American International University-Bangladesh (AIUB)
Department of Computer Science
Faculty of Science & Technology (FST)

Smart Hotel Management System

A Software Requirement Engineering
Project Submitted
By

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The project will be evaluated for the following Course Outcomes

Evaluation Criteria	Total Marks (50)	
Introduction, Format, Submission, Defense	[10 Marks]	
System Overall Description & Functional Requirements	[10 Marks]	
System Quality Attributes and Project Requirements	[10 Marks]	
UML and E-R Diagram with Data Dictionary	[10 Marks]	
UI/UX Prototyping	[10 Marks]	

Software Requirements Specification

for

Smart Hotel Management System

Version 1.0 approved

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Revision History

Name	Date	Reason for Changes	Version

1. Introduction

1.1 Identification

Throughout this document, the software is referred to as the SHM and is now known as Smart Hotel. Later, this name might be modified. The SHM is expected to have a version number of 1.0 for its initial release. Its functioning is described in this document. This document has a version number of 1.0. This SRS will be used by the system development team which is constructing the SHM. The Project team will use the SRS to fully understand the expectations of this SHM to construct the appropriate software.

1.2 Document Conventions

The document is prepared using Microsoft Word and has used the font type 'Times New Roman'. The fixed font size that has been used to type this document is 12pt with 1.15 line spacing. The document is written in a very simply way but some format is used to define some special identification. The bold words used for the heading of the contents. The italic is used for the hardware and the software requirements to run the SHM. The italic fonts are used only for the users who will be affected through the software.

1.3 Intended Audience and Reading Suggestions

Project managers, domain experts, developers, and requirements engineers are the main target audience for this document. There are also some intended audiences for this software. The document would finally provide a clear idea about the system that is being built. It is strongly requested that read the paper to gain an idea of the SHM before reading this document.

1.4 Product Scope

The Smart Hotel Management System is going to be created to automate most of the hotel's tasks. The Reservation System monitors reservations for rooms and meeting spaces and verifies their availability. All room kinds and services are managed via the room management system. All hotel inventories will be monitored by the inventory control system, and guest information

will be managed by guest management. The administration section will keep an eye on everything. For HMS, there are three end users. Owner, Manager, Customer and Receptionist are the end users. Owner has full, unrestricted access to all system features. Managers have limited restrictions and full access to all system features. Only the Reservation management area is accessible to receptionists.
The automated Hotel Management System's goals include streamlining the hotel's regular operations. The system will be able to manage numerous services to quickly take care of all customers. This program will be utilized to get around those issues due to the substantial volume of file handling occurring at the hotel. The development team will highlight several benefits of this system, including security, usability, and—most importantly—the effectiveness of information retrieval. The system should be user-friendly, simple to use, easy to recover from faults, and have high end-user subjective satisfaction overall.

2. Overall Description

2.1 Product Perspective

The product perspective of the Smart Hostel Management System is to provide an automated, secure, and feature-rich system for managing hotels. It will provide an efficient and organized way for hostel administrators to manage the day-to-day operations of their hotels. It will enable administrators to manage all aspects of the hotel, including room bookings, payments, and occupant data. It will also provide a platform for hotel administrators to communicate with their guests and keep track of their progress. The system will be designed to be user friendly and accessible from any device or platform. Additionally, it will offer a secure, reliable, and cost-effective solution for hotel administrators.

2.2 Product Functions

- Selection of one-to-many item of food.
- Booking of item
- Booking of room
- Billing of item
- Paying method
- Cancelation of item
- Frequently used item
- Manage users (Add, Update, Delete)
- Taking Backups
- Manage staffs
- E-mail notifications
- Voice command
- Email /Chat Notification (to provide their client everything they need important information about the hotel, booking process)

2.3 User Classes and Characteristics

There are three user levels in the Smart Hotel Management System: **Customer, Manager, Receptionist**.

2.3.1 Characteristics of User Classes

Customer:

The customer should also be able to make payment online. The payment should be secured and the customer should be provided with valid receipt. Customers should also be able to provide feedback and leave ratings on the services they have used. The customer should be able to access the website in multiple languages to make the booking process more accessible. The customer should also be able to access their account data and view the booking history. They should also be able to view the current promotions and discounts available to them. Customers should be able to access the website on mobile devices and benefit from the same services. The customer should also be able to access customer service desk and view the FAQ page and contact customer service directly. The customer should be able to access the customer service desk from any device. The customer should also be able to access the website from any device, with an easy-to-use interface.

Manager:

The manager is in charge of managing the resources offered by the hotel management system. Most of the rights listed above belong to the manager, except those that deal with handling payments. The goal of using a manager is to lessen the owner's workload by taking on duties that are too important to delegate to the receptionist. The Manager user level hasthe authority to access all reports in the system, with the exception of information on hotel revenue and financial matters. Managers have additional skills beyond those of user-level receptionists. Examples include adding a new employee to the system, editing or removing them,and adding a new guest to the system, editing or removing them. Managers can also make decisions about room availability and pricing, as well as assigning rooms to guests. They also have the ability to check in and check-out guests and can make changes to reservations. Managers have access to all system settings, including creating and editing user accounts, and setting up the hotel's system preferences. Finally, they have the ability to generate reports and analyze hotel trends.

Receptionist:

The receptionist's job as a hotel employee will be to make reservations and guarantee that every visitor receives superior service. The least accessible position in the hierarchy of system functions is that of the receptionist. The border role in the system is played by the receptionist. He or she is only able to carry out a few tasks, such as adding new guests to the system, making reservations, and reminding customers to confirm their bookings by email. The hotel management will favor hiring receptionists who have a high level of general education and perhaps in areas like English, math, and IT.

2.4 Operating Environment

Hardware and software requirementsHardware: -

- Operating System supports all known operating systems, such as Windows, Linux
- Computer 8GB RAM, monitor with minimum resolution of 1080X720, keyboard, and mouse
- Hard Drive should be in NTFS f i le-system formatted with minimum of 512GB of free space
- A Laser printer will need to be used to print these reports and notes

Software: -

- Software is designed to run on any platform above Microsoft Windows 10 (64bit).
- Microsoft NET Frameworks 4.0 or above.
- Microsoft SQL Server Management Studio Express 2016

2.5 Design and Implementation Constraints

Software development crew provides their best effort in developing the system. In order to maintain the reliability and durability of system, some design and implementation constraints are applied.
Availability of an android app for hotel management system could make the system portable but due to time constraint it is not possible. System will need a minimum memory of 8GB. But it is recommended to have a memory of 16GB. When designing interfaces of system, we had the capability of work with new tools such as Dev Express. Considering the client's budget, we decided to create those interfaces in a simple realistic manner using affordable technology.

2.6 Assumptions and Dependencies

Some software used in implementing the system is with high cost and the client has agreed to afford the amount of money needed to purchase them. It's assumed that the client won't change that decision in the next phases of the software development. Although we assume that the client is using Windows 7 or Windows 10. Otherwise, if the client uses an open-source operating system, there is a need of changing the SRS accordingly.

3. System Requirements

Users of the system should be able to retrieve room booking information with the given date/time of check-in and room availability. Customers will have access to the customer functions and the employees have access to both customer and registration functions.

CUSTOMER FUNCTIONS:

- Get all customers who have rooms booked on a given date.
- View the availability of rooms.

- Get all the rates.
- Can check their bills

ADMINISTRATIVE Functions:
- Add/Delete a registration
- Add a new registration
- Update rates
- Add a new event place
- Add a discount for a particular category

RECEPTIONIST Functions:
- Make Reservation
- Add new guest
- Receives customer requests

3.1 System Features

3.1.1 Functional Requirements of customers

REQ-1: Customer login
Customers can easily log into the system and the password is generated after completed the registration. The user interface Is so easy to understand and attractive that can ease the login process of the customer into the hotel management system.

Priority Level: High
Precondition: user has a valid user id and password
Cross-references:

REQ-2: Customer can book the room
The hotel management system monitors booking engine data, checks room status and availability and shows available rooms via a variety of channels. Additionally, this module keeps track of double bookings and group reservations. Additionally, it allows the front desk employees to change client reservations and schedule bookings. It also shows information about past and present bookings.

Priority Level: High
Precondition: user has to login into the system.
Cross-references:

REQ-3: Customer can give the feedback
Customer feedback on hotels is essential since it helps hotels improve their services, influences other customers, enables for customization of services, addresses difficulties, and drives ongoing improvement. It benefits both customers and hotels by improving the overall guest experience and maintaining excellent service standards.

Priority Level: Medium
Precondition: The user has to check out from the hotel.
Cross-references:

3.1.2 Functional Requirements of Management

REQ-1: Keep track of the reservations
Management can track the reservations and bookings and the filled rooms. There is no chance to collide with the booking room and the room which is already reserved, which is really important for customer satisfaction and the VIP environment, as well as to make the management system simpler.

Priority Level: High
Precondition: N/A
Cross-references:

REQ-2: Track customer feedback
All the customers are like angels for a hotel. Actually, the hotel business is dependent on hospitality and customer satisfaction. So, customer feedback and the customer's view are really important to check what is lacking in the hotel or the management system. Track the customer feedback, the hotel management system has the option to check the feedback of the customer who has already checked out.

Priority Level: High
Precondition: N/A
Cross-references:

REQ-3: Change the information
The management has the right to change any password of any guest if an issue occurs regarding security. The room number, the plan, the check-out date all things can be modified by the management.

Priority Level: High
Precondition: N/A
Cross-references

REQ-5: Inclusion and Exclusion of Data
The hotel management system allows for the inclusion and deletion of data such as room rates, menu items, prices, and user profiles.

Priority Level: High
Precondition: N/A
Cross-references

3.1.3 Functional Requirements of Receptionist

REQ-1: Make reservations
Receptionist will be entering guest details in the System then searches for room details and System presents room types and tariffs after that Customer selects room and confirms tariff. Receptionist will be entering all the necessary details for records. System records customer's name and address then receptionist confirms booking on system automatically System generates confirmation receipt.

Priority Level: High
Precondition: Guest shouldn't already exist

REQ-2: Add a new Guest
Receptionist can add a new guest. Receptionist selects "add guest" button, System prompts to fill out guest details then System validates details. After that database will be Updated. Display "Successful message" if Guest details are incorrect, Display the message "Unsuccessful" and display Add guest option.

Priority Level: High
Precondition: Log in to the system

REQ-3: Receives customer requests
Receptionist receives customers request for service worker then receptionist appoint the desire service for the customers and send a confirmation mail to the customers.

Priority Level: Medium
Precondition: Customer id should have to provide

3.2 Non-Functional/Quality Requirements

3.2.1 Performance Requirement

Acceptable system functionality response times are defined by performance requirements. Even though the system was designed to have the lowest possible system performance, the system's performance will largely depend on how well the computer that installed it uses its hardware and software. The load time for user interface screens should not exceed two seconds when considering the system's timing relationships. It facilitates rapid system function access. Within five seconds, the login information must be verified to ensure the system's efficiency. The search function is more accurate when it returns query results within five seconds.

Priority Level: High

Precondition: Computer 8GB RAM and installed **Microsoft** Windows 10 (64bit).

Cross-references:

3.2.2 Safety Requirements

A user login screen that requires a user name and password to access the various subsystems protects access to the Smart Hotel Management system's various user levels. This provides various user-level views and system-accessible functions. Backups ensure the security of the system database. In the event of an emergency, the system can be restored.

Priority Level: High
Precondition: Information's should be in database
Cross-references:

3.2.3 Security Requirements

The Smart Hotel Management System will be accessible to owner and customer service representatives. The Reservation/Booking and subsystems will be accessible to Customer Service Representatives. Both the Reservation/Booking subsystem and the Management subsystem will be accessible to managers. The Owner has full access to all subsystems. A user login screen that asks for a username and password to gain access to the various subsystems will serve as a security measure.

Priority Level: High

Precondition: The system shall have identified and authenticated the user

Cross-reference:

3.2.4 Software Quality Attributes

- Availability: - The system shall be available during normal hotel operating hours.
- Correctness: - the extent to which the program satisfies specifications, and fulfills the user's mission objectives.
- Efficiency: - How much smaller number of resources and time are required to achieve a particular task through the system.
- Flexibility: - Ability to add new features to the system and handle them conveniently.
- Integrity: - How the system would insecure the information in the system and how it avoids data losses. Referential integrity in database tables and interfaces.
- Maintainability: - How easy is it to keep the system as it is and correct defects by making changes?
- Portability: - The Hotel Management System shall run in any Microsoft Windows environment.
- Reliability: - Specify the factors required to establish the required reliability of the software system at the time of delivery. Mean time between failures and mean time to recovery.
- Reusability: - What is the ability to use the available components of the system in other

systems as well?

- Testability: - Effort needed to test to ensure performs as intended.
- Usability: - How easily a person can be taken the benefits of the system and the user-friendliness.
- Robustness: - Strength of the system to handle system functions accurately and maintain the database without facing unexpected failures.

Priority Level: High
Precondition: N/A
Cross-references:

3.2.5 Business Rules

Smart Hotel Management System will perform under three users which are Owner, Manager, and Receptionist. The system is designed in a way where responsibility and privileges are decreased in theorder of owner, manager, and receptionist. The role of the manager is elected with the aim of making the owners hands-free from regular interference with the system. So, most of the privileges that the owner hasbeen given to the manager, except the ones that are critical and important. Some features like that are, taking backups, restoring the system and handling financial details, and hotel income reports of the system.

The receptionist is given the most frequently used features of the system which has less responsibility than the other two users. Deleting any information in the system is only allowed for the owner of the hotel.

Priority Level: High
Precondition: Follow the business rules
Cross-references:

3.3 Project Requirements

When the system is completely developed and submitted to the client, a few sessions will be required to make the users of the system understand its functionality of it and some time to adapt to the system. After those sessions, it's required that a member of the development team should spend some time in the system background for an agreed time period. That time period will be used in identifying new bugs that could not be reached in the earlier phases of the development process. The client should have a valid e-mail account in order to receive reservation e-mail notifications.

4. Design and Interface Requirements

4.1 UML Diagrams

4.1.1 Data Flow Diagram

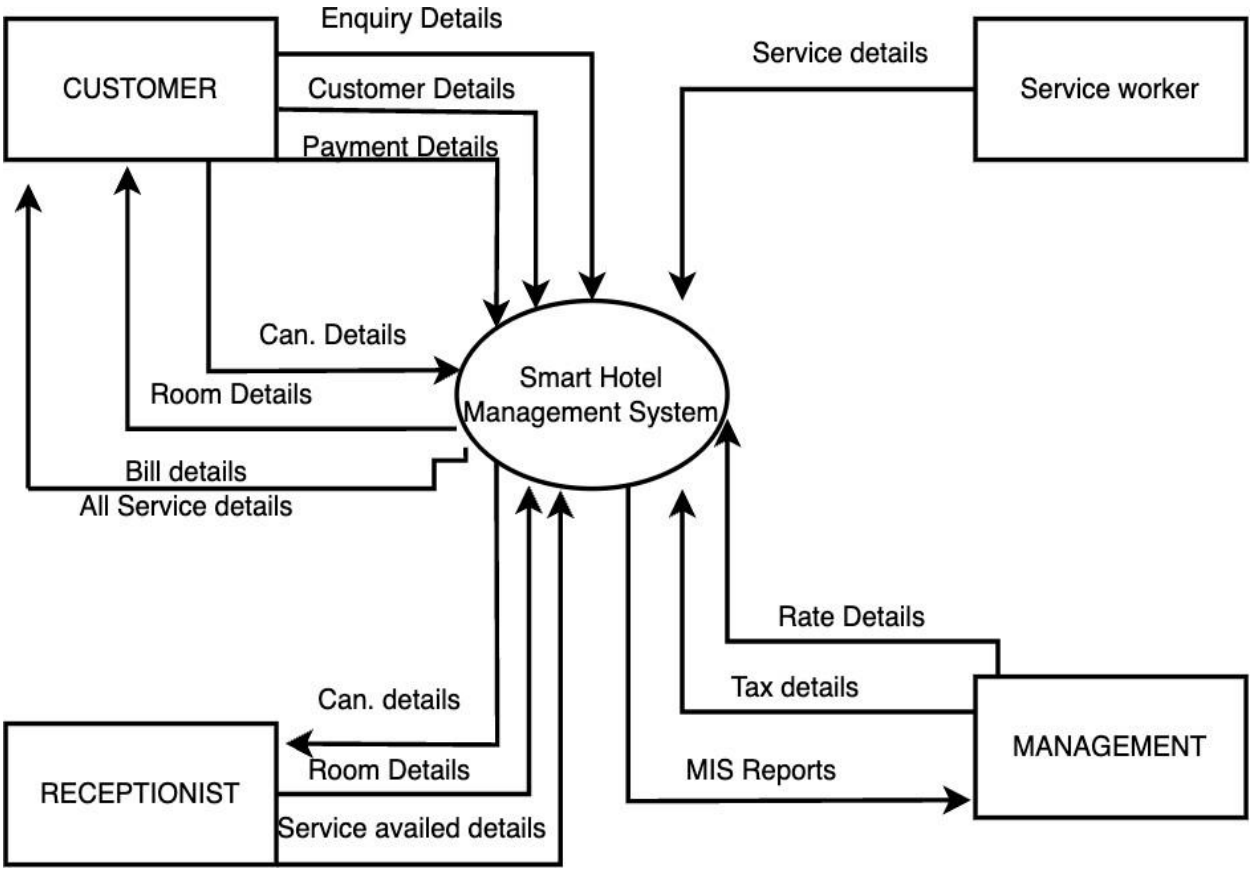


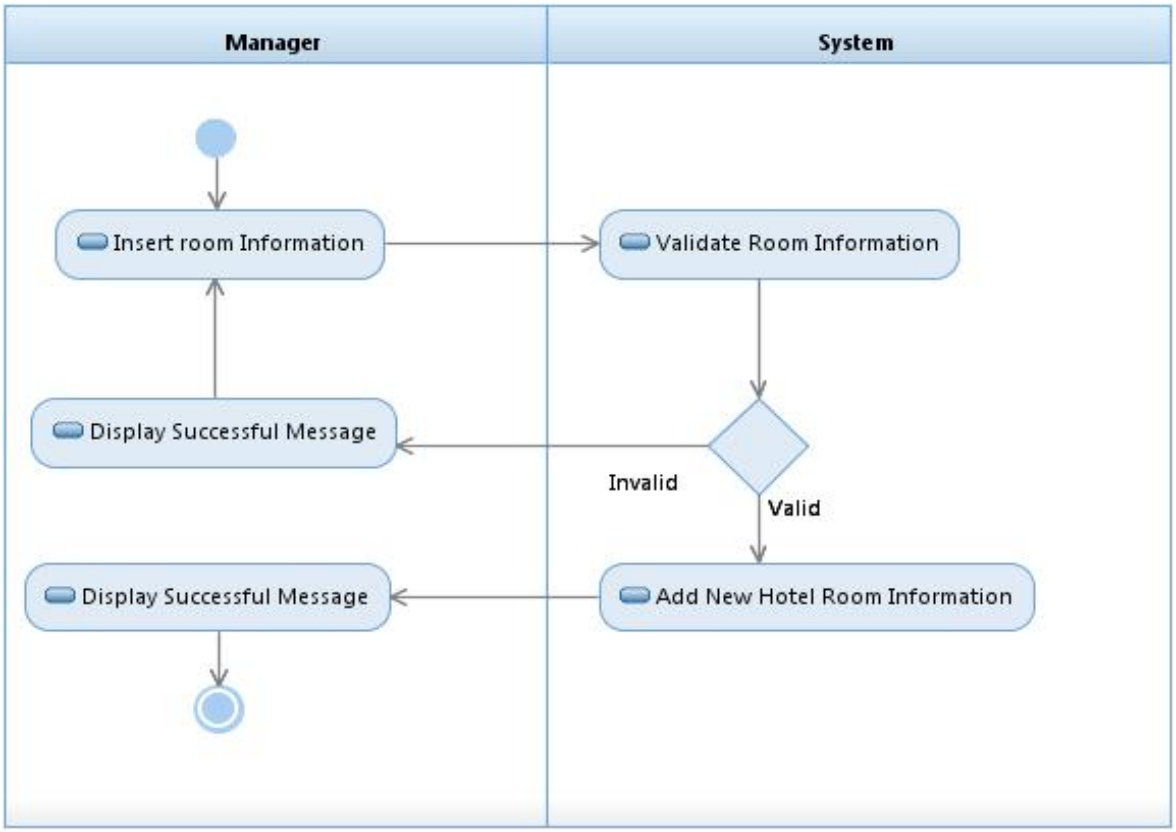
Fig 01: Data Flow Diagram

4.1.2 ER Diagram

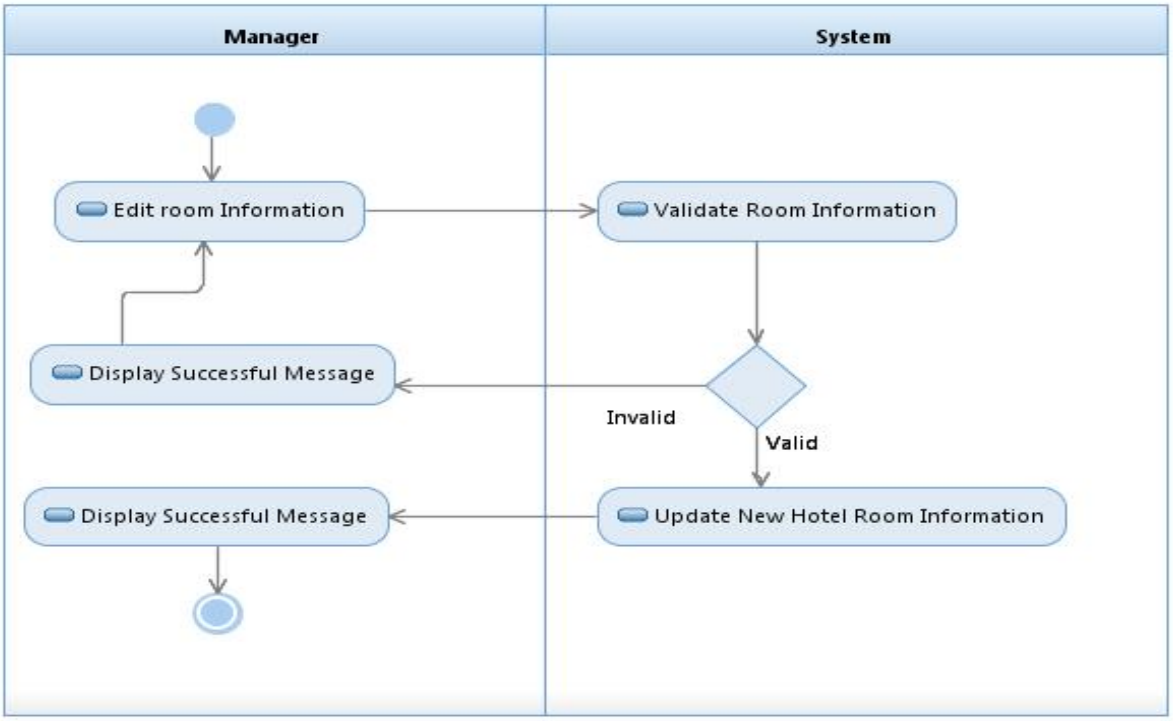
Fig 02: ER Diagram

4.1.3 Activity Diagram

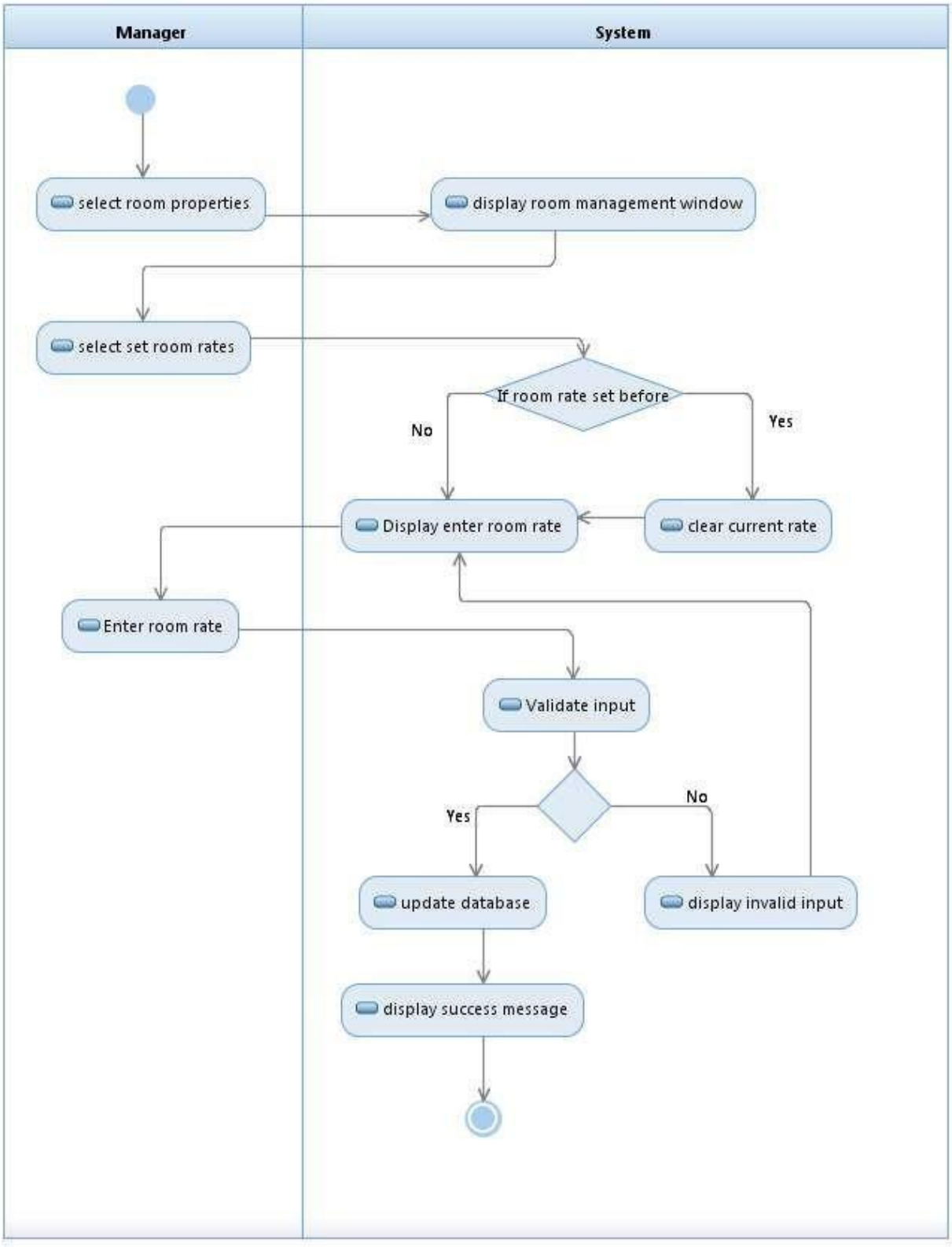
Add new Hotel Room by Manager



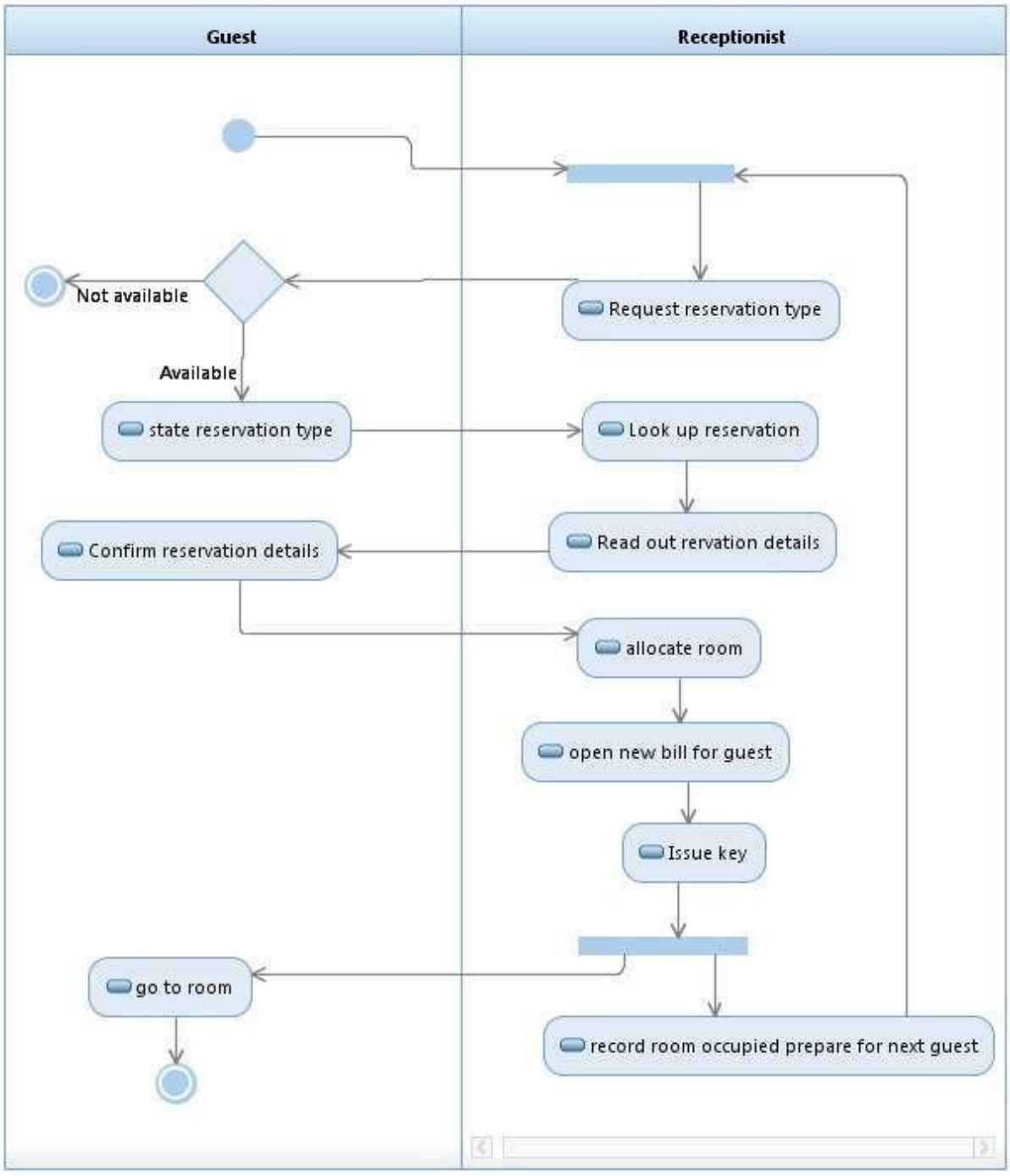
Edit Room by Manager



Set room rate by Manager



Make Room Reservation



4.2 Data Dictionary

Sample of Customer Data dictionary:

Entity	Attribute	Type/Size	Validation	Key
Customer	C_ID	Number(5)	10000-99999	Primary
Customer	Name	Text(40)	Required	
Customer	Email	Text(40)	Valid Mail	
Customer	Phone	Text(13)	Required	
Customer	Address	Text(50)	Required	
Customer	DOB	Date(8)	Valid Date	
Customer	NID_Num	Text(10)	Required	
Customer	Password	Text(32)	Required	
Customer	Confirm_password	Text(32)	Required	

Sample of Booking Data dictionary:

Entity	Attribute	Type/Size	Validation	Key
Booking	B_ID	Number(6)	100000-999999	Primary
Booking	C_ID	Number(5)	10000-99999	Foreign
Booking	Total_amount	Number(6)	(5000-100000)	
Booking	Payment_Status	Text(8)	Required	

Sample of Room dictionary:

Entity	Attribute	Type/Size	Validation	Key
Room	R_ID	Number(4)	(201-1640)	Primary
Room	R_type	Text(8)	Required	
Room	R_price	Number(6)	(5000-100000)	
Room	R-floor	Number(2)	Required	

4.3 UI/UX Design Specification

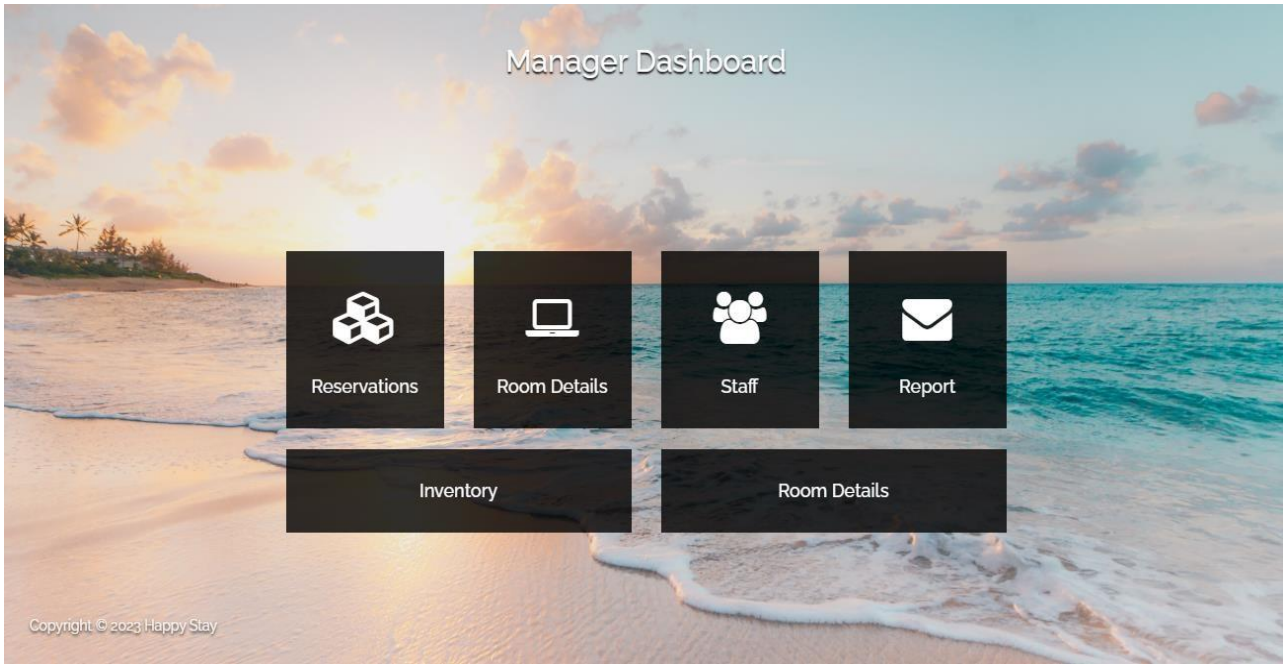


Fig 03: User friendly dashboard of system

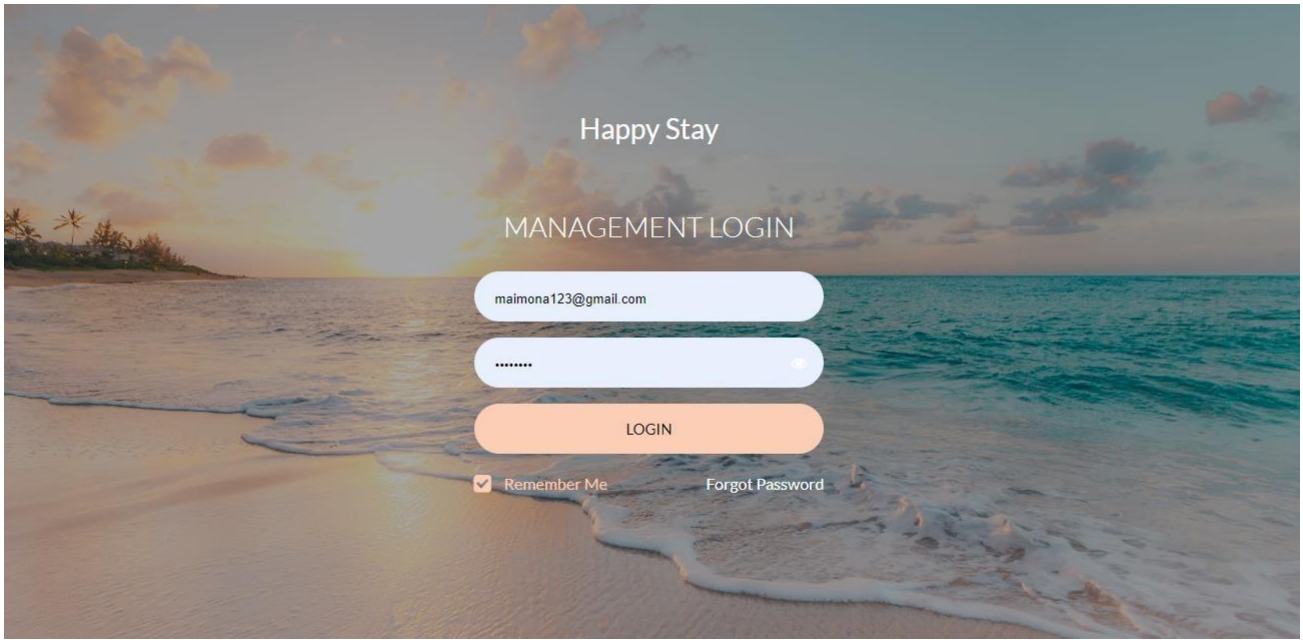


Fig 04: Login interface is used to login to the system using username and password for Management users and can be used same interface for different users.

Fig 05: User Interface for Customer

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