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**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTING AND INFORMATION SYSTEMS**

**SEG2202 SOFTWARE ENGINEERING**

**ACADEMIC SESSION: AUGUST 2022**

**FINAL ASSESSMENT PROJECT**

**DUE DATE: 28 NOVEMBER 2022**

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**PROGRAMME : Bachelor of Software Engineering (Hons)**

**YEAR / SEMESTER : Year 2 / Semester 4**

**PROJECT TITLE : Hotel Reservation System**

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**INSTRUCTIONS TO CANDIDATES**

- This is an **Individual** project.
- The total mark for this project is **100%**.
- The project mark will contribute to 50% of the Final Assessment component.

**IMPORTANT NOTICE**

The University requires students to adhere to submission deadlines for any form of assessment. Penalties are applied in relation to all late submission of work. Project submitted after the deadline will be regarded as a non-submission and marked zero.

**Academic Honesty Acknowledgement**

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27<sup>th</sup> November 2022

..... (Student's signature / Date)

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## **1.1 – Introduction**

Like any other industry, the hotel industry provides owners and guests with socioeconomic prospects. Its purpose is to offer guests like tourists, businessmen, travellers, etc, hospitality services. Guests are often limited in their ability to look for a place to spend the night due to the customary procedure that searching for a hotel once arrived at a specific area, and inquiring door-to-door to see if there is any room available to stay. If there is no available room, the guest will need to continue searching for the next nearest hotel to make another inquiry. So, imagine when it is extremely late at night and the guest is still searching for a place to stay knowing that the nearby hotels are completely booked. Even though there is a contact number for the guest to call and make a reservation, does the hotel staff guarantee that the room is reserved for the guest? This is because they would rather take care of those who walk in as opposed to those who call to book a room to secure their turnover. On the other hand, if the guest has family or friends near the place he or she wants to book, they will need to visit and check for the availability of the room and no system will guarantees that the guest has a room reserved. The guest would be trapped in the end, especially late at night. Therefore, a hotel reservation system will be useful especially for guests that are far from the area as they can make reservations without having to call, email or even visit the hotel by using a hotel reservation system where they can easily make online reservations of the room they like whenever and from any location.

## **1.2 – Relevant Work**

This section includes several studies I conducted to comprehend the hotel reservation system.

In research from (Bemile et al., 2014), one of the Shangri-La Corporation's hotel chains, Shangri-La Sentosa Resort in Singapore has a website that equips helpful features to publish the hotel information and the most important part is including the room reservation system. On the website, guests could discover the location of the hotel, room rates, room details, etc. There will be a form where the guests can fill out their reservation information like check-in and check-out date, and the number of pax to search for a suitable room as shown in figure 1. Room rates and details will be shown together as the result of the search as figure 2 shown. With these, the system attracts more potential guests to book from them which contributes to a win-win

situation as the guests can easily make a reservation online, while the hotel's revenue will be increased at the same time.

Check-in Thu, Dec 1		Check-out Thu, Dec 8
Rooms 1	Adults 2	Children 0
FIND ROOMS		

Figure 1

**Rooms & Rates**  
Your trip summary: Thu, Dec 1 - Thu, Dec 8 | Rooms: 1, Adults: 2  
[Change dates](#)

**Tower Wing Deluxe Room 1  
King Bed**  
Most popular!  
With your stay:  
X Airport Shuttle  
[Room amenities, details, and policies](#)

**RM1838**  
**BOOK NOW >**  
Today's Low Rate  
Pay Now & Save

**Amenities:**

- Room Service
- Fitness Center
- Gift Shop
- 24 hour front desk
- Restaurant
- Airport Transportation

Figure 2

Moreover, in the more local context of Malaysia, the Hotel Swiss-Garden which is located in Kuala Lumpur, the website serves a variety of purposes with the main function of an online hotel reservation system. Hotel guests could find out about the hotel's location, room prices, descriptions and also amenities. While for the room reservation step, guests must fill out a form with their information which is similar to Shangri-La Sentosa Resort. By providing their credit card information or by making a cash deposit, their reservations will be secured so that there will be no sudden changes when the guest reached the hotel for the stay. This has increased the satisfaction of the hotel's guests which also helped to build a good reputation for the hotel.

### 1.3 – Objectives and Scope

The main objective of having an online hotel reservation system is to reduce the hassle of looking for a hotel room at the last minute and the crowd of walk-in customers during

peak season especially now, most countries are in the endemic phase of COVID-19 where people are finally allowed to travel. An online hotel reservation system could aid in the booking process as it is a more systematic and secure system so it will be easier for hotel managers and guests to handle booking details. This could increase the efficiency and productivity of the hotel and guests too. For example, it helps guests to confirm and reserve their room before they even travel to ensure that they have a secure place to stay. Especially for travellers and businessman who needed to plan before they travel to make sure their schedule stick to the plan to prevent any unnecessary inconvenience as a place to stay is important for them after a long day of travelling or working.

Next, the hotel reservation system can help to save time and cut costs (Solutions, 2020). The guests could save much time as they will not have to wait for hours or even days for a booking confirmation when booking a room by using a hotel reservation system. At the same time, it brings revenue and saves costs as the likelihood that someone is choosing another hotel is quite low when they can easily book a room with a few simple steps. Apart from them, the hotel will not have to spend extra costs to employ staff to handle constant email correspondence with hotel guests and the hotel manager could easily access guests booking details through the system.

On the other hand, the online hotel reservation system allows guests to view the hotel surroundings and room layout with the virtual reality (VR) and 360-degree 3D tour function. This improvement allows guests to experience different types of hotel rooms just like they are visiting the hotel without leaving their doorstep. At the same time, it increases guests' satisfaction as they are no longer needed to read the long details of the room or check the images and guess which picture refers to which room. Instead, they can have a clear picture of the room by visiting virtually.

In summation:

Problems to solve	Intangible Objectives
<ul style="list-style-type: none"> <li>• No available room during last minute</li> <li>• Messy paper record of booking details</li> <li>• Time taken for booking confirmation</li> <li>• Extra cost and workforce needed</li> <li>• Reduce hassle during peak season</li> </ul>	<ul style="list-style-type: none"> <li>• Modern, and user-friendly interface</li> <li>• Book room online</li> <li>• Simple booking process for guests</li> <li>• VR room preview</li> <li>• Increase productivity of hotel staff</li> </ul>

## **1.4 – Suggested Improvements**

There are a few essential functionalities that may be applied to enhance and improve the hotel reservation system in light of the problem raised with the present solutions. Improvements to the system with the application of the latest technologies, can bring the hotel reservation system beyond only the traditional walk-in or call to reserve a hotel room concerning the user experience for hotel managers and guests.

### **Technological Improvements**

Technological improvements are the most vital and impactful improvements that can bring to a system. One of the improvements that can be applied to the conventional system would be implementing virtual reality (VR) technology. By using VR viewing, we can create simulated environments of our hotel environment like a hotel lobby, hotel rooms, facilities, etc (Bardi, 2022). So that hotel guests can fully immerse themselves in our hotel and easily choose which room they would like to book.

Apart from that, what if the hotel guest does not have VR equipment to preview our hotel environment? No worries. A 360-degree 3D virtual tour technology would also provide an immersive experience of viewing on their smartphone, laptops, or tablets. Virtual tours give potential guests an understanding of the room's layout that images cannot provide (Ellis, 2020).

Although there is a great deal of booking demand, people are less likely to enter the hotel to check on the room they are interested in due to the trouble of visiting the hotel or they might feel shy. Therefore, with VR and 360-degree 3D virtual tour technology, the hotel gives them the option to view and choose rooms online through their gadgets.

### **Experience Improvements**

Through the hotel website, hotel guests could access the hotel information as well as the hotel reservation system. By accessing the hotel reservation system online, users could choose the date they are checking in and out of the hotel and access the room available and the types of rooms with details through the Internet. To secure their booking, they can just easily make the payment online at their fingertips instead of rushing to the hotel, calling, etc. This brought a seamless booking experience to the guests when they are booking a room.

## **Process Improvements**

With direct synchronisation between the system and the hotel, it will lessen the workload of the hotel staff as the system will automatically check room availability by syncing and checking with the data uploaded by the hotel staff. Moreover, the system could also verify returning customers and access their account records to log the user in. When a guest is booking a room, the system will process the booking and payment automatically and even validate and record payment details before creating a booking record. These lessen the extensive steps needed to be taken by the hotel staff to help a guest with their booking. Lastly, the risk of data loss could be minimised as the guest and booking details are handled by the system itself instead of the hotel staff, which can prevent human error.

## **1.5 – Project Activities & Deliverables**

### **Key Deliverables**

This project in the end will deliver an online hotel reservation system with the function of filtering available hotel rooms according to the check-in and check-out date input by the guest. At the same time, hotel room details will be provided together with the search result. Users will be able to view the hotel environment, facilities like a swimming pool, gym, and different types of hotel rooms with the VR and 360-degree 3D virtual tour technology implemented. A separate interface for both hotel admin and also hotel guests will be provided. This allows the hotel admin to upload the room details, update room availability, and room prices, reject bookings, etc, while hotel guests to log in their accounts and check room availability, view room prices, search for a room, reserve a room, and make payment. Moreover, to provide safe data retrieval and storage between the hotel reservation system and the hotel, an application programming interface (API) should be implemented.

### **Project Activities**

There are four main activities while completing this project which include specification, design and implementation, validation, and evolution.

#### **Specification**

During this stage, stakeholders and the development team will have a discussion and brief on the requirements for the system. The website will mainly focus on providing

the online room reservation service, but additional information like hotel location, the background of the hotel, etc will also be included. On the home page, guests should be able to log in to their account and search for a room by inputting their details like dates and nights to stay. The result will be returned including the room types available with the price and details. Then, while the guests are viewing the room details, they should be able to access the VR function. The 360-degree 3D virtual tour option will also be provided if their device does not meet the requirements for VR viewing. Moving on, when they book a room, their details should be collected with a form, and it should be saved to the system. After getting the confirmation from the hotel side, payment will be requested, and the transaction details should be sent to the hotel side automatically after payment is done. The guest and hotel admin should be able to cancel the booking if they wanted to and an automated email will be sent to the user after the booking or cancellation is done. Last but not least, the UI design should be consistent and clean for a pleasant experience for both hotel admin and guest.

## **Design and Implementation**

The design of the system framework will be determined by the engineering team after having a discussion and deciding on which architecture pattern is suitable to be used in this process. The analysis will be carried out to determine the pros and cons of each pattern before deciding on which to be used. At the same time, the organisation of the system will be defined, and prototyping will be carried out to try out the design options. After that, the results will be concluded and presented to the stakeholders and modifications will be carried out after receiving comments. Once everything is approved, the programmer will start to code and design the database and interface of the system. At the end of the process, the system should be done debugging and completed to continue with validation.

## **Validation**

To ensure a high level of product quality, the system will undergo necessary testing during and after development. Several module, component and system testing will be carried out during the development of the system to filter out flaws and ensure the operations of the system. Then, release testing and user testing will be conducted. As a standard of the system, a list of necessary tests must be conducted and passed.

The system will need more enhancements and improvements if it fails the majority of the necessary tests, or it did not achieve the initial requirements.

## **Evolution**

This will be carried out when there is a need for change or update to the system due to the changing business environment so that the system can support the change of the hotel. Maintenance would involve if the system were experiencing problems to ensure a seamless experience for the users.

### **1.6 – Project Timeline**

Although an Agile framework is used for the development of the system, it is still important to have a plan. The project timeline defines the plan for developing the system to ensure every process is on track and able to be completed before the deadline. The timeline will be associated with the agile process; therefore, the planning is incremental. The project should first be started on the 2<sup>nd</sup> of December by evaluating and researching the conventional hotel reservation system. Then, stakeholders and the development team hold a meeting to discuss and brief the requirements of the improved version of the system on the 14<sup>th</sup> of December. Continuing to the 24<sup>th</sup> of December, the planning of the system should be carried out before starting the development process. The development process should then be started on the 4<sup>th</sup> of January by designing the UML diagrams for the projects which include the use case, class, sequence, and activity diagrams. After that, the design of the UI and prototype should be carried out on the 14<sup>th</sup> of January. The design of the interface and UML diagrams should then submit to the stakeholders for verification and feedback. After the correction is done on the 17<sup>th</sup> of January, the coding process will begin to develop the product. When it is done, the testing of the product will be carried out on the 28<sup>th</sup> of January. After the testing, the product will then deploy on the 7<sup>th</sup> of February to receive feedback from users for future upgrading. Below shows the project timeline associated with the agile process in figure 3.

## Project Timeline with Agile Process

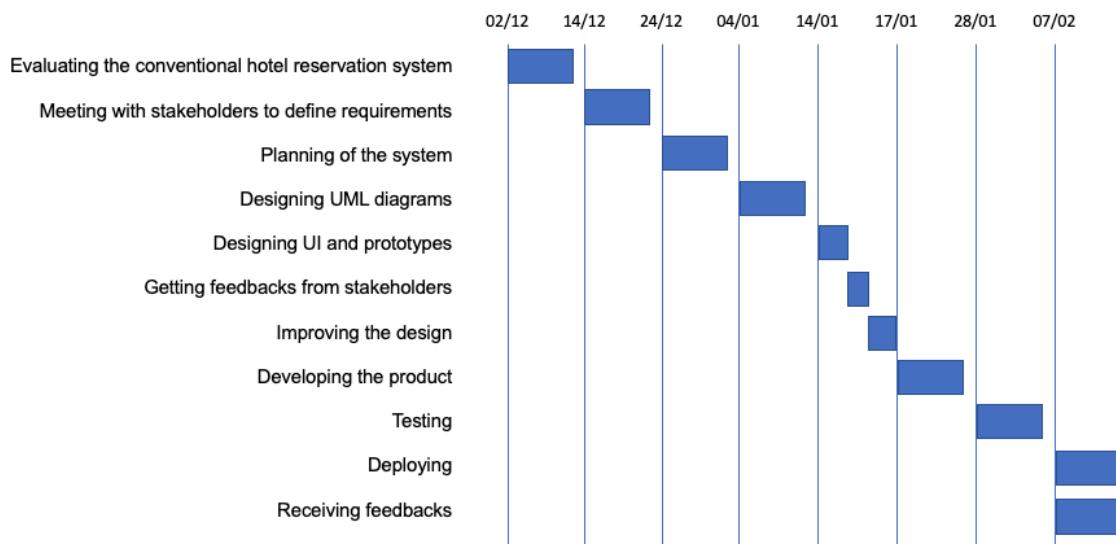


Figure 3

### 1.7 – Software Process Model (Agile Model)

The software process model that will be applied to develop this hotel reservation system will be the agile model. There are five main principles of agile methods that these agile methods follow which include customer involvement, incremental delivery, people over process, embracing change, and maintaining simplicity (Sommerville, 2010). Agile software development methods are developing methods that prioritise coding above design. The methods are designed to produce functional software in a short time and to develop this quickly in response to changing needs. This is especially important for a hotel reservation system due to the changing business environment and developing technologies nowadays. Agile methodology divides a project into multiple phases and uses these phases to manage the project as you can see from the project timeline shown in figure 3. Continuous improvement at every phase and regular collaboration with stakeholders is required for this method. Developers undergo a process of planning, carrying out, and assessing once the job starts. Collaboration between developers and project stakeholders is very important and it must always be ongoing.

Last but not least, the Agile model brings benefits like saving the total development time for the whole project, allowing working through pair programming which will

reduce the risk of having errors compared to programming alone, and easy to change any requirements when the stakeholders have any new idea or innovation.

## **2.1 – Requirements Elicitation Plan**

Requirements elicitation is a process of obtaining, investigating defining, structuring, and explaining a product's requirements (Erko, 2022). This is to examine and validate the needs, presumptions, and project risks of the stakeholders. It ends when the stakeholders are unable to come up with any new use cases or when the use case they come up with are low priority and can be addressed in subsequent iterations. There are two main roles of stakeholders to focus on in this case which include the hotel guests, and hotel staff.

### **Hotel Guests**

The most important end-user of this system would be the hotel guests since they are the ones who frequently need to access the hotel reservation system to book a room. As a result, it is vital to collect hotel guests' requirements and opinions to simulate the key system functionalities to fulfil their demands. This makes sure that the hotel reservation system can be sustained as the usual booking method for the hotel guests and adequately fulfils their use cases over time.

The elicitation process should have two main focus points while carried out, which include feedback on the current process. It is essential for setting domain criteria and identifying potential parts of the online reservation process where hotel guests might experience difficulties or problems. This should assess the hotel guests' criteria for qualitative attributes like user-friendly and dependability. On the other hand, the requirements gathered should then be useful in determining valued improvements that can be made to the new system by utilising the latest technologies. The second focus point will be the opinions on the implementation of VR and 360-degree 3D virtual tours. By getting opinions from the hotel guests based on the system, analyse the potential impact of adding VR and 360-degree 3D virtual tour technology. This should cover any possible issues hotel guests would have on the new system that is being suggested, as well as the recommendations on how to allay them. As a result, the existing level of acceptance needs to be used as a standard for innovating solutions that align with the preferences of both the hotel guests and the hotel.

Therefore, formal, and informal interviews could be carried out by the system analyst with the hotel guests to get an overall understanding of what they think of the system and how they may interact with the system. In this case, the system analyst should act as a good communicator so that he or she can understand the hotel guests' natural language and convert it to technical terms while finalising the elicitation and converting technical terms to hotel guests' natural language during the interviewing process. Questions and answers are prepared and collected for the elicitation process. Below are the questions prepared and the most common answers from the hotel guests.

*Questions:*

1. What do you think about the current hotel reservation system?
2. What functionalities do you wish to equip with the system?
3. What difficulties do you face while making a reservation?
4. What do you think of implementing a VR and 360-degree 3D virtual tour of the hotel?

*Answer:*

1. Lack of room preview. Some images provided don't even match what we are getting when we check in and the facility details are not clear.
2. More details especially a better preview of the hotel and the rooms.
3. I have no idea which layout of the room I am getting, and I am not sure if my room is secured or booked.
4. It would be a great idea as I can preview the exact room that I am booking! And the 360-degree 3D virtual tour sounds convenient for people like me who don't own a VR headset.

## **Hotel Staffs**

Continuing with the second most important end-user for this system would be the hotel staff as they are the ones who needed to access the hotel reservation system to confirm or cancel hotel guests' bookings, issue receipts and most importantly, update room availability, room details, prices and even upload the virtual tour files. Therefore, it is important to collect hotel staff's requirements and opinions to simulate the basic system functionalities to fulfil their demands. This makes sure that the hotel

reservation system can be sustained as the system to manage the hotel's booking and adequately fulfils their use cases over time.

The elicitation process should have two main focus points while carried out, which include observation and feedback on the current process. It is important for setting domain criteria and identifying potential parts in the system process where hotel staff might experience difficulties when receiving booking information or uploading details. This should assess the hotel staff's criteria for qualitative attributes like it is easy and secure to be used. Moreover, the requirements collected should then be useful in determining valued improvements that can be made to the new system to ease the staff and reduce workforce costs by utilising the latest technologies. The other focus point will be the opinions on the implementation of online reservation of hotel rooms. By getting opinions from the hotel staff based on the system, analyse the potential impact of using a hotel reservation system to receive and confirm booking online compared to email, call, and even walk-in. This should cover any possible issues hotel staff would have on the new system that is being suggested, as well as the recommendations on how to allay them. As a result, the existing level of acceptance needs to be used as a standard for innovating solutions that align with the preferences of both the hotel guests and the hotel.

Therefore, ethnography could be carried out to observe the busyness of the hotel staff and how crowded the hotel lobby is especially during peak season when they are using the conventional system. At the same time, formal, and informal interviews could be carried out by the system analyst with the hotel staff to get an overall understanding of what they think of the system and how they may interact with the system. In this case, the system analyst should act as a good communicator so that he or she can understand the hotel staff's natural language and convert it to technical terms while finalising the elicitation and convert technical terms to the hotel staff's natural language during interviewing process. Lastly, a follow-up with the interviewees would be useful to compare the result of interviews before and after implementing the new system to ensure that it is beneficial and even get feedback for improvement in the next upgrade. Ethnography is carried out to observe the hotel staff when there is no online hotel reservation system, at the same time questions and answers are prepared and

collected for the elicitation process. Below is the result of the ethnography and questions prepared and the most common answers from the hotel staff.

*Ethnography Result:*

- Hotel staffs were busy rushing around to show hotel guests the room and help to make a reservation.
- More workforce is needed at the reception, especially during peak season.
- Reservation and customer details are recorded on paper.

*Questions:*

1. What do you think about the current hotel reservation system?
2. What functionalities do you wish to equip with the system?
3. What difficulties do you face while handling a booking?
4. What do you think of implementing a VR and 360-degree 3D virtual tour of the hotel?
5. What do you think of an online hotel reservation system that automatically processes and record guests' details?

*Answer:*

1. More workforces are needed to reply to calls, and emails and serve the guests.
2. A function that can easily help to reserve a room and record guests' booking and details.
3. Too many procedures were needed and took a long time to complete one booking.
4. It could ease our job as we finally don't have to show the room to the guests one by one when they request.
5. It will make our job so much easier as we no longer need to repeat processing and recording guests' details every time there is a booking coming in, and this could increase our productivity too.

## **2.2 – Requirements Elicitation Results**

### **Hotel Guests**

Concluding all the answers from the interview, we can see that most of the hotel guests are facing the issues of lack of room and facilities preview while reserving a hotel room. This is caused by the images provided by the hotel is not complete enough. At the same time, they also realised that some images provided by the hotel don't match the room they are getting when they check in to the hotel. This can be caused by human error in uploading the wrong image to the wrong room types. Moreover, the guests are facing confusion as there is a different layout of the room pictures for the same room type and this could cause a bad reputation for the hotel. Then, some guests are not sure if their room is locked and booked as there is no payment needed for a booking and this might cause the issue of getting their room for those walk-in guests first. Conversely, they are happy about the idea of implementing a VR and 360-degree 3D virtual tour of the hotel as they can easily preview the exact view of the room they are booking. While the 360-degree 3D virtual tour provides them with an alternative option for people that don't own a VR headset which is much more convenient.

### **Hotel Staffs**

Concluding the ethnography result, we can see that most of the hotel staff are facing the issues of a huge workload seeing them busy rushing around to show hotel guests their rooms and help to make a reservation, especially during peak season. Moreover, the reservation and customer details are recorded on paper which is very inconvenient as it consumes more time, and it is not safe when there is a water spill or fire. Moving on to the answers from the interview with hotel staff, most of them are not happy with the current system as more workforces are needed to reply to calls, and emails and serve the guests. They are requesting a function that can easily help hotel guests to reserve a room and record guests' bookings and details instead of wasting so much time doing the same thing as too many procedures are needed and taking a long time to handle one booking. Conversely, they are happy about the idea of implementing a VR and 360-degree 3D virtual tour of the hotel as it could ease their job by reducing the trouble of showing the rooms to the guests one by one when they request. Last but not least, they think an online hotel reservation system that automatically processes, and records guests' details could make their job so much easier and even increase their productivity.

## 2.3 – Functional Requirements

Online hotel reservation system:

- **Associate every online booking with an account** – The system should be able to verify customers' accounts when they log in. When a customer books a room, the booking details should be recorded in their account.
- **Accept date and time to check available rooms for that particular date** – Date and time will be requested from the customer to filter rooms available for the customer to book. Therefore, the rooms available according to the room availability updated by the hotel admin will be shown as the result according to the date the customer enter.
- **Allow users to search for the most relevant room options** – This function allows users to easily search for a room so that they won't need to spend time browsing the whole website looking for the room they want.
- **Display room charges and other utilities** – With this implementation, customers can know how much they are being charged and there will be no hidden fees which might cause a bad reputation for the hotel. The total amount will be shown after booking details are filled in by the customer before making payment.
- **Send booking confirmation to customers** – After sending booking details to the hotel admin side and the booking confirmation attached with the receipt is given, the system will automatically generate an email to send booking confirmation to the customer.

Guests' mode website:

- **Display customer account page** – Allow customers to view their accounts with booking history and details. This enables customers to book a room more easily with the saved details.
- **Allow customers to search for room availability** – By entering the check-in and check-out time, customers can easily check which room is available on a particular date.
- **Reserve a room** – The room selected by the customer will be reserved for ten minutes so that it will be locked temporarily. While the customer will have to

make payment to confirm the booking. This is to secure the room the customer is looking for.

- **Make payment for booking** – Customers are allowed to make payment for their booking on the website. Payment will be requested by the system after customers reserve a room and the customer will be urged to make payment within ten minutes.
- **Allow users to cancel bookings** – Provide options for customers to cancel their bookings. Some customers might have accidentally booked the wrong date or room. Cancellation of booking is allowed 30 days before the booked date. This will help to earn a good reputation for the hotel and customers will be more satisfied with the system.

Hotel admin mode website:

- **Upload room details** – Allow hotel admin or staff to upload room details like images, 3D preview, size, facilities, etc. This gives a better view for the customers when they are choosing a room.
- **Update room availability** – Update the room availability according to the dates and empty room to prevent double booking on the same room from two different customers. This allows customers to view the available room on the website easily without calling or emailing the hotel which is much more convenient.
- **Update room prices** – All the room prices and charges will be updated according to the peak season or promotion season to ensure there is no fault price shown to the customer to prevent any inconvenience. All the charges and taxes will also be updated so that there are no hidden charges that might destroy the reputation of the hotel.
- **Confirm booking** – Hotel admin allows to choose whether to confirm or reject a booking when a customer made a booking. This is to enable the hotel admin to double confirm if the room can be booked so that the risk of making mistakes will be reduced.
- **Allow hotel admin to cancel bookings** – Provide options for hotel admin to cancel a customer's booking just in case the room is fully booked, and the previous staff accidentally accept the booking. This will prevent incidents like

running out of room when the customer arrived at the hotel and there is no room for him or her.

## 2.4 – Non-Functional Requirements

- **User-friendly, easy to access** – Allow users to have a seamless experience and easy to understand the function, which is easy to access the page they wanted to access. So that they won't get confused and accidentally click the wrong thing as the user could be not familiar with using a computer.
- **Use encryption to avoid bots from booking** – This is to prevent bots from stealing data like passwords, personal data, etc and using them without permission. At the same time, this could reduce the risk of the spamming problem on the system.
- **Search results should be shown within a short period** – This could avoid customers from spending a long time waiting for the result while searching for a room. A smooth experience will be provided by implementing this requirement.
- **Alert the user to fill in mandatory fields appropriately** – This can prevent invalid input filled by customers while booking a room which can cause the failure of verification when the customer arrives at the hotel or is unable to contact the customer when there is an emergency. Data validation should be carried out to ensure only numbers are allowed to be filled in the field as customers might accidentally press the keyboard and input a wrong character.
- **The system should accept payments via various payment methods** – This provides a wider choice for a customer by allowing customers to use a credit or debit card to pay for their stay. By allowing flexible payment method, the hotel revenue could increase as most of the customers are businessman or traveller from other countries and credit card is the only payment method they could use.
- **Record documentation and responses** – Record details like booking details, and payment details automatically when the customer submitted any of them to send to the hotel admin side for confirmation. This could allow future reference from the hotel admin or customers when they check back the history.

## 2.5 – Prototype Design

### Figma Links:

- Hotel Guest: [Customer Interface](#)
- Hotel Admin: [Admin Interface](#)

### 2.5.1 – Hotel Guest Website View

The home page of the website for hotel guests shows a welcome message and a form for them to fill in their check-in and check-out dates and the number of guests to search for the available suitable room shown in figure 4. After filling, they can simply click “Search Rooms”. The results will be shown after checking with the web server to validate the room availability details uploaded by the hotel admin. By scrolling downwards, they can see some features of the hotel like the new VR technology introduced and also previous guest reviews. Hotel guests can also view the facilities of the hotel by clicking “Facilities” on the navigation bar, shown in figure 5. Hotel facilities are shown with images and hotel guests can view more by scrolling downwards. On the other hand, hotel guests can log in to their accounts by clicking “Login” on the navigation bar. Figure 6 shows the login page of the website.

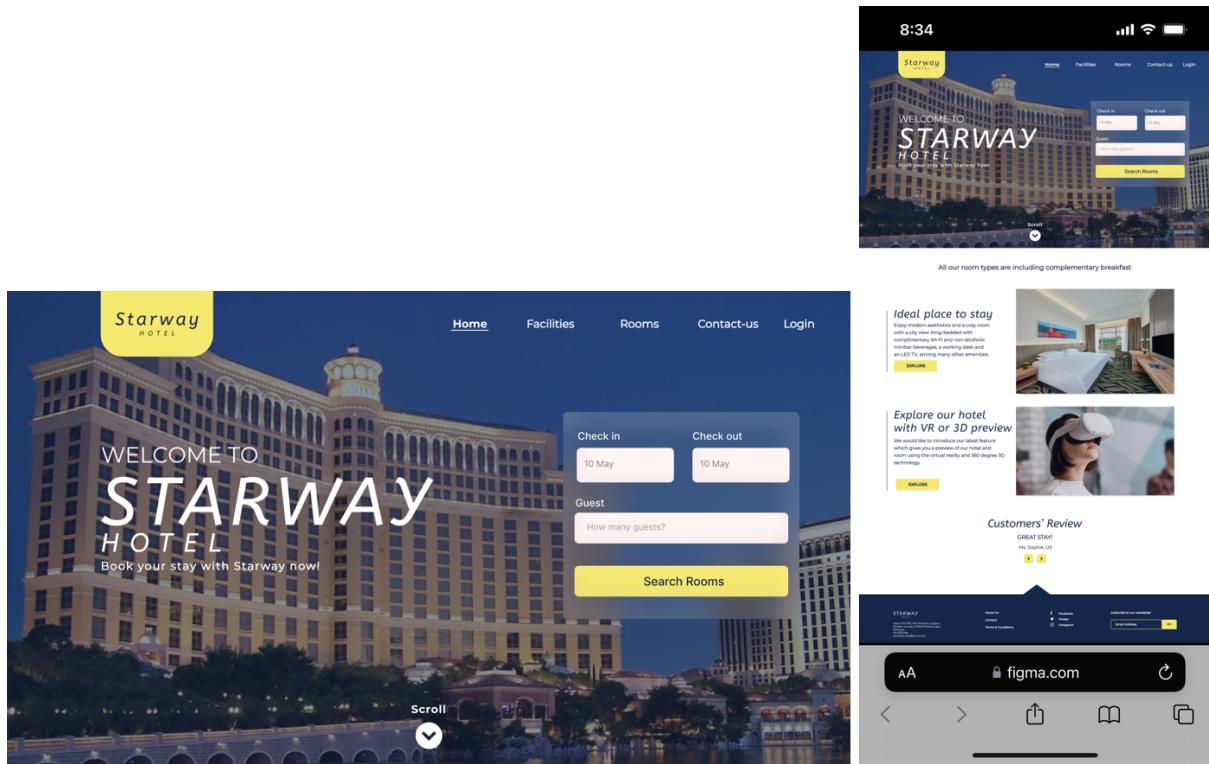


Figure 4: Home Page

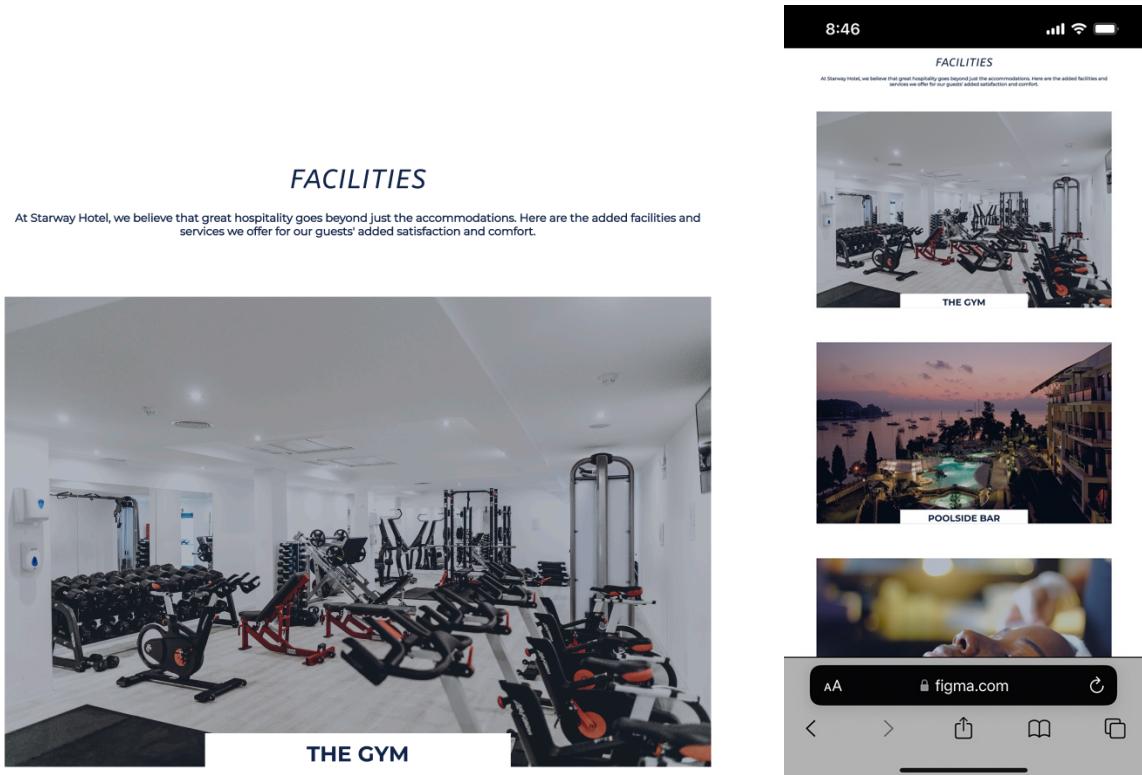


Figure 5: Facilities Page

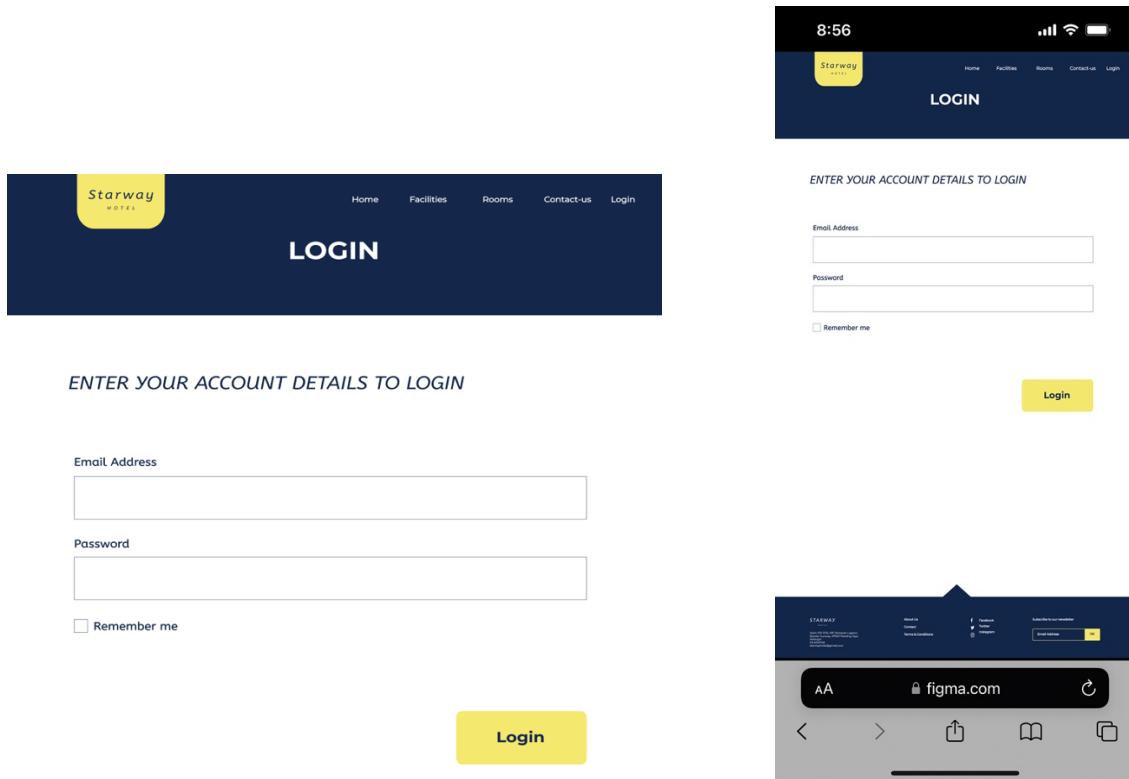


Figure 6: Login Page

Continuing with the room search. After hotel guests log in and search for rooms with their check-in and check-out dates, a list of room available results will be shown along with the price before adding taxes on the rooms page, shown in figure 7. By scrolling downwards, more options will be displayed.

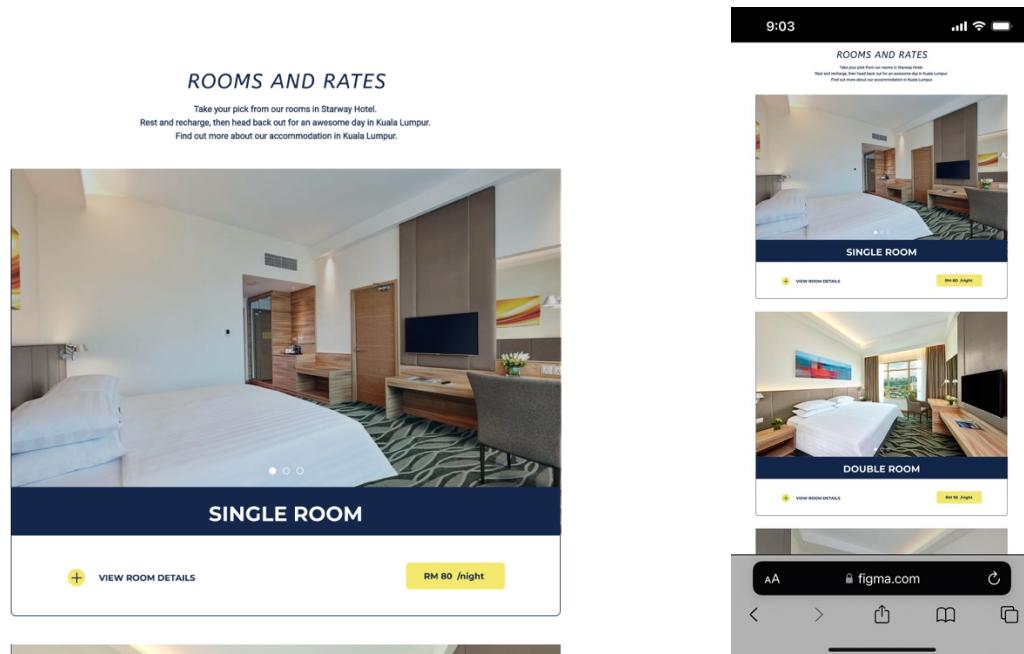


Figure 7: Rooms Available Page

To view more details of the room, hotel guests could just click “VIEW ROOM DETAILS”, and then they will be directed to the room details page shown in figure 8. On the room details page, there will be pictures and descriptions of the room to let hotel guests clearly understand what they are expecting. Under the description, the room details section shows how many people the room is suitable for, along with the size of the bed and room. While the room amenities section shows the features of the room which include a bidet, mini bar, TV, etc. While on the right-hand side, the room rates and price breakdown are clearly shown by separating into the rates and additional taxes and fees followed by the subtotal of the room per night. This is to make sure there are no hidden charges and let hotel guests ensure how much they will be charged in total.

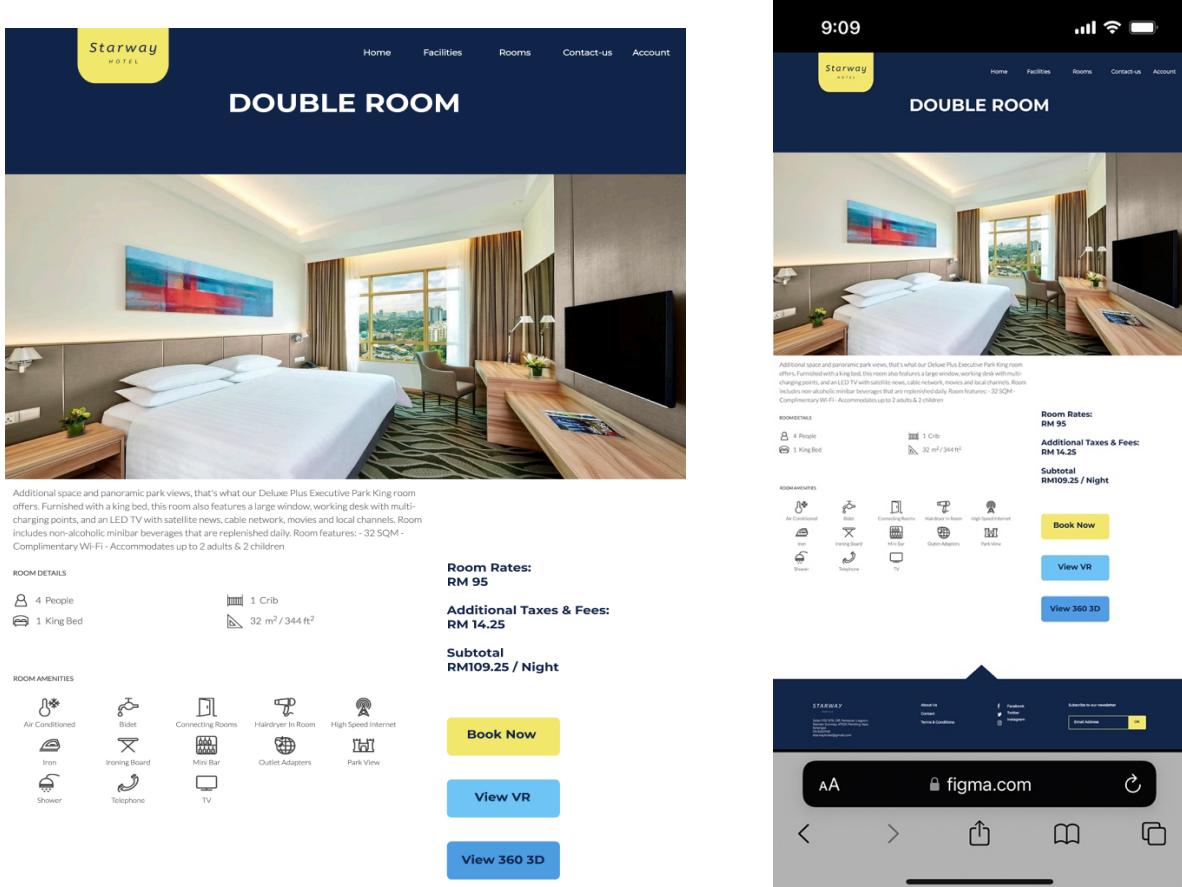


Figure 8: Room Details Page

After that, by clicking “View VR” or “View 360 3D”, hotel guests can view the complete layout of the room after being directed to the respective preview page. Figure 9 shows the Virtual Reality (VR) preview page, while figure 10 shows the 360-degree 3D preview page.

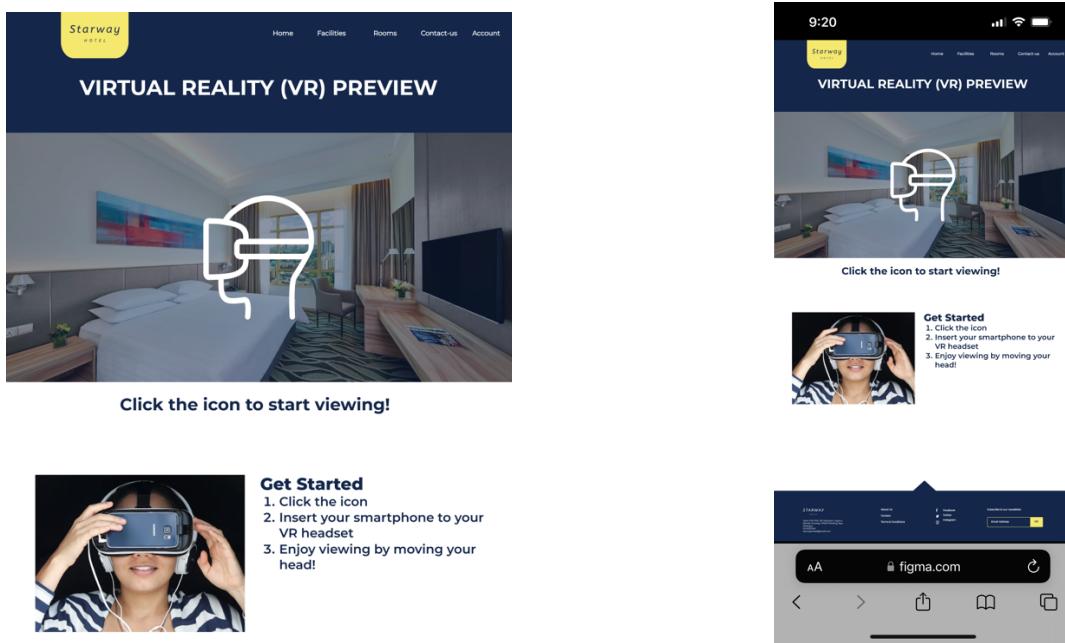


Figure 9: Virtual Reality (VR) Preview Page

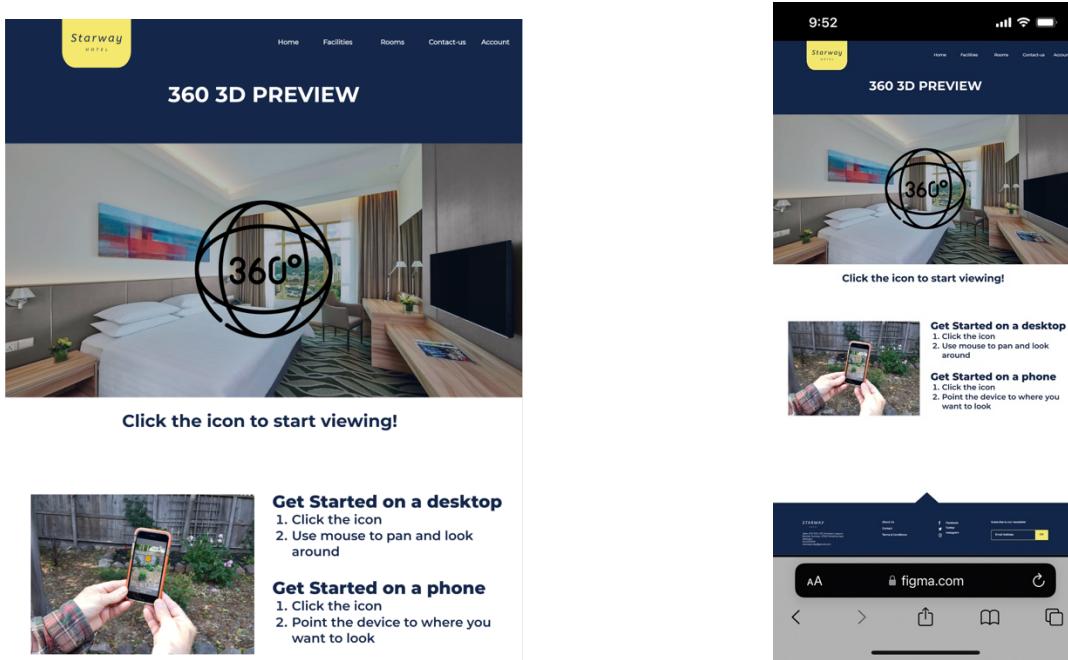


Figure 10: 360-Degree 3D Preview Page

By referring to figures 9 and 10, on the VR or 3D preview page, there is a guideline to show hotel guests how to start viewing on the bottom right. By following the instruction, hotel guests can easily start viewing by clicking the big icon in the middle. These two functions are provided as some guests might not have a VR headset; therefore, an additional option is provided for them to preview the room, which is the 360-degree 3D

preview. 360-degree 3D preview is accessible on desktop or smartphone and respected instructions are provided too which is to use a mouse to pan to look around using a desktop, while on the smartphone, users will just need to point the device to where they want to look just like figure 11 shown. Figure 12 is an example of a VR view when the hotel guest is wearing a VR headset to view the hotel lobby. It provides a fully immerse feel to the guests just like they are at the hotel, and they can look around by just moving their head.

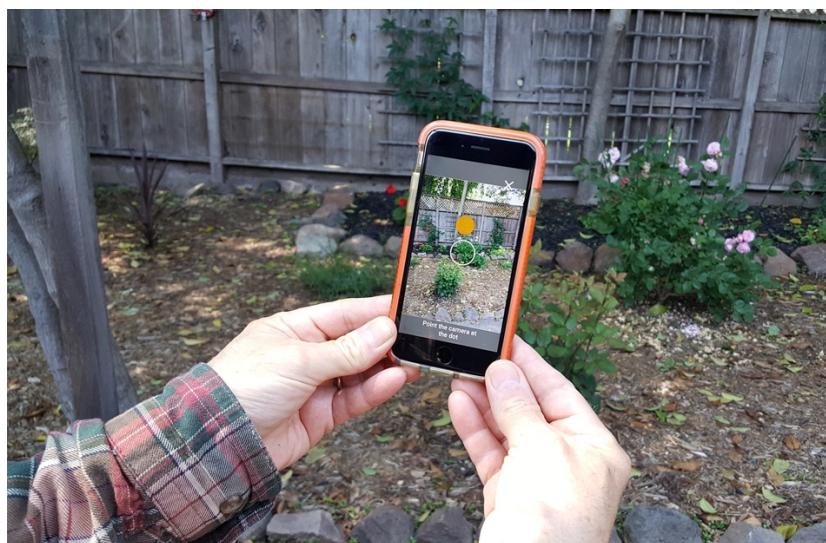


Figure 11: 360-Degree 3D Preview Using Smartphone



Figure 12: VR Headset View

After viewing is done, users can back to the hotel details page shown in figure 8 to make a booking by clicking “Book Now”. Users will be directed to the confirm details page shown in figure 13 to enter the guest information for the booking. On the confirm details page, there is a form for guests to fill in their details and red stars are shown to remind them to fill up the field. Apart from that, on the right-hand side of the form, there will be the reservation details which show how many nights the guest is staying, room type, number of guests, date, price, taxes, and subtotal. This allows the guest to double-check their reservation before submitting their details for booking.

The figure consists of two screenshots of the Starway Hotel website's 'CONFIRM DETAILS' page. Both screenshots feature a dark blue header with the Starway logo and navigation links for Home, Facilities, Rooms, Contact-us, and Account. The time '9:20' is displayed at the top right of the mobile screenshot.

**Left Screenshot (Desktop View):**

- Guest Information:** A form with fields for Salutation/Title, First Name, Last Name, Email Address (with a red asterisk and placeholder 'Please fill in this field'), Phone Number, Address, City, and Postal Code.
- Your Reservation:** Summary information including '1 night, 2 adults' (Tue, Dec 13, 2022), 'Double Room - RM 95', 'Additional Taxes & Fees RM 14.25', and 'Subtotal RM109.25'.
- Submit Button:** A yellow button at the bottom of the form.

**Right Screenshot (Mobile View):**

- Guest Information:** The same form fields as the desktop version.
- Your Reservation:** The same summary information as the desktop version.
- Submit Button:** A yellow button on the right side of the screen.
- Device View:** Shows the website displayed on a smartphone with a status bar indicating the time is 9:20.

Figure 13: Confirm Details Page

After making sure everything is correct, users can just click “Submit” to submit their details to process the booking. After the web server processed the booking, the user will be directed to the payment page shown in figure 14. On the payment page, the payment method will be shown which is credit or debit card. Guests will just need to follow and enter the details requested in the respective field and click “Submit” after making sure the details are correct to process the payment.

Figure 14: Payment Page

After payment is validated and recorded by the web server, the booking will be confirmed, and users will be able to view their booking history on the booking history page shown in figure 15. At the same time, if the hotel guest wishes to cancel their booking, he or she can do so on the booking history page by clicking “Cancel Booking” under the booking they wanted to cancel.

Figure 15: Booking History Page

Last but not least, if the users need help or the hotel guests would like to make complaints or requests, they can just click “Contact us” on the navigation bar to access the contact-us page shown in figure 16. On the contact-us page, there are hotel details that show the hotel address, phone number, and email so that for those emergency users or guests, they can directly contact the hotel using the details. While for other cases, they can just fill in their details in the fields and leave a message to the hotel.

The hotel will get back to them as soon as they receive the enquiry through email.

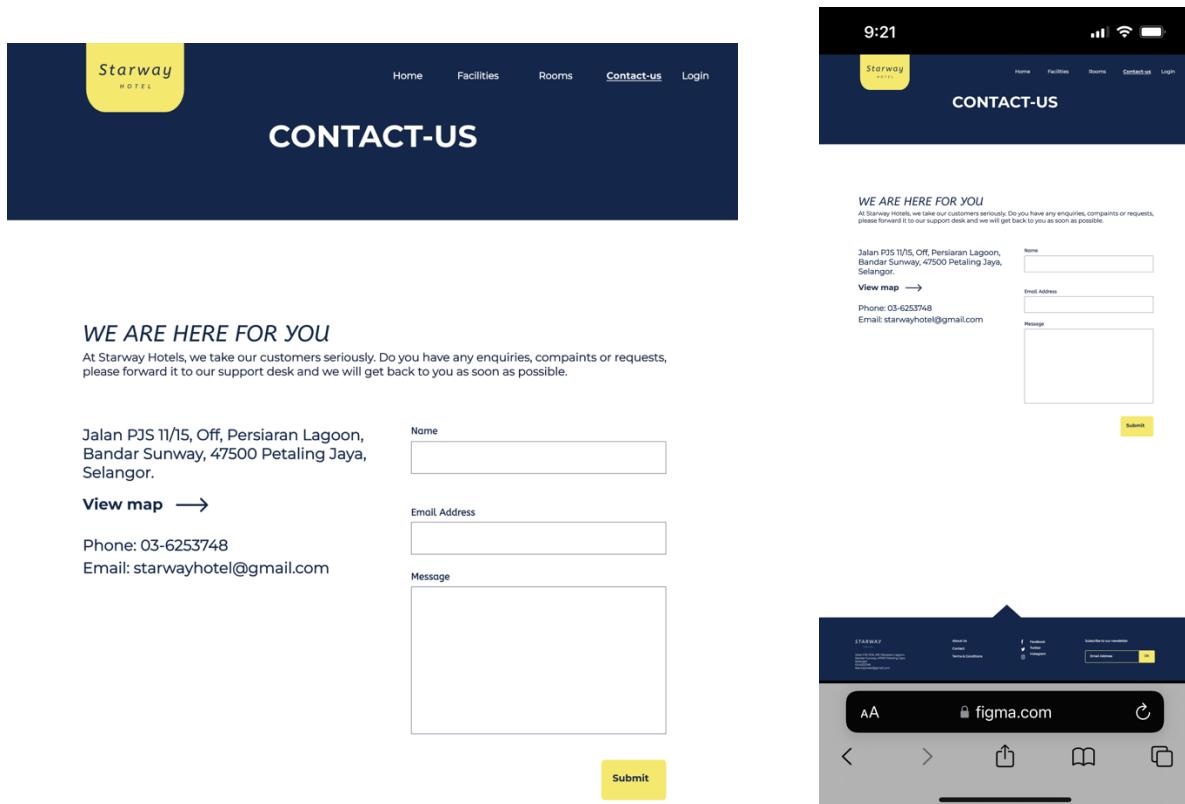


Figure 16: Contact-Us Page

### 2.5.2 – Hotel Admin Website View

On the other hand, the hotel admin view is only accessible using a desktop as the hotel does not allow staff to access the admin page on smartphones due to security purposes. Hotel staff can access the admin mode by using a special link which will direct them to the admin login page as figure 17 shown. They will be prompted to enter their staff email address and their password to log in. After logging in, staff will be directed to the admin home page as figure 18 shown.



Figure 17: Admin Login Page

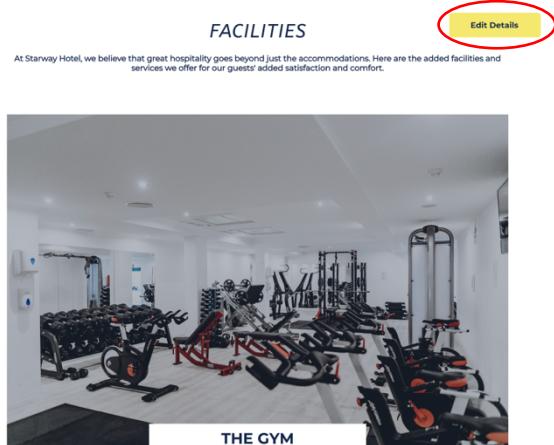


All our room types are including complementary breakfast Edit Details



Figure 18: Admin Home Page

On the home page, hotel staff are allowed to edit the home page details by clicking the “Edit Details” button I circled with red in figure 18. This allows the hotel staff to update the home page view with the latest information for the hotel guests by changing the pictures and information. On the other hand, the same function goes to the facilities page and rooms page shown in Figures 19 and 20. Hotel staff can update the latest facilities added to the hotel by editing details on the admin facilities page. While for the admin rooms page, hotel staff can update the latest price or image of hotel rooms and the types of rooms the hotel is showing on the rooms page according to the different seasons by clicking “Edit Details”.



**ROOMS AND RATES**

Take your pick from our rooms in Starway Hotel. Rest and recharge, then head back out for an awesome day in Kuala Lumpur. Find out more about our accommodation in Kuala Lumpur.

**SINGLE ROOM**

**VIEW ROOM DETAILS** **Edit Details**

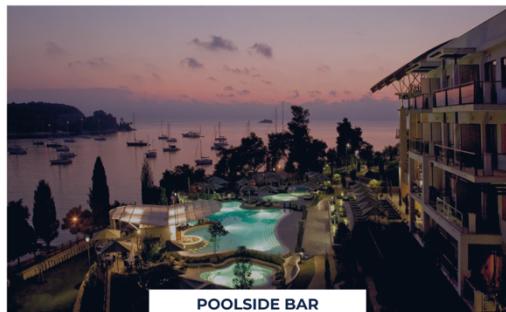


Figure19: Admin Facilities Page

Figure 20: Admin Rooms Page

To edit the room details, hotel staff can just easily click the room they would like to edit to view the admin room details page shown in figure 21. By clicking the “Edit Details” button, the staff could update the details for the specific room including its description, room details, room amenities, room rates, taxes, etc. By scrolling downwards, they could even update the VR and 360-degree 3D preview by uploading new files shown in Figures 22 and 23. Hotel staff can easily drag the VR or 3D file to the box shown or click the “Upload VR File” / “Upload 3D File” button to upload a new file. So that when there is a layout change, they can update the website easily to keep the hotel guests updated as soon as possible.

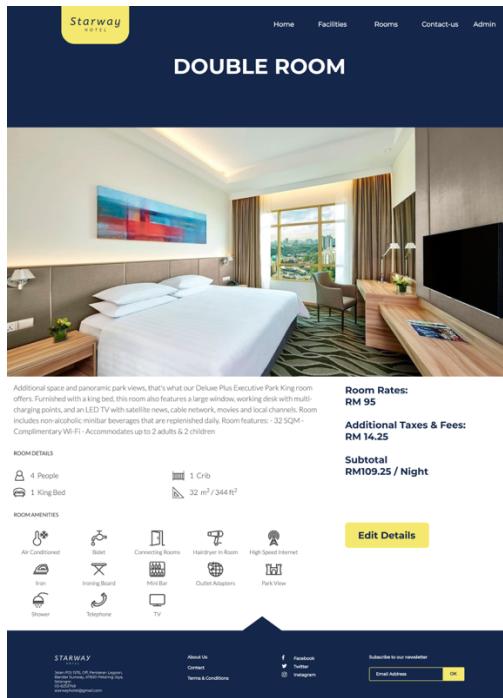


Figure 21: Admin Room Details Page

**VIRTUAL REALITY (VR)**

Upload VR File  
Or Drag File Here

**360-Degree 3D**

Upload 3D File  
Or Drag File Here

**STARWAY**  
Jalan PPS 010, Off Petaling Jaya,  
Bandar Petaling, 57100 Kuala Lumpur,  
Malaysia. Tel: +603 9054 6000  
Email: info@starwayhotels.com

About Us  
Contact  
Term & Conditions

Facebook  
Twitter  
Instagram

Subscribe to our newsletter  
Email Address

**STARWAY**  
Jalan PPS 010, Off Petaling Jaya,  
Bandar Petaling, 57100 Kuala Lumpur,  
Malaysia. Tel: +603 9054 6000  
Email: info@starwayhotels.com

About Us  
Contact  
Term & Conditions

Facebook  
Twitter  
Instagram

Subscribe to our newsletter  
Email Address

Figure 22: Update VR Page

Figure 23: Update 3D Page

In addition, the hotel staff could view the reservation coming in by clicking the admin tab on the navigation bar. On the confirm booking page shown in figure 24, hotel staff are allowed to confirm or reject the reservation customers made by clicking the

respective button after checking the availability. A confirmation or rejection email will be sent by the system automatically to inform the customer. After confirming, the hotel staff can easily scroll down to update room availability shown in figure 25 by clicking the respective date on the calendar for the specific room to mark as fully booked. For other room types, click “Next” to access.

**CONFIRM BOOKING**

*Guest Information*

**Reservation**

1 night, 2 adults  
Tue, Dec 13, 2022

Double Room - 1  
RM 95

Additional Taxes & Fees  
RM 14.25

**Subtotal**  
RM109.25

**Confirm**    **Reject**

**ROOM AVAILABILITY**

AVAILABLE DATES For Double Room  
Click to mark as fully booked

November 2022 ▾						
SUN	MON	TUE	WED	THU	FRI	SAT
01	02	03	04	05		
06	07	08	09	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	<b>FULL</b> 26

Next >



Figure 24: Admin Confirm Booking Page



Figure 25: Update Room Availability

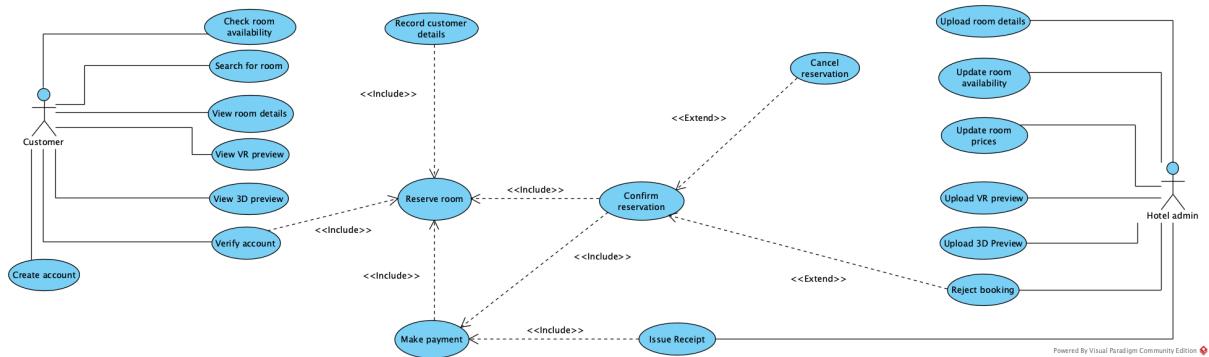
Last but not least, by scrolling downward after updating room availability, hotel staff can check the reservation list shown in figure 26 which shows the accepted booking. The booking details including nights booked, the number of pax, date, room type, and paid amount will be shown too. Hotel staff are allowed to cancel customers' bookings if they find there is an issue with the booking by clicking the “Cancel Booking” button under the respective booking details. The layout is made as a scrolling method for this page to make their job easier so that they can easily check the room availability to accept a booking, update the room availability and even view the booking accepted just by scrolling up and down.



Figure 26: Reservation List

### 3 - UML Diagrams

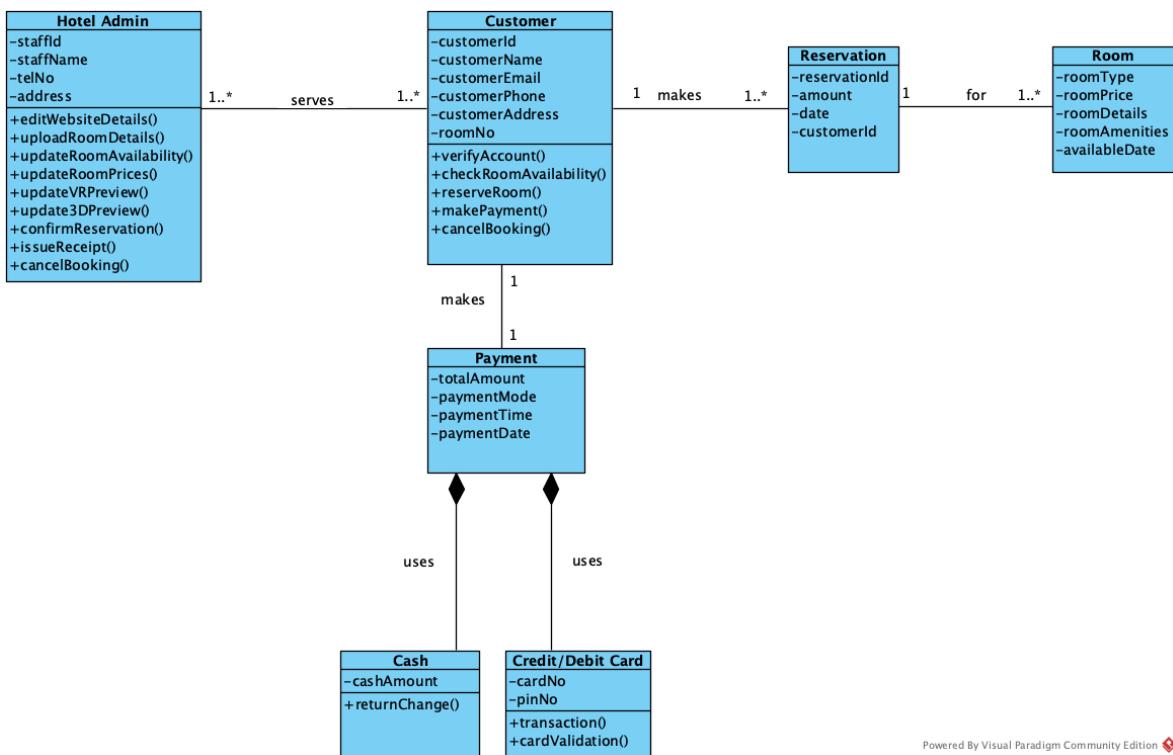
#### 3.1 – Use Case Diagram



In the use case diagram, there are two main actors which are the customer and hotel admin. The customer actor refers to the hotel guests that access the hotel reservation system. They can create an account if they don't have one. They are also able to check for room availability by using their check-in and check-out dates. At the same time, they can search for rooms they are interested in and view the room details which

include its description, room details, room amenities, room rates, taxes, etc. Apart from that, they were allowed to access the VR and 3D preview functions for a better view of the hotel and rooms. In addition, they could reserve a room by verifying their account first using the login function. To reserve a room, they have to fill in their details for the system to record and make payment. After making payment, the reservation will then confirm by the hotel staff which is represented by the hotel admin actor and a receipt will be issued at the same time. Hotel guests are also allowed to cancel their reservation if they want to after the reservation is confirmed. On the other hand, the hotel staff can upload the details of rooms, VR and a 360-degree 3D preview of the room, update room availability, and room prices. Last but not least, the hotel staff is also able to reject customers' bookings if there is a running out of room.

### 3.2 – Class Diagram

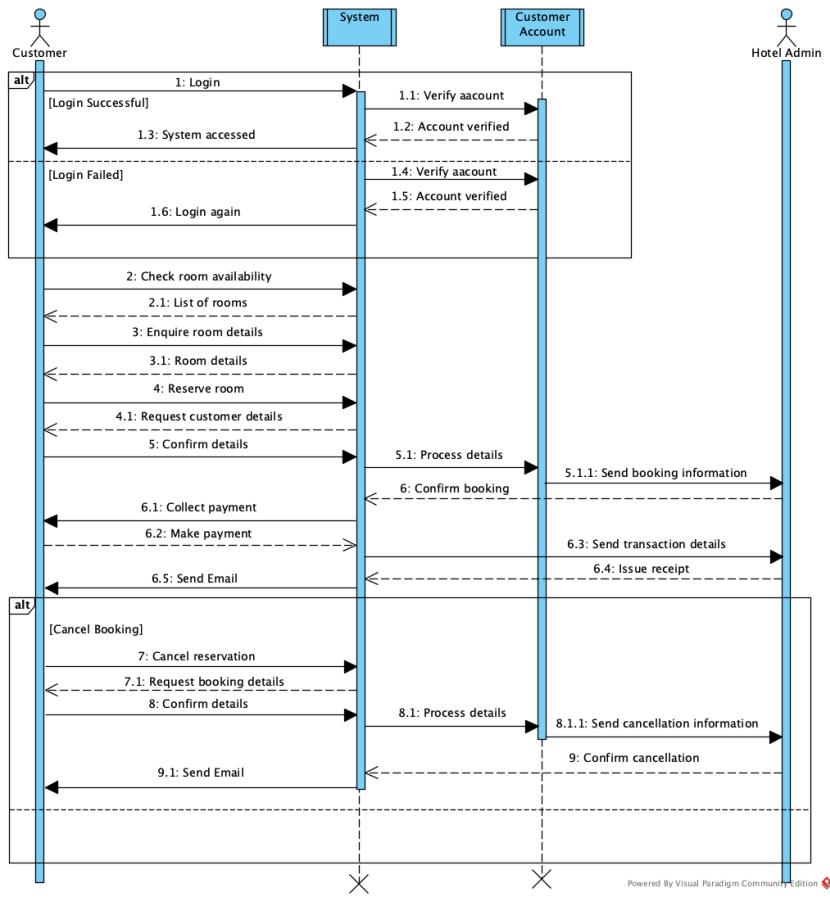


Customer and hotel admin classes were created to represent hotel guests and hotel staffs. The classes store the account information for all individuals involved in the hotel reservation system. For example, the customer's and staff's id, name, phone number, and address. The customer class contains extra information which is the email address and room number assigned to him or her which allows the system to send

confirmation or cancellation emails to notify the customer, while the room number is recorded as the booking information for references or emergency purposes. Accordingly, hotel staff serves at least one or more customers and customers could also be served by one or more hotel staff, which refers to updates on the website and room details, room availability, room prices, VR and 360-degree 3D previews. Hotel staff also serves by confirming a reservation, issuing receipts, and cancelling a booking. Apart from that, the customer class includes the operation of verifying the account, checking room availability, reserving a room, making payment, and cancelling the booking. One customer is only allowed to make one payment once, and the payment process is represented by the payment class. Payment class records the total amount the customer pays, the payment mode, and payment time and date. While a customer can pay by using cash which is represented by the cash class or debit or credit card which is represented by the credit/ debit card class. In the cash class, it records the amount of cash collected and returning change as the operation. For the credit/ debit card class, it records the card and PIN for validation purposes, and it operates by processing the transaction and validating the card to deduct the amount from the customer's card.

Moving on, one customer allows making one or more reservations which are represented by the reservation class. The reservation class stores the reservation id, amount of booking, reservation date and customer id to identify which customer makes which reservation. Each reservation can be made for one or more rooms represented by the room class. Room class records the room type, price, details, amenities, and available date to define which type of room is reserved and the room details.

### 3.3 – Sequence Diagram



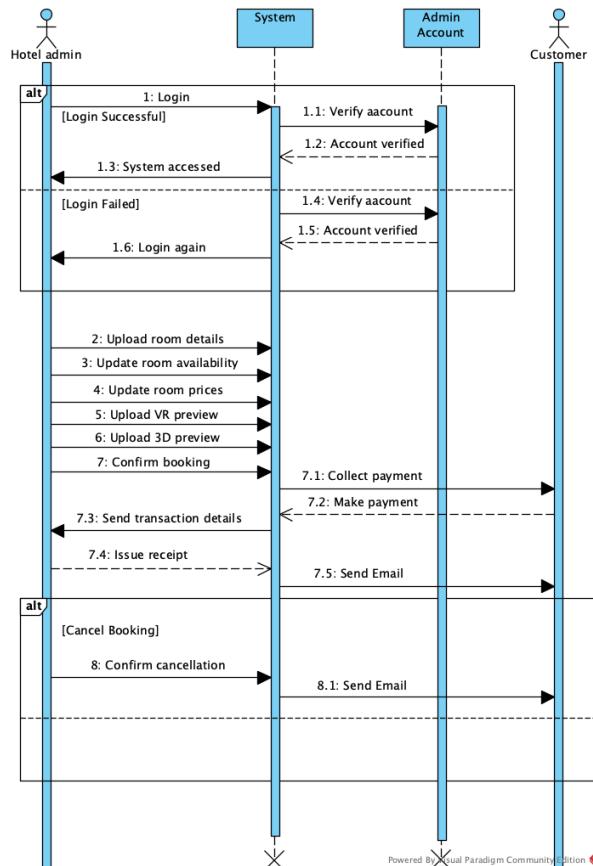
Customers' point of view

The diagram models the procedure needed to be taken for a hotel guest to make a booking for a room which is represented by a customer actor in this case. The first alt operand indicates that the customer login to the system to access their account. By using the email address and password, customers log in to their account through the website, which is then verified with the data in the customer account database which is represented by the Customer Account lifeline. If the account is successfully verified, the customer will be given system access. Conversely, if the verification failed, the system would prompt the customer to log in again.

When a customer wants to check the room availability, a check-in and check-out date will be needed, and a list of rooms will be returned as a reply message after that. When the customer is interested in a room in the list, they can enquire the system for room details and the details like price, size, preview, etc will be returned. After viewing the room, the customer can reserve the room and their details will be requested by the

system as booking details. After the customer is done confirming his or her details, the details will be processed by the system and sent to the customer account database to be recorded. The booking information is then sent to the hotel staff which is represented by the hotel admin actor. After some validation, the booking will be confirmed by the hotel staff and returned as a reply message to the system to initiate the payment process. The system will then collect payment from the customer by directing the customer to the payment page. After the customer is done making a payment through the system, the transaction details are then sent to the hotel staff, and a receipt will be issued to the system to generate an email to send to the customer.

Apart from that, the second alt-operand indicates the cancellation of the booking. If a customer would like to cancel his or her reservation, the system will request the booking details by prompting the customer to choose which booking they would like to cancel. After confirming the details, the request will be processed by the system and sent to the customer account for record purposes and then the cancellation information will be sent to hotel staff for confirmation. After confirming, the cancellation confirmation will be returned to the system to generate an email for the customer.



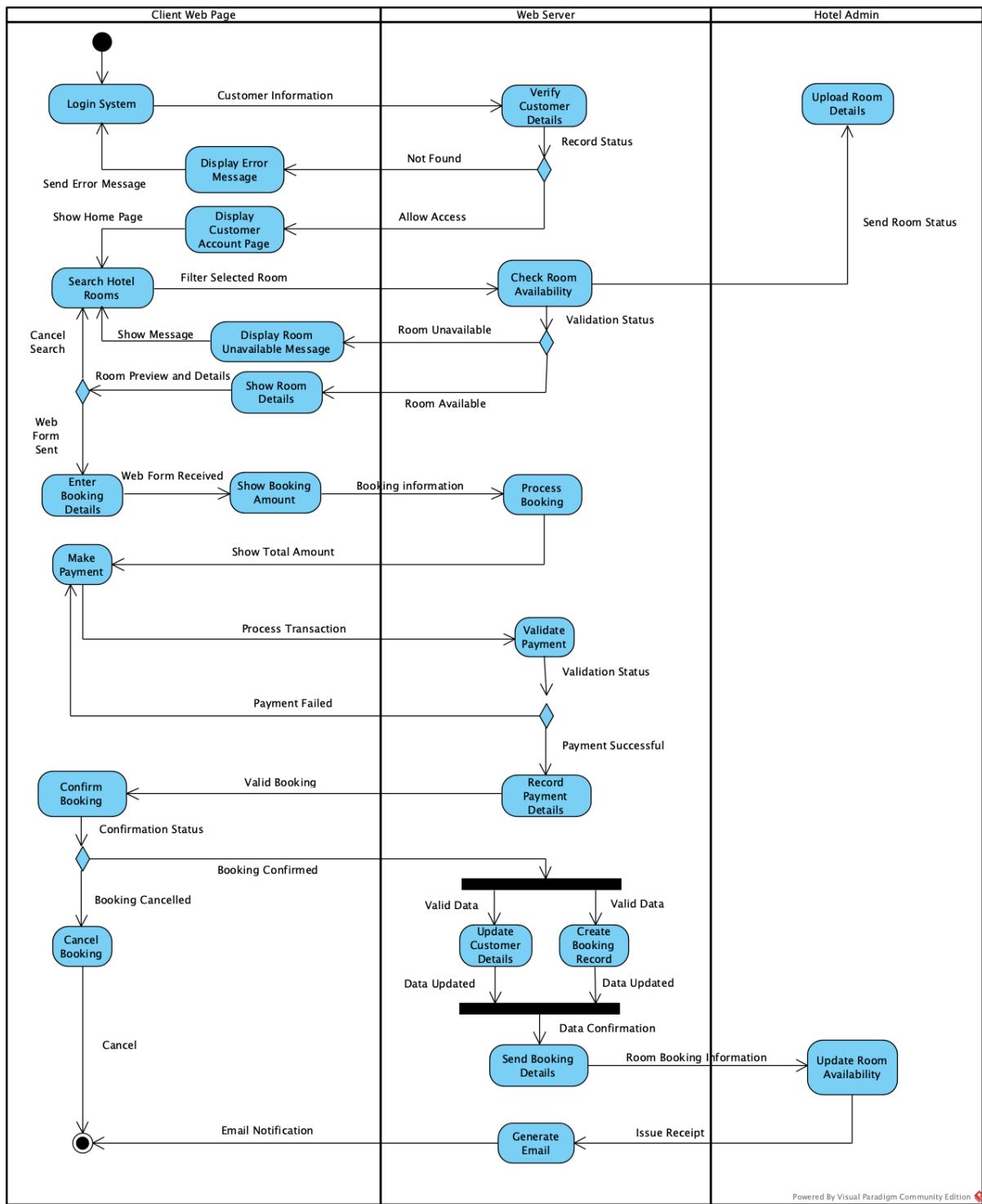
## Hotel Admin Point of View

On the other hand, for the admin version, the hotel staff represented by the hotel admin first log in to the website through the first alt operand. By using the email address and password, staff log in to their account through the website, which is then verified with the data in the admin account database which is represented by the Admin Account lifeline. If the account is successfully verified, the staff will be given system access. Conversely, if the verification failed, the system would prompt the staff to log in again.

After logging in, the hotel staff can access the admin page to upload and update room details, room availability, prices, VR, and 360-Degree 3D preview through the website which is represented by the system. Apart from that, the hotel staff could also confirm the booking when received a booking from a customer who represents the hotel guests. After confirming a booking through the system, the system will then collect payment from the customer and then send the transaction details to the hotel staff once the payment is done and the reply message is returned. The hotel staff will then issue a receipt to the system to generate an email to the customer.

The second alt-operand indicates the cancellation of the booking. If the staff wants to cancel a booking due to unexpected reasons, the cancellation confirmation will be sent to the system. While the system will then generate an email to notify the customer.

### 3.4 – Activity Diagram



The client web page represents the website of customers' view. When it received customers' information through the login system, it sends it to the web server which represents the system to verify the customer details. The information is then matched with the customers' records. A decision node branches according to whether or not a

valid matching record could be found. If the record is not found, an error message will be displayed and restart the login process. On the other hand, if a matching record is found, access will be allowed, and the customer's account page will be displayed. The customer will then be directed to the home page.

When the customer search for hotel rooms, he or she required to enter the check-in and check-out date or choose the room they desire. Rooms will be filtered and checked if it is available or not through the details uploaded by the hotel admin which represents the hotel staff. A decision node branches according to whether or not the room is available. If the room is not available, a room unavailable message will be displayed, and the search hotel rooms process will be restarted. Conversely, if the room is available, the room preview, and details will be shown. Then, a decision node branches according to whether or not the customer wants to reserve the room. If the customer is not interested, the search will be cancelled, and the search room process will be restarted. On the other hand, if the customer wants to reserve the room, he or she will need to enter the booking details and the booking amount will be shown. The booking information will then send to the webserver to process the booking. After that, the amount needed to pay will be shown from the web server and payment will be collected from the customer through the client web page. Once the payment is made, the transaction will be processed, and the system will validate the payment. A decision node branches according to whether or not the payment is successful. If the payment failed, the payment process will be restarted. Conversely, if the payment is successful, the payment details will be recorded by the web server and the booking will be confirmed by the customer. A decision node branches according to whether or not the customer wants to cancel the booking. If the customers confirmed the booking, data will be validated through the fork and customer details will be updated at the same time the booking record is created. After the data is updated, the confirmed data from join will be sent as booking information to the hotel admin to update the room availability. The hotel admin will then issue a receipt and the web server will generate an email to notify the customer and the process will be terminated. On the other hand, if the customer wants to cancel the booking, the booking will be cancelled, and the process will be terminated.

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