

Smart Hotels Gate



Final Graduation Project

By:

1. Abeer Abdalziz Albishri
2. Atheer Turki Almaghrabi
3. Asayel Osamah Almaghrabi
4. Maha Abdulrahman Almazroai

A project submitted in the requirements for the degree of Bachelor of Science
(Information Technology)

Supervised by Dr. Nourah Janbi

Academic Year 1444 (2022-2023)

Abstract

There is no doubt that the impact of technology in our lives has greatly made it important to many things and to complete some operations that in the past required some effort, for example when you want to search for accommodation and travel. The tourism sector, of which hotels are a major part is of great importance in tourism and travel and adds a distinct customer experience. Satisfying guests is an essential and inseparable part of the tourism sector, but we noticed several problems in the field of hotel hospitality, including the problem of many difficult entry procedures to confirm the reservation in the hotel, as it leads to wasting guests time and effort, especially since guests often come to the hotel after travel and need rest. Hence, the idea of the project called "Smart Hotel Gate" (SHG) for hotel reservations came out which proposes creating a site that provides customers with the most important hotels around the world. SHG is an online reservation system that allows guests to make secure reservations online through the site. It provides important features that will facilitate procedures for entry (check-in) and exit (check-out) from the hotel by making them quick technical procedures. It aims to make it easier for guests to book different types of rooms, and the guest receives an electronic key to his room in the hotel, facilitating entry and exit procedures, and many other services that help guests enjoy a better experience in the hotels.

الخلاصة

لا شك أن تأثير التكنولوجيا في حياتنا جعلها مهمة إلى حد كبير لأشياء كثيرة وإتمام بعض العمليات التي كانت تتطلب في الماضي بعض الجهد، على سبيل المثال عندما تريد البحث عن الحجوزات والسفر. يحظى قطاع السياحية والضيافة التي تشكل الفنادق جزءاً رئيسياً منها، لها أهمية كبيرة في السياحة والسفر وتضيف تجربة مميزة للعملاء.

فإرضاء الضيوف هو جزء أساسي لا ينفصل عن قطاع السياحة. لكننا لاحظنا عدة مشاكل في مجال الضيافة الفندقية، منها مشكلة كثرة وصعوبة إجراءات الدخول لتأكيد الحجز في الفندق، حيث يؤدي ذلك إلى ضياع وقته وجهده، خاصة وأن الضيوف غالباً ما يأتون إلى الفندق من السفر الطويل ويحتاجون إلى الراحة. ومن هنا انطلقت فكرة المشروع المسمى "بوابة الفنادق الذكية (SHG)" لحجوزات الفنادق من خلال إنشاء موقع يزود العملاء بأهم الفنادق حول العالم. هو نظام حجز إلكتروني يتتيح للضيوف إجراء حجوزات آمنة عبر الإنترنت من خلال الموقع، حيث يوفر أهم ميزة فيه وهي تسهيل إجراءات الدخول والخروج من الفندق بجعله إجراءات فنية سريعة، حيث إن هذا الموقع سيسهل على الضيوف وعمال الفندق الحجز لأنواع مختلفة من الغرف، ويتلقى الضيف مفتاحاً إلكترونياً لغرفته في الفندق حيث يسهل ذلك من إجراءات الدخول والخروج، والعديد من الخدمات التي تساعد الضيوف على الاستمتاع بإقامة أفضل في الفندق.

Table of Contents

Abstract.....	2
Table of Contents	4
List of Figures.....	7
List of Tables	9
General introduction	10
Part 1: Planning Phase	12
Chapter 1: Project Identification	13
Introduction	13
1.1 Scope of Work.....	13
1.2 Problem Statement	14
1.3 Project Objectives.....	14
Conclusion.....	15
Chapter 2: Study Review.....	16
Introduction	16
2.1 Background.....	16
2.2 Existing works	16
2.2.1 Booking site	16
2.2.2 Agoda site	18
2.2.3 kayak site	19
2.2.4 Almosafer site.....	20
2.2.5 Comparison Among Related Works:.....	21
2.3 Recommendation.....	22
2.4 Project methodology	22
2.4.1 Agile project management	23
2.4.2 Agile Software Development Project Life Cycle Phases:.....	23
Part 2: Analysis phase	25
Chapter 3: Requirement determination	26
Introduction	26
3.1 Requirements elicitation Techniques	26
3.2 Functional and Non-Functional requirements	30
3.2.1 Functional requirements:.....	30
3.2.2 Nonfunctional requirements:.....	31
Conclusion.....	31
Chapter 4: Use case analysis	32
Introduction	32

4.1 Elements of a Use Case	32
4.2 Use Case Diagram	33
4.2.1 General Use Case Diagram.....	33
4.2.3 Bank worker Use Case Diagram	34
4.2.4 System Admin Use Case Diagram.....	35
4.2.5 Hotel Manager Use Case Diagram.....	35
4.3 Use Case Description.....	36
Conclusion.....	41
Chapter 5: Data Modeling.....	42
Introduction.....	42
5.1 Data dictionary	42
5.2 The Entity Relationship Diagram	44
Conclusion.....	44
Chapter 6: Architecture Design.....	46
Introduction	46
6.1 Elements of an Architecture Design	46
6.2 Creating an Architecture Design	46
6.2.1 Deployment Diagram	46
6.2.2 Purpose of architecture diagrams	47
6.3 Hardware and Software Specification.....	48
Conclusion.....	48
Chapter 7: User Interface Design.....	49
Introduction	49
7.1 Graphic charter	49
7.2 Interface Design Prototyping	50
7.3 Navigation scheme.....	59
Conclusion.....	59
Chapter 8: Data Design	60
Introduction	60
8.1 Data storage formats	60
8.2 Conceptual Data Model (CDM)	61
8.3 Logical Data Model (LDM)	62
8.4 Physical Data Model (PDM)	63
Conclusion.....	63
Part 4: Implementation Phase	64
Chapter 9: Data Design	65
Introduction	65

9.1 Class diagram	65
9.2 Sequence diagrams	66
9.3 Software environment.....	70
9.3.1 Programs Used in the Project.....	70
9.3.2 Languages Used in the Project	71
Conclusion.....	72
Chapter 10: Programming process.....	73
Introduction.....	73
10.1 Work Performed	73
10.1.1 The general pages	73
10.1.2 The Admin pages	75
10.1.3 The Manager pages	77
10.1.4 The Customer pages	78
10.1.5 The Reservation process by customer pages	79
10.2 Testing	81
10.2.1 Unit test	81
10.2.2 Integrating.....	85
Conclusion.....	86
General Conclusion.....	87
Reference	87
Appendix.....	91

List of Figures

Figure	2.1 Booking website graphical user interface (GUI)	17
Figure	2.2 The Agoda website GUI.....	18
Figure	2.3 Kayak website graphic user interface.....	19
Figure	2.4 Almosafer site GUI.....	20
Figure	2.5 Agile Software.....	23
Figure	3.1 Questionnaire questions 1 and 2 results.	27
Figure	3.2 Questionnaire questions 3 and 4 results	28
Figure	3.3 Questionnaire questions 5 and 6 results	29
Figure	3.4 The result for questions 7	30
Figure	4.1 General Use Case Diagram	33
Figure	4.2 Customer Use Case Diagram.....	34
Figure	4.3 Bank Work Use Case Diagram.....	34
Figure	4.4 Admin Use Case Diagram	35
Figure	4.5 Hotel Manager Use Case Diagram	35
Figure	5.1 Entity Relationship Diagram (ERD)	44
Figure	6.1 Deployment Diagram	47
Figure	7.1 The website logo.....	49
Figure	7.2 Home page.....	50
Figure	7.3 List of hotel in home page.....	50
Figure	7.4 Contact and About us page.....	51
Figure	7.5 Log in page.....	51
Figure	7.6 New register page.	51
Figure	7.7 Profile customer page.....	52
Figure	7.8 Favorite page.	52
Figure	7.9 add a room to the favorites page.....	52
Figure	7.10 Booking page.....	53
Figure	7.11 Booking rooms page.....	53
Figure	7.12 New Reservation page	53
Figure	7.13 Payment page.....	54
Figure	7.14 Check-in page.....	54
Figure	7.15 Nafath - check for your ID page.....	55
Figure	7.16 Admin profile page.....	55
Figure	7.17 Admine services page.....	56
Figure	7.18 Mange hotel page.	56
Figure	7.19 List of hotels page.	56
Figure	7.20 Create account for hotel manger page	57
Figure	7.21 View Customers Accounts page.....	57
Figure	7.22 Hotel manger profile page.....	58
Figure	7.23 Add Room Page.....	58
Figure	7.24 List of room page.....	58
Figure	7.25 Navigation Scheme.....	59
Figure	8.1 Conceptual Data Model (CDM).	61
Figure	8.2 Logical Data Model (LDM).	62
Figure	8.3 Physical Data Model (PDM).	63
Figure	9.1 Class diagram.	65
Figure	9.2 The customer log in sequence diagram.	66
Figure	9.3 The customer reservation process sequence diagram.....	67

Figure	9.4 The customer payment process sequence diagram.	68
Figure	9.5 The customer check-in process sequence diagram.....	68
Figure	9.6 The admin manage hotels process sequence diagram.	69
Figure	9.7 The manager add rooms process sequence diagram.....	69
Figure	10.1 The Home page.....	73
Figure	10.2 List of hotels in home page.	74
Figure	10.3 Contact and About Us page.	74
Figure	10.4 Login page.	74
Figure	10.5 Admin profile page.	75
Figure	10.6 Admin services page.	75
Figure	10.7 Manage hotel page.	75
Figure	10.8 Create account for hotel manager page.	76
Figure	10.9 List of hotels page.	76
Figure	10.10 List of customer page.	76
Figure	10.11 Hotel manager profile page.	77
Figure	10.12 Add room page.	77
Figure	10.13 List of rooms page.	77
Figure	10.14 Customer profile page.	78
Figure	10.15 Customer favorite page.....	78
Figure	10.16 Add a room to the favorites page.	78
Figure	10.17 Booking page.	79
Figure	10.18 Booking for rooms page.	79
Figure	10.19 New reservation page.	79
Figure	10.20 Payment page.....	80
Figure	10.21 Check-In page.	80
Figure	10.22 Nafath - check for your ID page.	80
Figure	10.23 Barcode key sanded to email page.	81
Figure	10.24 Booking without log in.	82
Figure	10.25 Registering with wrong password requirements.	83
Figure	10.26 log in with wrong password or email.	83
Figure	10.27 Booking with check-in date after the check-out date.	83
Figure	10.28 Adding hotel with empty location.	84
Figure	10.29 Register new costumer.	85
Figure	10.30 The database state after adding new customer.	85
Figure	10.31 Adding new hotel.	86
Figure	10.32 The hotel can be seen by the customer.	86

List of Tables

Table 2.1 Comparison of related works	21
Table 4.1 "Log in" use case description.....	34
Table 4.2 "Search hotels" use case description.....	34
Table 4.3 "Confirm reservation" use case description.....	35
Table 4.4 "Make a payment for room" use case description.....	35
Table 4.5 " Manage hotels " use case description.....	36
Table 4.6 "Create account for hotel manager" use case description.....	37
Table 4.7 "Check in" use case description.....	38
Table 5.1 Data Dictionary.....	40

General introduction

In our modern age, technology has made our lives easier, and has developed and entered into many simple and complex matters of our lives and made the tasks to complete them easier. This intervention created great importance for technology and its impact on us, meaning that the simplest things in your daily routine are free from dealing with technology. For instance, communicating with relatives, completing academic duties, or even searching for opening hours for a restaurant or searching for a hotel room.

Today, the world is witnessing a major technological transformation in all aspects of life, whether social or health, the most important of which is entertainment. To talk about entertainment and the many technical transactions it contains, starting from the search for a destination for entertainment, places at your destination, how to book and other things, most of which are done in a manner completely via the website on the internet. The websites make it easier for people to deal with most things in their lives more easily and flexibly and in different ways, so people are accustomed to using them [1].

The way for companies to carry out their operations, especially for business, depend greatly on web servers and business gateway and site. For instance for entertainment businesses and travel agencies, hotel reservation sites are sites that offer reservation offers from several hotels in one place and provide the ability to book through them. This aspect of the hotel and guest hospitality attracted our attention as a team therefore we aimed to introduce and enhance some areas of life utilizing technology.

We noticed that the hotel field lacks some facilities for guests and the most important of these matters is the process of checking in and checking out from every hotel. When guests arrive at the hotel, they mostly have to wait just to check in and this is a stressful process, especially after a long trip. Due to this problem, we have proposed a technical solution that is fast and safe, facilitating and speeding up the reservation process and the entry and exit procedures for the customer. To guarantee customer satisfaction and comfort, measuring customer satisfaction is an essential indicator of the company's success in providing services to customers.

Our proposed website provides reservations for various hotels in one website and provides many advantages. The most important feature is, that facilitates all

procedures of the booking, entry, and exit processes for the customer, issuing an electronic barcode key that is sent to the customer's email and number after being booked through our website. In this way, when the customer arrives at the hotel, he does not need to go to the reception and line up for check-in.

The advantage of this site is that the customer goes directly to his hotel room and can enter using the barcode key issued specifically for him. In addition, for the checkout process, he does not need to hand the key to the reception employee and wait for check out process. The barcode will simply stop working and will not open the room to the customer. In this way, all procedures are facilitated for the customer from entering and leaving. Customers can also use the barcode key to enter the hotel facilities such as parking, gym, pool, and even the spa, and restaurant. In this way, we were able to utilize the technology to solve a problem faced by many and achieve customer satisfaction in enjoying the stay and making it comfortable and easy for him.

In this report, we will introduce our project and show how it works, In this report, we will introduce our project and explain how it works, its advantage over the rest of the booking sites, and the problems it will help solve.

This report is organized as follows: The first part is the planning phase that contains chapters one and two, which defines the project objectives and review of the study. Analysis phase part II which includes chapters 3 and 4 identification project requirements and use case analysis, chapter 5 for data modeling. The third part is the design stage which contains the sixth, seventh, and eighth chapters. This part shows the design elements and user interface. Finally, the implementation phase of the fourth part which contains chapter 9 that introduces the object-oriented explaining the system design and program environment, Chapter 10 the end result of our work.

Part 1: Planning Phase

Chapter 1: Project Identification

Introduction

Technology has made our lives easier. In particular, mobile applications make it easier for people to improve their lives in different ways such as tourism websites. Reservation apps can support us in planning our trips and make us much more comfortable. Going somewhere you've never been before can be a stressful experience. In this chapter, the scope of work, problem statement, and project objective are presented.

1.1 Scope of Work

Fortunately, there are more options than ever when it comes to booking hotels. One of the most important things we look for when we want to travel is to book hotels and secure accommodation in the country that we are going to. Many travel and tourism applications and websites allow travelers to stay in many hotels around the world at different prices. Suitable or not, this is very stressful and after the emergence of hotel booking applications and websites, it became possible to choose among the best areas and know the prices as well as a book before visiting this country. thus a main feature of our website is that you will be able to receive your room key 24 to 12 hours before you arrive at the hotel and once you arrive, you can go down to the hotel and enter your room directly. Also, you can share your room key with two to three people if you share a room.

Based on Saudi Arabia's Vision 2030, the tourism sector in Saudi Arabia especially has experienced an increased level of growth in recent years and is seen as continuing this trend going forward. Therefore, we found it important to develop an application that improves the experience of hotel guests, facilitates their reservations and entry to hotels in the Kingdom and the world in general, and provides them with excellent services to help them enjoy their travel more easily.

One of the challenges that can be faced in the future is that the service we provide does not arouse the interest of hotels and their unwillingness to develop this service.

1.2 Problem Statement

The issue here is the lack of speed, efficiency, and the difficulty of procedures in booking and receiving hotels, which results in the guest's unsatisfaction. among these issues is the check-in and check-out process of each hotel, so When guests arrive at the hotel, they often have to wait just to check this issue. thus, the idea of the graduation project "Smart Hotel Gate" came to us to solve this problem, especially since the guest has an important role in the hotel management process, as this leads to a decline in the hotel's profits and performance.

1.3 Project Objectives

In this project, we aim to achieve hotel guest satisfaction and facilitate the reservation process. Therefore, our main objectives can be summarized as follows:

- To provide as many as possible choices of hotels for the customers to choose from on the site.
- To achieve maximum customer satisfaction and facilitate the reservation process.
- To allow customers to make reservations easily using the hotel's smart portal website.
- To allow customers to use the ability to modify or cancel reservations easily on the website.
- To provide exclusive offers for site customers only, such as a special discount for a three-night stay or free breakfast with the room.
- To increase the profits of hotels shared with the smart hotel gate site by approximately 40% per year.
- To facilitate the procedures for entering and exiting the customer from the hotel with all speed and ease.
- To enable the site the ability to create a barcode key and then use it to enter the hotel room without resorting to the reception.
- To Save time and effort for hotel guests by facilitating the reservation process when entering the hotel and going directly to the room.

Conclusion

In this chapter, we discussed the idea of the project and the problems that arose because of it, as well as our goal of trying to satisfy the guest.

Chapter 2: Study Review

Introduction

The field of hotel reservation management is an important topic, and the most important thing we aim at is facilitating these reservations. There are many innovative projects to facilitate hotel reservations, airline tickets, cinema tickets, and the Umrah app. In this chapter, we provide an overview of different applications and websites in hotel booking websites that are similar to our application idea, suggest recommendations, and include a project methodology.

2.1 Background

In the past, a hotel was an establishment that provided paid accommodation on a short-term basis, it was only a room with a bed, wardrobe, small table and sink in rooms with modern facilities. But now that internet technology has improved, they have reservation systems. Today it is possible through the Internet to make a hotel reservation anywhere in the world [2].

Now the online hotel reservation system is one of the most complete and advanced fields in the travel software suite in the hospitality market.

From here, the importance of booking a hotel via the Internet, the time and effort of the guest and the advantages of the hotel will be explained. In the field of hotel reservations, there are many sites that help in better booking hotels we will present some here in this chapter and compare them with our proposal.

2.2 Existing works

Searching and looking at the existing work of others make us able to improve our work in an attempt to present something new and different. So, in this section, we will show a general background of related works that are similar to our project, and we will describe the advantages and disadvantages of those similar projects.

2.2.1 Booking site

Booking is an online travel agency website for making hotel reservations, acting as an intermediary between guests who want to make a reservation at your hotel and accommodation. Its database contains a huge number of hotels for guests. First, an

interface is displayed in which you specify the destination you want to travel to, the date of stay and the number of guests, then select the reason for your travel and the type of place, whether room, house, hotel, chalet, and others. After that, the site will suggest you the best accommodation and the best prices, select the room you want and then the site will send you to the booking data page that includes all your data. Figure 2.1 shows the Booking website user interface [3].

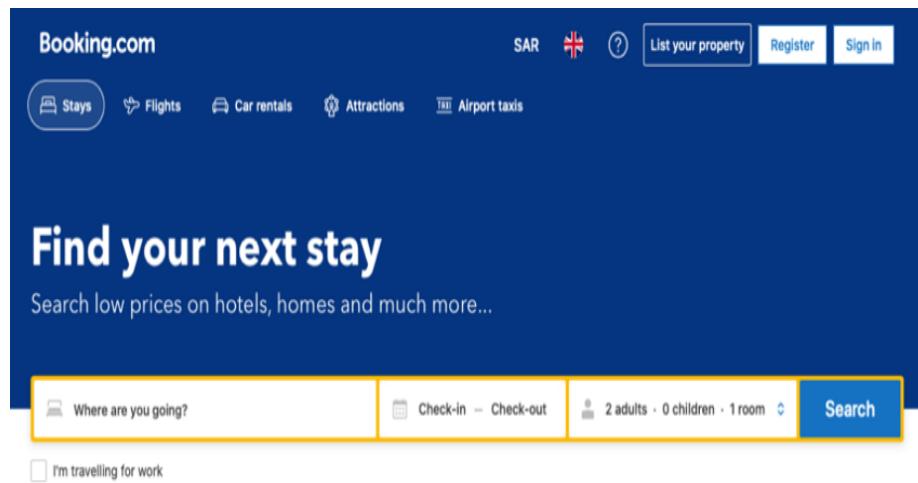


Figure 2.1 Booking website graphical user interface (GUI)

Advantages:

- It contains a large number of accommodations.
- It does not charge you as a customer in return.
- Needs only to subscribe to be able to book.
- It offers an interface rich in details and easy to use.
- Ease of cancelling a reservation.
- There is reward program.

Disadvantages:

- When you arrive at the hotel, you are asked to pay in the local currency and the consequent use of the exchange rate by the hotels.
- No hotel check-in services.
- When you cancel your reservation, the amount will not be returned to your balance until passing 10 working days.

2.2.2 Agoda site

Agoda offers Agoda hotel reservation services at affordable prices for customers. It is distinguished from the rest of the sites that if the customer can prove that there are cheaper accommodations in other places, they reduce or adjust the price specifically for him. It provides offers for comfortable accommodations at varying prices that suit all categories: such as hotels, hostels, cottages, furnished apartments, studios and resorts. In addition to the places that provide breakfast, then the customer makes a reservation and pays the rent using a credit card. After that, your reservation is confirmed by e-mail. Figure 2.2 shows the Agoda GUI [4].

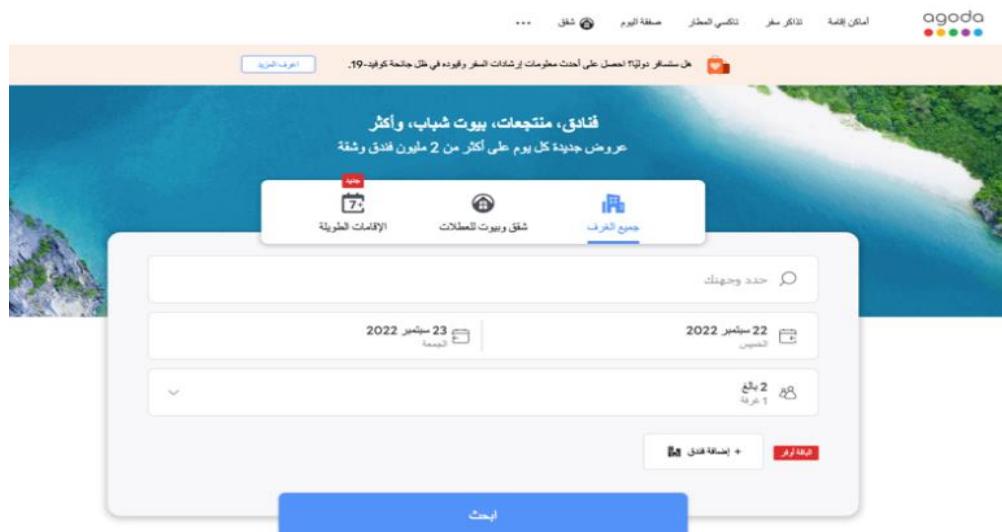


Figure 2.2 The Agoda website GUI

Advantages:

- Bookings can be made in Saudi riyals, and the visa is deducted in Saudi riyals, meaning there is no change in the exchange rate.
- No need to pay any amount to the hotel when you arrive at the hotel because the amount is discounted when booking.
- There is a reward program.

Disadvantages:

- When you cancel your reservation, the amount will not be returned to your balance until 10 working days have passed.
- It does not show you the final price when booking, it shows you the value of the amount and the value of taxes, and you have to calculate it.
- It does not show you the maximum number of people in the room or apartment.
- It takes up to 8 hours for the reservation number to arrive.

- You cannot amend your reservation or change the hotel because the amount has already been deducted from your account.
- No hotel check-in services.

2.2.3 kayak site

kayak is a free website and application that is one of the best hotels booking sites, as it displays hotel rooms at cheap prices, and you can also see reviews about hotels. Figure 2.3 shows the graphic user interface of the kayak site [5].



Figure 2.3 Kayak website graphic user interface

Advantages:

- It works easily.
- It's free and does not require a fee to use.
- Contains a currency conversion feature for each country.
- It is characterized by the presence of some offers and discounts for the user.

Disadvantages:

- Filter options are limited.
- Does not support the Arabic language.
- It does not offer the ability to search for flexible dates.
- This site may be less attractive because there are many tools in the search.
- No hotel check-in services.

2.2.4 Almosafer site

The Saudi Almosafer site is considered one of the sites that help to book hotels through the Internet and the ability to see the reviews of those hotels, in addition to the possibility of booking without fees. Figure 2.4 shows the graphic user interface of Almosafer site [6].



Figure 2.4 Almosafer site GUI.

Advantages:

- Offers the best prices.
- Make discounts for reservations for as many hotels as possible.
- The multiplicity of payment methods and its ease, as it allows the feature to pay later, in addition to the wrong payment in installments.
- It's free and easy to use because it has a simple interface.

Disadvantages:

- Few hotels offered.
- The hotel pictures shown are of poor quality, which makes the customer resent the decision to book the hotel.
- There are not enough details and information about the hotel.
- No hotel check-in services.

2.2.5 Comparison Among Related Works:

The most related to our website is:

- Booking is an online travel agency website for making hotel reservations [3].
- Agoda offers hotel reservation services at affordable prices for customers. It is distinguished from the rest of the sites that if the customer can prove that there are cheaper accommodations in other places [4].
- Kayak is a free website and application that is one of the best hotels booking sites, as it displays hotel rooms at cheap prices [5].
- The Saudi Almosafer site is considered one of the sites that book hotels through the Internet and the ability to the possibility of booking without fees [6].

In the table 2.1, the most famous websites for booking hotels around the world are compared to our site. The comparison was made in many different aspects, including: Is it free, does it have customer service 24/7, It is easy to interact with its GUI, does provide online check-in/out services, and can Generate room barcode key.

Table 2.1 Comparison of related works

Related works	icons	Free website	24/7 customer services	Easy to interact with GUI	Provide online check-in/out services	Generate room barcode key
Booking site		No	Yes	Yes	No	No
Agoda site		Yes	Yes	No	No	No
kayak site		Yes	Yes	No	No	No
Almosafer site		Yes	Yes	Yes	No	No
SHG site		Yes	Yes	Yes	Yes	Yes

2.3 Recommendation

When guests arrive at the hotel after a long trip, waiting in line only to check in to the hotel consumes their time, so we thought to create a website called Smart Hotels Gate (SMG). All you have to do is go to your room and scan the barcode at the room door to enter it.

the barcode key it's generated randomly by using (Mailtrap) which is a dummy server that can test if the email is safe and comprehensive to send the barcode key to it.

by the barcode key you can enter to all the hotel facilities such as car parking, gym and dining hall. It is a cheaper alternative to the regular keys, and from the services provided by our site, the barcode can be shared if there is more than one guest in the same room on our site, it will be easy to use and supports all devices.

2.4 Project methodology

The Agile methodology is a methodology or principle followed by the team to manage the project by dividing it into several phases. In which stakeholders collaborate on an ongoing basis and seek improvement at every stage. Once work begins, the team begins a process of planning, implementation, and evaluation [7]. Collaboration in this approach is vital and necessary both with stakeholders and with team members.

Whereas the traditional "waterfall" approach used in the methodological development process has only one discipline contributing to the project, progress in this approach is in static, top-down pieces (like a waterfall). Communication, collaboration, and trust among team members are at the core of agile [8]. The team in the agile approach takes the lead in deciding how to get work done and organizing around the performance of tasks.

Agile is a methodology that commits to feedback cycles and continuous improvement. Agile (and its derivatives such as Scrum and Kanban) is an iterative process that brings benefits to organizations for the management of software development [9]:

- Better Quality Products.
- User Satisfaction.
- Enhanced Control.
- Better Product Predictability.

2.4.1 Agile project management

Agile methodology in project management is a process for managing a project that involves collaboration and working in iterations. It works off the basis that a project can be continuously improved upon throughout its life cycle, and changes can be made quickly and responsibly. Agile is one of the most popular approaches to project management due to its flexibility and adaptability to change [10].

In short, we chose the Agile methodology management because it is an iterative process that ensures continuous improvement at every stage, and the team members cooperate continuously and dynamically with the stakeholders.

2.4.2 Agile Software Development Project Life Cycle Phases:

The agile project life cycle in general has 6 phases (Figure 2.5 shows these phases):

1. Concept
2. Inception
3. Iteration
4. Testing
5. Production
6. Review

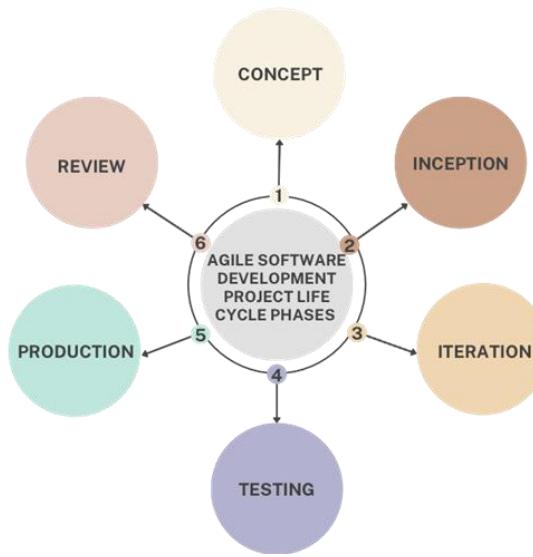


Figure 2.5 Agile Software

Conclusion

In this chapter, we have clarified the most familiar related works to our project, mentioned their advantages and disadvantages, found new features that provide better services and provided them to our project, and explained the methodology used for our project, which showed us a clear path of what should be done in the next stages of the project.

Part 2: Analysis phase

Chapter 3: Requirement determination

Introduction

In this chapter, we introduce the requirements elicitation process. It describes the data-gathering technique used. Then, it analyzes the requirements that have been gathered and we present functional and non-functional elicitation techniques and requirements.

3.1 Requirements elicitation Techniques

To discover system requirements the information should be collected from specific resources such as the users and other stakeholders. There are several methods to perform requirements elicitation, which include brainstorming, document analysis, interface analysis, interviews, observation, prototyping, requirements workshops, and survey/questionnaire. We decided to choose the questionnaire to gather the requirements of our project.

A questionnaire is a research tool that consists of a series of questions designed to collect information from potential clients [11]. Questionnaires are similar to written interviews in that they collect information. We chose Google surveys since they are a reasonably inexpensive, rapid, and effective approach to collect significant quantities of data from a broad group of individuals. Because the researcher is not required to be present while the surveys are completed, data may be obtained fast. When conducting interviews with large groups of people is unfeasible, this method is beneficial. This is beneficial as it means both quantitative and qualitative data can be obtained.

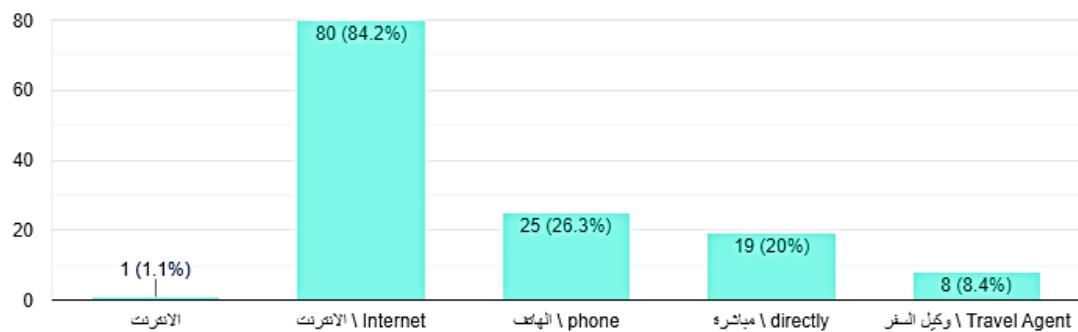
We made a survey based on the target user who is the guest. This questionnaire aims to identify the opinions of guests about the necessity and importance of having a location that facilitates entry and exit from the hotel easily (Figure 3.1 show the result for Two questions 1 and 2).

نسخ

١. ما الطريقة المفضلة لديك لحجز الفنادق

What is your preferred way to book hotels

رداً 95



نسخ

٢. ما سبب قدومك الى الفنادق عادة
why do you usually come to hotels

رداً 95

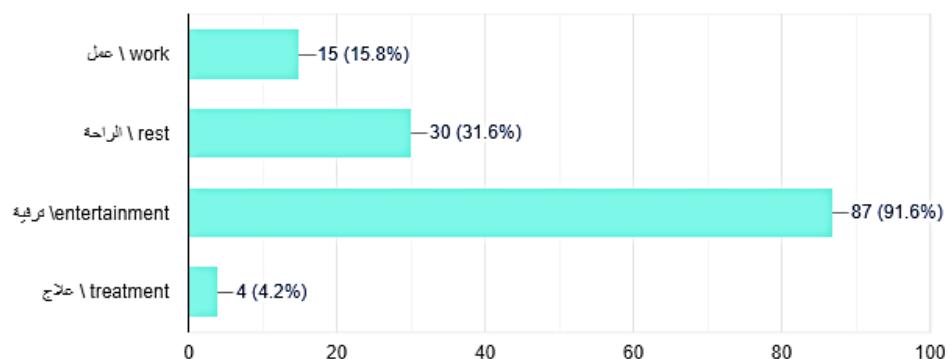


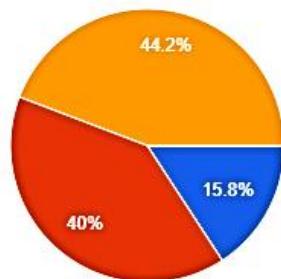
Figure 3.1 Questionnaire questions 1 and 2 results.

نسخ

3. ما الطريقة المفضلة للدخول إلى الفندق

What is your preferred way to enter the hotel

95 ردًا



● محبة البيانات عن طريق مكتب الاستقبال في الفندق و
● اسلام المفاتيح عرفةك
the reception desk at the hotel and
receive your room key

● محبة البيانات و اسلام المفاتيح فوراً عن طريق الموقع
● قبل الوصول الى الفندق
Fill in the data and
receive the key immediately through the
website before arriving at the hotel

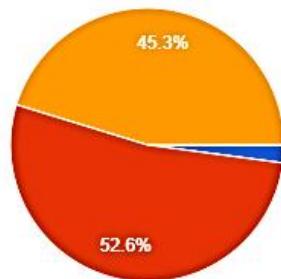
● محبة البيانات عن طريق الموقع للنفدي ثم اسلام مفاتيح
● عرفةك من مكتب الاستقبال
Fill in the data
through the hotel website, then receiv...

نسخ

4. ما الطريقة المفضلة للدخول إلى غرفتك في الفندق

What is your preferred way to enter your hotel room

95 ردًا



● key (منصة)
● card (بطاقة)
● barcode from your phone (باركود من هاتفك)

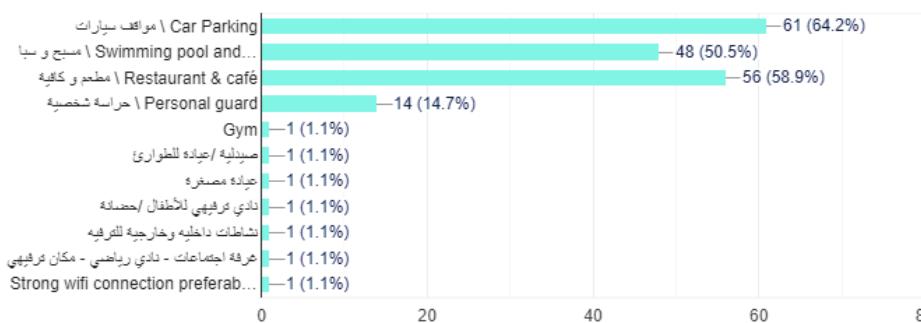
Figure 3.2 Questionnaire questions 3 and 4 results

نسخ

5. من واقع تجربتك ما الخدمات التي تحتاج ان تتوفر في الفنادق

From your experience, what are the services you wish the hotels would have

رداً 95



نسخ

6. ماهي المشاكل التي تواجهك عادة عند الوصول الى الفندق

What are the problems you usually encounter when arriving at the hotel

رداً 94

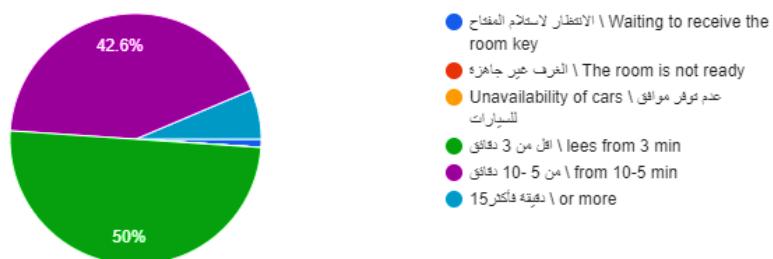


Figure 3.3 Questionnaire questions 5 and 6 results

7. هل لديك أية اقتراحات لتحسين جودة خدمات موقع حجز الفنادق في المستقبل؟ رجاء شاركتنا بها.

57 رداً

Figure 3.4 The result for questions 7

3.2 Functional and Non-Functional requirements

3.2.1 Functional requirements

Functional requirements are product features or functions those developers must implement to enable users to accomplish their tasks. So, it's important to make them clear both for the development team and the stakeholders. Generally, functional requirements describe system behavior under specific conditions [12].

Administrator

This function is used by the administrator to manage the website.

- Manage hotels.
- Create an account for the manager.

Booking website

This function is used by the customer to login into the website.

- Create an account-by-account name and password.
- Search hotels.
- Make a reservation.
- Check-in room.

Hotel manager

This function is used by the hotel manager to manage hotel.

- Add room.
- Help and support customer.
- Cancel barcode and generate new one for security.

3.2.2 Nonfunctional requirements:

The system should perform well, it should be implemented in a professional way to avoid any software failures and should perform as expected when it is in use. Also, should be available for use all of the time for users and meet their needs. As there are many security issues over the internet the system should be secure to use and protected very well from any attacks. Non-functional requirements are the constraints on the services or functions offered by the system [12]. Our system's non-function requirement includes:

- Availability: The website (smart hotel Gate) must be running all the time.
- Flexibility: The website must meet design conventions to be user-friendly.
- Reliability: The smart Gate (Smart Hotel Gate) will support multiple languages.
- Performance: The website should avoid any delays and be faster when used.
- Security: Logging in must ask you for a username and password.
- Usability: The website should be easy to use and the user experience when interacting with systems should be perfect.

Conclusion

To sum up, this chapter introduced the analysis part of the project. We introduced data-gathering methods used to implement the project. We have addressed the website requirements for developing our website. Also, we have mentioned the functional and non-functional requirements, what this website is about and who are the main stakeholders of this website. In the next chapter, we will analyze the use case by providing its elements and drawing the diagrams.

Chapter 4: Use case analysis

Introduction

In this chapter, we will analyze the use case diagrams. Analysis of requirements leads to the development of a concept for the proposed system. The purpose of the use case diagram is to show the interaction among the requirements actors. A use case diagram is a depiction of the interactions among the elements of a system. It is a used analysis methodology to identify, clarify, and organize system requirements.

4.1 Elements of a Use Case

The use case model is a model of how different types of users interact with the system to solve problems. The use case model consists of several model elements. The most important model elements are use cases, actors, and relationships between them.

4.1.1 Actors

The actors in the use case refer to entities, another software system, or a hardware device that plays a role in a particular system. to achieve a useful goal. There are four actors in the proposed system:

1. The system admin is responsible for:

- Manage hotels.
- View customer accounts.
- Create an account for hotel managers.
- Update discount details.

2. The customer is responsible for:

- Search hotels.
- Make a reservation.
- Confirm reservation.
- Make a payment for the room.
- Edit/cancel reservation.
- Check-in / check-out and generate barcode key room for the customer.

3. The hotel manager is responsible for:

- Manage hotel rooms.
- Update price rooms.

4.2 Use Case Diagram

4.2.1 General Use Case Diagram

Figure 4.1 shows the basic services of the system and describes the interaction between actors and use cases.

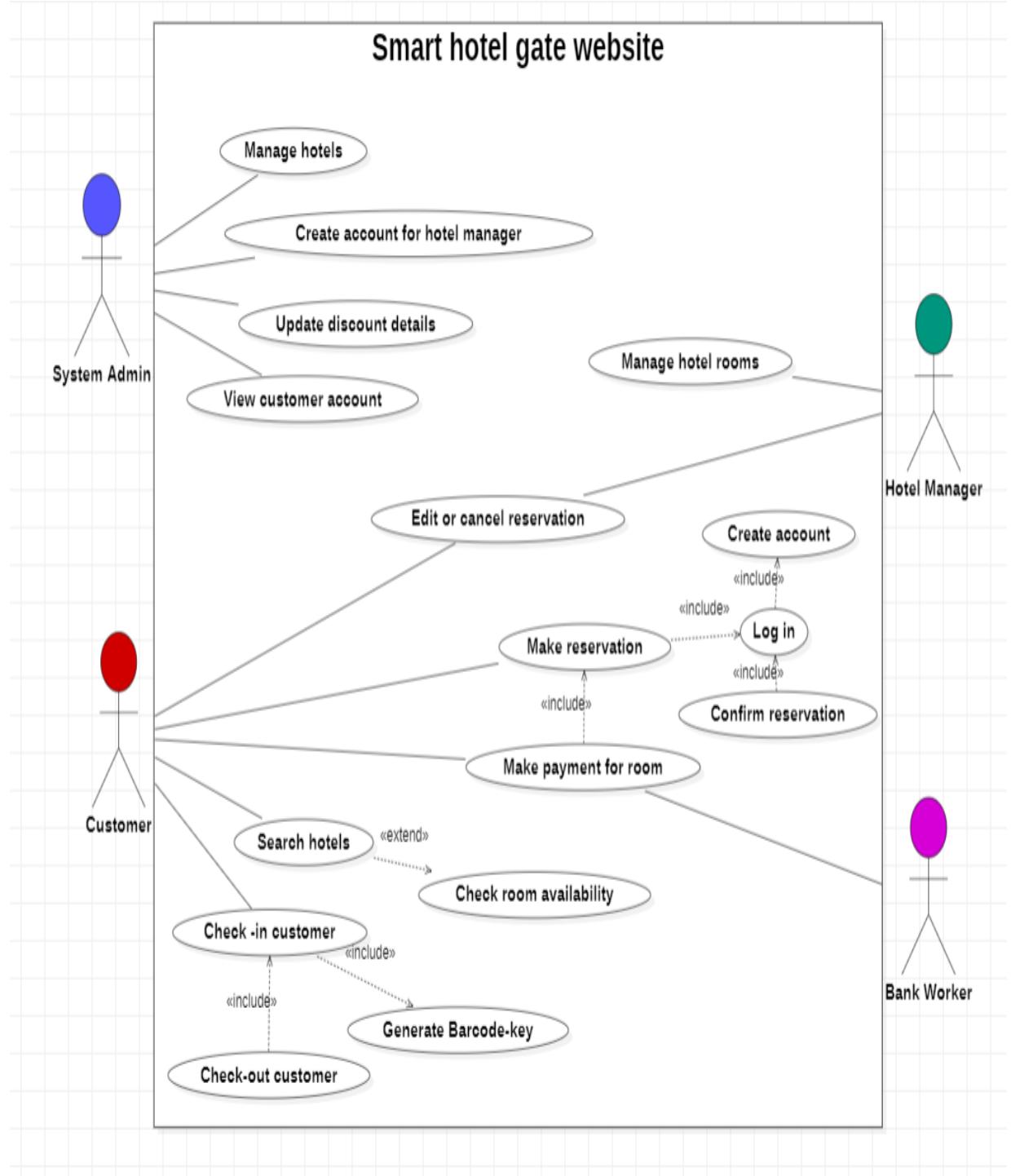


Figure 4.1 General Use Case Diagram

4.2.2 Customer Use Case Diagram

Figure 4.2 shows the basic services of the customer in the system and describes the interaction between him and the use cases.

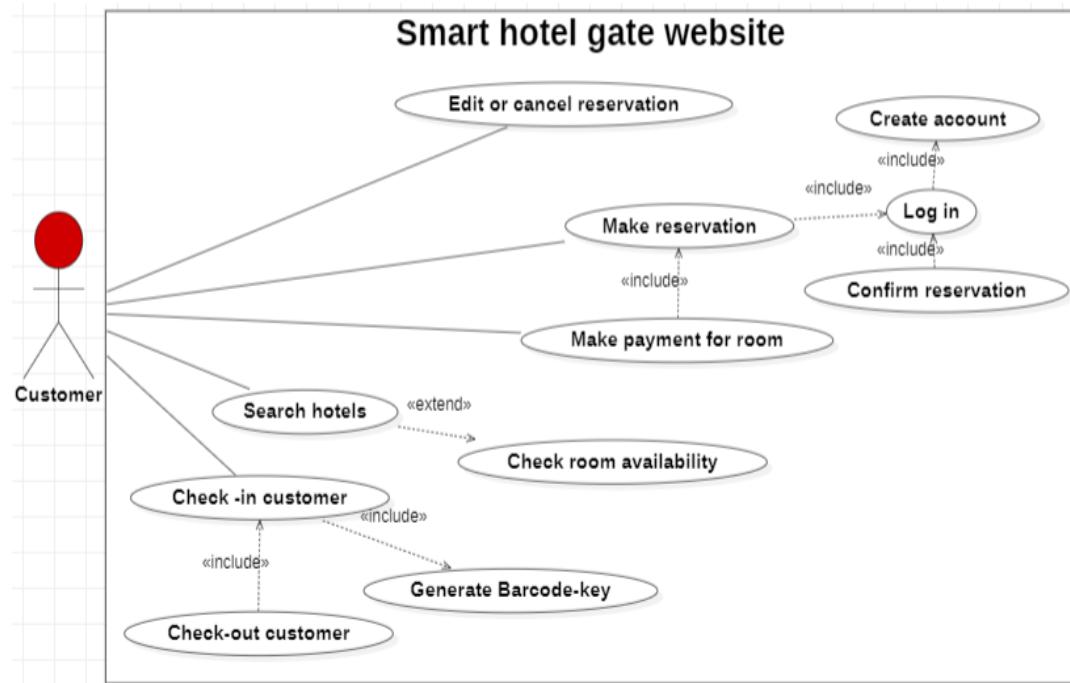


Figure 4.2 Customer Use Case Diagram

4.2.3 Bank worker Use Case Diagram

Figure 4.3 shows the basic services of the Receptionist in the system and describes the interaction between him and use cases.

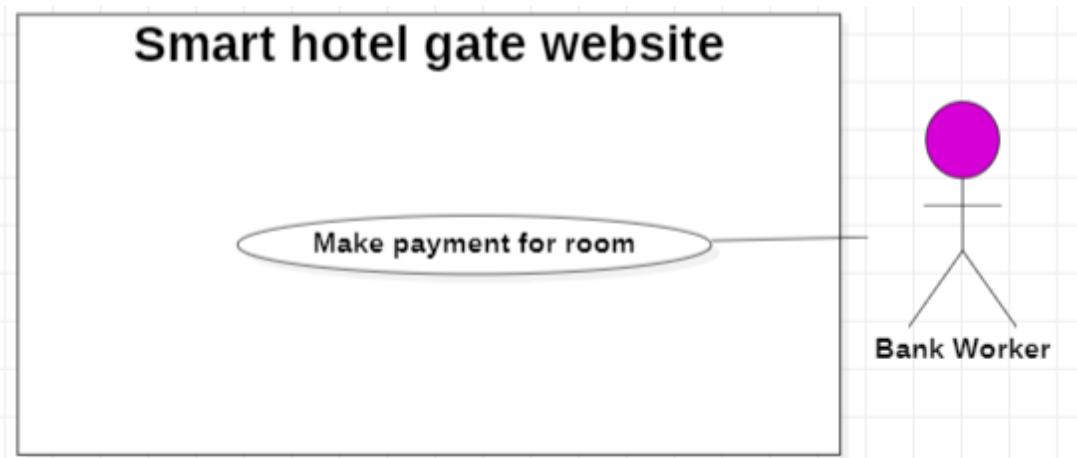


Figure 4.3 Bank Work Use Case Diagram

4.2.4 System Admin Use Case Diagram

Figure 4.4 shows the basic services of the System Admin and describes the interaction between him and use cases.

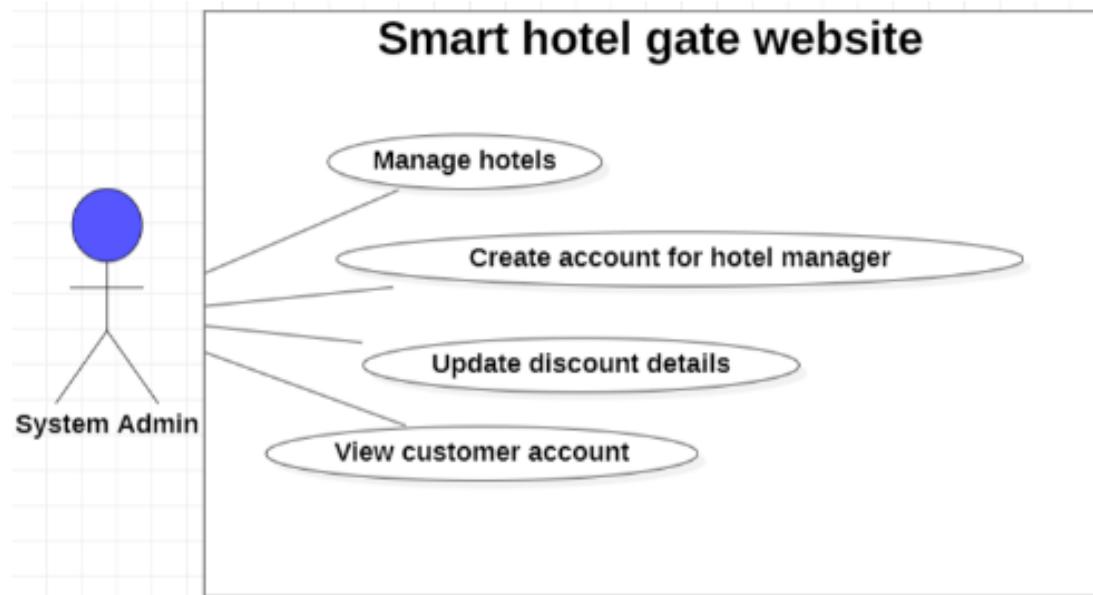


Figure 4.4 Admin Use Case Diagram

4.2.5 Hotel Manager Use Case Diagram

Figure 4.5 shows the basic services of the Hotel Manager in the system and describes the interaction between him and use cases.

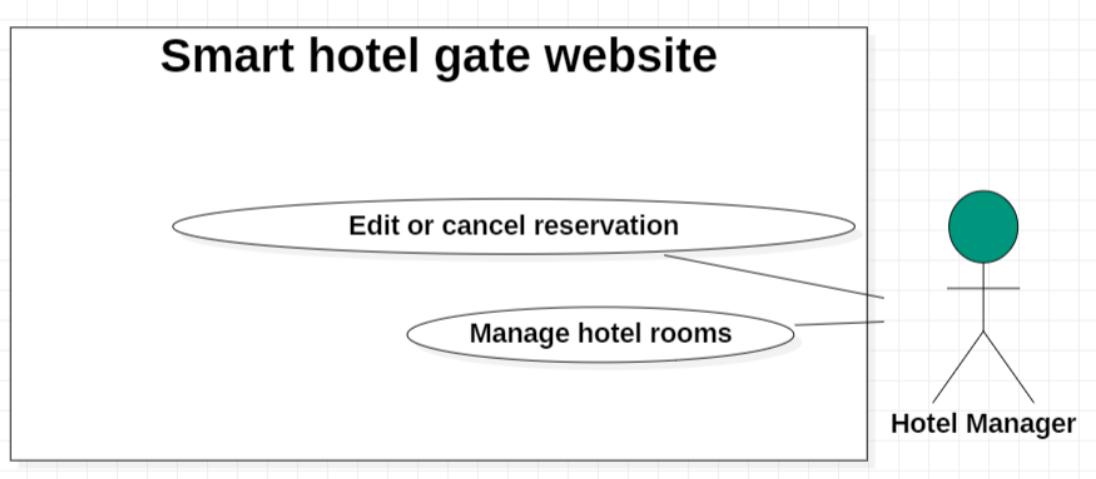


Figure 4.5 Hotel Manager Use Case Diagram

4.3 Use Case Description

Tables 4.1 to 4.7 provide a detailed description of our use cases including its name, actors, pre-condition, nominal scenario, alternative, and post-condition.

Table 4.1 "Log in" use case description

Name	Log in
Actor	Customer
Short Description	A customer login to the system to access the functionality of the website.
Pre-condition	The website must be connected to the network. The customer must have an account.
Nominal Scenario	1. Enter email and password. 2. Validate email and password. 3. Allow access to the system.
Alternative	Error message related to problems asking the customer to correct the error.
Post-Condition	After a successful login customer can access the functionality of the system.

Table 4.2 "Search hotels" use case description

Name	Search hotels
Actor	Customer
Short Description	The customer searches a variety of hotels for hotel reservation.
Pre-condition	Website must be connected to the network. Customer mast use log in.
Nominal Scenario	1. Select destination city and search for hotels. 2. Select the check in and check out date
Alternative	1. The customer doesn't fill out all the required information. <ul style="list-style-type: none">• The website notifies the customer and ask him to fill the required information.• The customer complete information to search for hotels. 2. If the hotel not available suggest alternative date.
Post-Condition	The customer can now choose a suitable hotel to book in.

Table 4.3 "Confirm reservations " use case description.

Name	Confirm reservation
Actor	Customer
Short Description	The customer can confirm his reservation in the hotel.
Pre-condition	The website must be connected to the network.
Nominal Scenario	<ol style="list-style-type: none"> 1. Log in to their account. 2. Click on view my reservation button. 3. Click on confirm the reservation.
Alternative	<ol style="list-style-type: none"> 1. The customer can edit the reservation. <ul style="list-style-type: none"> • The website shows for customer he can edit or cancel he reservation.
Post-Condition	After the customer login to his account on the website, his reservation is confirmed by the customer himself.

Table 4.4 "Make a payment for room" use case description

Name	Make a payment for the room
Actor	Customer and bank owner
Short Description	The customer pays for the room he booked
Pre-condition	<p>The website must be connected to the network.</p> <p>The customer should have a money in his bank owner.</p>
Nominal Scenario	<ol style="list-style-type: none"> 1. Paying for a room by credit card online 2. Enter the credit card information on the website. 3. Enter a verification number sent by the bank to confirm the payment process.
Alternative	<ol style="list-style-type: none"> 1. If the customer's payment for the room is declined, provide an alternative payment process: <ul style="list-style-type: none"> • Payment in installments for 2 or 3 months. • Pay with the discount code provided by the hotel.
Post-Condition	By paying the price of the room to the hotel confirms the room reservation for the customer.

Table 4.5: "manage hotels" use case description.

Name	Manage hotels
Actor	System admin
Short Description	The system administrator can manage hotels on the website
Pre-condition	The website must be connected to the network.
Nominal Scenario	<p>1-When add hotels:</p> <ul style="list-style-type: none"> • The system admin logs on to the website and through the permissions available to him, he clicks on Add hotel. • Fill out all the required information to add a hotel. • Create a receptionist and manager account for the added hotel. <p>2- When check the hotels list:</p> <ul style="list-style-type: none"> • The system admin logs on to his account on the website. • From the manage section, the system admin search for a hotel by entering hotel information. • Update the hotel information and manager accounts.
Alternative	<ol style="list-style-type: none"> 1. The system administrator has deleted some hotel information and data incorrectly. <ul style="list-style-type: none"> • The website notifies the system admin and displays a confirmation and save changes message. 2. The system admin doesn't fill out all the required information <ul style="list-style-type: none"> • The website notifies the system admin and asks him to fill in the required information. • The system admin completes all information correctly.
Post-Condition	Managing hotels correctly, avoiding mistakes, and simultaneously updating each hotel to match what exists.

Table 4.6 "Create an account for hotel manager " use case description

Name	Create an account for the hotel manager
Actor	System admin
Short Description	The system admin creates an account for the hotel manager to use the website
Pre-condition	The website must be connected to the network.
Nominal Scenario	<ol style="list-style-type: none"> 1. The system admin clicks on Create account. 2. The system asks the system admin to fill in the required information related to the hotel manager. 3. The system admin fills in the required information. 4. The system admin clicks the submit button. 5. Select some suitable properties and assign them to the hotel manager. 6. The system registers the information in the database. 7. The hotel manager is signed in and returned to the home page as a logged-in hotel manager.
Alternative	<ol style="list-style-type: none"> 1. The system admin does not fill out all the required information <ol style="list-style-type: none"> 1.1 The system notifies the system admin and asks him to fill in the required information. <ol style="list-style-type: none"> 1. The system admin fills in all the required information. 2. The system admin clicks submit. 3. The system validates the information provided. 4. The system registers the information in the database. 5. The system admin is signed in and returned to the home page as a logged in.
Post-Condition	The hotel management account is created successfully.

Table 4.7 "Check in" use case description.

Name	Check-in
Actor	Customer and receptionist
Short Description	The customer logs into his account, clicks on the view my Reservation button after that click on check in button and using NAPHADH the ID is verified.
Pre-condition	The website must be connected to the network.
Nominal Scenario	<ol style="list-style-type: none"> 1. The customer enters the website and login to verify the reservation. 2. The website provides reservation details to the customer by clicking on the view my Reservation button that found in Profile page. 3. After clicking on check in button in reservation details page it will open a NAPHATH page to verify the ID of the customer. 4. After the ID is verified a barcode key will sends to the customer via email. <ul style="list-style-type: none"> • The customer opens the email and scan the barcode key to enter the room. 5. The customer can share the barcode key for the room in safe ways.
Alternative	<ol style="list-style-type: none"> 1. The customer does not receive the barcode key. <ul style="list-style-type: none"> • Send a request to solve the problem, and the manager will resend the barcode key. 2. The barcode key is not activated: <ul style="list-style-type: none"> • Attempting to reissue a valid barcode key to the customer. • If the problem is technical, resort to traditional methods until the problem is solved, such as: <ul style="list-style-type: none"> - Give the customer a room entry card. Give the customer a key to enter the room.
Post-Condition	A room is allocated to the customer in the hotel, and he can enter it correctly in terms of technology and security.

Conclusion

In this chapter, we specify our project use cases, actors, and what every actor does in the system. This will help us when we develop this website and also display elements of the use case. We started with the planning phase to gather information, then the analysis phase for the website requirements. Then we transpose it to a use case as shown in this chapter.

Chapter 5: Data Modeling

Introduction

In this section, we will give a brief description describing all the information related to the design and structure of the database. This section will describe the data dictionary and the Entity Relationship Diagram (ERD).

5.1 Data dictionary

This section will explain the meaning of entities on the website Smart Hotel Gate (SHG) by including a table for each entity. These tables will show the field name, data type, length and any other descriptions if they exist as shown in Table 5.1.

Table 5.1 Data Dictionary

Field name	Data type	Description
Table name: Customer		
Customer_id	NUMBER (10)	The customer id .
Customer_name	VARCHAR (20)	The name of the customer.
Customer_password	VARCHAR (50)	The password used in registration and login.
Customer_city	VARCHAR (50)	The city of the customer.
Customer_email	VARCHAR (50)	The email of the customer.
Customer_phone	INT	The phone of the customer.
Customer_address	VARCHAR (50)	The address of the customer.
Table name: Hotel Manager		
Hotel Manager_id	NUMBER (10)	The hotel manager id .
System Admin_id	NUMBER (10)	The admin id .
Room_price	VARCHAR (50)	The price of room in hotel.
Hotel Manager_password	VARCHAR (50)	The password used in registration and login.
Hotel Manager_email	VARCHAR (50)	The email of manager.
Table name: System Admin		
System Admin_id	NUMBER (10)	The system admin id .

Table name: Hotel		
Hotel_id	NUMBER (10)	The hotel id .
Room_id	NUMBER (10)	The room id .
Hotel_name	VARCHAR (20)	The name of the hotel.
Hotel_city	VARCHAR (50)	The city of the customer.
Hotel_location	VARCHAR (50)	The city of the customer.
Table name: Room		
Room_id	NUMBER (10)	The room id .
Room_price	VARCHAR (50)	The price of a room in the hotel.
Room_type	VARCHAR (50)	The type of room in the hotel.
Room_availability	VARCHAR (50)	The availability of rooms in the hotel.
Table name: Reservation		
Reservation_id	NUMBER (10)	The room id .
Reservation_days	DATE	The number of days for reservation.
Reservation_date	DATE	The start and end date for reservation.
Reservation_check-in	DATE	The check-in of reservation.
Reservation_check-out	DATE	The check-out of reservation.
Reservation_price	VARCHAR (50)	The total price of the reservation.
Reservation_status	VARCHAR (50)	The status of the reservation.
Hotel_id	NUMBER (10)	The hotel id .
Customer_id	NUMBER (10)	The customer. Id.
Customer_adults	INT	The number of adults for the customer.
Customer_children	INT	The number of children for the customer.
Receptionist_id	NUMBER (10)	The receptionist id .
Room_id	NUMBER (10)	The room id .
Room_price	VARCHAR (50)	The price of the room in the hotel.
Barcode_key_room	VARCHAR (50)	The barcode key room of the customer.
Payment_status	VARCHAR (50)	The status of the payment in the hotel.
Payment_type	VARCHAR (50)	The type of payment in the hotel.

5.2 The Entity Relationship Diagram

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects or concepts relate to each other within a system [13]. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education, and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships, and their attributes. Figure 5.1 shows our system ERD.

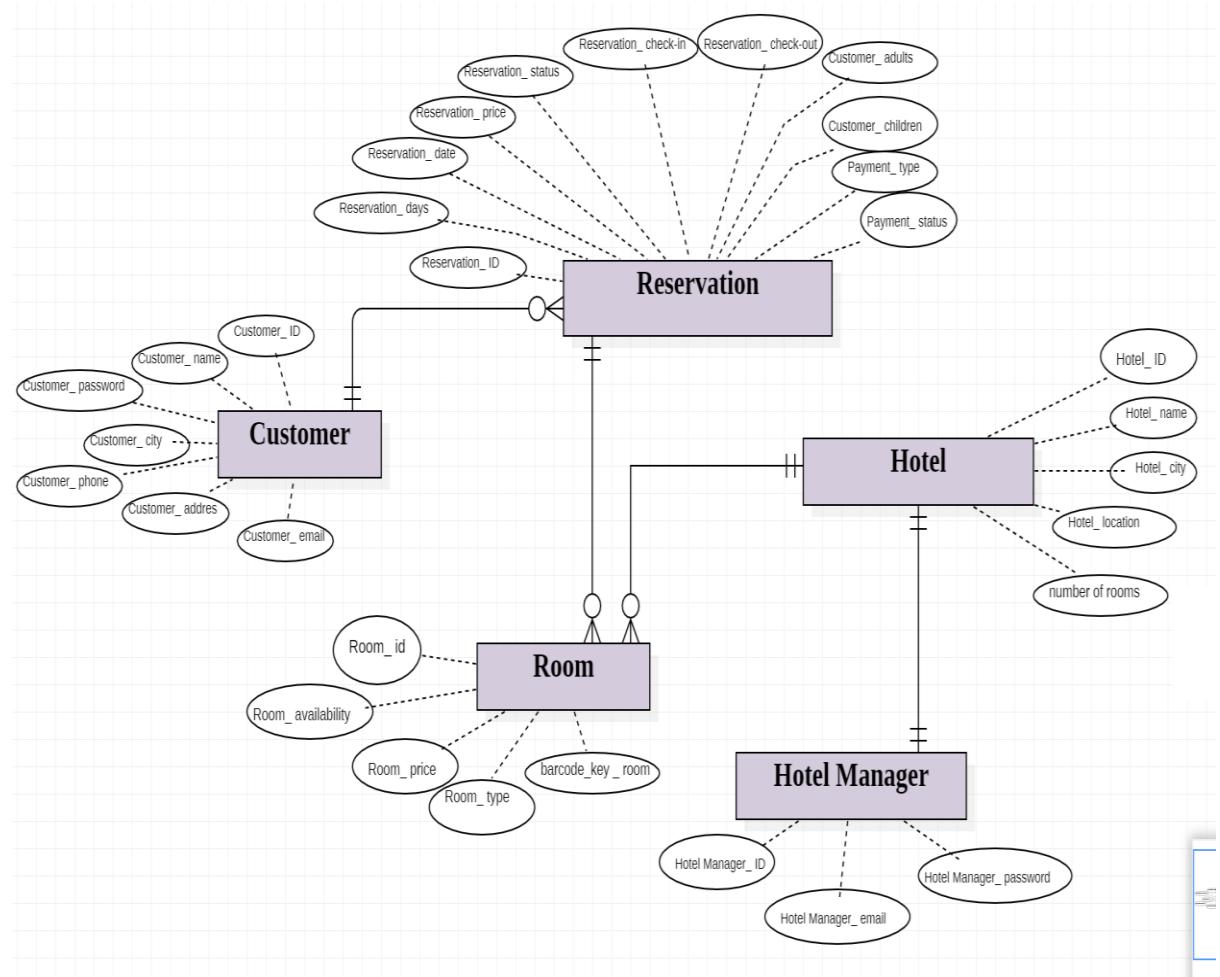


Figure 5.1 Entity Relationship Diagram (ERD)

Conclusion

In this chapter, the data dictionary was discussed, tables and fields were identified for each table, the ERD chart was created, and the core entities and relationships were identified.

Part 3: Design Phase

Chapter 6: Architecture Design

Introduction

The architecture design specifies the architecture components (client computers, servers, and the network that connects them); It also defines the software that will run on each component. It includes specifying the operating system (e.g., Windows, Linux) and any special-purpose software on the client and servers (e.g., databases). Then a list of the hardware needed to support the future system.

6.1 Elements of an Architecture Design

Software architecture is a model that describes the structure of a software system in terms of computational components, the relationships among components, and the constraints for assembling the components. That is, software architecture can be defined in terms of the following elements [14]:

- Components: Components are the computational elements that collectively constitute an architecture. Software architecture is typically decomposed into subsystems, which in turn may be decomposed into modules. Further decomposition is also possible. Examples of components include clients, services, and persistent stores.
- Relationships: Relationships are the logical connections between architectural components. Examples of concrete component relationships include client-server protocols and database protocols.
- Constraints: Constraints provide conditions and restrictions for component relationships. They connect the architecture to system requirements. Examples of constraints include restrictions on parameter types for communication protocols and high availability requirements for fault tolerance.

6.2 Creating an Architecture Design

6.2.1 Deployment Diagram

A UML architecture diagram is a diagram that shows the configuration of run-time processing nodes and the components that live on them.

Architecture diagrams are a kind of structure diagram used in modeling the physical aspects of an object-oriented system. They are often used to model the static deployment view of a system (topology of the hardware) [15].

6.2.2 Purpose of architecture diagrams

- Show the structure of the run-time system.
- Show the hardware that will be used to implement the system and the links between them.
- Model physical hardware elements and the communication paths between them.
- Used to plan the architecture of a system.
- They are also useful for documenting the deployment of software components or nodes [15].

Figure 6.1 shows the components of the deployment diagram which defined the way to deploy our website.

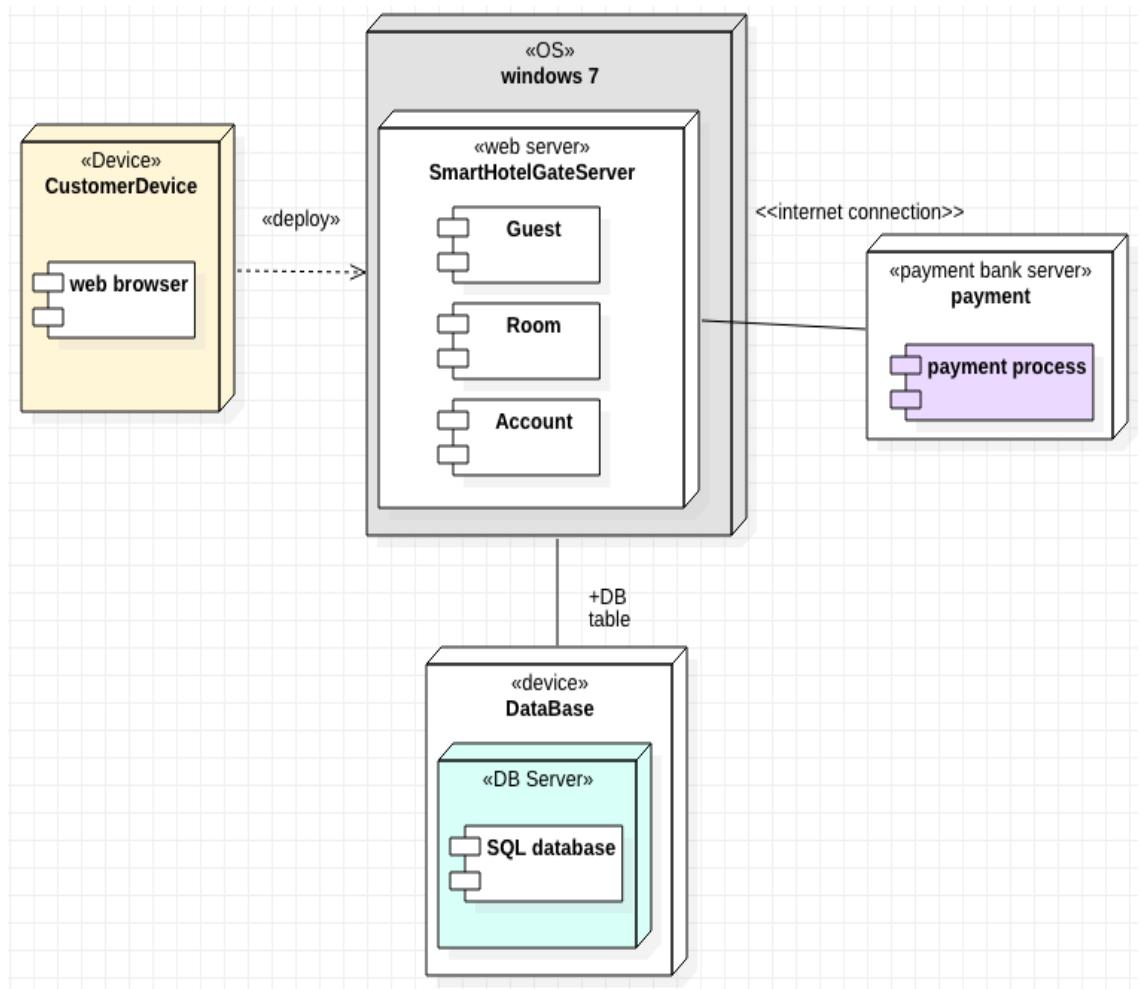


Figure 6.1 Deployment Diagram

6.3 Hardware and Software Specification

- **Software tools:**

1. WampServer for the database server.
2. HTML, CSS, PHP, and JavaScript for the web server.
3. Web browser

- **Operating system:**

1. (Customer device) Android 4.4 “KitKat” or higher, which covers 99% of android devices.
2. (Customer device) iOS 6.1.6 or higher, which covers 99% of iPhone devices.
3. (Customer device) Windows 7 or higher, which covers 99% of computer devices.
4. (Servers) Windows 7 or higher.

- **Minimum hardware requirements for servers:**

1. Secondary Memory: 250 GB.
2. RAM size: 4 GB.
3. Processor type: i5 Intel Processor.

Conclusion

In this chapter, we presented the architectural design of the system which included all the needed components to deploy the system. Then the deployment diagram demonstrated the required connections between the components. In the next chapter, we will present the user interface design which includes the screens and forms that capture data, and the screen displays that provide navigation through the system.

Chapter 7: User Interface Design

Introduction

This chapter demonstrates the project logo and the user interface design, which involves the screens and forms that collect data through the system.

7.1 Graphic charter

Logos are symbols made up of text and images that help us identify brands. It helps users understand what you do, who you are, and what you value. Our website helps tourists to identify the best hotel deals at the best prices, and the letters in it refer to the abbreviation of the website name (Smart Hotel Gate) and the triangle sign symbolizes the house so that through your search you will get a comfortable hotel similar to your home, with regard to the stars in it symbolizing that we care about the guest evaluation of hotels Available on our site, and in the end the colors were chosen in the logo based on the pastel colors that make you feel comfortable (figure 7.1).



Figure 7.1 The website logo.

7.2 Interface Design Prototyping

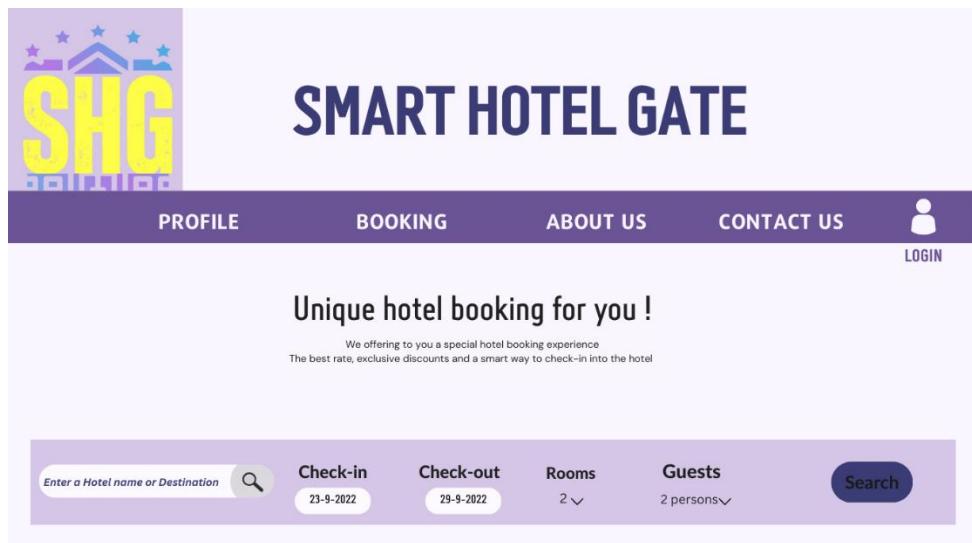


Figure 7.2 Home page.

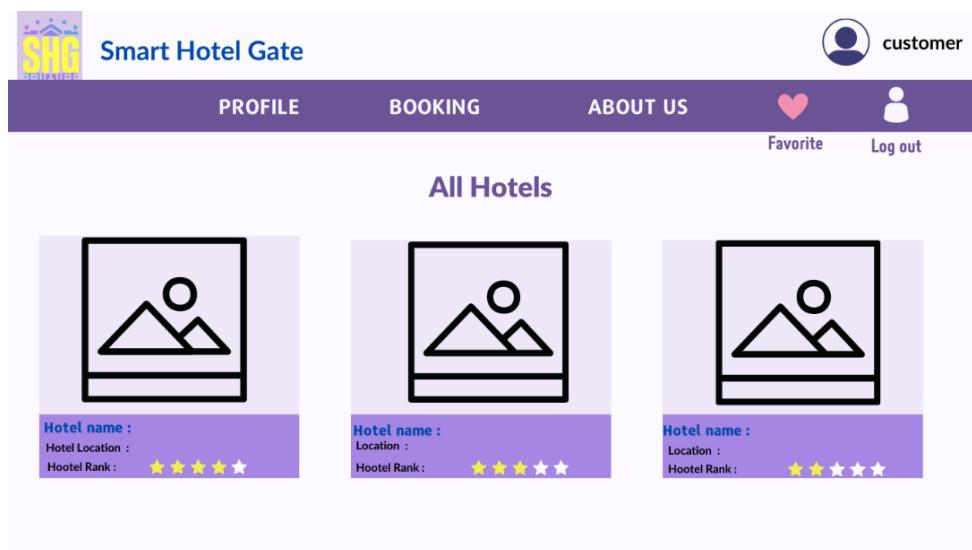


Figure 7.3 List of hotels in home page.



Figure 7.4 Contact and About us page.

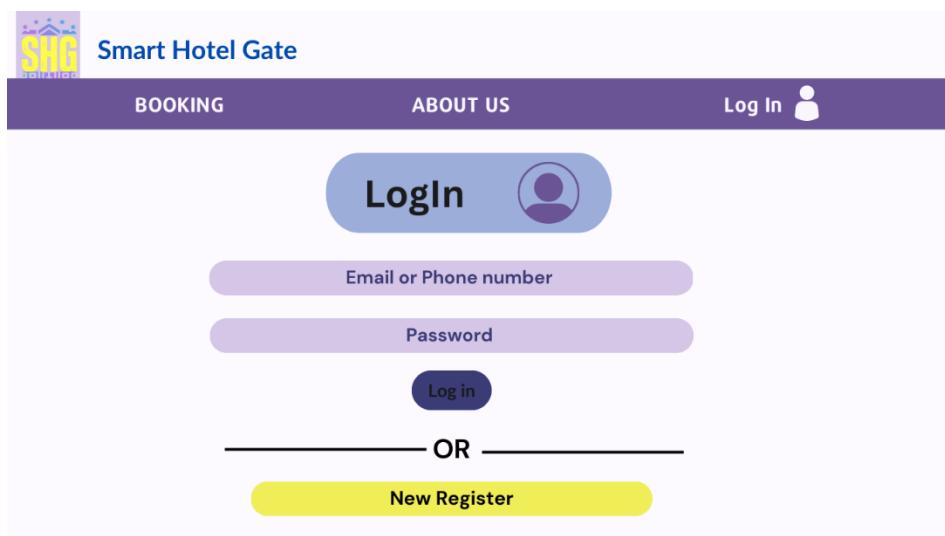


Figure 7.5 Log in page.

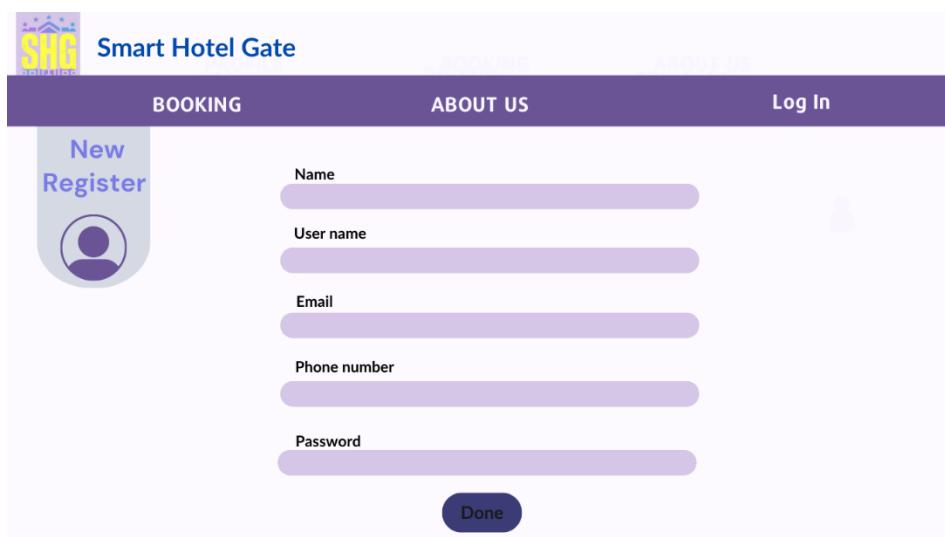


Figure 7.6 New register page.

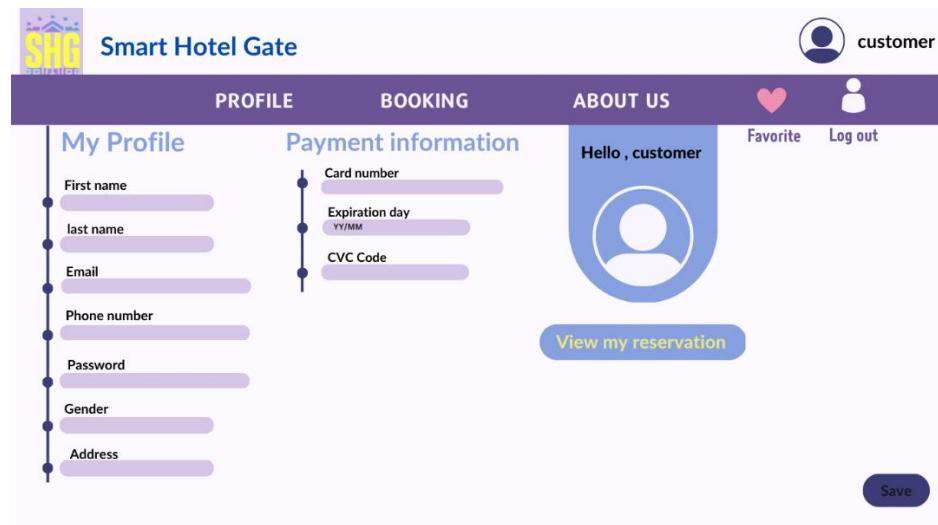


Figure 7.7 Profile customer page.

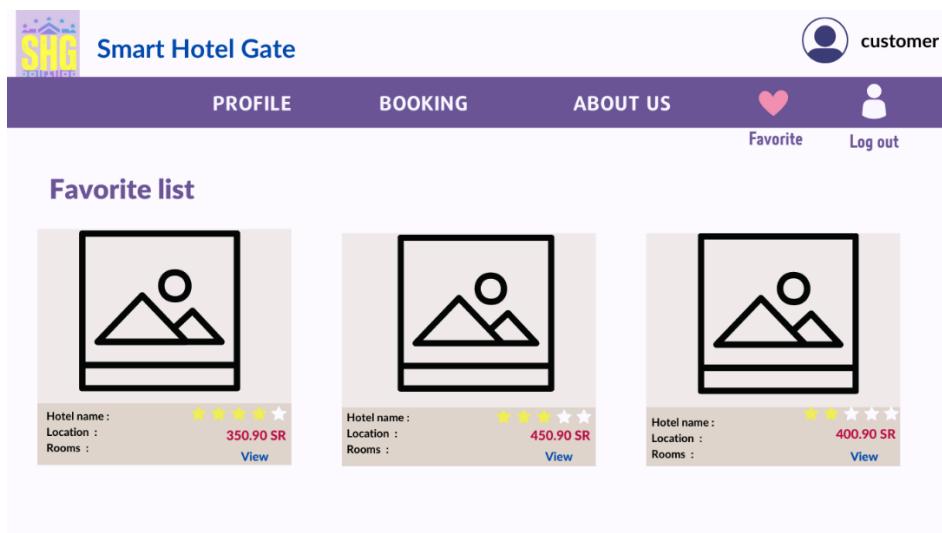


Figure 7.8 Favorite page.

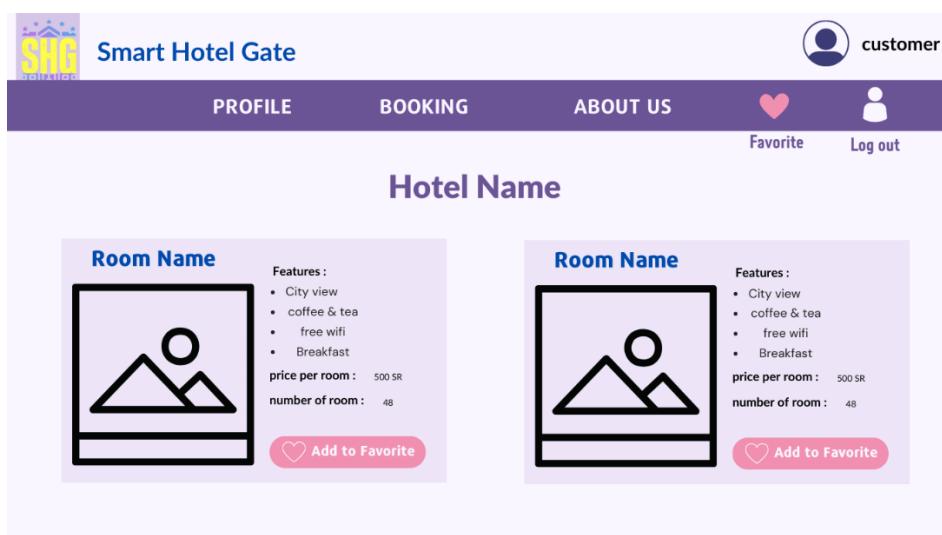


Figure 7.9 add a room to the favorites page.

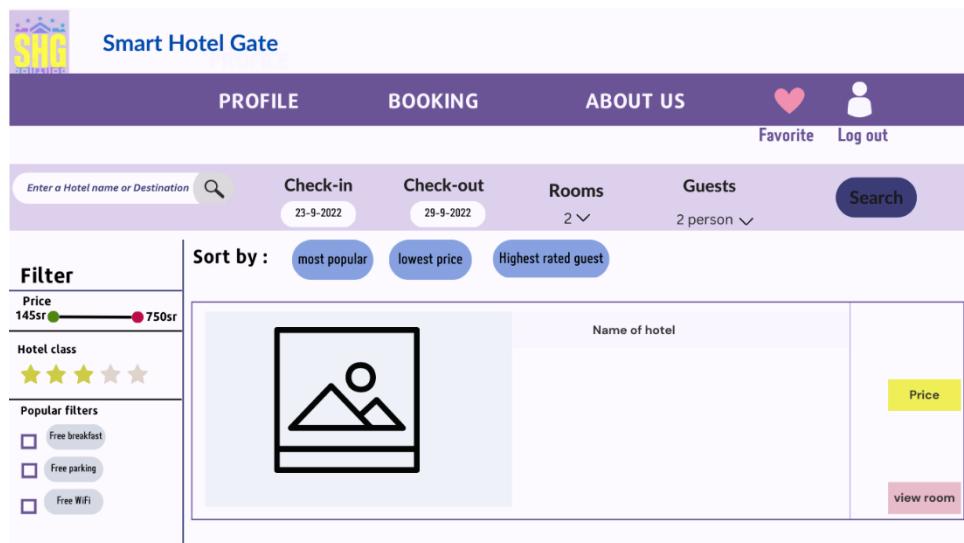


Figure 7.10 Booking page.

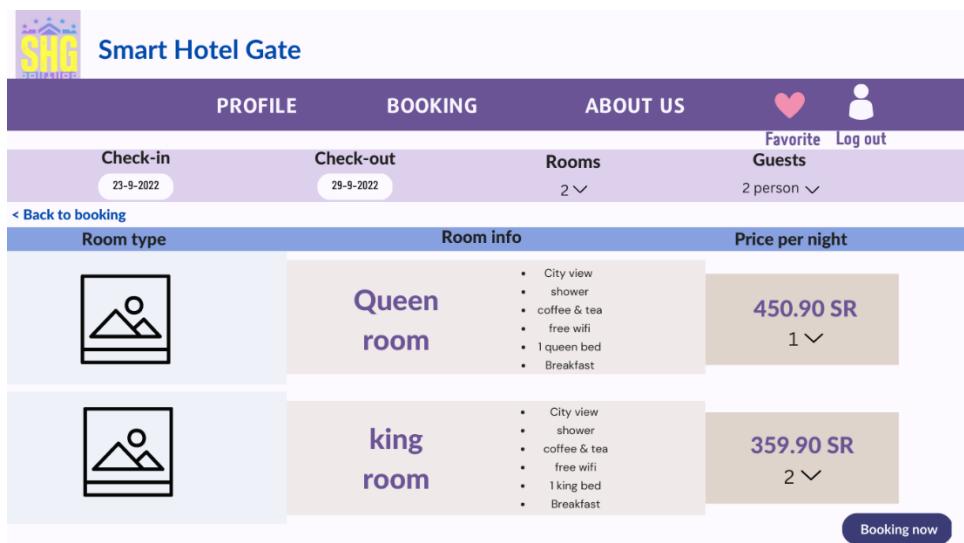


Figure 7.11 Booking rooms page.

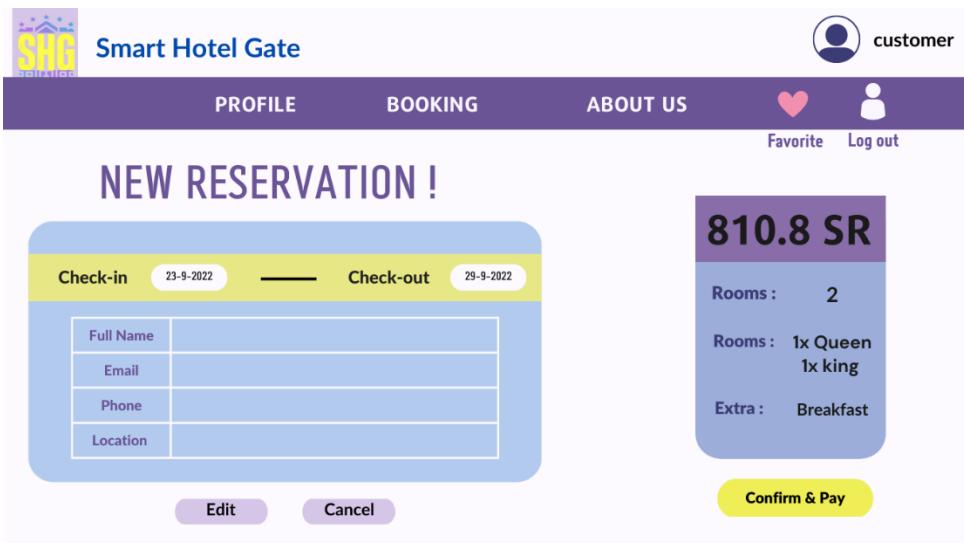


Figure 7.12 New Reservation page.

The screenshot shows the payment page of the Smart Hotel Gate website. At the top, there's a logo for 'SHG Smart Hotel Gate' and a 'customer' icon. The main navigation menu includes 'PROFILE', 'BOOKING', 'ABOUT US', and 'Favorite Log out'. On the left, under 'Billing Details', there are fields for First name, last name, Email, and Phone number. Below that is a radio button for 'Discount code' followed by a text input field. Under 'Payment Method', there's a 'Credit card' section with fields for Card number, CVC Code, and Expiration day, along with logos for VISA, MASTERCARD, and AMEX. There are also 'Pay' and 'PayPal' buttons. On the right, a 'Billing Summary' table shows the breakdown of costs: Queen Room (400.90 SR), King Room (309.90 SR), Breakfast (100 SR), and Discount (0.00 SR), totaling 810.8 SR.

Figure 7.13 Payment page.

The screenshot shows the check-in page of the Smart Hotel Gate website. At the top, it features the 'SHG Smart Hotel Gate' logo and a 'customer' icon, with a navigation bar for 'PROFILE', 'BOOKING', 'ABOUT US', and 'Favorite Log out'. A prominent blue box displays the total price 'PRICE : 810.8 SR' and indicates 'Rooms : 2' and 'Extra : 100 SR'. It shows check-in date '23-9-2022' and check-out date '29-9-2022'. Below this, there are four input fields for 'Full Name', 'Email', 'Phone', and 'Location'. At the bottom of the box are 'Edit' and 'Cancel' buttons. To the right, a large message says 'CONGRATS YOU GET A NEW RESERVATION !' and a large blue button labeled 'CHECK IN'.

Figure 7.14 Check-in page.

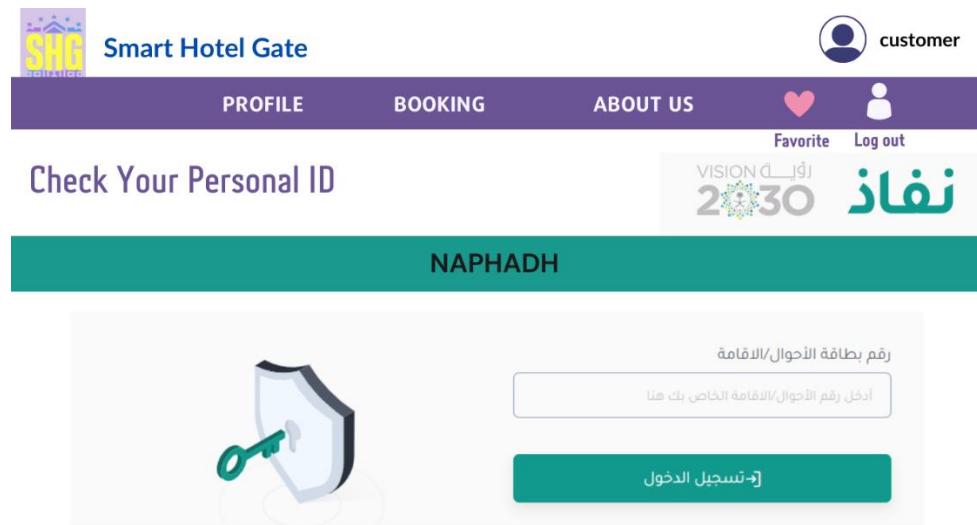


Figure 7.15 Nafath - check for your ID page.

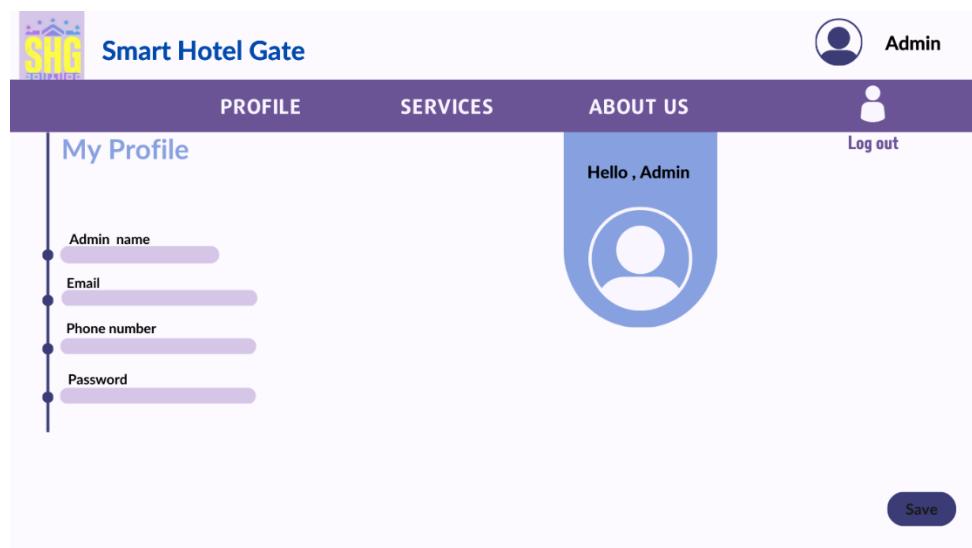


Figure 7.16 Admin profile page.

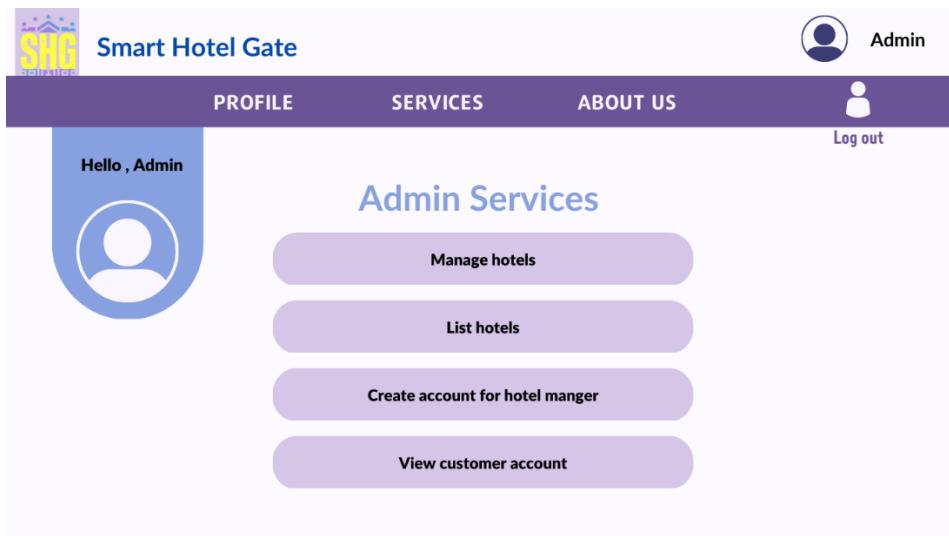


Figure 7.17 Admine services page.

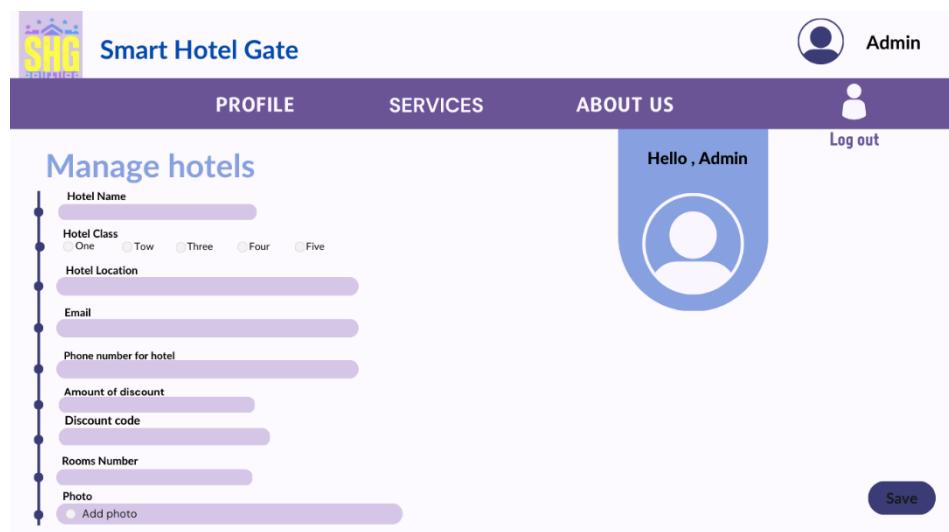


Figure 7.18 Mange hotel page.

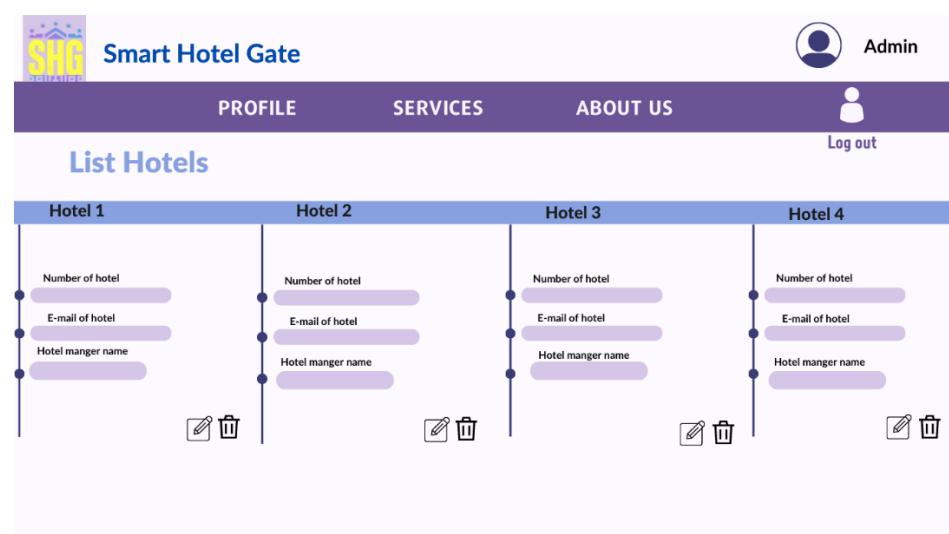
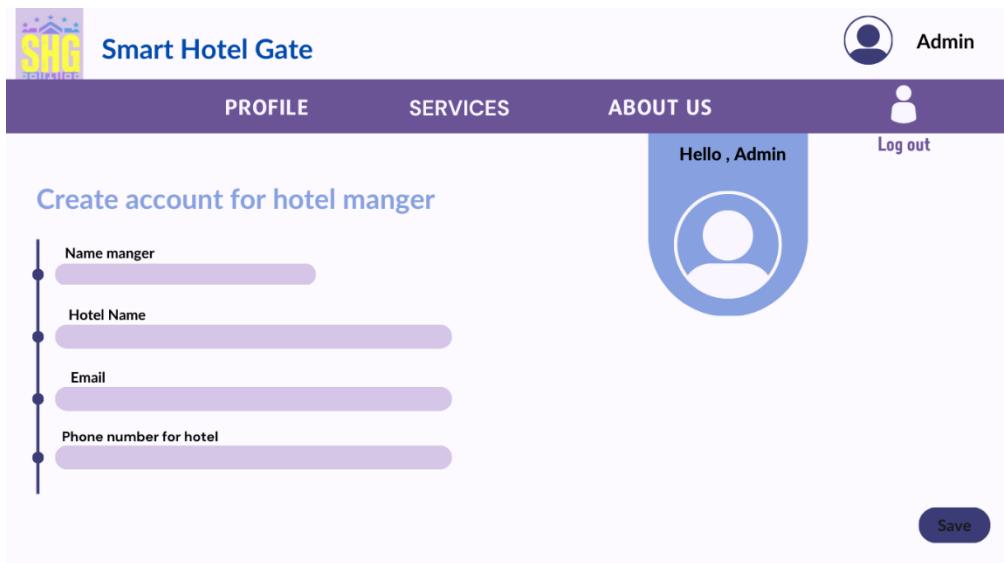
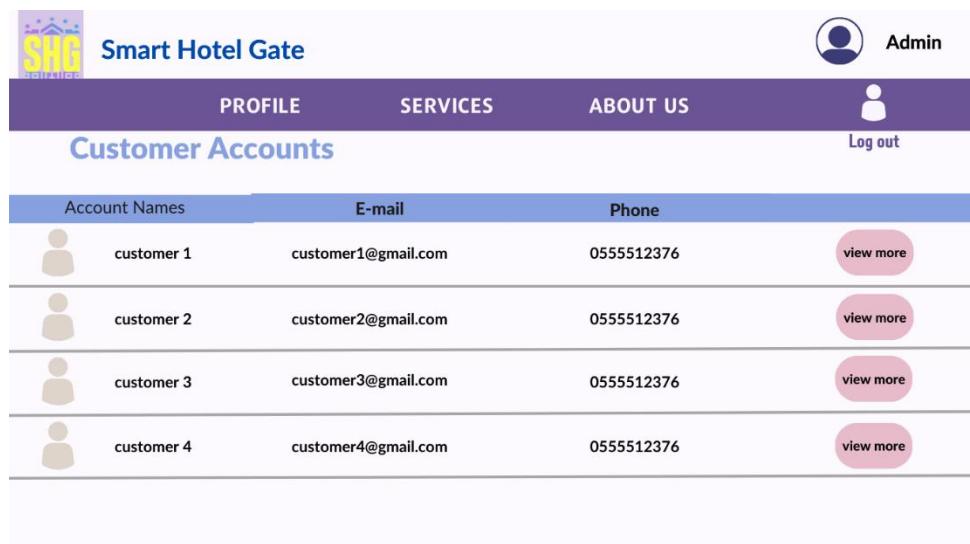


Figure 7.19 List of hotels page.



The screenshot shows the 'Create account for hotel manager' page. At the top, there is a purple header bar with the 'Smart Hotel Gate' logo on the left and navigation links for 'PROFILE', 'SERVICES', and 'ABOUT US'. On the right side of the header, there is a user profile icon labeled 'Hello, Admin' and a 'Log out' link. Below the header, the main content area has a light blue background. It features a large input field for 'Name manger' with a placeholder 'Enter name manger'. Below it are three more input fields for 'Hotel Name', 'Email', and 'Phone number for hotel', each with their respective placeholder text. In the bottom right corner of the input area, there is a dark blue 'Save' button.

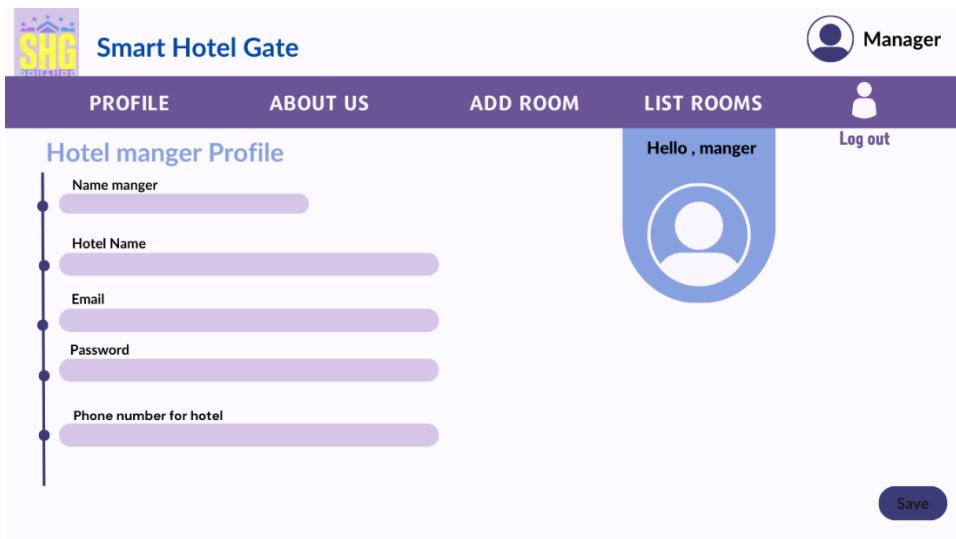
Figure 7.20 Create account for hotel manager page.



The screenshot shows the 'Customer Accounts' page. The interface is similar to Figure 7.20, with a purple header bar and 'Smart Hotel Gate' logo. The 'PROFILE', 'SERVICES', and 'ABOUT US' links are at the top, along with a user profile icon and 'Log out' link. The main content area is titled 'Customer Accounts' and displays a table of customer information. The table has four columns: 'Account Names', 'E-mail', 'Phone', and a 'view more' button. There are four rows of data, each corresponding to a customer named 'customer 1' through 'customer 4', with their respective email addresses and phone numbers listed. The 'view more' button is located in the fourth column of each row.

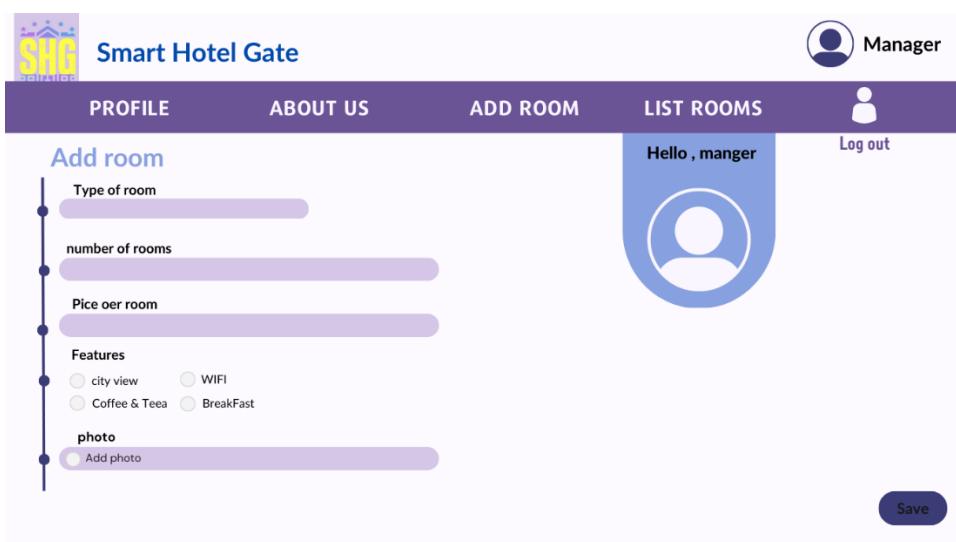
Account Names	E-mail	Phone	
customer 1	customer1@gmail.com	0555512376	view more
customer 2	customer2@gmail.com	0555512376	view more
customer 3	customer3@gmail.com	0555512376	view more
customer 4	customer4@gmail.com	0555512376	view more

Figure 7.21 View Customers Accounts page.



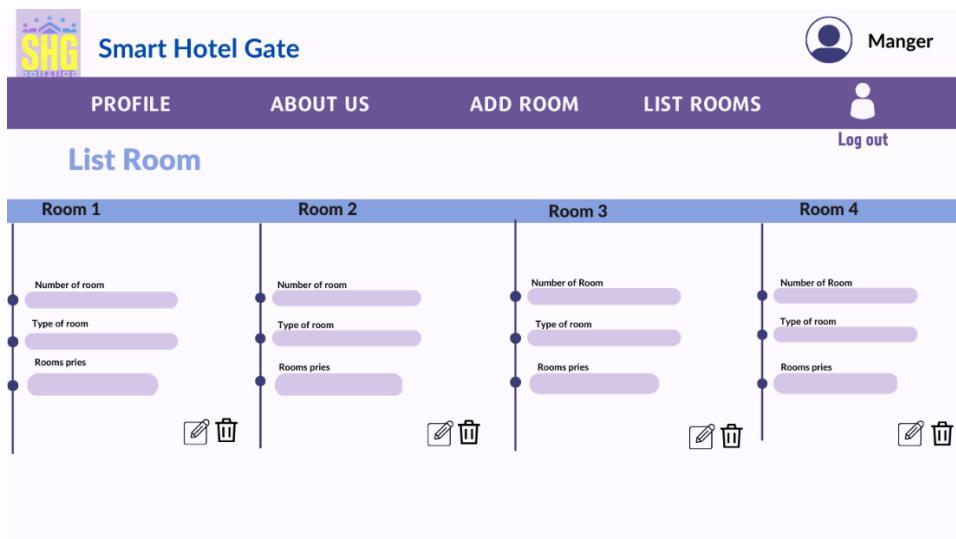
The screenshot shows the 'Smart Hotel Gate' application interface for a hotel manager. At the top right, there's a 'Manager' profile icon and a 'Log out' button. The main content area is titled 'Hotel manger Profile' and contains five input fields: 'Name manger', 'Hotel Name', 'Email', 'Password', and 'Phone number for hotel'. On the far right, there's a blue circular placeholder for a profile picture with the text 'Hello , manger' inside it. At the bottom right is a 'Save' button.

Figure 7.22 Hotel manger profile page.



This screenshot shows the 'Add room' page. It features a form with several input fields: 'Type of room', 'number of rooms', 'Pice or room', and a 'Features' section with checkboxes for 'city view', 'WIFI', 'Coffee & Tea', and 'BreakFast'. Below these is a 'photo' field with an 'Add photo' placeholder. A blue circular placeholder for a profile picture is present, along with the text 'Hello , manger'. A 'Save' button is located at the bottom right.

Figure 7.23 Add Room Page.



The 'List Room' page displays four room entries, each with a header and three input fields: 'Number of room', 'Type of room', and 'Rooms pries'. Below each entry are edit and delete icons. The room headers are 'Room 1', 'Room 2', 'Room 3', and 'Room 4'. The page also includes a 'Manager' profile icon, a 'Log out' button, and a 'List Rooms' button in the top right corner.

Figure 7.24 List of room page.

7.3 Navigation scheme

Navigation schemes define the structure of the application. The navigation scheme should enhance the purpose of the application and help visitors find the information they seek. A navigation scheme is a plan that determines how application pages will relate to each other. In a hierarchical navigation scheme, pages are arranged in levels from top to bottom. Pages at lower levels typically contain specific information about the application's topic. Figure 7.21 presents our website navigation scheme.

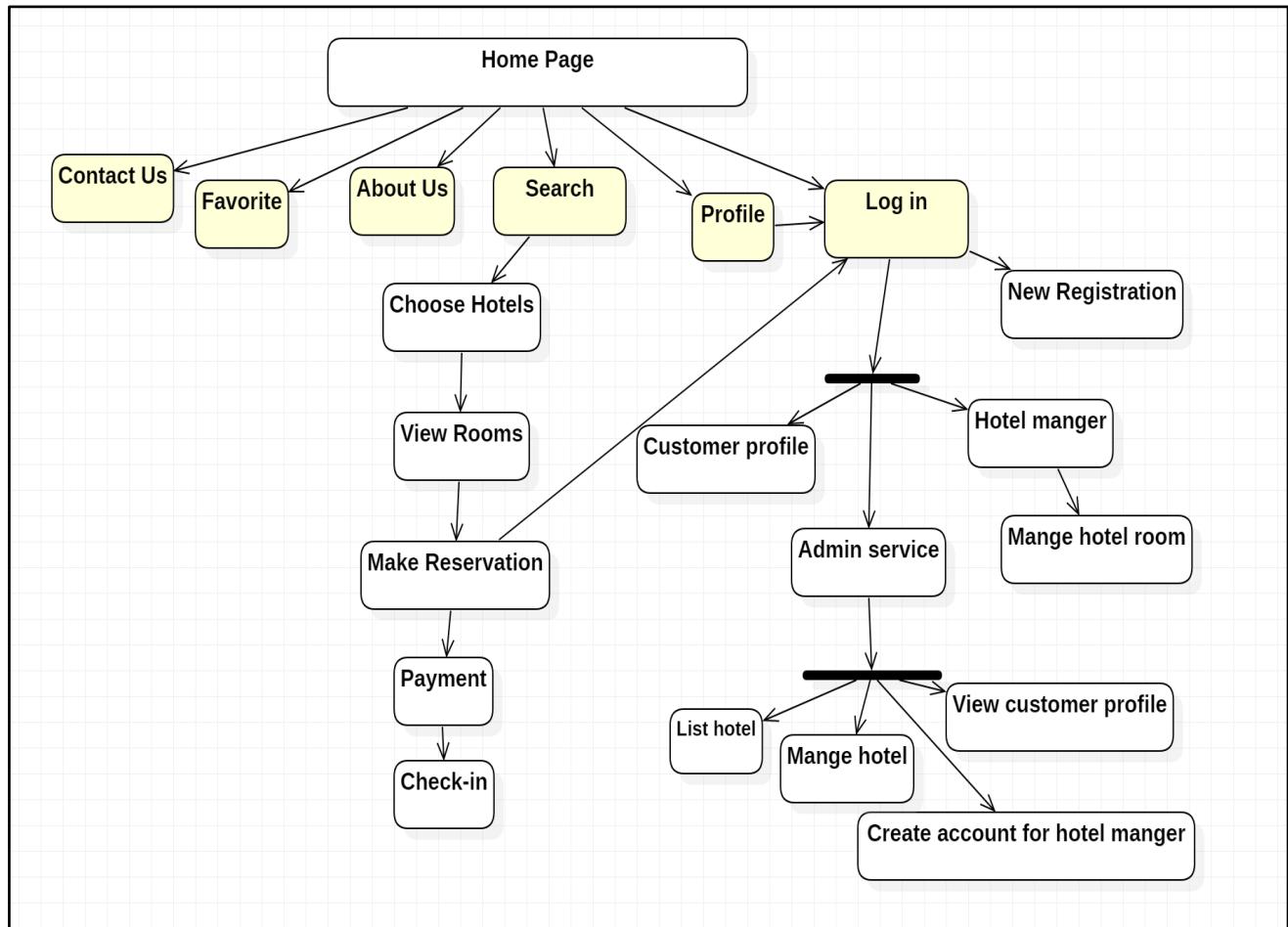


Figure 7.25 Navigation Scheme.

Conclusion

This chapter presents the graphical components of the application, which included the logo and the graphical interfaces, these interfaces represent the screens and forms of the application that display or capture data. Then we showed the navigation scheme of the application, this scheme explains how the user can go through the application. The next chapter will present different models of data design such as CDM, LDM and PDM.

Chapter 8: Data Design

Introduction

In this chapter, we discuss the data elements of the system design. We present the detailed models of the database. The conceptual, logical, and physical data models are introduced.

8.1 Data storage formats

Database files are composed of a series of tables, built using columns and rows, and information may or may not be linked between tables. Though databases are advantageous because they are searchable, database files can be shared among team members and are usually opened via common applications. Data storage is the recording (storing) of information (data) in a storage medium. It is recommended to store information in the database format for more efficient and reliable filing and retrieval of information. We utilized WampServer to build and maintain databases for our website Smart Hotel Gate, WAMP is an acronym that stands for Windows, Apache, MySQL, and PHP. It's a software stack which means installing WAMP installs Apache, MySQL, and PHP on your operating system (Windows in the case of WAMP).

8.2 Conceptual Data Model (CDM)

A Conceptual ERD models information gathered from business requirements. The main aim of this model is to establish the entities, their attributes, and their relationships. In this Data modeling level, there is hardly any detail available of the actual Database structure. Conceptual ERD is the simplest model of all [16]. The conceptual data model here is shown the basic entities (Reservation, customer, room, hotel, and hotel manager) and their main features in the next figure (8.1) using StarUML software.

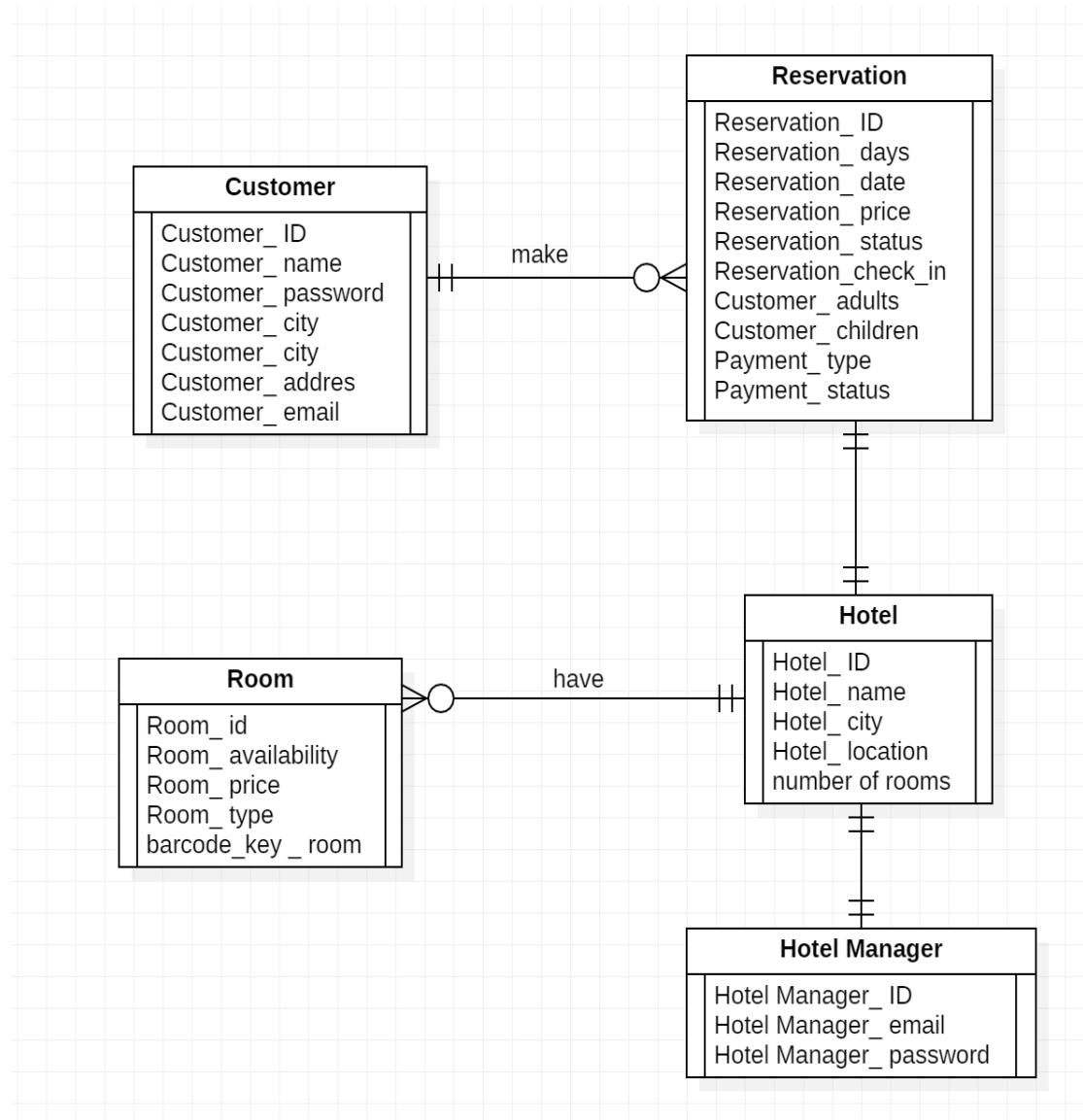


Figure 8.1 Conceptual Data Model (CDM).

8.3 Logical Data Model (LDM)

A logical data model describes the data in as much detail as possible, without regard to how they will be physically implemented in the database [17]. Here, we will present the basic entities (Reservation, customer, room, hotel and hotel manager) and their main features and keys and subkeys as shown in (figure 8.2).

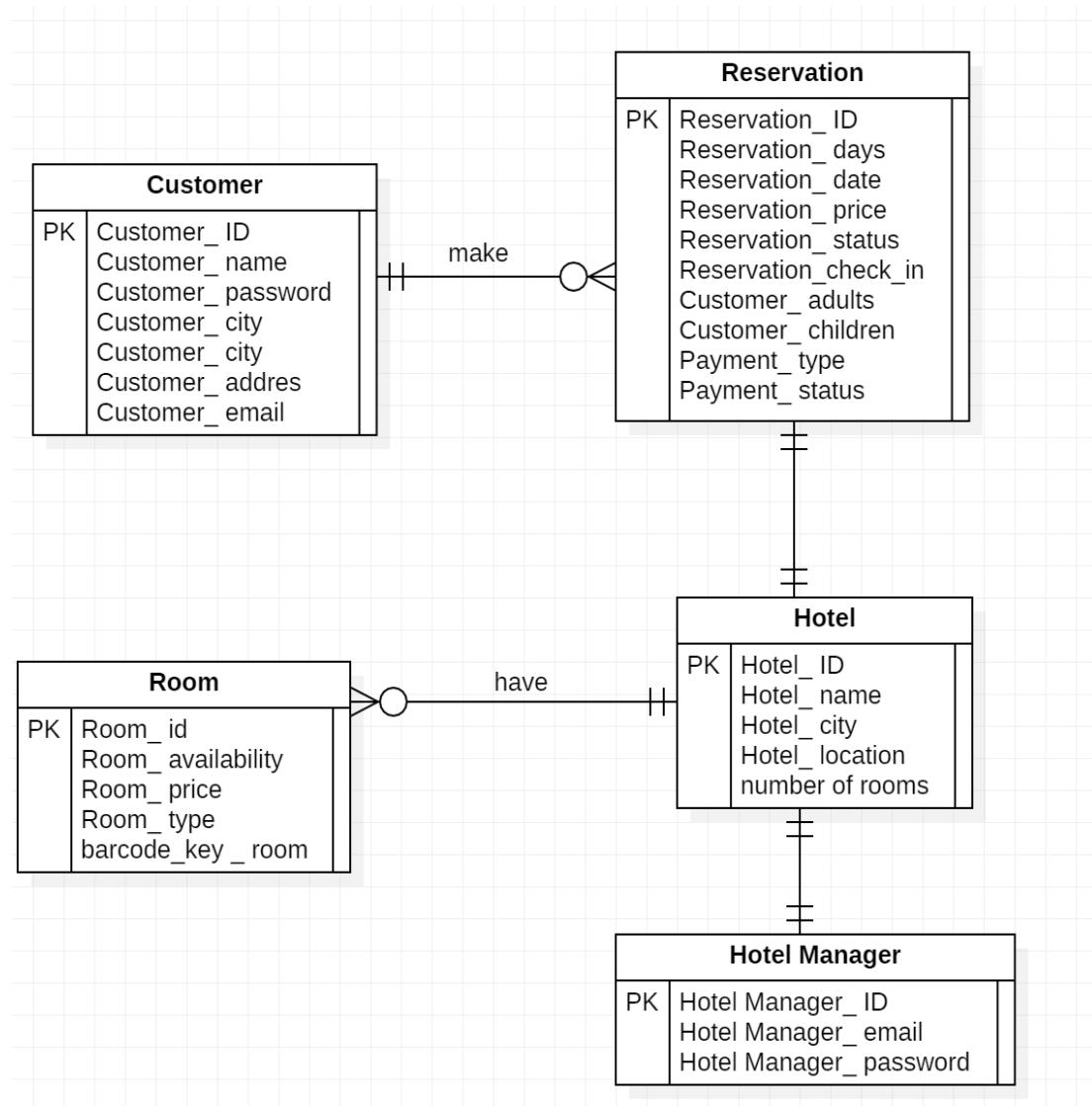


Figure 8.2 Logical Data Model (LDM).

8.4 Physical Data Model (PDM)

A physical data model represents how the model will be built in the database. A physical database model shows all table structures, including column name, column data type, column constraints, primary key, foreign key, and relationships between tables [17]. Here, the radical difference will be in the external form of the chart, but it is the same as the contents of figure 8.2, it will appear in the names that will be in the database and the link will show the relationship to each other in detail in the next figure (8.3) shows all table structures including column name, column data type, column constraints etc.

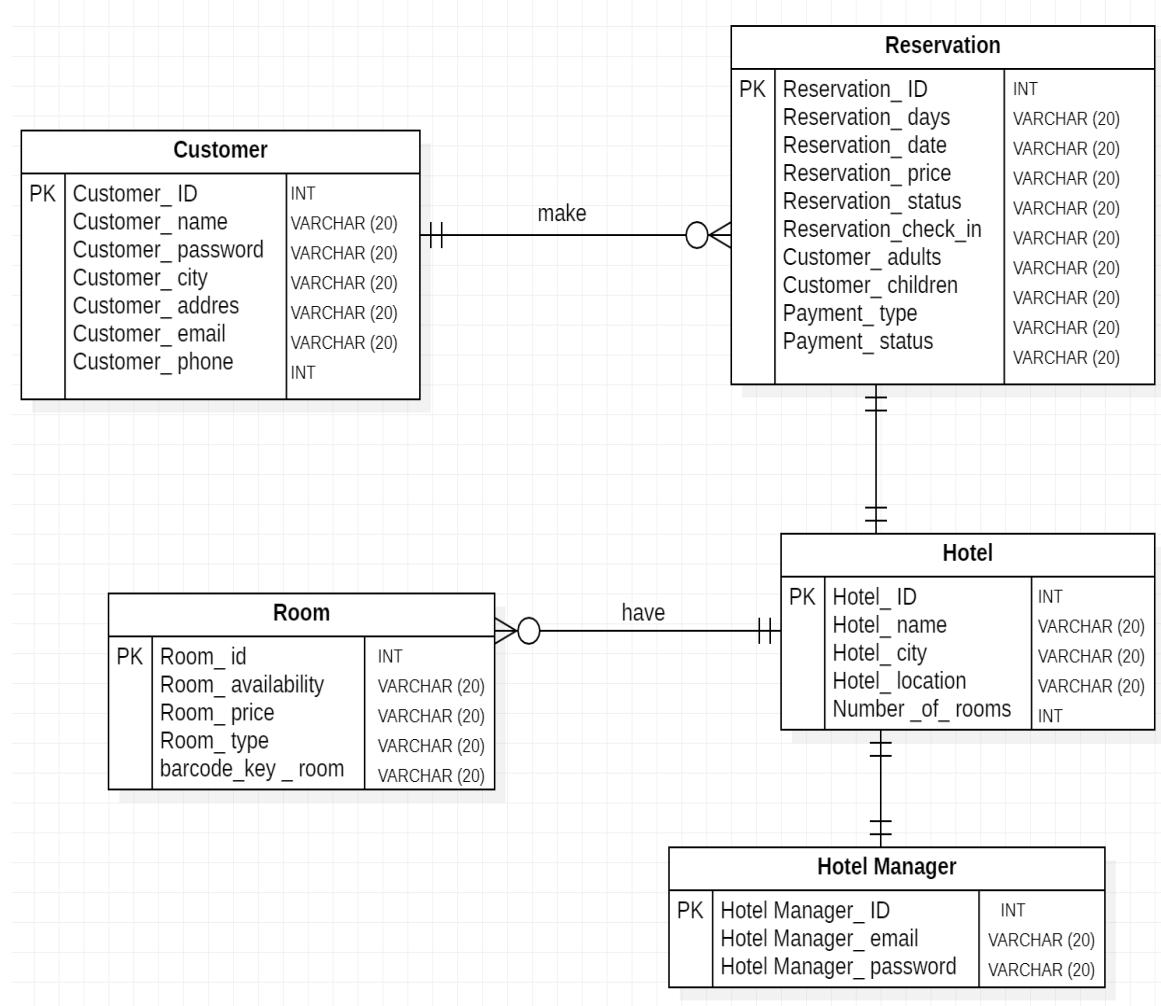


Figure 8.3 Physical Data Model (PDM).

Conclusion

In this chapter, we presented the data design, which contained the different available storage formats for the different models of data. The next chapter is the start of the implementation design.

Part 4: Implementation Phase

Chapter 9: Data Design

Introduction

The final phase is the implementation phase, during which the system is built. This part presents the Object-oriented system design and tools needed (software environment). This chapter describes the views as class and sequence diagrams which highlight the characteristics of the object-oriented system and justify the choice of the software used in the project.

9.1 Class diagram

A class diagram is a static diagram. It represents the static view of an application. The class diagram describes the attributes and operations of a class and the constraints imposed on the system. The class diagrams are widely used in the modeling of object-oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages. Figure 9.1 shows the class diagram for our website that displays the operations contained in the site and the data that will be saved in the database [18]:

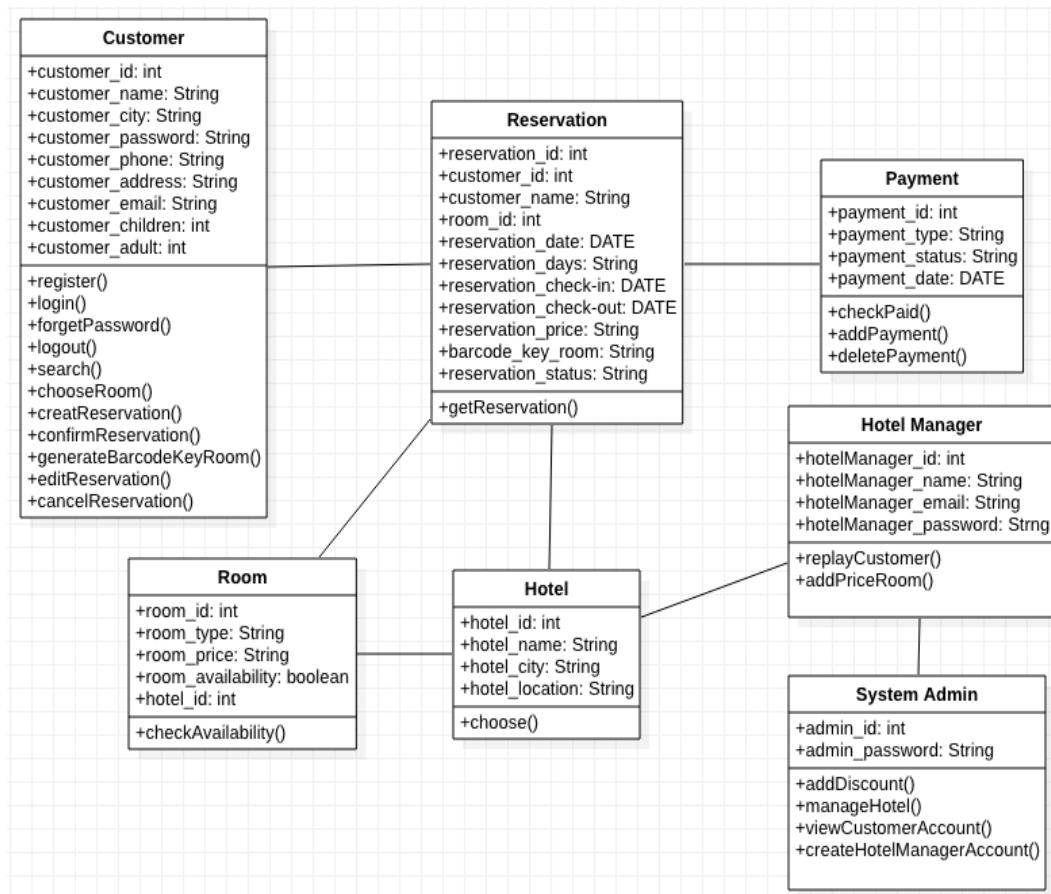


Figure 9.1 Class diagram.

9.2 Sequence diagrams

Sequence diagrams describe interactions among classes in terms of an exchange of messages over time. They are also called event diagrams. A sequence diagram is a good way to visualize and validate various runtime scenarios. These can help to predict how a system will behave and to discover responsibilities a class may need to have in the process of modeling a new system. (Figure 9.2 shows customer log in sequence diagram) [19].

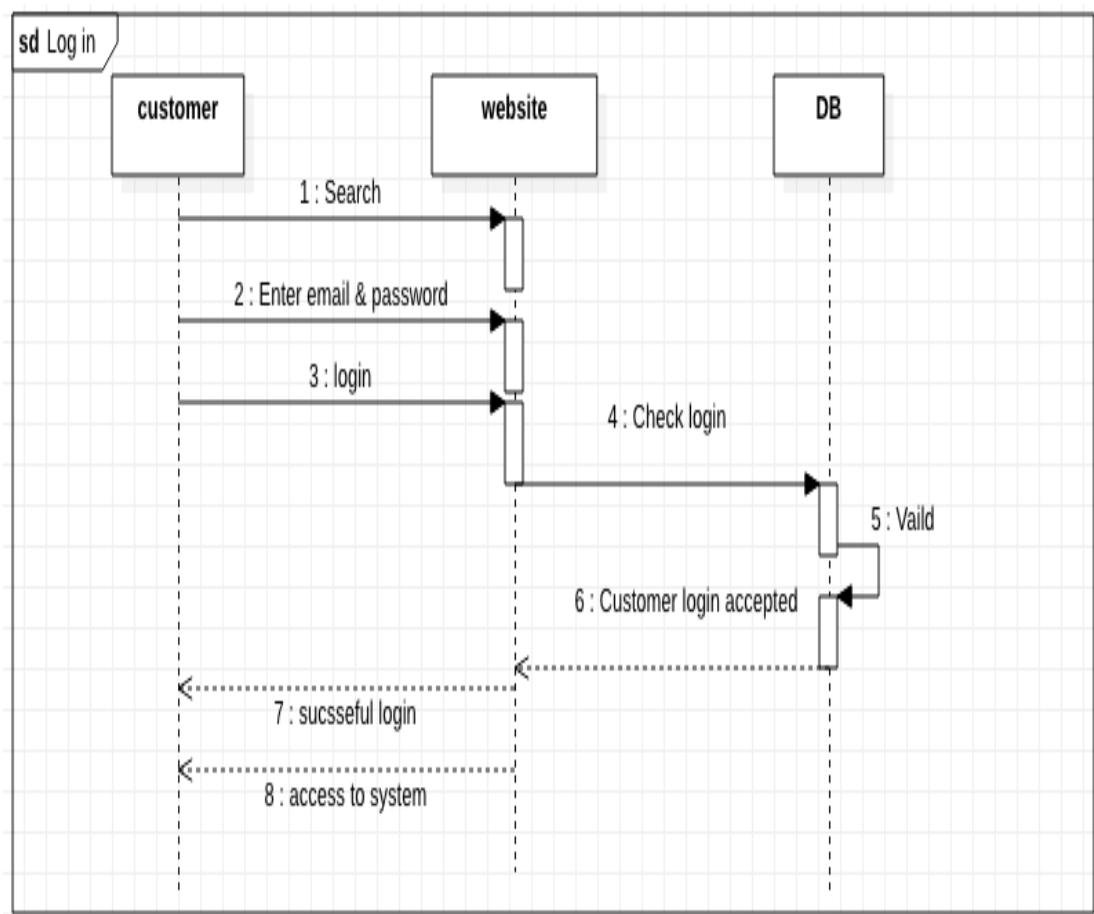


Figure 9.2 The customer log in sequence diagram.

Here shows customer reservation process sequence diagram in figure (9.2).

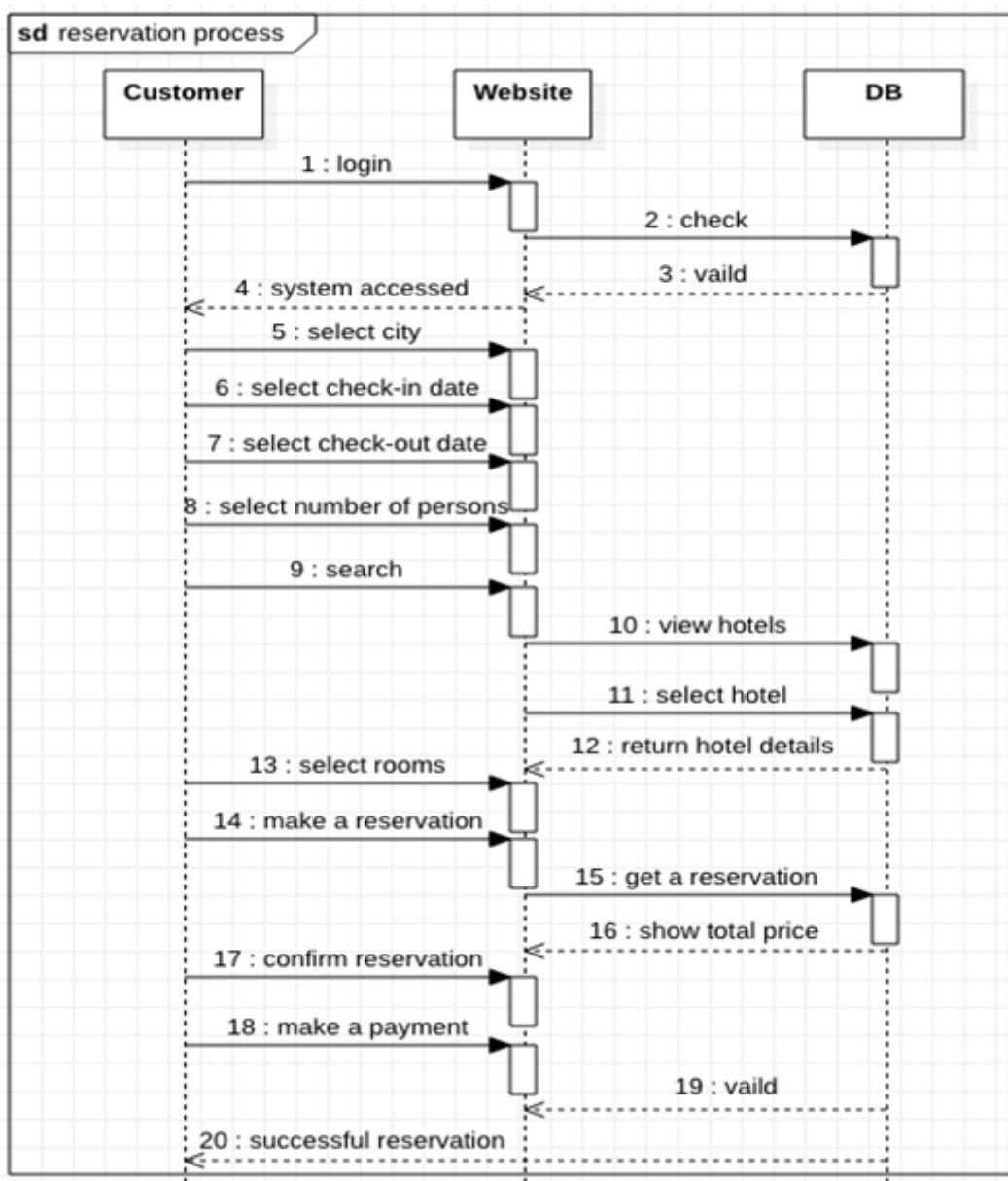


Figure 9.3 The customer reservation process sequence diagram.

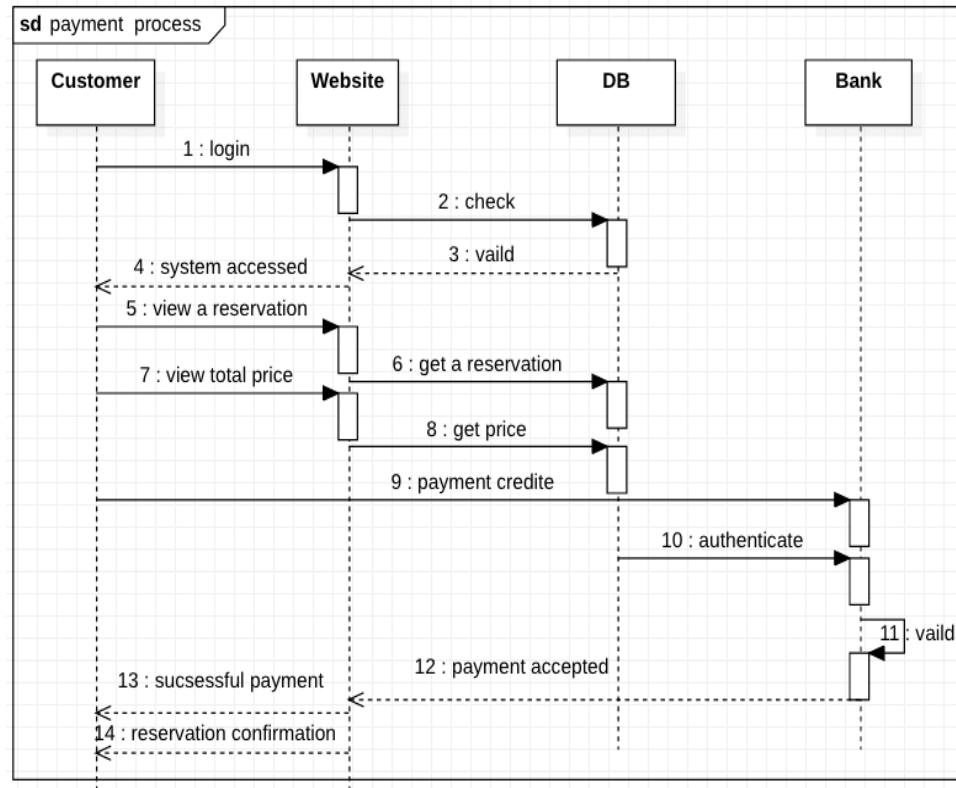


Figure 9.4 The customer payment process sequence diagram.

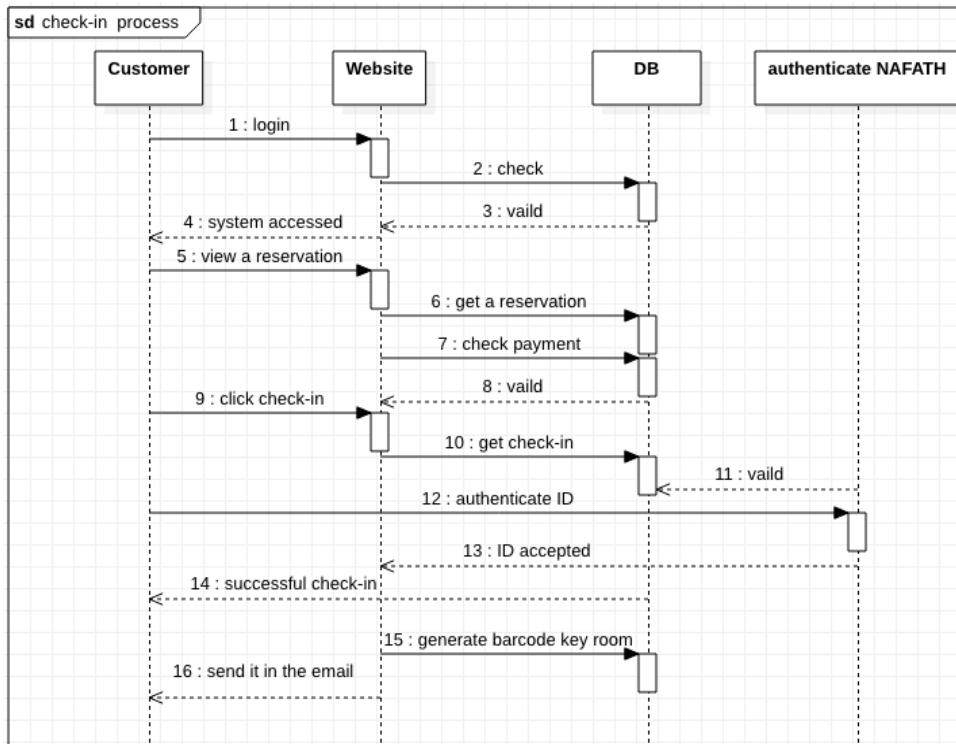


Figure 9.5 The customer check-in process sequence diagram.

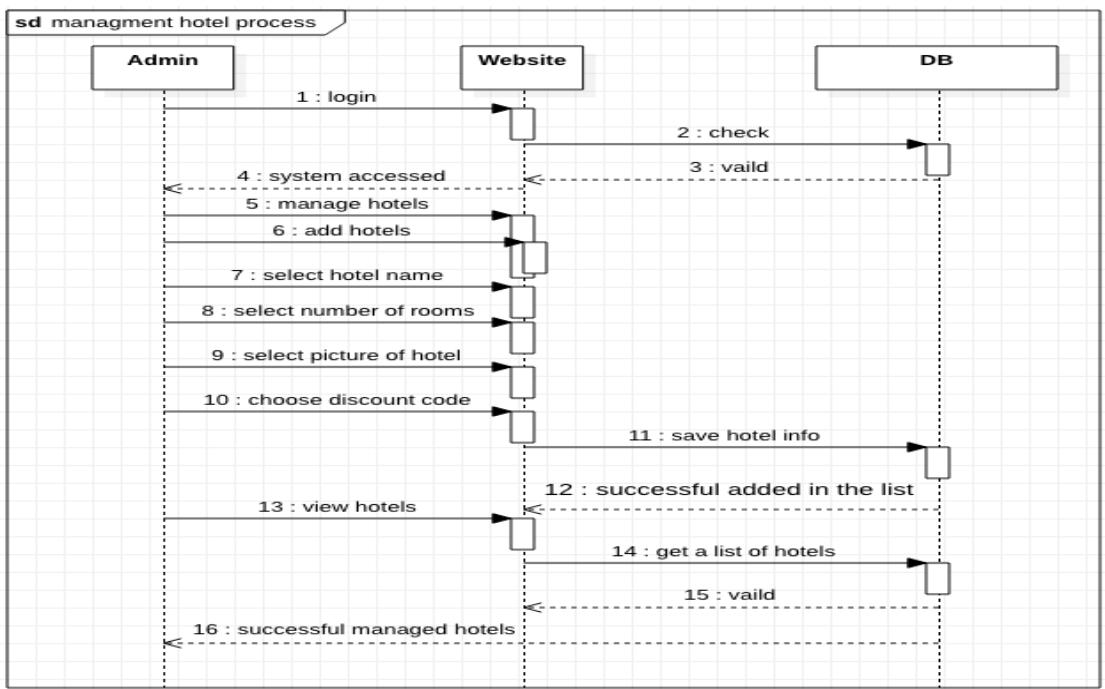


Figure 9.6 The admin manage hotels process sequence diagram.

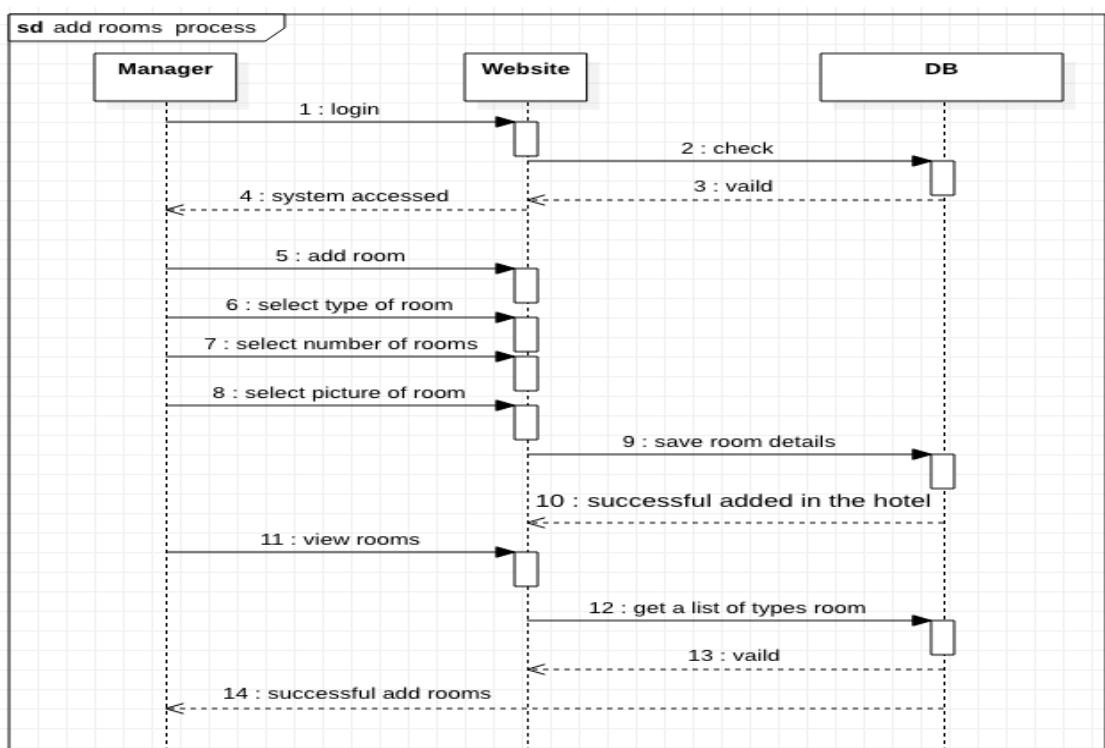


Figure 9.7 The manager add rooms process sequence diagram.

9.3 Software environment

In this section, we describe the software used in the project (the programming languages, database). These include the Visual Studio Code and WampServer.

9.3.1 Programs Used in the Project

1. Visual Studio Code

We used Visual Studio Code to write our code editing because it is a streamlined code editor that supports development processes such as debugging, task running, and version control. It aims to provide only the tools a developer needs for a quick cycle of building code and debugging and leaves more complex workflows to the more feature-packed IDEs, such as the Visual Studio IDE. Visual Studio Code, also commonly referred to as VS Code, is a source code editor built by Microsoft using the Electron Framework, for Windows, Linux, and macOS [20].

2. WampServer

We utilized WAMP to build and maintain databases for our website Smart Hotel Gate, WAMP is an acronym that stands for Windows, Apache, MySQL, and PHP. It's a software stack which means installing WAMP installs Apache, MySQL, and PHP on your operating system (Windows in the case of WAMP). Even though you can install them separately, they are usually bundled up, and for a good reason too. What's good to know is that WAMP derives from LAMP (the L stands for Linux). The only difference between these two is that WAMP is used for Windows, while LAMP – is for Linux-based operating systems. Let's quickly go over what each letter represents [21]:

- “W” stands for Windows, there’s also LAMP (for Linux) and MAMP (for Mac).
- “A” stands for Apache. Apache is the server software that is responsible for serving web pages. When you request a page to be seen by you, Apache grants your request over HTTP and shows you the site.
- “M” stands for MySQL. MySQL’s job is to be the database management system for your server. It stores all of the relevant information like your site’s content, user profiles, etc.
- “P” stands for PHP. It’s the programming language that was used to write WordPress. It acts like glue for this whole software stack. PHP is running in conjunction with Apache and communicating with MySQL.

Instead of installing and testing WordPress on your hosting account, you can do it on your personal computer (localhost).

9.3.2 Languages Used in the Project

1. HTML

We used to design web pages using a markup language HTML stands for Hypertext Markup Language. HTML is the combination of Hypertext and Markup language. Most markup languages (e.g. HTML) are human-readable. The language uses tags to define what manipulation has to be done on the text. HTML is a markup language used by the browser to manipulate text, images, and other content, in order to display it in the required format [22].

2. CSS

Fondly referred to as CSS, Cascading Style Sheets is a simply designed language that aims to simplify the process of making web pages presentable. we use the CSS language to design our pages for the Smart Hotel Gate website CSS allows you to apply styles to web pages. More importantly, CSS enables you to do this independently of the HTML that makes up each web page. It describes how a webpage should look: it prescribes colors, fonts, spacing, and much more. CSS lets developers and designers define how it behaves, including how elements are positioned in the browser. While HTML uses tags, CSS uses rulesets. CSS is easy to learn and understand [23].

3. JavaScript

JavaScript, which we use on our site to create more interactive pages. JavaScript is a programming language that adds interactivity to your website, and it is the most popular programming language in the world.

The browser loads the program written in JavaScript, either embedded within the HTML page or from an external file. All operations are performed on the user's machine that is, within their browser. JavaScript creates interactive functions, and this is what many websites and pages like Facebook use.

4. PHP

PHP is short for "PHP: Hypertext Preprocessor" a popular general-purpose scripting language that is particularly suitable for web development. PHP often runs on a web server, and it can also be used as a command line interface or used to develop programs with a graphical interface that runs on the user's computer. PHP can be used under most web servers as it runs on most operating systems, and its development team It provides its complete source code so that users can build and develop it to suit their needs. We have used it in our website to develop a graphical interface and server [24].

Conclusion

This chapter describes the first steps in implementing the application, it included the class diagram that showed views as class and sequence diagrams and justifies the choice of the software used in the project. The next chapter will describe the final work and the unit and integrating tests.

Chapter 10: Programming process

Introduction

In this chapter we are presenting the final result of our work this year, the website is complete and ready to be used, we are showing all the components of the website, and we also perform a testing process for the units and for the whole application to make sure that it works as expected.

10.1 Work Performed

The website is divided into three parts, each one for a different type of customer, the manager, and the admin and each one has a number of pages that can be used to perform his tasks. The general pages: These are the home page, Contact and About Us page and the login page (Figures 10.1, 10.2, 10.3, 10.4):

10.1.1 The general pages

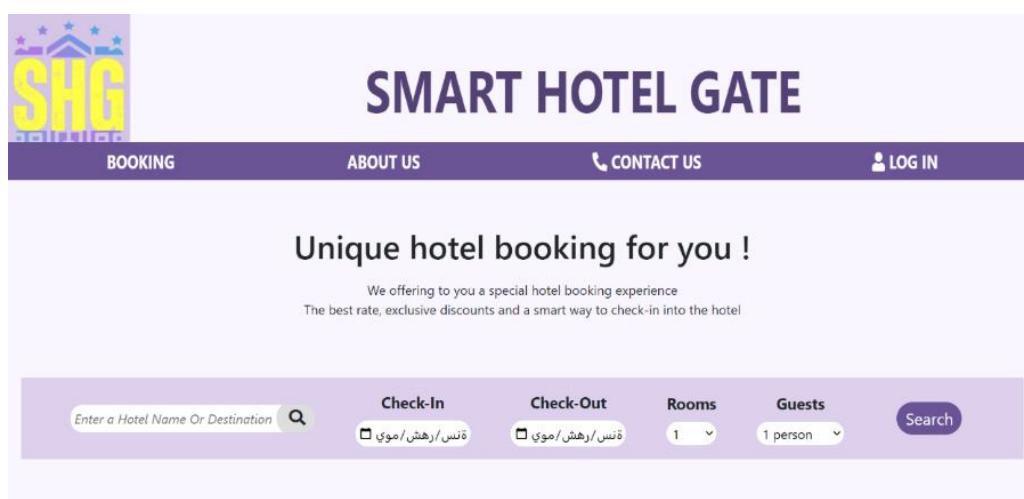


Figure 10.1 The Home page.

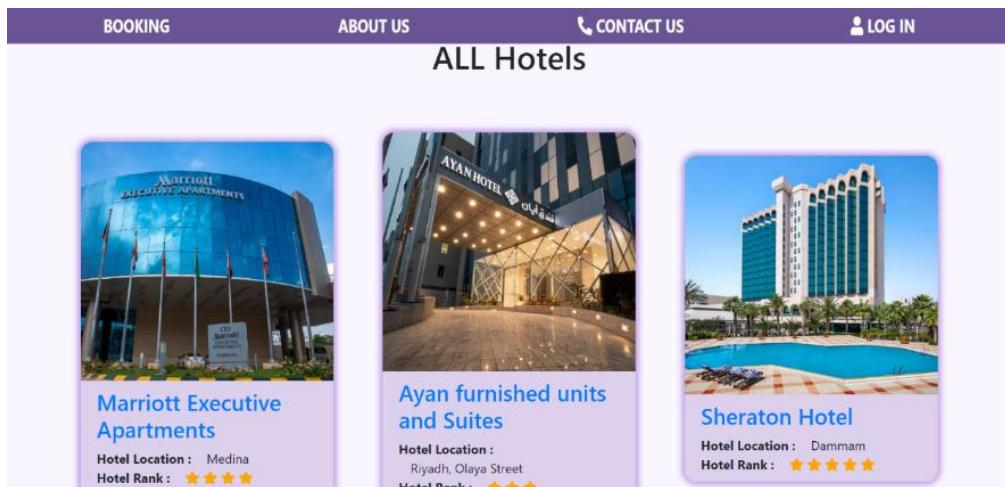


Figure 10.2 List of hotels in home page.

Contact Us

Email Address: smarhotelgate@gmail.com
Phone Number: +966 556 677700

About Us

Our proposed website provides reservations for various hotels in one website and provides many advantages , In our journey to achieve this, we practice strong beliefs and actions that respect the diversity of people, the community, ethics and the planet.

Figure 10.3 Contact and About Us page.

Login

Email
Password
Admin

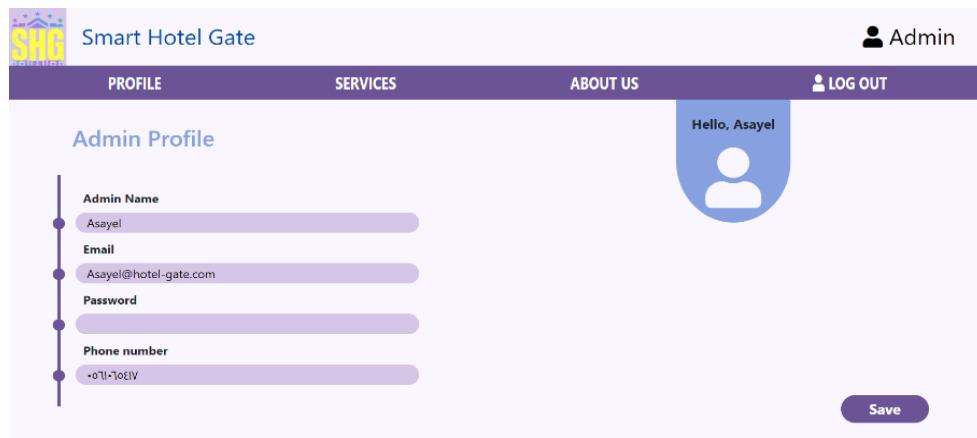
Log In

OR

New Register

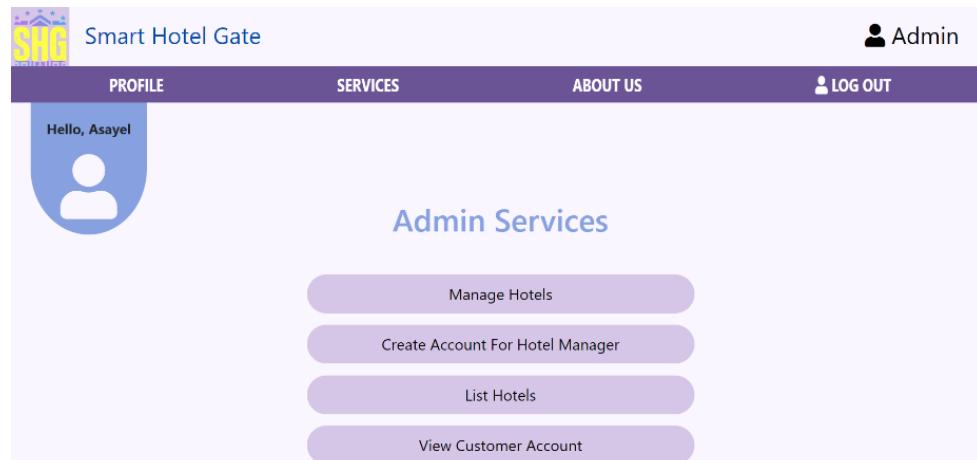
Figure 10.4 Login page.

10.1.2 The Admin pages



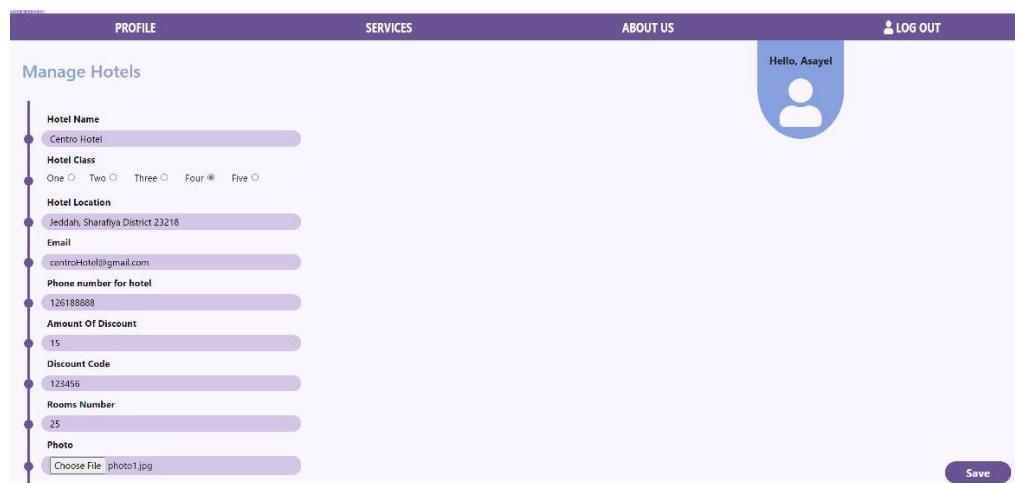
The screenshot shows the Admin Profile page of the Smart Hotel Gate system. At the top right, it says "Admin" and "LOG OUT". On the left, there's a sidebar titled "Admin Profile" containing fields for "Admin Name" (Asayel), "Email" (Asayel@hotel-gate.com), "Password" (redacted), and "Phone number" (+96610811). On the right, there's a blue profile icon with "Hello, Asayel" and a "Save" button.

Figure 10.5 Admin profile page.



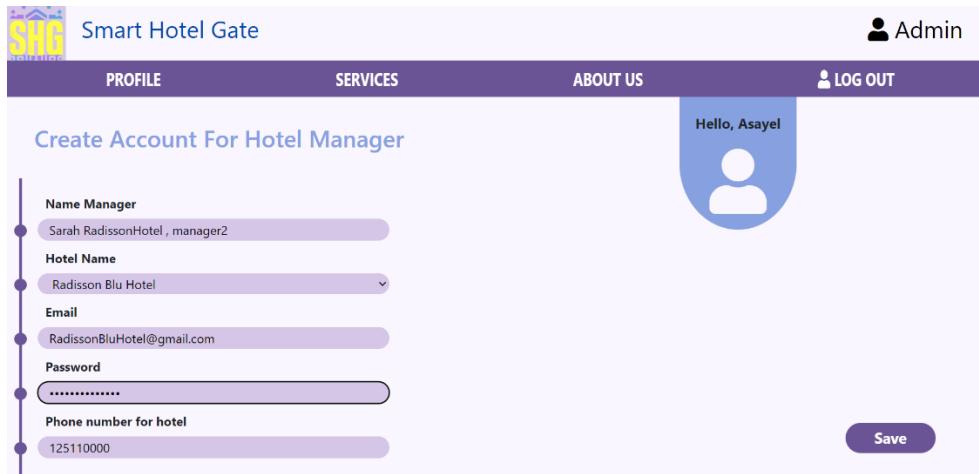
The screenshot shows the Admin Services page. At the top right, it says "Admin" and "LOG OUT". On the left, there's a sidebar with "Hello, Asayel" and a profile icon. In the center, there's a section titled "Admin Services" with four buttons: "Manage Hotels", "Create Account For Hotel Manager", "List Hotels", and "View Customer Account".

Figure 10.6 Admin services page.



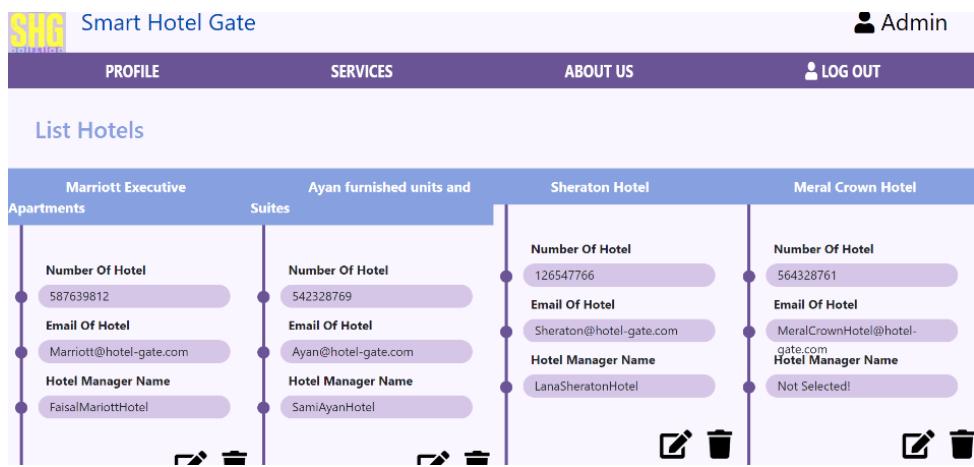
The screenshot shows the Manage Hotels page. At the top right, it says "LOG OUT". On the left, there's a sidebar with "Hello, Asayel" and a profile icon. In the center, there's a form titled "Manage Hotels" with fields for "Hotel Name" (Centro Hotel), "Hotel Class" (Four selected), "Hotel Location" (Jeddah, Sharafya District 23218), "Email" (centroHotel@gmail.com), "Phone number for hotel" (126188888), "Amount Of Discount" (15), "Discount Code" (123456), "Rooms Number" (25), and a "Photo" input field with "Choose File photo1.jpg". A "Save" button is at the bottom right.

Figure 10.7 Manage hotel page.



The screenshot shows the 'Create Account For Hotel Manager' page. At the top right, there is a user profile icon with the text 'Hello, Asayel' and a 'LOG OUT' button. The main form contains fields for Name Manager (Sarah RadissonHotel, manager2), Hotel Name (Radisson Blu Hotel), Email (RadissonBluHotel@gmail.com), Password (redacted), and Phone number for hotel (125110000). A 'Save' button is located at the bottom right.

Figure 10.8 Create account for hotel manager page.

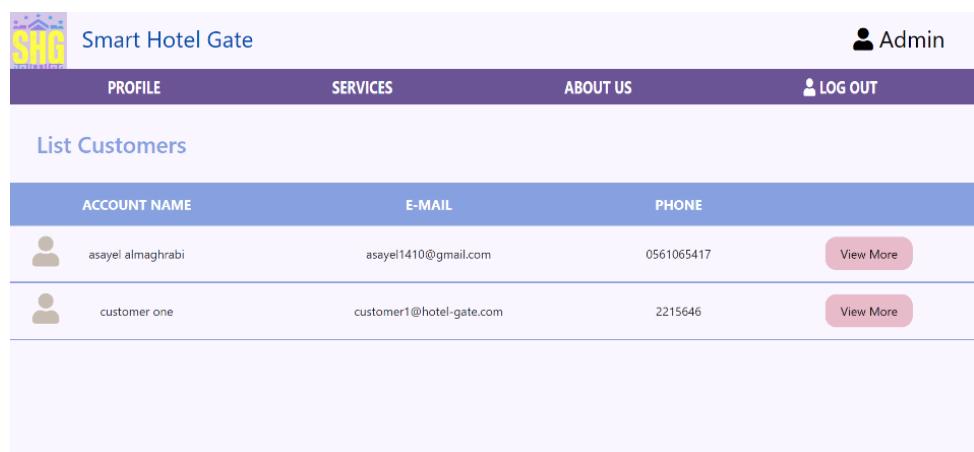


The screenshot shows the 'List Hotels' page. At the top right, there is a user profile icon with the text 'Hello, Asayel' and a 'LOG OUT' button. The page displays four hotel entries in a grid:

- Marriott Executive Apartments**: Number Of Hotel (587639812), Email Of Hotel (Marriott@hotel-gate.com), Hotel Manager Name (FaisalMariottHotel).
- Ayan furnished units and Suites**: Number Of Hotel (542328769), Email Of Hotel (Ayan@hotel-gate.com), Hotel Manager Name (SamiAyanHotel).
- Sheraton Hotel**: Number Of Hotel (126547766), Email Of Hotel (Sheraton@hotel-gate.com), Hotel Manager Name (LanaSheratonHotel).
- Meral Crown Hotel**: Number Of Hotel (564328761), Email Of Hotel (MeralCrownHotel@hotel-gate.com), Hotel Manager Name (Not Selected!).

Each entry has edit and delete icons below it.

Figure 10.9 List of hotels page.



The screenshot shows the 'List Customers' page. At the top right, there is a user profile icon with the text 'Hello, Asayel' and a 'LOG OUT' button. The page displays two customer entries in a table:

ACCOUNT NAME	E-MAIL	PHONE	
asayel almaghrabi	asayel1410@gmail.com	0561065417	View More
customer one	customer1@hotel-gate.com	2215646	View More

Figure 10.10 List of customers page.

10.1.3 The Manager pages

Smart Hotel Gate

Manager

PROFILE ABOUT US ADD ROOM LIST ROOMS LOG OUT

Hello, manager1

Hotel Manager Profile

Name Manager
manager1

Hotel Name
Centro Hotel

Email
manager1@hotel-gate.com

Password

Phone number for hotel
٩٣٢٣٦

Save

Figure 10.11 Hotel manager profile page.

Smart Hotel Gate

Manager

PROFILE ABOUT US ADD ROOM LIST ROOMS LOG OUT

Hello, manager1

Add Room

Type Of Rooms
King

Number Of Rooms
60

Price Per Room
475

Features

city View Shower Coffee & Tea
Free WiFi 1 Queen Bed 1 King Bed
Free Breakfast Free Parking

Photo
choose file

Save

Figure 10.12 Add room page.

Smart Hotel Gate

Manager

PROFILE ABOUT US ADD ROOM LIST ROOMS LOG OUT

Hello, manager1

List Rooms

Room 1	Room 2	Room 3
Type Of Rooms Queen room	Type Of Rooms twin room	Type Of Rooms Studio room
Number Of Rooms 10	Number Of Rooms 15	Number Of Rooms 10
rooms price 3000	rooms price 7500	rooms price 6000

Figure 10.13 List of rooms page.

10.1.4 The Customer pages

The screenshot shows the customer profile page. At the top right, there are 'FAVORITE' and 'LOG OUT' buttons. Below them is a blue shield-shaped icon with the text 'Hello, customer one'. A 'View my reservation' button is located next to it. The main area is divided into two sections: 'My Profile' on the left and 'Payment Information' on the right. The 'My Profile' section contains fields for First Name ('customer'), Last Name ('one'), Email ('customer1@hotel-gate.com'), Phone number ('٩٦٦٥٣٧٨١'), Password, Gender ('Male'), and Address. The 'Payment Information' section contains fields for Card Number ('1234'), Expiration Day ('12/2025'), and CVC Code ('...'). A 'Save' button is located at the bottom right.

Figure 10.14 Customer profile page.

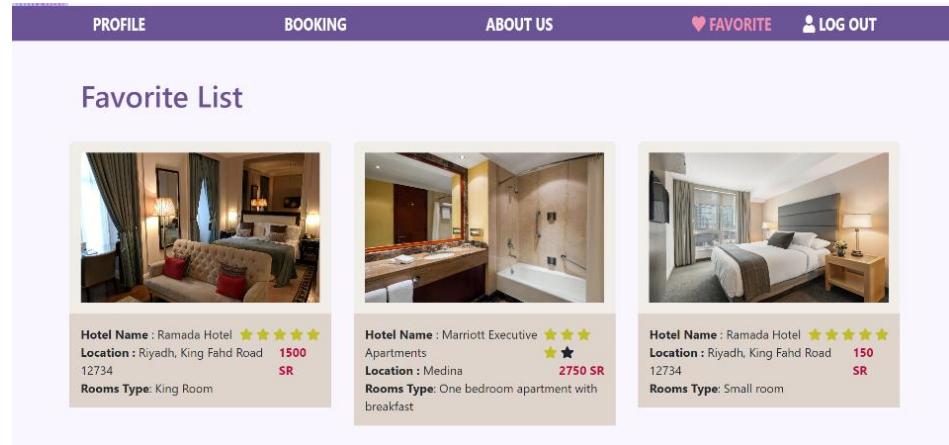


Figure 10.15 Customer favorite page.

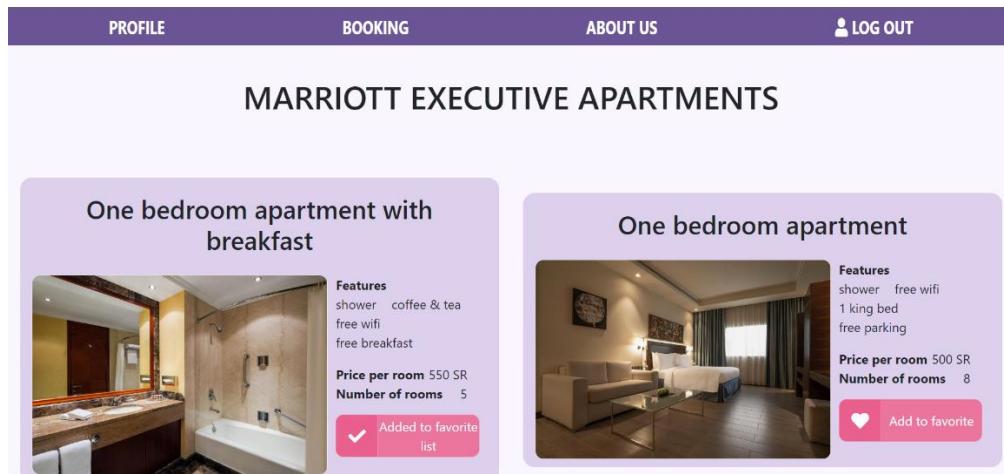


Figure 10.16 Add a room to the favorites page.

10.1.5 The Reservation process by customer pages:

The booking page displays a search result for the 'Centro Hotel' located in Jeddah, Sharafiyah District 23218. The hotel is rated 4 stars. The search filters used include a price range from 3255R to 14755R, and a 4-star hotel class. Popular filters selected are 'Free WiFi'. The main content area shows the hotel's exterior at night and its room types: twin room and Queen room.

Figure 10.17 Booking page.

The booking for rooms page shows two room options: a 'twin room' and a 'Queen room'. Both rooms are described as having a city view, shower, coffee & tea, and free wifi. The twin room costs 485 SR per room, and the Queen room costs 285 SR per room. Room availability is shown as 0.

Figure 10.18 Booking for rooms page.

The new reservation page allows users to enter their check-in date (2023-01-01) and check-out date (2023-01-09). It also includes fields for Name, Email, Phone, and Location. On the right, it shows a summary of the reservation: 800 SR for 2 rooms, 1 twin room and 1 Queen room. A 'Confirm And Pay' button is present.

Figure 10.19 New reservation page.

The screenshot shows a payment page with a purple header bar containing navigation links: PROFILE, BOOKING, ABOUT US, a favorite icon, and LOG OUT.

Billing Details:

- First Name: customer
- Last Name: one
- Email: customer1@hotel-gate.com
- Phone number: 2215646
- Discount Code: 123

Payment Method:

- Credit Card
- Card Number: 103
- Expiration Day: 01/17/2023
- CVC Code: ...

Billing Summary:

1-twin room	500 SR
1-Queen room	300 SR
TOTAL : 800	
Discount	15 SR
WITH DISCOUNT : 785	

Pay

Figure 10.20 Payment page.

The screenshot shows a check-in page with a purple header bar containing navigation links: PROFILE, BOOKING, ABOUT US, a favorite icon, and LOG OUT.

Price : 800 SR

Rooms Types: twin room - Queen room Rooms Number : 2

Check-in: 2023-01-01 Check-out: 2023-01-09

Hotel Name	Centro Hotel	Customer Name	customer one
Hotel Email	centroHotel@gmail.com	Customer Email	customer1@hotel-gate.com
Hotel Phone	126188888	Customer Phone	2215646
Hotel Location	Jeddah, Sharafiyah District 23218	Card Number	103

CONGRATS YOU GET A NEW RESERVATION !

Check In

Cancel

Figure 10.21 Check-In page.

The screenshot shows a Nafath - check for your ID page with a purple header bar containing navigation links: PROFILE, BOOKING, ABOUT US, a favorite icon, and LOG OUT.

Check Your Personal ID

NAPHADH

VISION ٢٠٣٠ نفاذ

رقم بطاقة الأحوال/الإقامة

أدخل رقم الأحوال/الإقامة الخاص بك هنا

[تسجيل الدخول]

Figure 10.22 Nafath - check for your ID page.

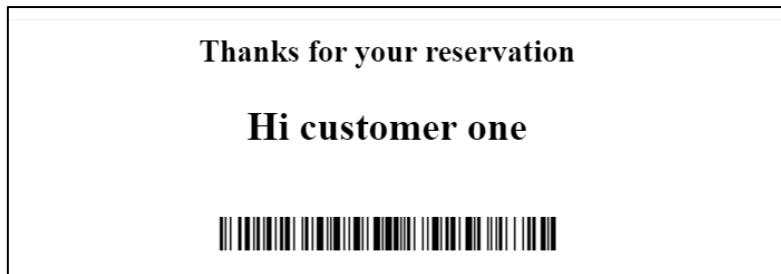


Figure 10.23 Barcode key sanded to email page.

10.2 Testing

In order to say that the website does the required work as expected, the testing process must be performed. The testing goal is to check a number of scenarios and monitor the behavior of the website, in order to find if the output is correct or not. There are two major classes of testing, unit testing, which focuses on testing every component individually, and integration testing, which tests the whole system. Next, we present a few testing cases in both the unit and integration testing.

10.2.1 Unit test

A unit test is a method that instantiates a small portion of our application and verifies its behavior independently from other parts [25]. the properties of a good unit test are:

- **Easy to write:** it should be easy to code all unit tests without enormous effort.
- **Readable:** it should be easy to understand which scenario is being tested and —if the test fails— easy to detect how to address the problem. With a good unit test, we can fix a bug without actually debugging the code.
- **Reliable:** Unit tests should fail only if there's a bug in the system under test.

- **Fast:** Developers write unit tests so they can repeatedly run them and check that no bugs have been introduced. If unit tests are slow, developers are more likely to skip running them on their own machines.

In the following, we present examples of our testing cases:

Case 1: Testing reservation confirmation without log in to the website (Figure 10.24):



Figure 10.24 Booking without log in.

Case 2: Testing wrong input when the user register (Figure 10.25) or wrong log in to the website (Figure 10.26) and booking dates (Figure 10.27):

The screenshot shows a registration form with the following fields and values:

- First Name:** MAHA
- Last Name:** ALMZROAI
- Email:** Maha11123800@gmail.com
- Phone number:** 0538628247
- Password:** (The password is empty)

A red error message at the bottom states: "Password should be at least 8 characters in length and should include at least one upper case letter, one number, and one special character."

Figure 10.25 Registering with wrong password requirements.

The screenshot shows a login form with the following fields and values:

- Email:** Maha11123800@gmail.com
- Password:** ... (The password is empty)
- User Type:** Customer

A red error message at the bottom states: "Email or password is incorrect". Below the error message is a yellow button labeled "New Register".

Figure 10.26 log in with wrong password or email.

The screenshot shows a search interface for hotel bookings. It includes fields for:

- Check-In:** ٢٠٢٣/١٢/٢٥
- Check-Out:** ٢٠٢٣/١٢/٢٤ (This date is earlier than the check-in date)
- Rooms:** 1
- Guests:** 1 person

A red error message in a callout box states: "Check out date must be bigger than check in date".

Figure 10.27 Booking with check-in date after the check-out date.

Case 3: Testing saving information with empty required inputs. Figure (10.28) shows the case where the hotel location is left empty when the admin adds a hotel.

PROFILE SERVICES ABOUT US LOG OUT

Hotel Class

One Two Three Four Five

Hotel Location

Email

Hilton@hotel-gate.com

Phone number for hotel

9998000333

Amount Of Discount

299

Rooms Number

4350

Photo

لم يتم اختيار أي ملف اختر ملف

Save

Hotel location is REQUIRED

Figure 10.28 Adding hotel with empty location.

Case 4: Testing the connection to the database in the registration process (Figures 10.29 , 10.30):

BOOKING ABOUT US LOG IN

New Register

First Name
asayel

Last Name
almaghribi

Email
asayel1410@gmail.com

Phone number
0561065417

Password
.....

Sign In

Figure 10.29 Register new costumer.

id	password	phone	email	lastname	firstname	id
1	customer1@hotel-gate.com	2215846	customer1@hotel-gate.com	one	customer	1
11	JLL ...\$2y\$10\$Wk2G7DiASXqLA5CTLAgehUaf30UOHY4zCvaGabUxs	0561065417	asayel1410@gmail.com	almaghribi	asayel	11

Sort by key: ابحث في هذا الجدول تصفية الصنف: عرض الكل عدد الأسطر: 25

Figure 10.30 The database state after adding new customer.

10.2.2 Integrating

Integration Testing: is defined as a type of testing where software modules are integrated logically and tested as a group. A typical software project consists of multiple software modules, coded by different programmers. The purpose of this level of testing is to expose defects in the interaction between these software modules when they are integrated [26].

We tested the connection between the system and the customer, the admin added a new hotel to the website and then we examined if it's able to see by customer.

Hotel Name
RADISSON BLU HOTEL

Hotel Class
One Two Three Four Five

Hotel Location
Jeddah, Al Shati District, Corniche Road

Email
RadissonBluHotel@gmail.com

Phone number for hotel
125110000

Amount Of Discount
15

Rooms Number
6

Photo
reception.jpg

Save

Figure 10.31 Adding new hotel.

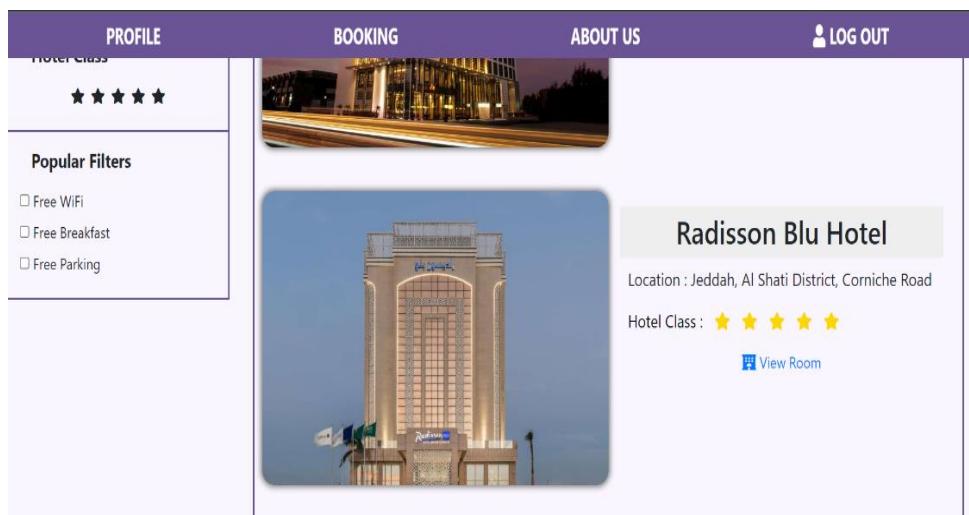


Figure 10.32 The hotel can be seen by the customer.

Conclusion

This is the last step in developing this project, in this chapter we showed the work we have done, and the final results of testing the website so that it can be used. The next step is to find new ideas to be added to the website. The rest is the process of updating and adding new technologies and resources to the development process.

General Conclusion

Today, the world is witnessing a major technological transformation in all aspects of life, whether social or health, the most important of which is entertainment and to talk about entertainment and the many technical transactions it contains, starting from the search for a destination for entertainment, places at your destination, how to book and other things, most of which are done in a manner completely via the website on the internet. So, the websites make it easier for people to deal with most matters of their lives more easily and flexibly and in different ways, so people are accustomed to using them.

Guest hospitality has attracted our attention as a team that seeks to develop and introduce technology to some areas of life. we noticed that the hotel field lacks some facilities for guests and the most important of these matters is the process of checking in and checking out from every hotel. When guests arrive at the hotel, they mostly have to wait just to check in and this is a stressful process, especially after a long trip. Due to this problem, we have proposed a technical solution that is fast and safe, facilitating and speeding up the reservation process and the entry and exit procedures for the customer. And because customer satisfaction is our goal and measuring customer satisfaction is an indicator of the company's success in providing services to customers, the comfort of the guest is the goal we want achieving it and our solution to this problem. Was to propose a website that provides reservations for various hotels in one website and provides many advantages, the most important of which is facilitating the booking process and entry and exit procedures for the customer. In this way, we were able to activate the technology to solve a problem faced by many and achieve customer satisfaction in enjoying their stay and making it comfortable and easy for them.

In this report, our site is explained how it works, what is its unique feature, and what problem has the site helped solve. We presented our planning and analysis stages, which included the objectives of the project, related works, project requirements, use cases, and data modeling. Also, in the third part the design stage, which contains the sixth, seventh, and eighth chapters. This part shows the design elements and user interface. Finally, the implementation phase of the last part, which contains chapter 9 that introduces the object-oriented explaining the system design and program environment, Chapter 10 the end result of our work.

Reference

- [1] S. H. Ivanov, "Conceptual Marketing Framework for Online Hotel Reservation System Design," 5 November 2008. [Online]. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1296040.
- [2] Bartleby Research, "Online Reservation System of Dagupan Garden Village Hotel," 2017. [Online]. Available: : <https://www.bartleby.com/essay/Online-Reservation-System-of-Dagupan-Garden-Village-P38LNCEK6ZZS>. [Accessed 9 september 2022].
- [3] Booking.com, "About booking.com," 1996. [Online]. Available: <https://www.booking.com/index.ar.html>. [Accessed 10 september 2022].
- [4] Agoda, "About us Agoda who we are?," 1998. [Online]. Available: <https://www.agoda.com/?cid=-216>. [Accessed 10 september 2022].
- [5] Kayak, "About us - KAYAK," 2004. [Online]. Available: : <https://www.kayak.com/flights>. [Accessed 12 september 2022].
- [6] Almosafer, "who us," 2012. [Online]. Available: <https://www.almosafer.com/ar>. [Accessed 12 september 2022].
- [7] HealthIT, "frequently Asked Questions," 2009. [Online]. Available: <https://www.healthit.gov/faq/every-state-and-every-provider-within-state-different-level-hie-adoption-how-does-program>. [Accessed 15 september 2022].
- [8] Atlassian, "the agile coach," 2007. [Online]. Available: <https://www.atlassian.com/agile>. [Accessed 14 september 2022].
- [9] DistantJob, "The Agile Software Development Life Cycle: All You Need to Know," 2022. [Online]. Available: <https://distantjob.com/blog/agile-software-development-life-cycle>. [Accessed 14 september 2022].
- [10] Wrike, "What Is Agile Methodology in Project Management?," 2001. [Online]. Available: <http://web.archive.org/web/20221017184816/https://www.wrike.com/project-management-guide/faq/what-is-agile-methodology-in-project-management/>. [Accessed 20 september 2022].

- [11] Questionpro, "Questionnaires: The ultimate guide, advantages & examples," 2015. [Online]. Available: <https://www.questionpro.com/blog/what-is-a-questionnaire/>. [Accessed 22 september 2022].
- [12] Cs.ccsu, "CS 410/510 - Software Engineering Requirements Engineering," 2010. [Online]. Available: <https://cs.ccsu.edu/~stan/classes/CS410/notes16/04-Requirements.html>. [Accessed 28 september 2022].
- [13] medium, "What is an Entity Diagram (ERD)?," 2020. [Online]. Available: <https://medium.com/@soni.dumitru/what-is-an-entity-relationship-diagram-erd-13daee5b2a>. [Accessed 24 oct 2022].
- [14] previous_toolbox_user, "Software Architecture Elements," 21 Sep 2010. [Online]. Available: <https://community.spiceworks.com/topic/2454908-software-architecture-elements>.
- [15] visual paradigm, "What is Deployment Diagram?," Jun 2014. [Online]. Available: <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-deployment-diagram/>.
- [16] visual paradigm, "What is Entity Relationship Diagram (ERD)?," 16 7 2015. [Online]. Available: <https://www.visual-paradigm.com/guide/data-modeling/what-is-entity-relationship-diagram/>.
- [17] pediaa, "What is the Difference Between Logical and Physical Data Model," 4 July 2019. [Online]. Available: <https://pediaa.com/what-is-the-difference-between-logical-and-physical-data-model/#:~:text=Definition%20A%20logical%20data%20model%20is%20a%20model,that%20represents%20how%20the%20actual%20database%20is%20built..>
- [18] tutorialspoint, "UML - Class Diagram," 18 Nov 2011. [Online]. Available: https://www.tutorialspoint.com/uml/uml_class_diagram.htm.
- [19] smartdraw, "Sequence Diagram," 20 4 2017. [Online]. Available: <https://www.smartdraw.com/sequence-diagram/>.
- [20] visual studio code, "Visual Studio Code FAQ," 10 10 2012. [Online]. Available: <https://code.visualstudio.com/docs/supporting/FAQ>.
- [21] h. E. Y., "What Is WAMP – a Friendly Guide for Beginners," 14 Des 2022. [Online]. Available: <https://www.hostinger.com/tutorials/what-is-wamp>.

- [22] geeksforgeeks, "HTML Introduction," 20 March 2013. [Online]. Available: <https://www.geeksforgeeks.org/html-introduction/amp/>.
- [23] geeksforgeeks, "CSS Introduction," 22 6 2018. [Online]. Available: <https://www.geeksforgeeks.org/css-introduction/amp/>.
- [24] w3schools, "PHP Introduction," 14 Sep 2017. [Online]. Available: https://www.w3schools.com/php/php_intro.asp.
- [25] microsoft, "Unit testing," 31 8 2022. [Online]. Available: <https://learn.microsoft.com/en-us/dotnet/architecture/maui/unit-testing>.
- [26] T. Hamilton, "Integration Testing: What is, Types with Example," 31 Des 2022. [Online]. Available: <https://www.guru99.com/integration-testing.html>.

Appendix

<https://docs.google.com/forms/d/e/1FAIpQLSdKYrax1qYfhvbqVn8Pp97Lw-3WhxOcIyAMIdYwjr654LyNA/viewform>

SHG

...We are students of the College of Computing and Information Technology

We are pleased to offer you the best hotel booking experience through (SHG), which is an acronym for Smart Hotel Gate, the best and fastest in the hotel check-in and check-out procedures. We would like to know how you feel about your hotel reservation, your ..participation in this survey and your feedback will be useful to us

...Thanks for your time

(لا تتم مشاركته) تبديل الحساب 

*مطلوب

نحن طلاب كلية الحاسوب وتقنية المعلومات ...

سعدنا أن نقدم لكم أفضل تجربة حجز فندقي من خلال (SHG) ، وهي اختصار لـ Smart Hotel Gate ، وهي أسرع إجراءات تسجيل الوصول والمغادرة بالفندق. نود أن نعرف ما هو شعورك حال حجزك الفندقي ، وستكون مشاركتك في هذا الاستبيان وملحوظاتك مفيدة لنا ..

شكراً على وقتك...

* 1. ما الطريقة المفضلة لديك لحجز الفنادق
What is your preferred way to book hotels

إجابتك

* 4. ماهي الطريقة المفضلة للدخول الى غرفتك في الفندق

What is your preferred way to enter your hotel room

key \ مفتاح

card \ بطاقة

barcode from your phone \ باركود من هاتفك

أخرى: _____

* 5. من واقع تجربتك ماهي الخدمات التي تحتاج ان تتوفر لدى الفنادق

From your experience, what are the services you wish the hotels would have

مواقف سيارات \ Car Parking

مسبح و سبا \ Swimming pool and spa

مطعم و كافيه \ Restaurant & café

أخرى: _____

* 2. ما سبب قدومك الى الفنادق عادة
why do you usually come to hotels

عمل \ work

الراحة \ rest

ترفيه\ entertainment

علاج \ treatment

أخرى: _____

* 3. ما هي الطريقة المفضلة للدخول الى الفندق

What is your preferred way to enter the hotel

تعبئة البيانات عن طريق مكتب الاستقبال في الفندق و استلام مفتاح غرفتك \
Fill in the data through the reception desk at the hotel and receive your room key

تعبئة البيانات و استلام المفتاح فوراً عن طريق الموقع قبل الوصول الى الفندق \
the key immediately through the website before arriving at the hotel

تعبئة البيانات عن طريق الموقع للنحو ثم استلام مفتاح غرفتك من مكتب الاستقبال \
the hotel website, then receive your room key from the reception desk

أخرى: _____

6. ما هي المشاكل التي تواجهك عادةً عند الوصول إلى الفندق

What are the problems you usually encounter when arriving at the hotel

الانتظار لاستلام المفتاح \ Waiting to receive the room key

الغرف غير جاهزة \ The room is not ready

عدم توفر موافق للسيارات \ Unavailability of cars

أخرى: _____

7. هل لديك أية اقتراحات لتحسين جودة خدمات موقع حجز الفنادق في المستقبل؟ رجاء شاركتنا بها.

إجابتك