

FPT ACADEMY INTERNATIONAL FPT – APTECH COMPUTER EDUCATION

Hotel Management System

Supervisor: LÊ THANH NHÂN

Semester: 02

Batch No: *T2.2410.E0*

Group No: 02

Order:	Full name	Roll No.
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4.	Lê Quang Huy	Student1394600

Month: 08 Year: 2025

This i	s to certify that
	_
Mr.	HÒ AN THỊNH
Mr.	PHẠM ĐĂNG VINH
Mr.	NGUYỄN HOÀNG PHÚC
Mr.	LÊ QUANG HUY
Have suc	ccessfully Designed & Developed
н	OTEL MANAGEMENT
11	SYSTEM
Submitte	ed bv:
Date Of	Issue:
Authoriz	zed Signature:
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Content

Acknowledge

As we understand that the eProject is a step-by-step learning environment that closely simulates the class-room and Lab based learning environment into actual implementation. It is a project implementation at your fingertips!! An electronic, live juncture on the machine that allows you to.

- ✓ Practice step by step i.e. laddered approach.
- ✓ Build a larger more robust application.
- ✓ Usage of certain utilities in applications designed by user.
- ✓ Single program to unified code leading to a complete application.
- ✓ Learn implementation of concepts in a phased manner.
- ✓ Enhance skills and add value.
- ✓ Work on real life projects.
- ✓ Give a real-life scenario and help to create applications more complicated and useful.
- ✓ Mentoring through email support.

We would like to send a great thank to our professor and others student for the adorable supports during the time in project.

Beside several mistakes we had made in the project, we hope to have more opportunities to widen our knowledge in web developing world.

We also thank you so much for your information and the "demo" project from India APTECH to help us get more reality experience in this project. Since we have gained more experience from this project, we will not stop learning anything as much as we can to be more successful in the future.

Your Sincerely,

Team Group 04.

Synopsis



Design Plan:	Document Name: Problem Definition	SWD/Form No.01/PD/Ver1.0
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Problem Definition

1.1. Background

The Lotus Grand Hotel is a 45-room mid-sized hotel in Hồ Chí Minh city, Vietnam. The hotel has four floors with a mix of Standard and Deluxe rooms. It caters to tourists, business travelers, and families. Despite a growing customer base, the hotel relies heavily on manual systems for reservations, check-in/check-out, and billing.

1.2. Problems Identified

1.2.1. Reservation & Availability Issues

Bookings are recorded manually in spreadsheets and paper forms, causing double-bookings.

Guests often call to check availability, but staff cannot answer accurately without manually checking records.

1.2.2. Slow Check-In/Check-Out

Guests wait while staff manually verify reservations, calculate bills, and write invoices.

Delays cause dissatisfaction and poor reviews.

1.2.3. Room Status Confusion

Housekeeping updates are not real-time; front desk does not always know which rooms are clean or out of service.

This causes delays in assigning rooms to waiting guests.

1.2.4. Poor Financial Oversight

Revenue and expenses are recorded separately in spreadsheets.

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Management cannot generate daily occupancy or revenue reports efficiently.

1.2.5. No Security or Accountability

Paper records make it impossible to trace which employee handled a reservation or payment.

Mistakes or fraud cannot be tracked.

1.3. Problem Statement

1.3.1 General Requirements

- The hotel requires a desktop-based room management system to manage 45 rooms at The Lotus Grand Hotel.
- The system must allow staff to check which rooms are empty or occupied in realtime.
- The system must store basic guest information (full name, date of birth, phone number, email, check-in date, check-out date).
- The system must allow simple booking, check-in, and check-out operations.
- The system must allow staff accounts with different access rights (administrator, receptionist).

1.3.2. Functional Requirements

The receptionist should be able to:

- Register a guest and assign them to a room.
- View which rooms are available or occupied.
- Update check-in and check-out status.
- Search for guest information by name or room number.

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The manager should be able to:

- Create and manage staff accounts.
- Manage and edit room information (e.g., room number, capacity, room type (standard or VIP)).
- View system activity logs.

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Customer Requirements Specifications

Based on the issues above, the hotel management has defined the following requirements for the Hotel Management System:

2.1. Functional Requirements

2.1.1. Reservation Management

Create, edit, cancel reservations.

Check real-time room availability to prevent double-booking.

Support walk-in reservations.

2.1.2. Guest Management

Store guest information (name, DOB, contact, ID).

Maintain guest history (previous stays, preferences).

2.1.3. Room & Housekeeping Management

Show room status (Vacant, Occupied).

Track maintenance periods and reasons for out-of-service rooms.

2.1.4. Check-In/Check-Out

Simple workflow for check-in and check-out.

Auto-generate guest invoices with tax and service charges.

Allow early check-out or stay extension.

2.1.5. Billing & Payments

Create folios with line items (room rate, extras, service charges).

Record payments (cash, card, transfer).

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Issue refunds or adjustments with manager approval.

2.1.6. Reporting

Generate reports: occupancy rate, revenue summary, housekeeping status.

Export reports to PDF and CSV for sharing.

2.1.7. User Management & Security

Role-based access (Front Desk, Manager).

Audit log for key operations (reservations, payments, cancellations).

Secure authentication with username & password.

2.2. CRS/Requirements Specifications

Clie	ent/F	Project Undertaken:
1.	Lis	t of inputs to the system
	1	Receptionist:
		- Guest registration data (name, DOB, check-in/out dates)
		- Room assignment
		- Reservation creation/cancellation
		- Payment info
	2	Manager:
		- Add/edit/delete staff accounts
		- View reports
2.	Lis	t of outputs expected from the system
	1	Receptionist:
		- Updated room status (occupied or empty)
		- Guest list
		- Reservation confirmation
		- Invoice / receipt
	2	Manager:
		- Staff account updates
		- Occupancy and revenue reports
3.	Ov	erview of processes involved in the system
	1	Receptionist:
		- Check room availability

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	- Assign room
	- Record guest data
	- Calculate billing
2	Manager:
	- Validate staff data
	- Generate occupancy & revenue reports

Ad	min/Project Undertaken:		
1.	List of inputs to the system		
	System configuration		
	User account roles		
2.	List of outputs expected from the system		
	Updated system configuration		
	Role permissions applied		
3.	Overview of processes involved in the system		
	Validate admin actions		
	Apply system settings		
Ha	Hardware and software required for implementing the project		
1	Operating System: Windows 10 or higher.		
2	Hardware: Dual-core CPU, 2GB RAM or better.		
3	Software: JavaFX-based desktop application with Microsoft SQL server database.		
4	Unicode Fonts: Arial, Tahoma, Times New Roman, Lucida Console.		

2.3. CRS/Customer Acceptance Criteria

Sinh viên dùng cấu trúc để mô tả sau:

<u>Given</u> [precondition] <u>when</u> [action] <u>then</u> [result]

S.No	Customer's Acceptance Criteria
1	Given the manager is logged into the system
	When they view the dashboard
	Then they should see the current occupancy status of all rooms.
2	Given the receptionist is logged into the system
	When they check in a guest with valid details
	Then the system should mark the selected room as "occupied" and save the
	guest's info.

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Given the administrator has access rights
When they create a new staff account
Then the system should add the staff account with the assigned role and login credentials.

2.4. Project Plan

1. I	Project Details
+	Name of the Client:
	The Lotus Grand Hotel
+	Date of Project Plan:
	Start: 20 th August 2025
+	Project Vision/Objectives:
	The system aims to simplify and digitalize the management of the hotel's 45
	rooms, covering both standard and VIP categories. The vision is to reduce manual
	errors, improve staff efficiency, and provide quick access to customer and room
	information.
+	Scope:
	Develop a desktop-based hotel management system.
	Core features:
	- Room availability tracking (occupied, vacant, under maintenance).
	- Guest information storage (name, date of birth, contact).
	- Basic booking/check-in/check-out handling.
	Out of scope:
	- Online booking integration.
	- Mobile application support.
	- Complex payment gateway integration.
+	Our understanding of the client organization:
	The Lotus Grand Hotel is a medium-sized hotel with 45 rooms, ranging in
	capacity from 1 to 3 guests per room. Rooms are classified as Standard or VIP.
	The hotel requires a system that allows staff to quickly manage room status,
	record guest details, and assist with smooth daily operations.
+	Project Organization with Responsibilities and Authorities:
	- Client (Hotel Manager): Provides requirements, validates system features, final
	approval.
	- Reception Staff: End-users of the system; responsible for check-in/check-out
	operations.
	- Project Team (Developers/Students): Responsible for system design, coding, and

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testing.

- Project Leader: Coordinates tasks, ensures deliverables are on time.
- Instructor (Supervisor): Oversees project progress, provides guidance, ensures academic standards are met.

2. Project Initiation/Requirement Documents

- Design Documentation
- Installation Guide
- User Guide

3. Deliverables

- Design Documentation
- Installation Guide
- User Guide (include of maintenance Manual)
- Source Code

4. Project Dependencies

JavaFX for the graphical user interface.

Microsoft SQL Server for database management.

JDK for running the Java application.

Windows OS as the target deployment environment.

5. Major Project Milestones

- Review 1
- Review 2
- Review 3

6. Quality Plan

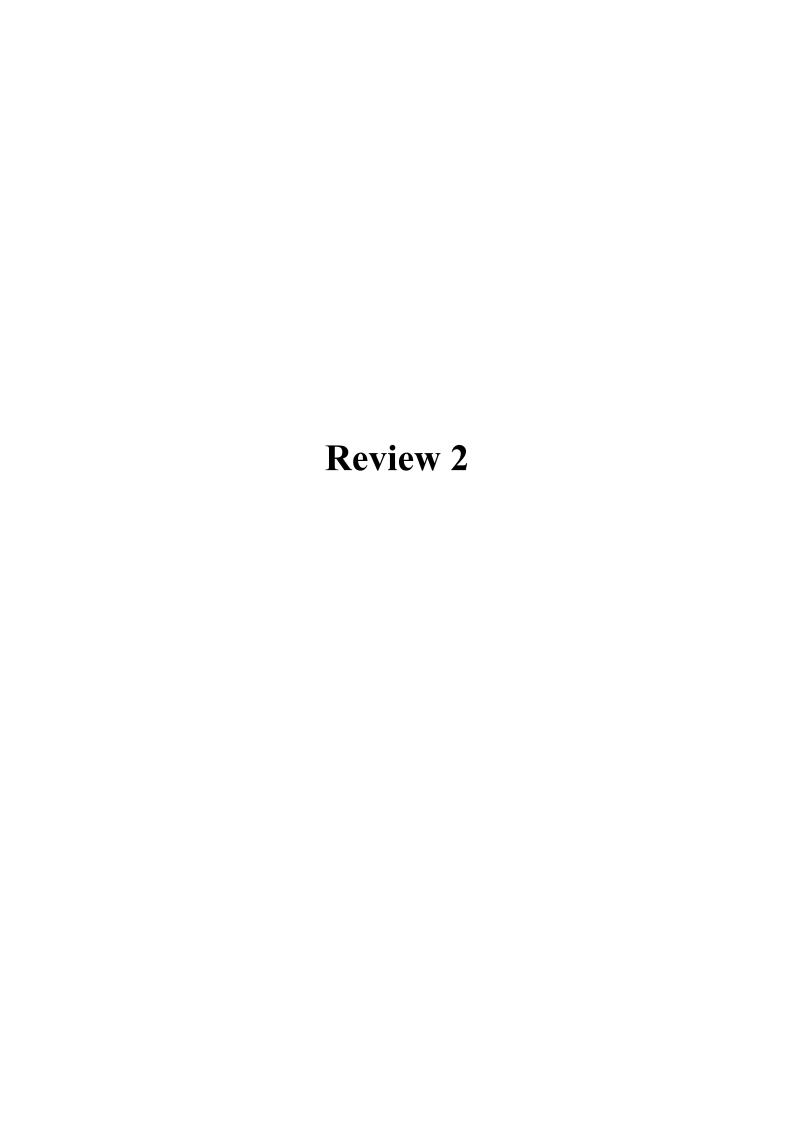
- + Review Activities:
 - Review meeting
 - Development meeting
- + | Testing Activities:

Final meeting

+ Backup and recovery strategies:

Finale meeting

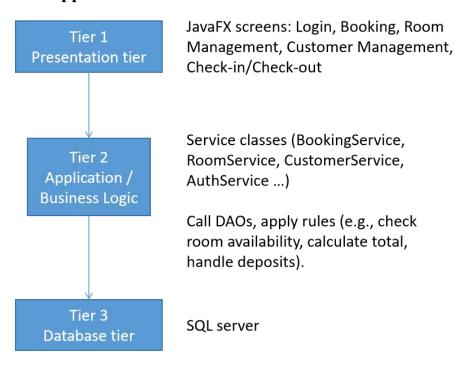
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Design Plan:	Document Name:	SWD/Form No.03/ARD/Ver1.0
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Architecture and design of the Application

3.1. Application Architecture



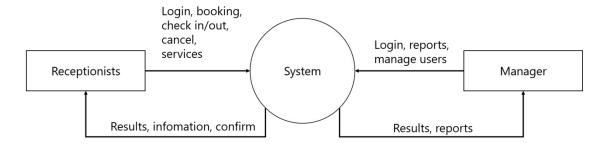
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3.2. Data Flow Diagram

3.2.1. **DFD** level 0

DFD Level 0

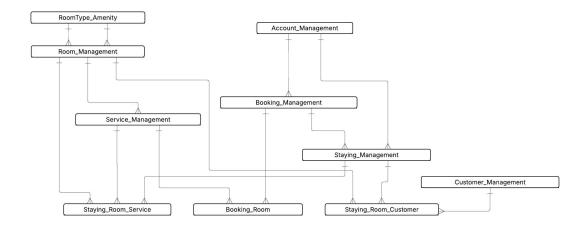


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Design Plan:	Document Name:	SWD/Form No.04/ERD/Ver1.0
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Entity Relationship Diagram

4.1. ERD



4.2. ERD Properties

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Table Design

5.1. Table Design

5.1.1. Staying_Management

Column name	Data type	Keys	Constraints	Description
Staying_id	nvarchar(100)	PK	NOT NULL	Unique ID for each staying record
Booking_id	nvarchar(100)	FK, UNIQUE	References Booking_Management	Links staying to booking
Checkin_date	datetime		NOT NULL	Actual check-in date
Checkout_date	datetime		NOT NULL	Actual check-out date
Payment_method	nvarchar(50)		NOT NULL	Payment method used
Staying_status	tinyint		NOT NULL, DEFAULT 0	0 = occupied, 1 = checked out
Total_amount	int		NOT NULL, DEFAULT 0	Total bill amount
Created_at	datetime		NOT NULL	Record creation time
Updated_at	datetime		NOT NULL	Last update time
By_role	nvarchar(100)	FK	References Account_Management	User who created the record

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5.1.2. Staying_Room_Service

Column name	Data type	Keys	Constraints	Description
Staying_id	Invarchar(100)	PK, FK	References Staying_Management	Related staying
Room_id	nvarchar(100)	PK, FK	References Room_Management	Related room
Service_id	nvarchar(100)	PK, FK	References Service_Management	Related service
Quantity	int		NOT NULL, DEFAULT 0	Number of times service used

5.1.3. Account_Management

Column name	Data type	Keys	Constraints	Description
username	nvarchar(100)	PK	NOT NULL	User login ID
pass	nvarchar(100)		NOT NULL	User password
is_admin	bit		NOT NULL	1 = Admin, 0 = Normal user

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5.1.4. Room_Management

Column name	Data type	Keys	Constraints	Description
Room_id	nvarchar(100)	PK	NOT NULL	Unique ID for room
Room_category	nvarchar(50)	FK	References RoomType_Amenity (with Room_quality)	Room type (single, double, suite)
Room_num	nvarchar(100)	UNIQUE	NOT NULL	Displayed room number
Room_quality	nvarchar(50)	FK	References RoomType_Amenity (with Room_category)	Quality type per category
Room_price	int		NOT NULL	Room price
Room_status	tinyint		NOT NULL	0 = Empty, 1 = Occupied, 2 = Cleaning

5.1.5. RoomType_Amenity

Column name	Data type	Keys	Constraints	Description
Room_category	nvarchar(50)	PK	NOT NULL	Room category (single, double, suite)
Room_quality	nvarchar(50)	PK	NOT NULL	Quality type for category
Room_capacity	int		NOT NULL	Max occupancy capacity
Room_amenity	nvarchar(300)		NOT NULL	Amenities provided

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5.1.6. Customer_Management

Column name	Data type	Keys	Constraints	Description
Customer_id	nvarchar(100)	PK	NOT NULL	Unique customer ID
Customer_name	nvarchar(100)		NOT NULL	Full name
DOB	date		NULL allowed	Date of birth
Citizen_identity_number	nvarchar(50)	UNIQUE	NULL allowed	National ID (nullable for kids)
Is_foreigner	bit		NOT NULL	1 = Foreigner, 0 = VN
Gender	bit		NOT NULL	1 = Male, 0 = Female
Is_child	bit		NOT NULL, DEFAULT 0	1 = Child, 0 = Adult
Phone_num	nvarchar(20)		NOT NULL	Contact number

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5.1.7. Booking_Management

Column name	Data type	Keys	Constraints	Description
Booking_id	nvarchar(1 00)	PK	NOT NULL	Unique booking ID
Deposit_amount	int		NOT NULL	Deposit amount
Payment_method	nvarchar(5 0)		NOT NULL	Payment method
Booking_status	tinyint		NOT NULL	4=Received,3=Late,2=Active,1= Cancelled(hotel),0=Cancelled(customer)
Booking_date	datetime		NOT NULL	Booking creation date
Planned_checkin_date	datetime		NOT NULL	Scheduled check-in
Planned_checkout _date	datetime		NOT NULL	Scheduled check-out
Book_by	nvarchar(1 00)		NOT NULL	Booker's name
Book_contact	nvarchar(5 0)		NOT NULL	Contact info
Created_at	datetime		NOT NULL	Record creation
Updated_at	datetime		NOT NULL	Record last update
By_role	nvarchar(1	FK	References Account_Manag ement	Staff who created booking

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5.1.8. Service_Management

Column name	Data type	Keys	Constraints	Description
Service_id	nvarchar(100)	PK	NOT NULL	Unique service ID
Service_name	nvarchar(100)		NOT NULL	Service name
Service_price	int		NOT NULL	Price per service
Service_description	nvarchar(100)		NULL allowed	Description of service

5.1.9. Staying_Room_Customer

Column name	Data type	Keys	Constraints	Description
Staying_id	nvarchar(100)	PK, FK	References Staying_Management	Related staying
Room_id	nvarchar(100)	PK, FK	References Room_Management	Related room
Customer_id	nvarchar(100)	PK, FK	References Customer_Management	Related customer

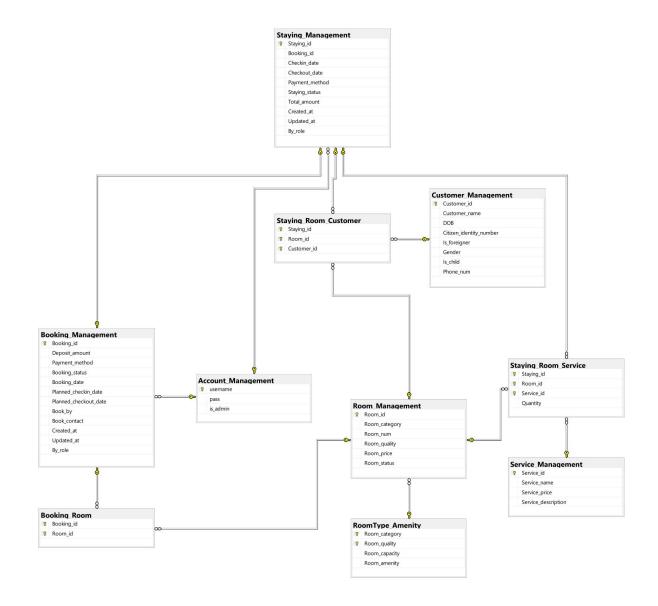
5.1.10. Booking_Room

Column name	Data type	Keys	Constraints	Description
Booking_id	nvarchar(100)	PK, FK	References Booking_Management	Related booking
Room_id	nvarchar(100)	PK, FK	References Room_Management	Related room

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5.2. Relationship Diagram

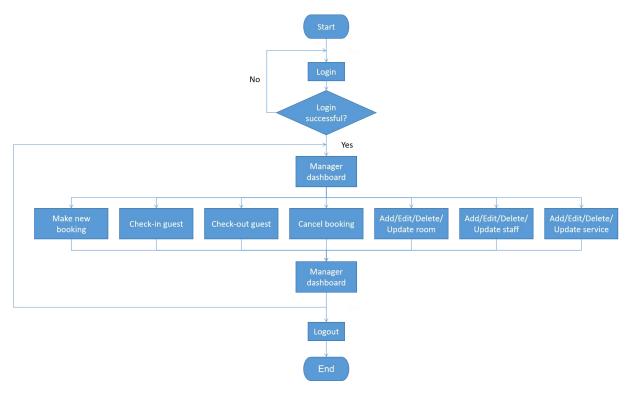


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Design Plan:	Document Name: Algorithm	SWD/Form No.06/ALG/Ver1.0
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Algorithm

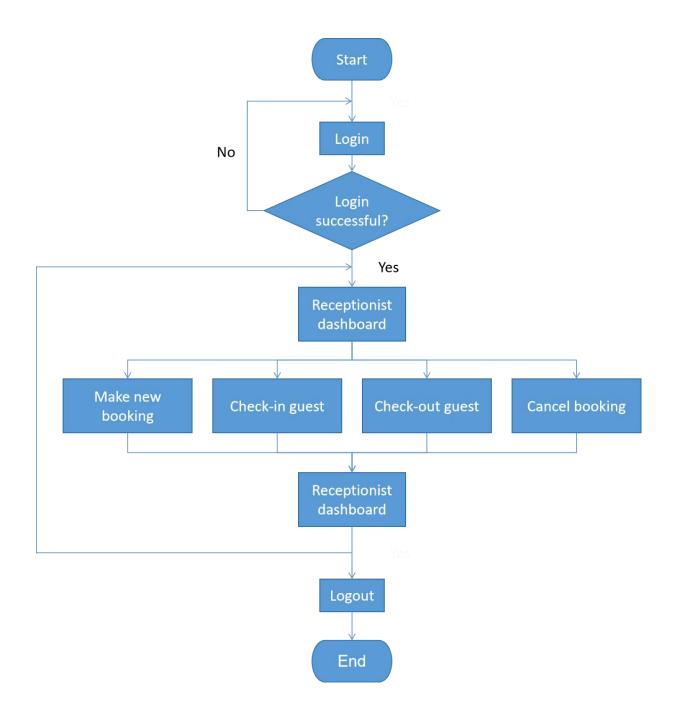
6.1. Administraror



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6.2. Staff



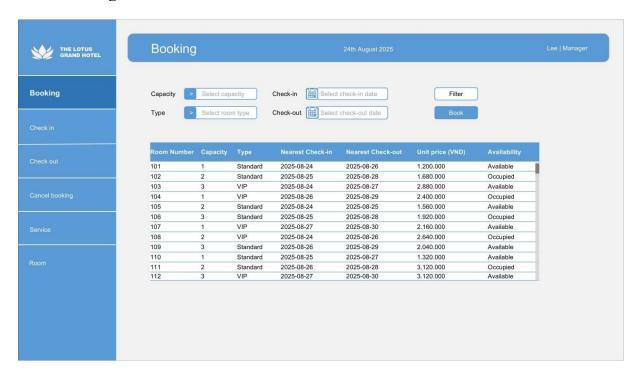
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Screen shots

7.1. Booking



Description: Used to create a new booking with customer details and stay duration.

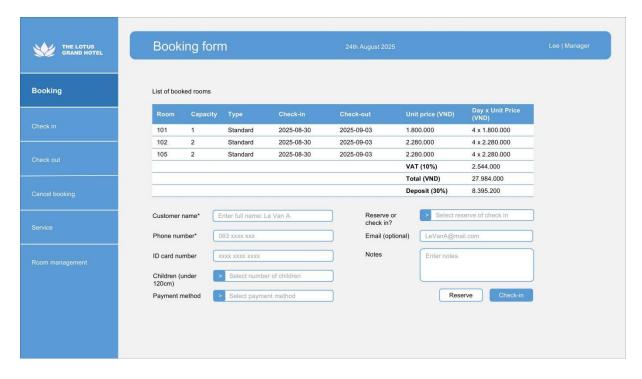
From: Opened from Main Menu \rightarrow Booking.

To: Leads to Booking Form (detailed info) or Invoice/Payment after confirmation.

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7.2. Booking form



Description: Detailed booking information, used for editing or confirming before saving.

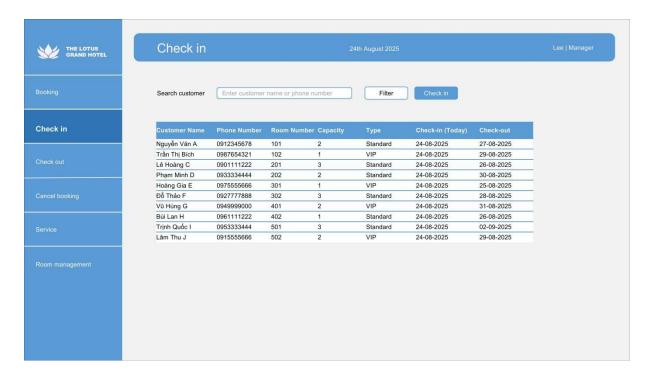
From: Opened after filling the Booking Screen.

To: Goes to Check-in screen once booking is confirmed.

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7.3. Check-in



Description: Used when customers arrive to confirm room assignment and check them in.

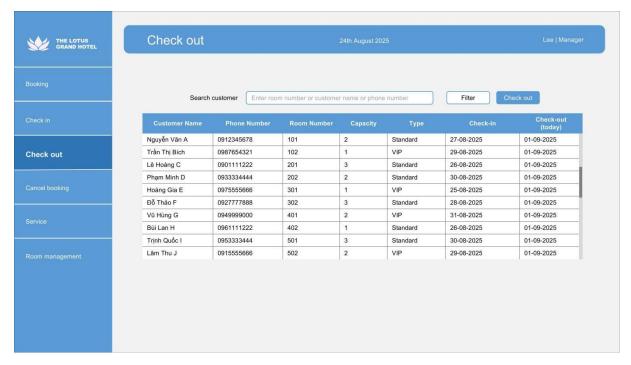
From: Accessed from Main Menu → Check-in.

To: Updates room status → leads back to Dashboard / Room Management.

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7.4. Check out



Description: Used to prepare a checkout for a customer.

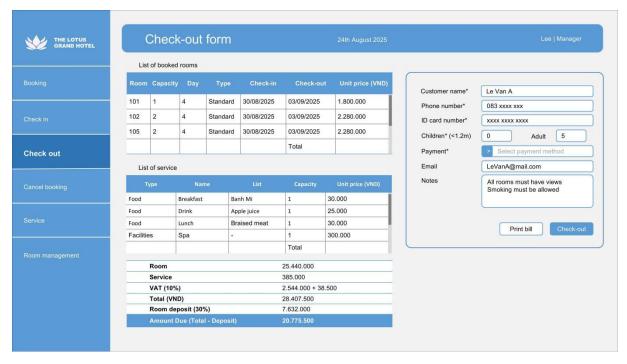
From: Main Menu → Checkout.

To: Opens Checkout Form.

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7.5. Check out form



Description: Displays detailed billing for the stay and services.

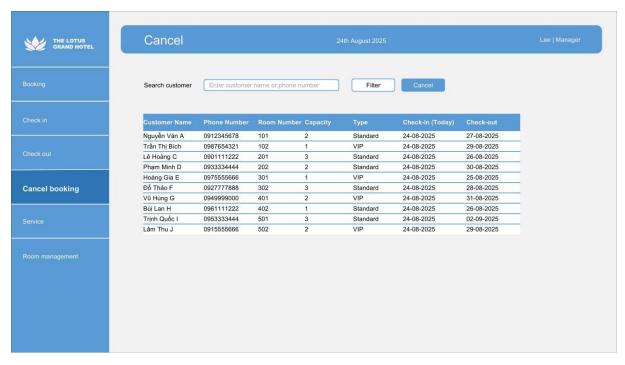
From: Opened from Checkout Screen.

To: Payment confirmation \rightarrow Booking closed.

	Prepared by (Student)	Approved by (Faculty)
	Project Group No:	LE THANH NHAN
Signature		
Date		

Design Plan: Hotel	Document Name: Screen shots	SWD/Form No.07/SS/Ver1.0
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7.6. Cancel



Description: Used to cancel an existing booking.

From: Main Menu → Cancel Booking.

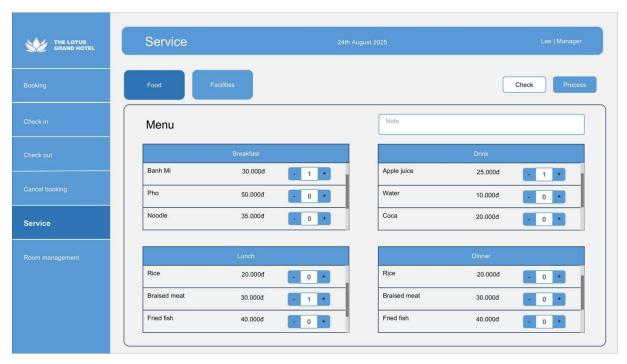
To: Updates system and frees room in Room Management.

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7.7. Service

7.7.1 Service - Food



Description: Manage extra services offered by the hotel (food & facilities).

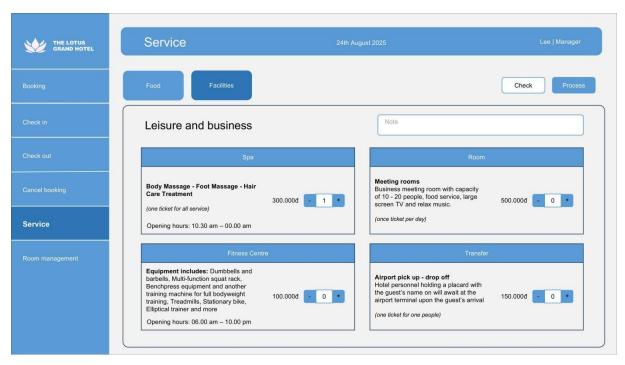
From: Main Menu → Services.

To: Linked to Checkout Form for billing.

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Date		

Design Plan: Hotel	Document Name: Screen shots	SWD/Form No.07/SS/Ver1.0
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7.7.2. Service - Facilities



Description: Manage extra services offered by the hotel (food & facilities).

From: Main Menu → Services.

To: Linked to Checkout Form for billing.

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Date		

Design Plan: Hotel	Document Name: Screen shots	SWD/Form No.07/SS/Ver1.0
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7.8. Room management



Description: Manage hotel rooms (add, update, delete).

From: Main Menu → Room Management.

To: Used by Booking, Check-in, Checkout to update room availability.

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Design Plan: Hotel	Document Name: Testing document	SWD/Form No.08/TD/Ver1.0
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Testing document

Sr.No	Features Tested	Remarks
1	Test cases (Check-in, Check-out, Booking, Cancel booking, Payment)	Pass
2	Test plan (Strategy for modules: Booking, Room, Customer, Staff)	Pass
3	Test scenarios (Cases: successful booking, cancellation, payment failure)	Pass
4	Test report (Results of hotel system module testing)	Pass
5	Requirements Specification (Requirements: manage guests, rooms, staff, invoices)	Pass
6	Functional Specification (Functions: Booking, Payment, Room management)	Pass
7	Use-Case Reports (Use cases: Customer booking, Manager report, Staff assignment)	Pass
8	Project plan(Hotel system project timeline)	Pass
9	Design Specifications (ERD, UI mockup, Database schema)	Pass
10	Prototype (Demo interfaces: Booking form, Dashboard, Cancel booking form)	Pass
11	User's Manuals (Guides for Staff/Manager usage)	Pass
12	Business Functions and Rules (Policies: booking rules, room pricing, refund rules)	Pass
13	Project or Business Risk Assessment (Risks: data loss, system overload)	Pass
14	Responsibilities (Roles: Manager, Staff, Developer, Tester)	Pass
15	Approvals (Confirmation from stakeholders/customers)	Pass

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Date		

Design Plan: Hotel	Document Name: Final checklist	SWD/Form No.09/FC/Ver1.0
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Final checklist

Sr.No	Aspect Tested	Suggestion/Remarks
1	Application launches successfully on all target	
	machines (Windows)	
2	Login screen functions correctly: Test with	
	valid/invalid credentials	
3	User roles: Admin/Receptionist/Staff permissions	
	display and work correctly	
4	Dashboard displays correct information (available	
	rooms, bookings, revenue, etc.)	
5	Room management: Add, edit, delete, and search	
	rooms work as expected	
6	Customer management: Add, edit, delete, and search	
	customers work correctly	
7	Booking system: Room booking, cancellation, and	
	room change functions work correctly	
8	Billing/Payment module: Total calculation, invoice	
	printing, and payment processing are correct	
9	Check-in/Check-out process: Functions are complete	
	and accurate	
10	Reports: Revenue, customer, and room reports display	
	accurate data	
11	Database connectivity: Connection with database	
	(SQL Server) is stable	

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Signature		
Date		

Design Plan: Hotel	Document Name: Final checklist	SWD/Form No.09/FC/Ver1.0
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12	Validation: Input fields validate correctly (email,	
12		
	phone number, dates, etc.)	
13	Error handling: Clear error messages are shown	
	when issues occur (connection, invalid input, etc.)	
14	UI/UX: JavaFX interface is responsive, user-friendly,	
	and displays correctly on various resolutions	
15	Performance: Application loads quickly, screen	
	transitions are smooth, no lag	
16	Search & Filters: Searching and filtering for rooms,	
	customers, and bookings work correctly	
17	JavaFX controls: Buttons, menus, and TableViews	
	work as expected	
18	Security: Password encryption and secure login	
	implemented	
19	Backup/Restore functionality: Data backup and	
	restore features work correctly	
20	Cross-platform testing: Application runs on multiple	
	operating systems (if required)	
21	Exception logging: Logs record errors properly for	
	debugging	
22	Installer/Executable packaging: .jar or .exe installer	
	runs smoothly	
23	Third-party libraries: All dependencies (JavaFX,	
	JDBC, Hibernate, etc.) integrate without errors	
24	Future feature placeholders: Unimplemented buttons	
	or menus display proper messages	

	Prepared by (Student)	Approved by (Faculty)
	Project Group No:	LE THANH NHAN
Signature		
Date		

Design Plan: Hotel	Document Name: Final checklist SWD/Form No.09/FC/N	
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25	Overall stability: Application does not crash under	
	heavy or repetitive operations	

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Signature		
Date		

Design	n Plan:	Document Name: Task Sheet	SWD/Form No.08/TS/Ver1.0		
Hotel M	/lanagement System				
Effectiv	ve Date:15-01-2025	Version 1.0	Page No: 36 of 41		

				Activity Plan	Date of Preparation of Activity Plan			
No	Member	Contents		Table Name	Planed Start Date	Actual Start Date	Actual Days	Status
1		Admin		Staying_Management	01/01/2002	01/01/2002	5	OK
2	Hồ An Thịnh				01/01/2002	01/01/2002	5	OK
3	HO Ali Tujun	TT	Checkin		01/01/2002	01/01/2002	5	OK
4		User			01/01/2002	01/01/2002	5	OK
1			D		01/01/2002	01/01/2002	5	OK
2	Phạm Đăng Vinh	Admin	Room management Service management	Service Management	01/01/2002	01/01/2002	5	OK
3		Ser	Room_	Room_Management	01/01/2002	01/01/2002	5	OK
4		User			01/01/2002	01/01/2002	5	OK
1		Admin			01/01/2002	01/01/2002	5	OK
2	N		01/01/2002	01/01/2002	5	OK		
3	Nguyễn Hoàng Phúc	User Check-out	Check-out	Accout_Management	01/01/2002	01/01/2002	5	OK
4			Staff management		01/01/2002	01/01/2002	5	OK
1	1.00 11	Admin			01/01/2002	01/01/2002	5	OK
2			D 1: M	01/01/2002	01/01/2002	5	OK	
3	Lê Quang Huy	$ R_{\ell} $	Booking	Booking_Management Customer Management	01/01/2002	01/01/2002	5	OK
4		User	Cancel Customer_ivianagement	01/01/2002	01/01/2002	5	OK	

	Prepared by (Student)	Approved by (Faculty)
	Project Group No: 04	LE THANH NHAN
Signature		
Date		

