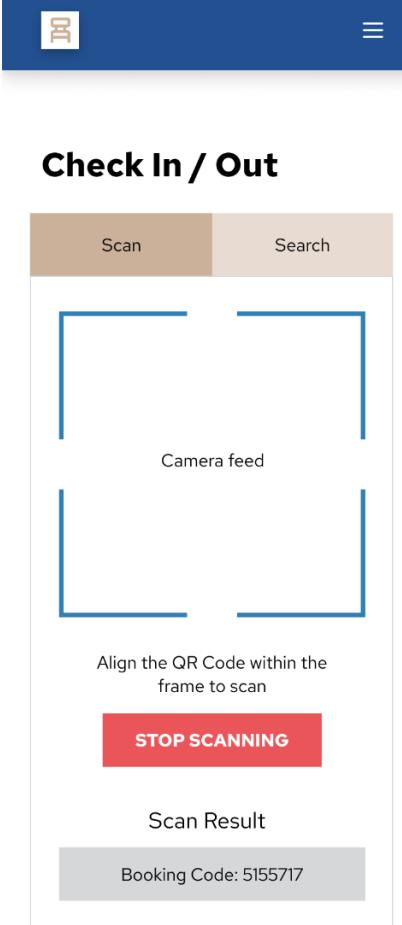
**Check In / Out**

Scan      Search

Camera is Disabled

Ready to Scan?

**START SCANNING**



**Check In / Out**

Scan      Search

Camera feed

Align the QR Code within the frame to scan

**STOP SCANNING**

Scan Result

Booking Code: 5155717

Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022

Bookings for 10:00 am to 11:00 am

Code	Seat	Visitor	Date
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022
55717	R01	John Doe	April 15, 2022

**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

**Seat Save**

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**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

**Seat Save**

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## View Bookings

### Seat Map

Select date

Select period

■ Available ■ Occupied  
■ Seat Unavailable



## View Bookings

### Seat Map

Select date

Select period

■ Available ■ Occupied  
■ Seat Unavailable

### All Bookings



Booking ID	Seat	Visitor
XkeRvmSioV	R01	John Doe <u>johndoe</u>

< 1 2 3 >

### All Bookings



Enter Booking ID

Select Status

Enter Date

Enter Visitor Email

**SEARCH**

Booking ID	Seat	Visitor
XkeRvmSioV	R01	John Doe <u>johndoe</u>

< 1 2 3 >

### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

## Seat Save

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### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

## Seat Save

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## Generate Reports

[Visitor Data](#)   [Seat Occupancy](#)

[DOWNLOAD ALL REPORTS](#)

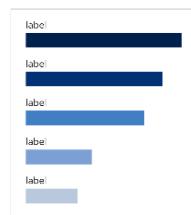
From

Select Date

To

Select Date

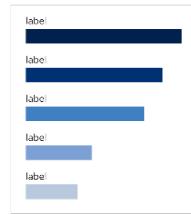
### Top Departments of Student Visitors



Count each visitor once

[Download report](#)

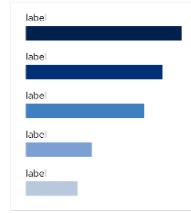
### Top Programs/Strands of Student Visitors



Count each visitor once

[Download report](#)

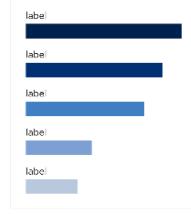
### Top Year Levels of Student Visitors



Count each visitor once

[Download report](#)

### Top Programs/Strands and Year Levels of Student Visitors



Count each visitor once

[Download report](#)

#### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

**Seat Save**

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The screenshot shows a mobile application interface. At the top, there is a blue header bar with a logo icon and a three-line menu icon. Below the header, the main title "Manage Seats" is displayed in bold black font. To the left of the title, there is a large graphic of a theater seating arrangement with several rows of seats, some highlighted in light orange. On the right side, there is another graphic showing two rows of theater seats with central aisle access.

**Available Seats**

Einstein-1	E-1

**Seat Information**

Seat ID: Text

Name: Enter Seat Name

Type: Select Seat Type

Description: Enter Seat Description

Activate Seat

**SAVE**

The screenshot shows a mobile application interface. It features a brown header bar with the word "Links" and two links: "Malayan Colleges Laguna" and "MCL Center for Learning and Information Resources". Below the header, there is a large graphic of a theater seat with a central aisle, labeled "Seat Save".

**Links**

[Malayan Colleges Laguna](#)

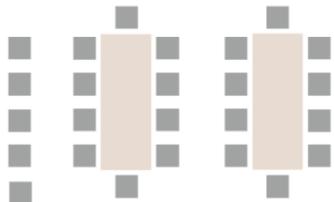
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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## Manage Seats



Seat Information X

Seat ID

Name

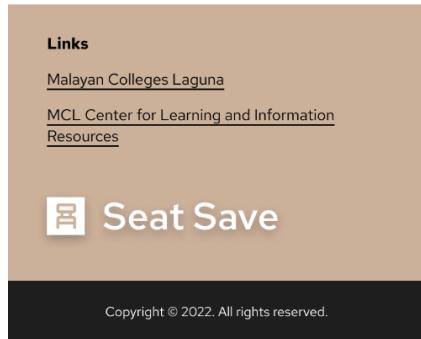
Type

Description

Activate Seat

SAVE

DELETE



×

Are you sure you want to  
delete this seat?

**YES**

**NO**

×

Seat Added!

You have successfully added a  
new seat: Einstein-1

**OK**

The image shows a mobile application interface for managing date and time settings. At the top, there is a blue header bar with a logo and a three-line menu icon. Below the header, the main title "Manage Date & Time" is displayed in bold black font. The interface is divided into two main sections: "Regular Hours" and "Override Days".

**Regular Hours:** This section contains a list of days of the week: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. Each day is represented by a white rectangular box.

**Override Days:** This section is titled "Time" and contains a list of time intervals. Each interval is represented by a row with a checkbox and a time range. Some checkboxes are checked, while others are empty.

Time Range	Status
7:00 am to 8:00 am	<input type="checkbox"/>
8:00 am to 9:00 am	<input type="checkbox"/>
9:00 am to 10:00 am	<input checked="" type="checkbox"/>
10:00 am to 11:00 am	<input checked="" type="checkbox"/>
11:00 am to 12:00 pm	<input checked="" type="checkbox"/>
12:00 pm to 1:00 pm	<input type="checkbox"/>
1:00 pm to 2:00 pm	<input type="checkbox"/>
2:00 pm to 3:00 pm	<input type="checkbox"/>
3:00 pm to 4:00 pm	<input checked="" type="checkbox"/>
4:00 pm to 5:00 pm	<input checked="" type="checkbox"/>
5:00 pm to 6:00 pm	<input checked="" type="checkbox"/>
6:00 pm to 7:00 pm	<input type="checkbox"/>
7:00 pm to 8:00 pm	<input type="checkbox"/>
8:00 pm to 9:00 pm	<input type="checkbox"/>
9:00 pm to 10:00 pm	<input type="checkbox"/>

A large blue "SAVE" button is located at the bottom right of the "Time" section.

This section contains a "Links" heading followed by two links: "Malayan Colleges Laguna" and "MCL Center for Learning and Information Resources". Below this is a "Seat Save" button.

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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This section is a duplicate of the footer section in the left panel, containing the same "Links" and "Seat Save" components.

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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## Manage Date & Time

X

Time

Regular Hours

Override Days

February 2022						
Mo	Tu	We	Th	Fr	Sat	Su
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1	2	3	4	5
6	7	8	9	10	11	12

Time

- 7:00 am to 8:00 am
- 8:00 am to 9:00 am
- 9:00 am to 10:00 am
- 10:00 am to 11:00 am
- 11:00 am to 12:00 pm
- 12:00 pm to 1:00 pm
- 1:00 pm to 2:00 pm
- 2:00 pm to 3:00 pm
- 3:00 pm to 4:00 pm
- 4:00 pm to 5:00 pm
- 5:00 pm to 6:00 pm
- 6:00 pm to 7:00 pm
- 7:00 pm to 8:00 pm
- 8:00 pm to 9:00 pm
- 9:00 pm to 10:00 pm

**SAVE**

**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)


**Seat Save**

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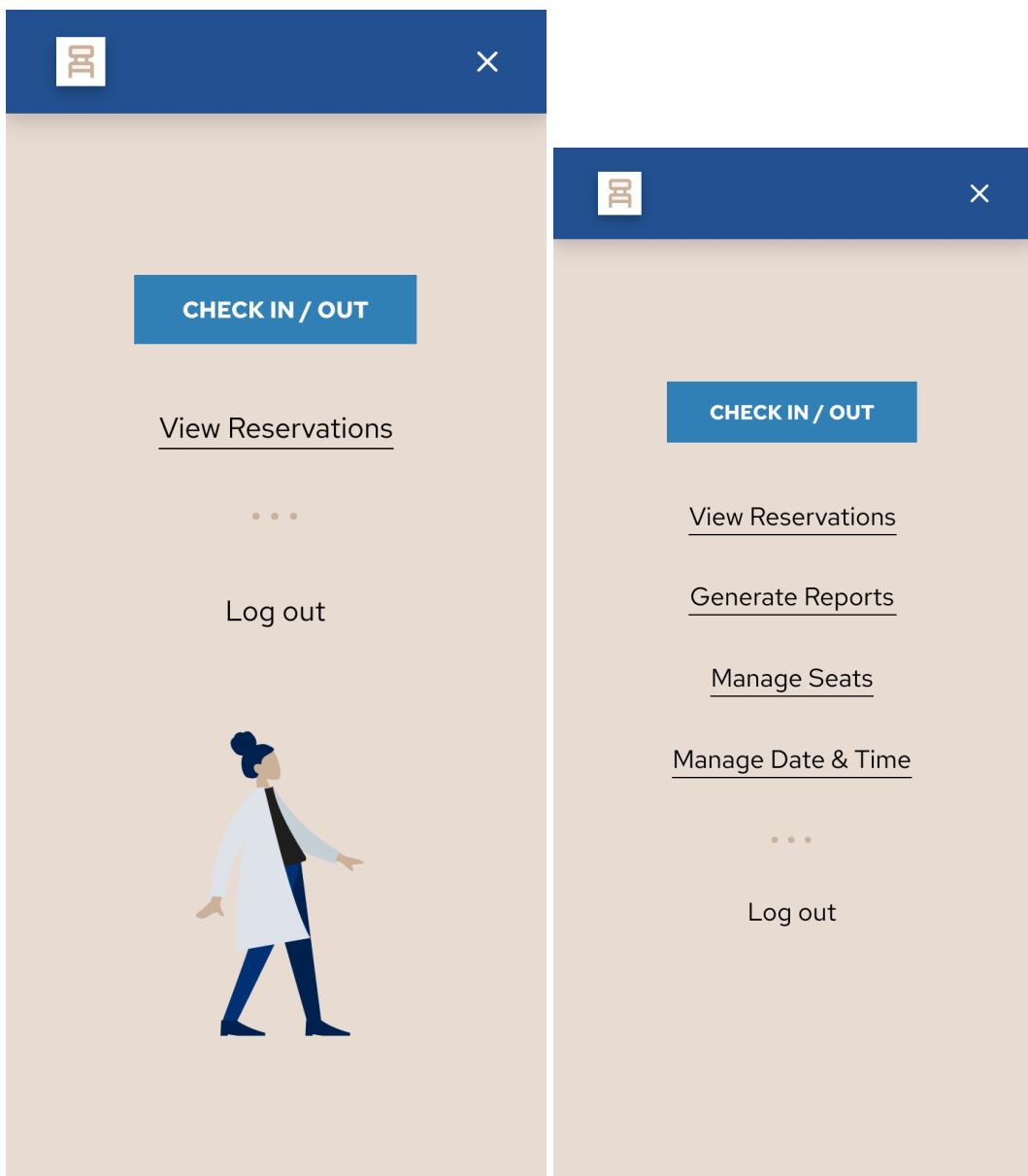
**Links**

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)


**Seat Save**

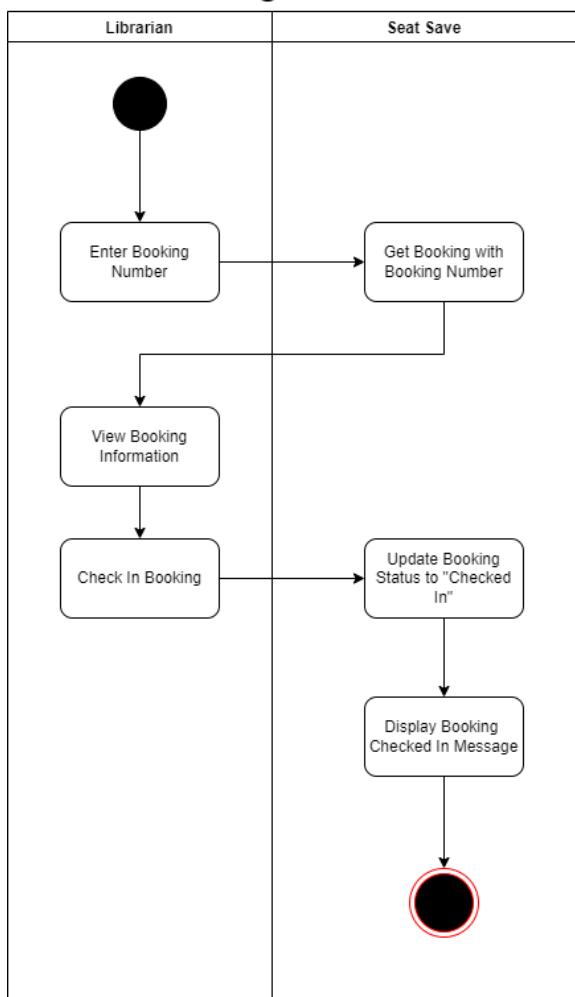
Copyright © 2022. All rights reserved.



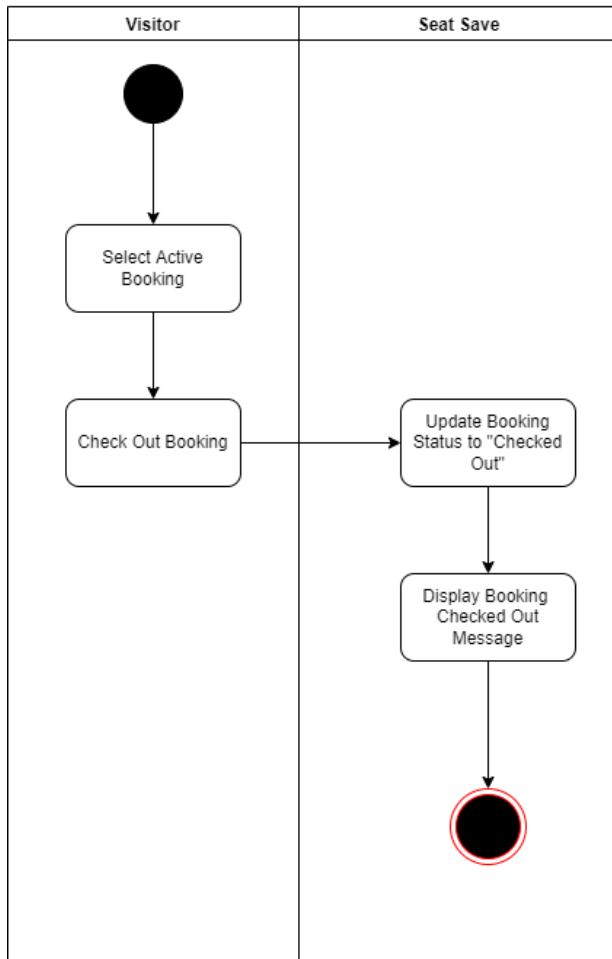
## APPENDIX E

### The Activity Diagram of the System

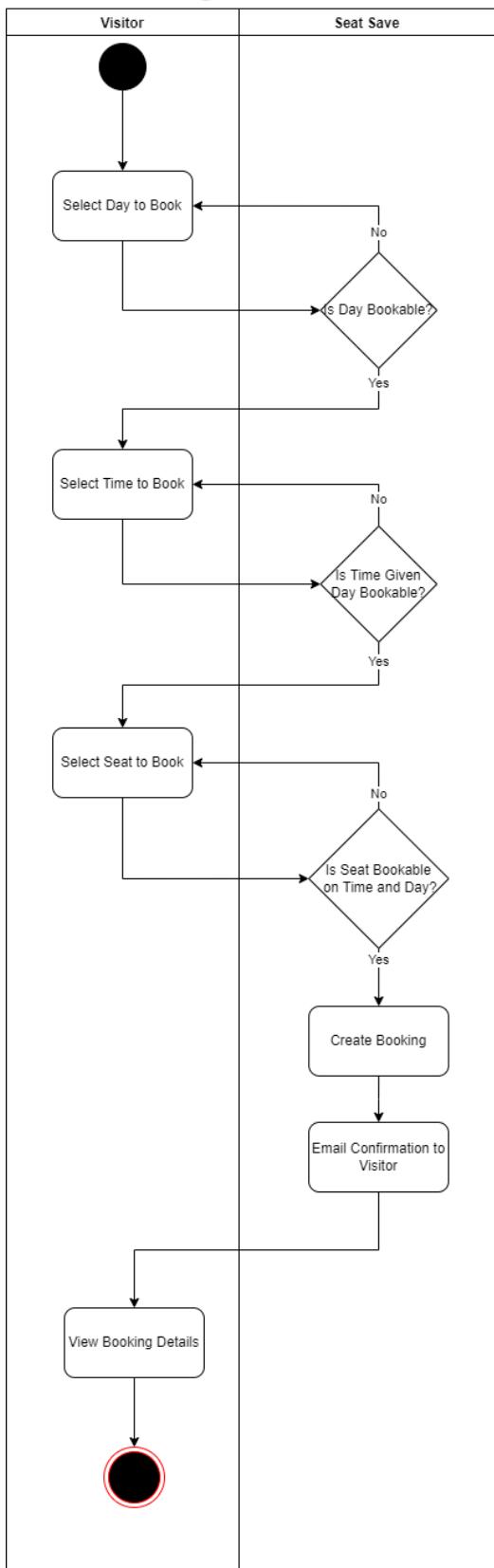
#### **Check in Booking**



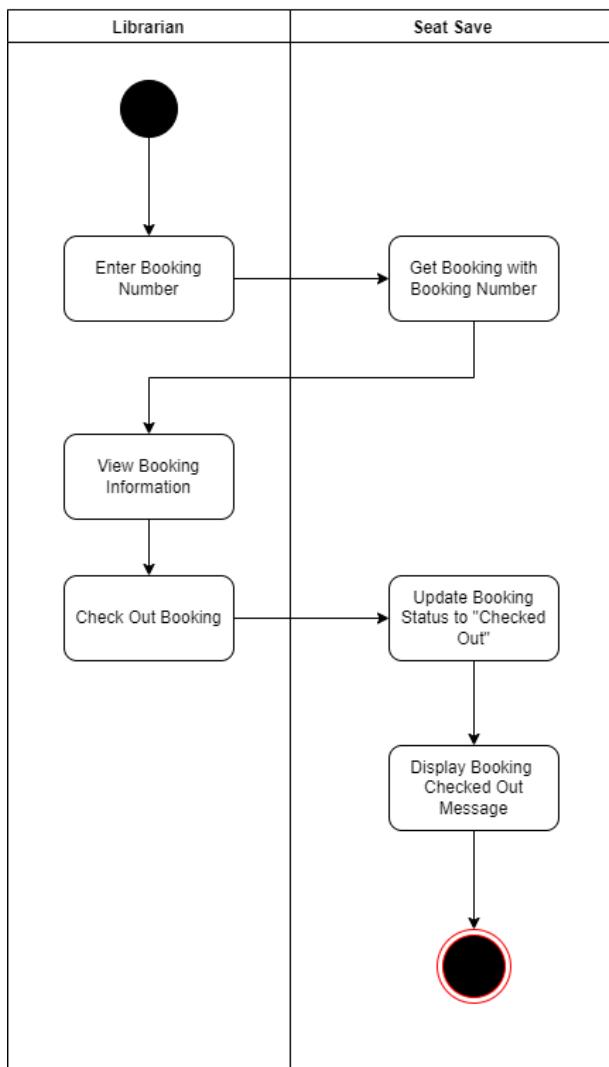
#### **Check Out Booking (Visitor)**



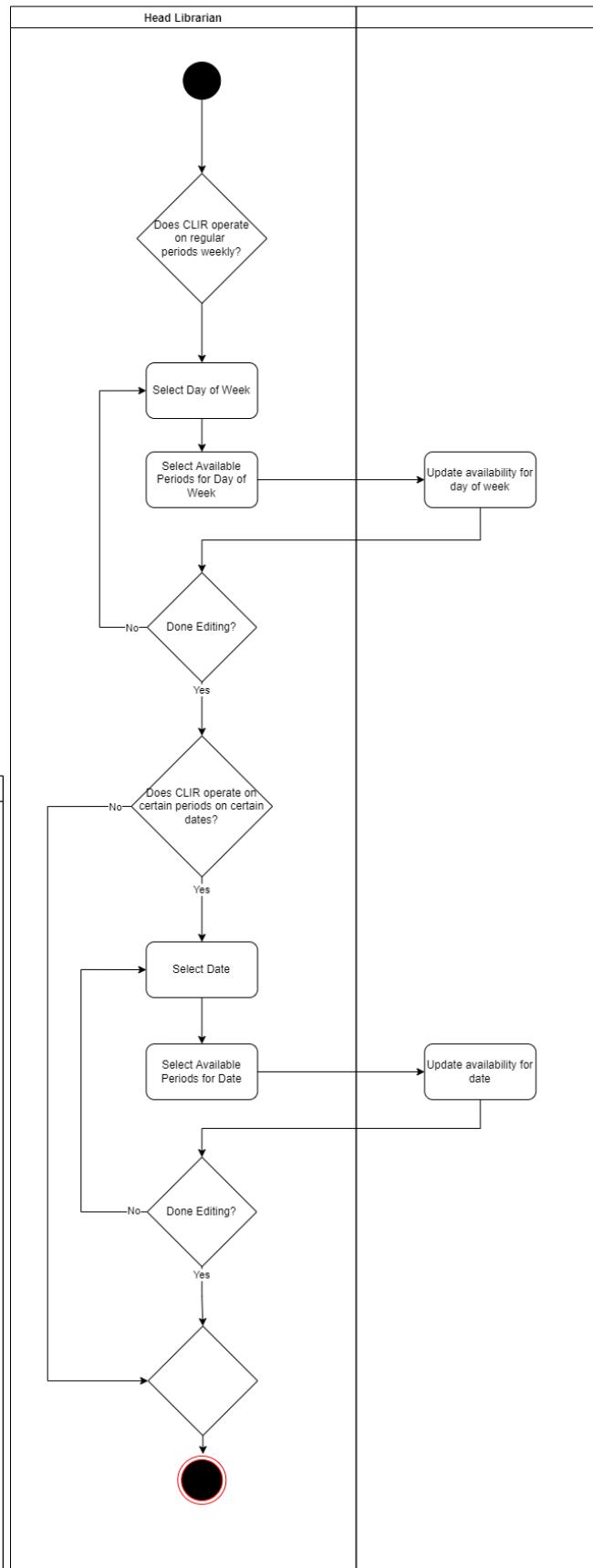
## Create Booking



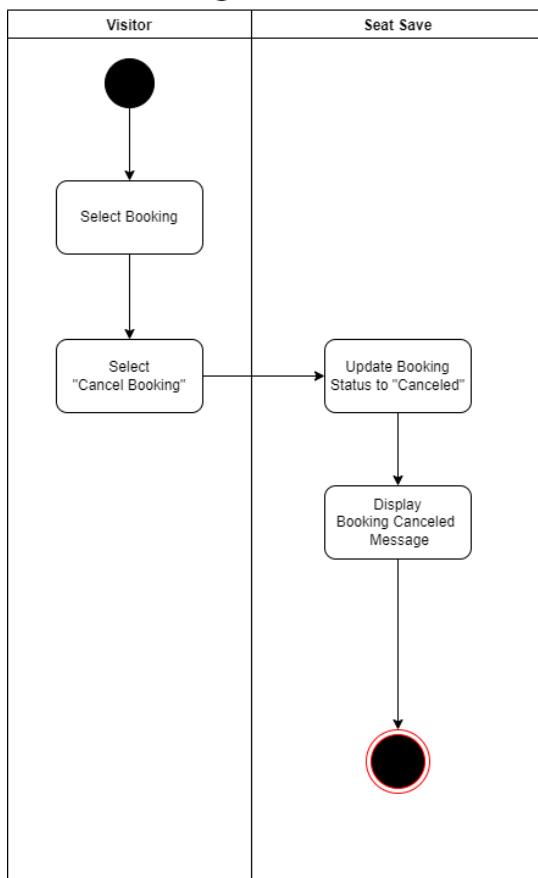
## Check Out Booking (Librarian)



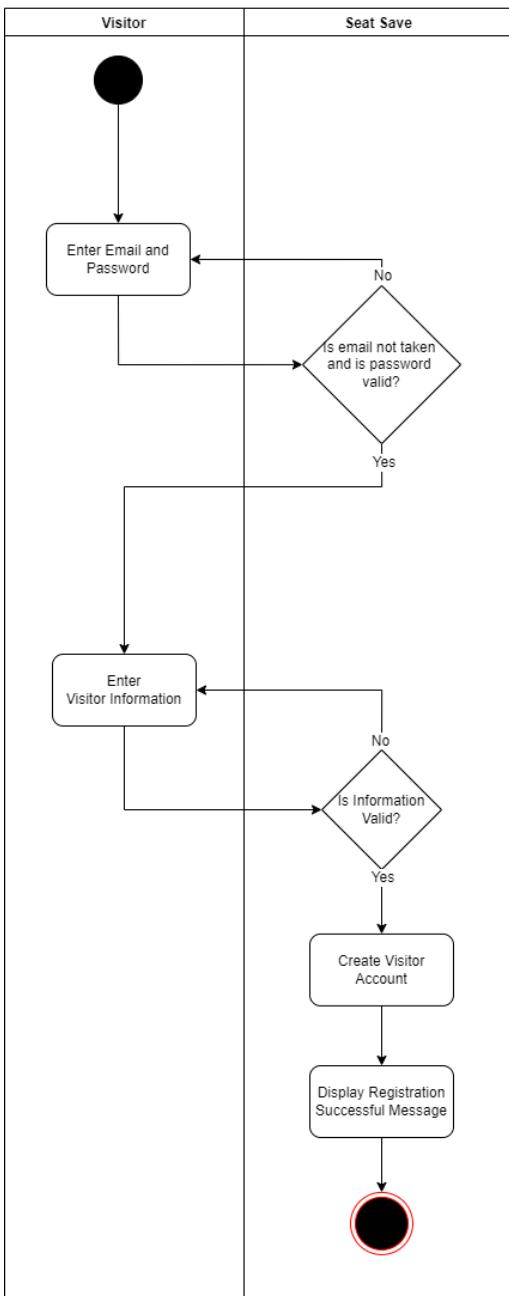
### Specify Reservation Time and Day



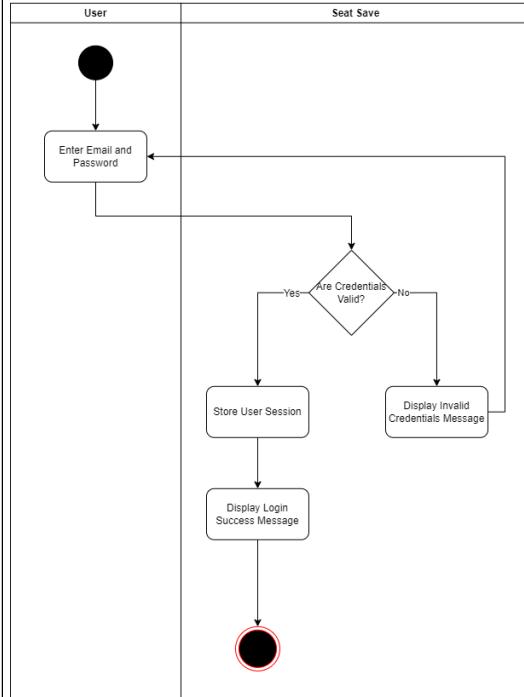
### Cancel Booking



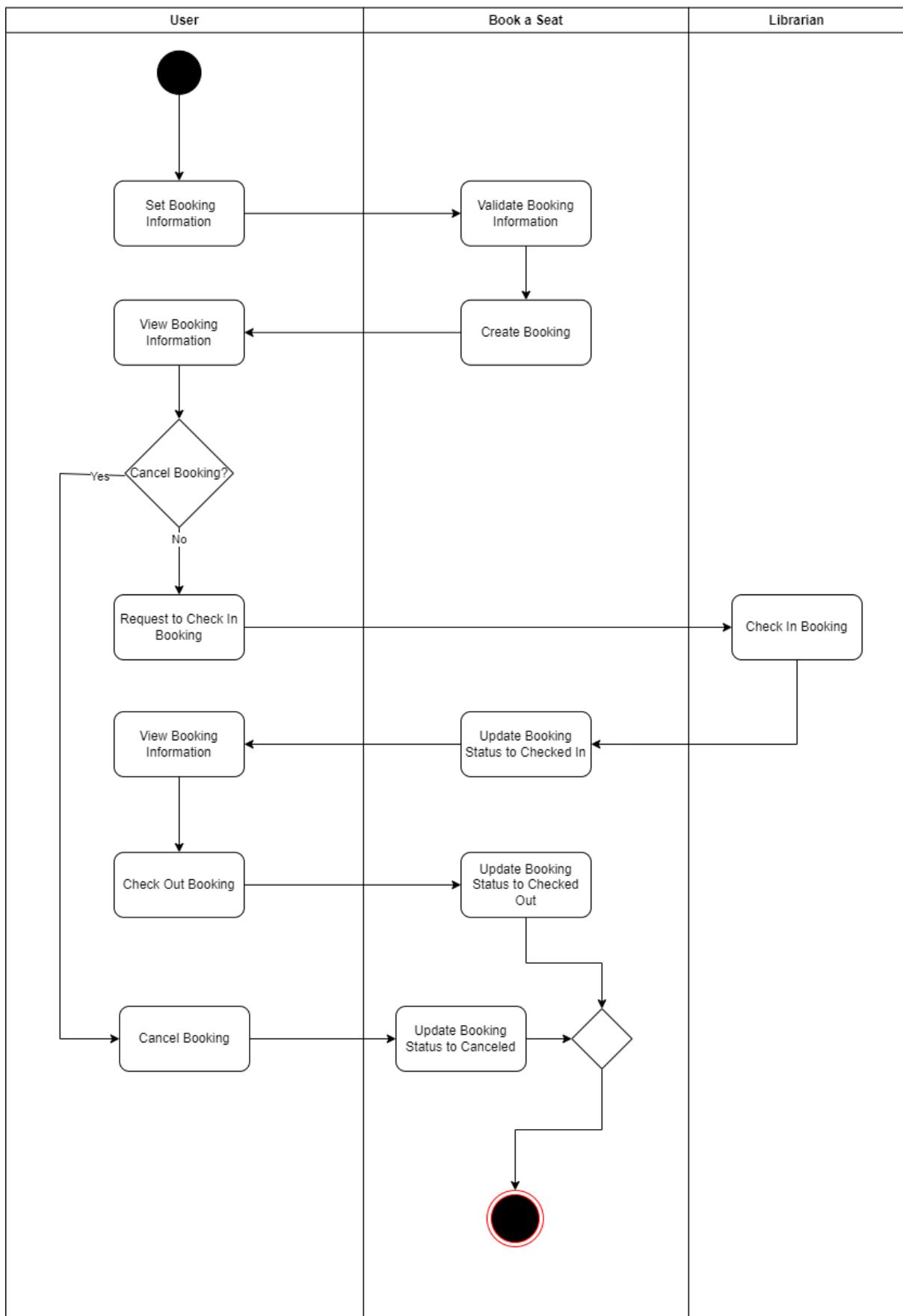
## Register



## Login

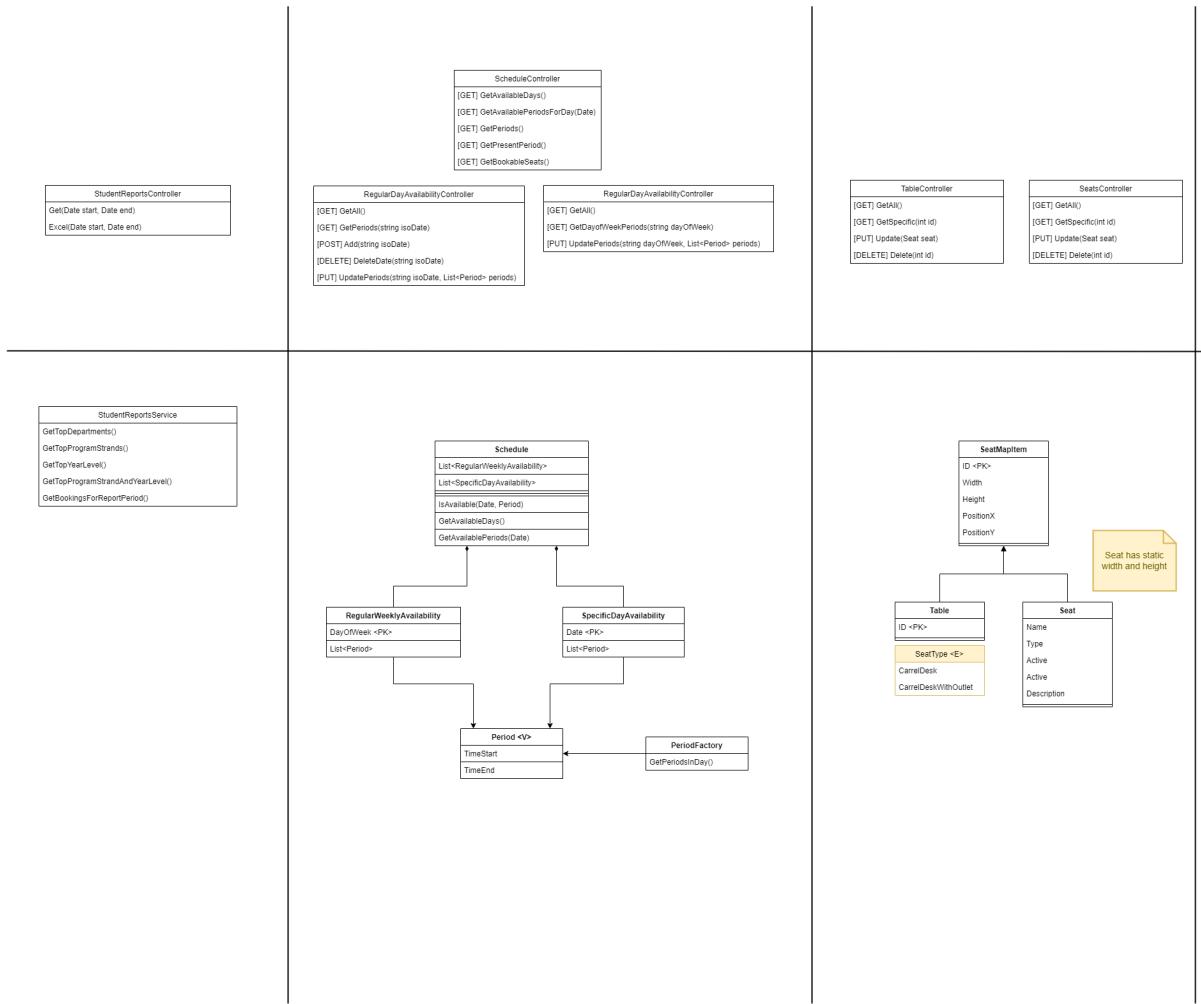


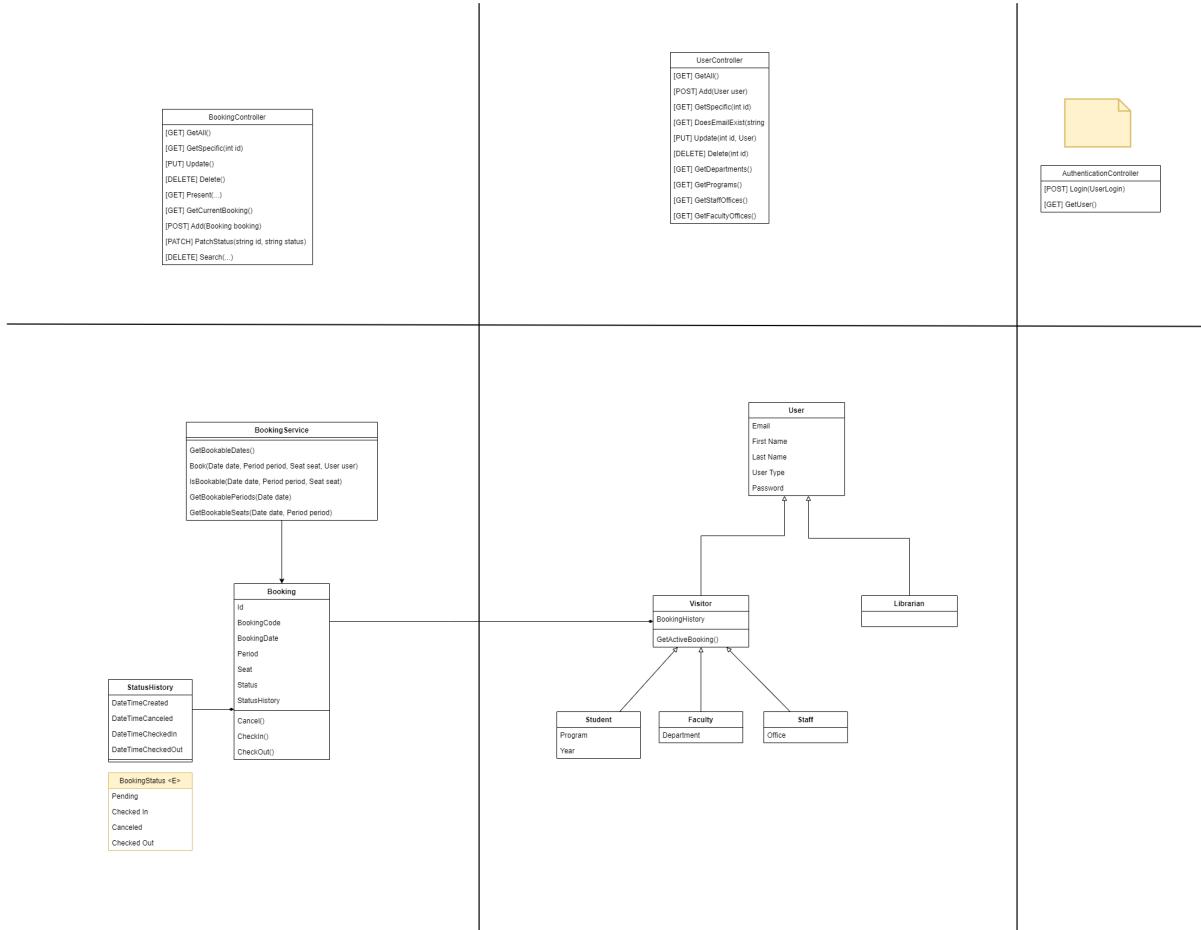
## Booking Process (High Level)



## APPENDIX F

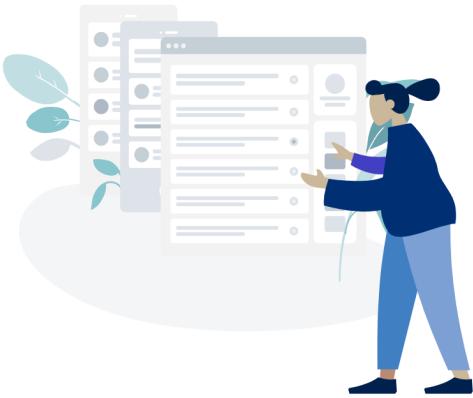
### Component Design





## APPENDIX G

### Visitor Features Desktop Version



### Create Your Account

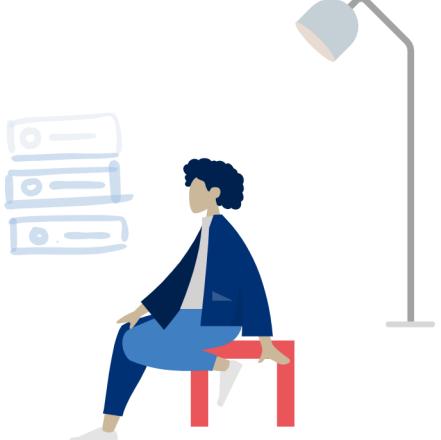
First Name  Last Name   
Email  student@live.mcl.edu.ph  
Password  \*\*\*\*\*

**CONTINUE**

Already have an account? [LOG IN](#)



### Registration (Desktop)



Type of Visitor  Student

Department  Select Department

Program/Strand  Select Program/Strand

Year/Grade Level  Year/Grade Level

**CREATE ACCOUNT**



### Registration Part 2 (Desktop)

## Welcome Back!

Email  
Password  
**LOG IN**Don't have an account? [Create](#)

**Links**  
[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

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 **Seat Save**

## Login Page (Desktop)



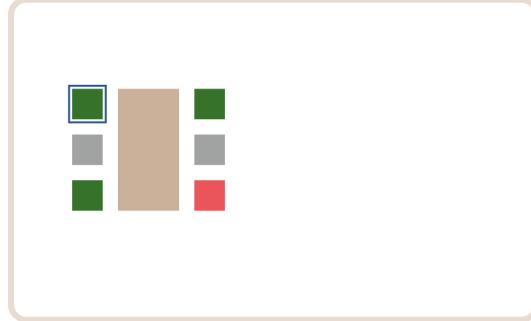
 **Seat Save** View Booking Details Book A Seat dropdown icon

**Book a Seat**

Center for Learning and Information Resources - Einstein Bldg.

**Select your date**

May 2022						
Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

**Pick your seat****Select your time**

7:00 am	8:30 am
10:00 am	11:30 am

Available Reserved Unavailable**BOOK SEAT**

**Links**  
[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

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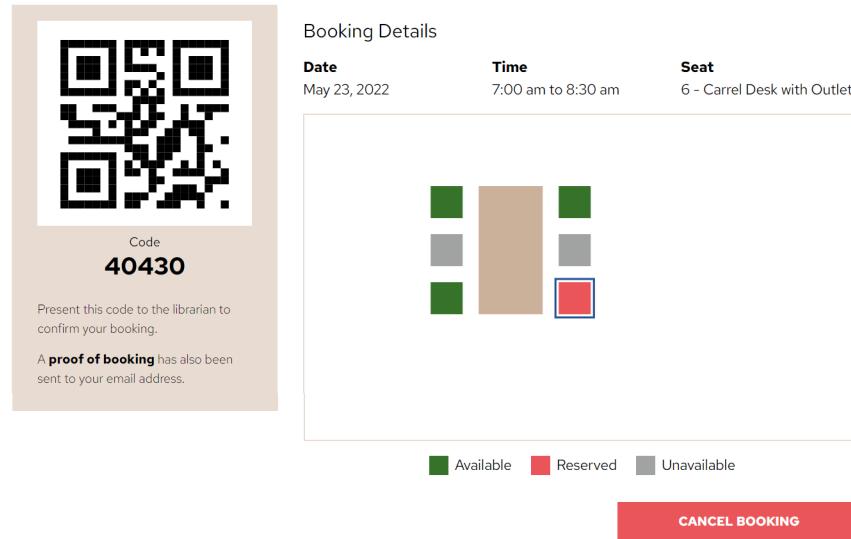
 **Seat Save**

## Book a Seat (Desktop)



The header of the website features a blue navigation bar with the "Seat Save" logo on the left, followed by links for "View Booking Details" and "Book A Seat". On the right side, there is a user icon and a dropdown menu.

Your booking is at May 23, 2022 (7:00 am)



The page displays a QR code and a booking code (40430) for a seat reservation. It includes a seating chart for a Carrel Desk with Outlet, showing availability status (Available in green, Reserved in red, Unavailable in grey). A legend at the bottom defines the colors. A "CANCEL BOOKING" button is located at the bottom right.

Booking Details

**Date** May 23, 2022    **Time** 7:00 am to 8:30 am    **Seat** 6 - Carrel Desk with Outlet

Code  
**40430**

Present this code to the librarian to confirm your booking.

A **proof of booking** has also been sent to your email address.

■ Available ■ Reserved ■ Unavailable

CANCEL BOOKING



The footer contains a "Links" section with links to "Malayan Colleges Laguna" and "MCL Center for Learning and Information Resources". It also features the "Seat Save" logo and a copyright notice: "Copyright © 2022. All rights reserved."

Links

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

**Seat Save**

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*View Booking Details (Pending) (Desktop)*

## Your booking is until 2:30 pm

### Booking Details

**Date**

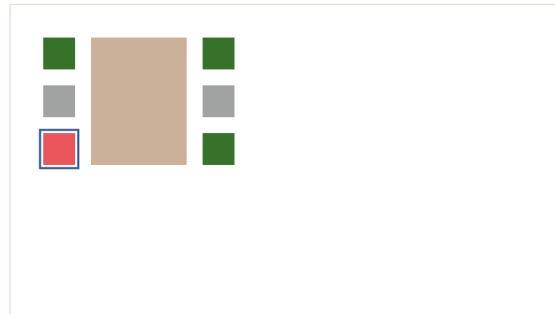
April 29, 2022

**Time**

1:00 pm to 2:30 pm

**Seat**

2 - Carrel Desk with Outlet



■ Available ■ Reserved ■ Unavailable

Are you leaving CLIR?

[CHECK OUT](#)

**Links**[Malayan Colleges Laguna](#) [MCL\\_Center for Learning and Information Resources](#) Seat Save

Copyright © 2022. All rights reserved.

*[View Booking Details \(Checked In\) \(Desktop\)](#)*

## Your booking is until 2:30 pm

### Booking Details

**Date**

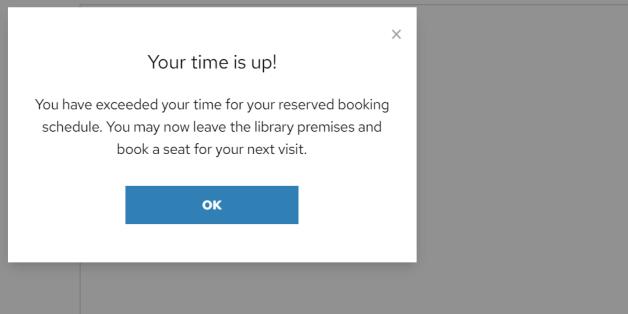
April 29, 2022

**Time**

1:00 pm to 2:30 pm

**Seat**

2 - Carrel Desk with Outlet



 Available  Reserved  Unavailable

Are you leaving CLIR?

[CHECK OUT](#)

**Links**

[Malayan Colleges Laguna](#) [MCL Center for Learning and Information Resources](#)

 Seat Save

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*Booking Expiration (Desktop)*

## APPENDIX H

### Librarian Features Mobile Version



## Welcome Back!

Email

librarian@mcl.edu.ph

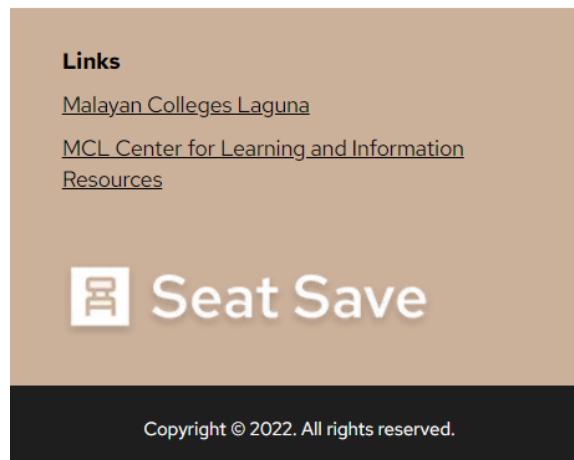
Password

\*\*\*\*\*

**LOG IN**

Can't access your account?

**Contact the administrators**



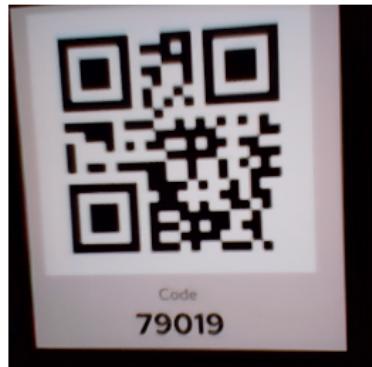


## Check In / Out

SCAN QR  
CODE

SEARCH

OPEN/CLOSE CAMERA



*Check In/Out via QR Part 1 (Mobile)*



## Check In / Out

X

Booking Details

**Code**  
79019

**Seat**  
ABC - Carrel Desk

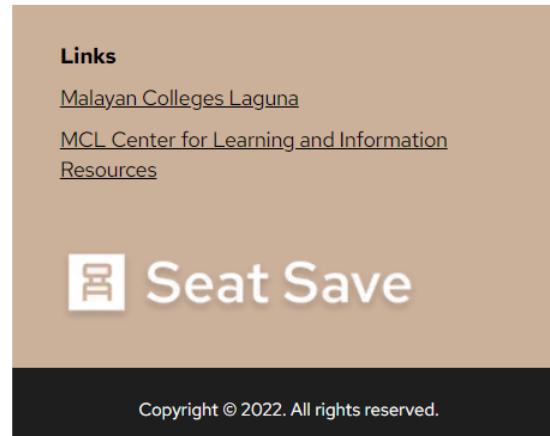
**Visitor**  
qwe qwe  
[qwe@mcl.edu.ph](mailto:qwe@mcl.edu.ph)

**Date**  
May 30, 2022

**Period**  
7:00 am to 8:30 am

**Status**  
Pending

**CHECK IN**



Check In/Out via QR Part 2 (Mobile)



## Check In / Out

**SCAN QR  
CODE**      **SEARCH**

5

**SEARCH**

Search Results      [Clear Search](#)

Code	Seat	Visitor	Date &
65498	DEF	Text Account	May 23 - 1
34531	DEF	Text Account	April 29 - 1
5678	DEF	Text Account	April 29 - 1

< 1 >

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

 **Seat Save**

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*Check In/Out via Booking Code (Mobile)*



## Check In / Out

X

Booking Details

**Code**  
5678

**Seat**  
DEF - Carrel Desk with Outlet

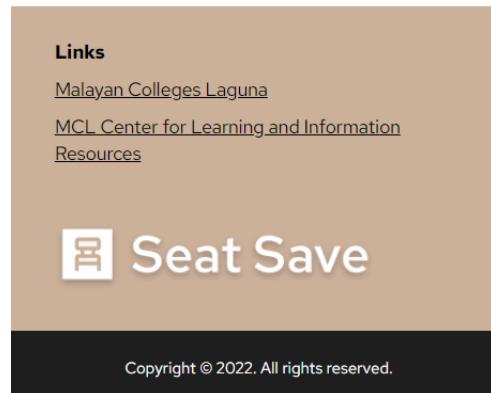
**Visitor**  
Text Account  
[student2@gmail.com](mailto:student2@gmail.com)

**Date**  
April 29, 2022

**Period**  
1:00 pm to 2:30 pm

**Status**  
Pending

**CHECK IN**



Check In/Out via Booking Code Part 2 (Mobile)

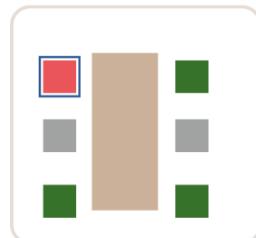


## View Bookings

Seat Map

05/30/2022

7:00 am - 8:30 am ▾



■ Available

■ Reserved

■ Unavailable

X

Booking Details

**Code**  
79019

**Seat**  
1 - Carrel Desk

**Visitor**  
Fname Lname

**Date**  
May 30, 2022

**Time**  
7:00 am to 8:30 am

All Bookings

Booking Code  Status   
Enter Booking Code Checked In

[View All Bookings](#)

Booking ID	Code	Seat	Visi
4	65498	DEF	Text Ac <u>student2@i</u>
3	34531	DEF	Text Ac <u>student2@i</u>

< 1 >

[View Bookings \(Mobile\)](#)



## Generate Reports

Visitor Data

**DOWNLOAD ALL REPORTS**

From

01/03/2022



To

22/05/2022



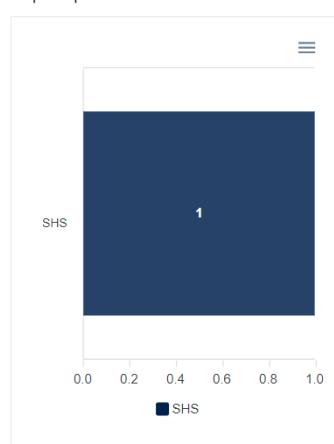
Chart

Top Departments



Count each visitor once

### Top Departments of Student Visitors



### Links

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information](#)  
[Resources](#)

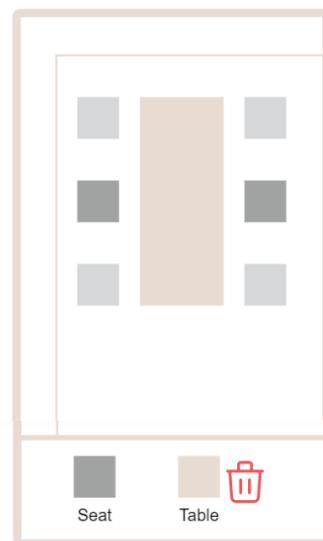
Seat Save

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*Generate Reports (Mobile)*

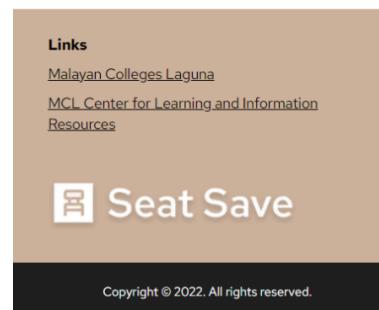


## Manage Seats



Available Seats	
ABC	1
DEF	2
GHI	3
JKL	4
LMNO	5
PQRST	6

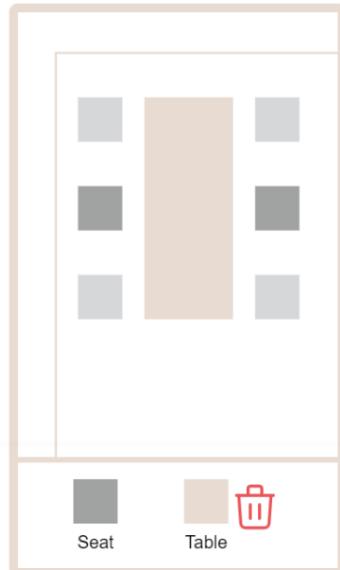
+



Manage Seats (Mobile)



## Manage Seats



Seat Information X

Seat ID	Active
3	<input checked="" type="checkbox"/>
Name	GHI
Type	Carrel Desk
Description	Edit Description

**SAVE** DELETE

Manage Seats Part 2 (Mobile)



## Manage Date & Time

Regular Hours	Override Days
Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

 **Seat Save**

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*Manage Date & Time Regular Hours (Mobile)*



## Manage Date & Time

Periods for Monday X

- 7:00 am to 8:30 am
- 8:30 am to 10:00 am
- 10:00 am to 11:30 am
- 11:30 am to 1:00 pm
- 1:00 pm to 2:30 pm
- 2:30 pm to 4:00 pm
- 4:00 pm to 5:30 pm

**SAVE**

**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

 **Seat Save**

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*Manage Date & Time Regular Hours Part 2 (Mobile)*



## Manage Date & Time

Regular Hours      Override Days

May 4, 2022 (X)

+

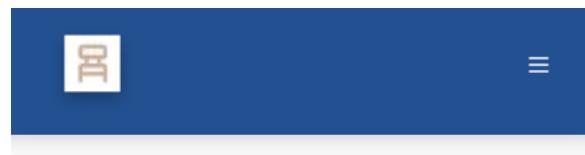
**Links**

[Malayan Colleges Laguna](#)  
[MCL Center for Learning and Information Resources](#)

**Seat Save**

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*Manage Date & Time Override Days (Mobile)*



## Manage Date & Time

Periods for May 4, 2022 X

- 7:00 am to 8:30 am
- 8:30 am to 10:00 am
- 10:00 am to 11:30 am
- 11:30 am to 1:00 pm
- 1:00 pm to 2:30 pm
- 2:30 pm to 4:00 pm
- 4:00 pm to 5:30 pm

**SAVE**

### Links

[Malayan Colleges Laguna](#)

[MCL Center for Learning and Information Resources](#)

 **Seat Save**

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*Manage Date & Time Override Days Part 2 (Mobile)*

**APPENDIX I**  
**Manual Testing Template**

**Test Case # X**

<b>Test Case #:</b> X	<b>Test Case Name:</b>
<b>System:</b>	<b>Subsystem:</b>
<b>Executed by:</b>	<b>Design Date:</b> <b>Execution Date:</b>

<b>Pre-conditions</b>
-----------------------

Step	Action	Expected System Response	Pass/Fail	Comment

<b>Post-conditions</b>
1.

## APPENDIX J

### Manual Testing Unit Tests

#### Test Case # 1

<b>Test Case #: 1</b> <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony Mamaug	<b>Test Case Name:</b> User Authentication <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
---	---

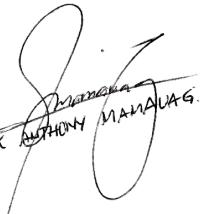
#### Pre-conditions

Step	Action	Expected System Response	Pass/Fail	Comment
	Login Credentials	User is able to log in	Pass	
-	Login using Librarian Credentials	User is not able to log in using the Librarian's credentials	Pass	
	Enter email address with no '@'	User is prompted with an error message	Pass	
	Enter password less than 5 characters	User is prompted with an error message	Pass	

#### Post-conditions

1. Visitor is now able to access the Visitor Home Page for Booking

## Test Case # 2

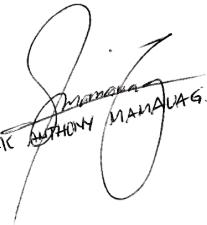
<b>Test Case #:</b> 2 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	 <b>Test Case Name:</b> User Registration <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
--	--

<b>Pre-conditions</b> -
----------------------------

Step	Action	Expected System Response	Pass/Fail	Comment
-	Enter an existing email address	User is prompted with an error message	Pass	
	Enter email address with no '@'	User is prompted with an error message	Pass	
	Enter a password less than 5 characters	User is prompted with an error message	Pass	
	Enter new credentials for registration	User is able to create his/her account	Pass	

<b>Post-conditions</b> 2. Change are reflected to the database regarding a newly created user
--

## Test Case # 3

<b>Test Case #:</b> 3 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG 	<b>Test Case Name:</b> User Authentication <b>Subsystem:</b> Librarian Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
--	---

### Pre-conditions

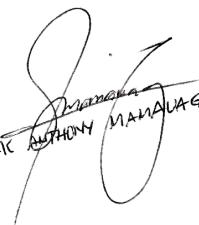
- Librarian must have an account
- The account is given by the administrators of the system

Step	Action	Expected System Response	Pass/Fail	Comment
-	Login credentials	Librarian is able to login	Pass	
	Login using Visitor credentials	Librarian is not able to login using the Visitor's credentials	Pass	
	Enter email address with no '@'	Librarian is prompted with an error message	Pass	
	Enter password less than 5 characters	Librarian is prompted with an error message	Pass	

### Post-conditions

3. Librarian is able to access the Librarian Home Page and its corresponding options

## Test Case # 4

<b>Test Case #:</b> 4 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG 	<b>Test Case Name:</b> View Booking Details <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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<b>Pre-conditions</b>	
<ul style="list-style-type: none"> <li>- User must be a visitor</li> <li>- Visitor must be logged in</li> </ul>	

Step	Action	Expected System Response	Pass/Fail	Comment
-	Visit the Home Page	Displays a the appropriate view depending on booking status (Has a pending booking, or checked in)	Pass	
	Visit the Home Page	Displays the booking details after booking	Pass	
	Visit the Home Page	Displays QR Code related to the Booking Code	Pass	
	Display Booking Details	Displays the specific booking details (date, period, seat)	Pass	
	View Seat Map on the Home Page	Displays the booked seat on the Seat Map	Pass	
	Click on the Cancel Button	If a pending booking has been created, this button will appear.  When clicked, the current pending reservation will be canceled.	Pass	

**Post-conditions**

4.

## Test Case # 5

<b>Test Case #:</b> 5 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	<b>Test Case Name:</b> Book-A-Seat <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

- Visitor must not have a booking

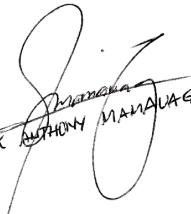
Step	Action	Expected System Response	Pass/Fail	Comment
-	Select date from the date picker (calendar)	Able to select the specific date wanted by the Visitor	Pass	
	Select the unavailable dates from the date picker (calendar)	Unable to select the dates that are unavailable	Pass	
	Select date from the date picker (calendar)	Only display the available periods for that specific date	Pass	
	Select time	Able to select time	Pass	
	Select seat from the Seat Map	Able to select seat from the Seat Map	Pass	
	Seat Map displays Available, Unavailable and Occupied Seats	Displays the Available, Unavailable and Occupied Seats	Pass	

	Select an available seat	Able to book the available seat	Pass	
	Select an unavailable / occupied seat	Unable to book the selected seat	Pass	

**Post-conditions**

5. Visitor has created a new pending booking

## Test Case # 6

<b>Test Case #:</b> 6 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG 	<b>Test Case Name:</b> Booking Expiration <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

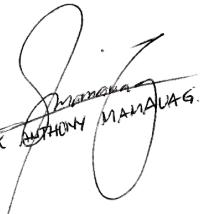
- Visitor must have a pending booking
- Visitor must be checked in

Step	Action	Expected System Response	Pass/Fail	Comment
-	Pending booking has exceeded the booking date and time	Visitor is prompted with a message of booking expiration  The system then automatically expires this reservation	Pass	
	Checked-in booking has exceeded its ending period w/ 16 minutes allowance	Visitor is prompted with a message stating that the user must leave the premises.  The system then automatically checks out the booking of this Visitor.	Pass	

### Post-conditions

6. Visitor has no more booking

## Test Case # 7

<b>Test Case #:</b> 7 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	 <b>Test Case Name:</b> Booking Proof Email <b>Subsystem:</b> Visitor Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

- Visitor must have created a pending booking

Step	Action	Expected System Response	Pass/Fail	Comment
-	Created a new booking	The system will send a proof of booking through the Visitor's email address	Pass	This feature only works on dummy email addresses

### Post-conditions

7. None

## Test Case # 8

<b>Test Case #:</b> 8 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	<b>Test Case Name:</b> Check In / Out <b>Subsystem:</b> Librarian Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

- Librarian must be logged in

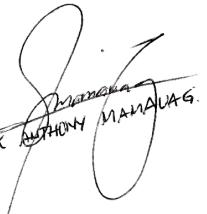
Step	Action	Expected System Response	Pass/Fail	Comment
-	Click the “Scan QR Code” button	Displays QR Code scanner	Pass	
	Present QR Code on the scanner	Scans the QR code and displays the booking associated with the QR Code	Pass	
	Click ‘X’ on the booking window displayed	Closes the window	Pass	
	Click the “Check In” button in the booking window	Librarian is able to check in the booking of the visitor	Pass	
	Click the “Search” Button on the topmost part	Displays UI for searching bookings based on Booking Code	Pass	
	Click “Search” Button beside the search bar with no	Displays all the bookings	Pass	

	entries			
	Click “Search” Button beside the search bar with Booking Code	Displays the booking associated with the Booking Code entered	Pass	
	Click “Clear Search” Text Button	Clears the booking search history	Pass	
	Click “Search” Button beside the search bar with an invalid Booking Code	Displays “No results found”	Pass	

**Post-conditions**

- 8. Librarian updates the pending bookings to ‘Checked In’

## Test Case # 9

<b>Test Case #:</b> 9 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	 <b>Test Case Name:</b> Generate Reports <b>Subsystem:</b> Librarian Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

- Librarian must be logged in

Step	Action	Expected System Response	Pass/Fail	Comment
-	Select date from the date filter (from - to)	Filters the data within the corresponding dates entered	Pass	
	Visit Generate Reports Page	Displays all the data correctly	Pass	There is not clear information on the source of data.
	Select “Count each visitor once” Check Box	Displays data, but only counts the users once	Pass	
	Click “Download All Reports” Button	Downloads an excel file containing the reports displayed on this web page	Pass	

### Post-conditions

9. None

## Test Case # 10

<b>Test Case #:</b> 10 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG	<b>Test Case Name:</b> Manage Seats <b>Subsystem:</b> Librarian Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

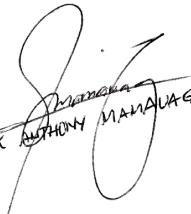
- Librarian must be logged in

Step	Action	Expected System Response	Pass/Fail	Comment
-	Click the ‘+’ Button to add a new seat	Librarian is prompted with a pop-up for adding a new seat	Pass	
	Drag Seat and Table objects on the seat map	Able to add Seat and Table Objects on the Seat Map	Pass	
	Drag Seat and Table objects on the Trash Bin Icon	Able to delete the Seat and Table Objects from the Seat Map	Pass	
	Click on a specific seat on the seat map/window beside the Seat Map	Librarian is able to edit the seat selected from the Seat Map/window beside the Seat Map	Pass	
	Click the “Save” Button	Able to save the changes made on the details of the selected seat	Pass	

### Post-conditions

10. Seat Map will be updated if the Librarian creates new seats or edits existing seats

## Test Case # 11

<b>Test Case #:</b> 11 <b>System:</b> Seat Save <b>Executed by:</b> Mark Anthony MAMAUAG 	<b>Test Case Name:</b> Manage Date and Time for Regular Hours and Override Hours <b>Subsystem:</b> Librarian Module <b>Design Date:</b> 5/23/2022 <b>Execution Date:</b> 5/24/2022
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### Pre-conditions

- Librarian must be logged in

Step	Action	Expected System Response	Pass/Fail	Comment
-	Select specific day from the window on the left	Displays all periods for that specific day	Pass	
	Select designated checkboxes of periods in a specific day	Able to select specific periods on for the selected day	Fail	If one checkbox is selected, all checkboxes are selected
	Click the “Save” button	Able to save the selected periods on the selected day	Fail	

### Post-conditions

11. The available days and periods will be updated