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## Introduction

Today in Singapore, restaurant owners in Singapore are scratching their head over a very costly issue which is no-shows by diners who have made reservations. The costs of no-shows can add up quickly with local restaurant owners revealing that it can affect up to 30% of their monthly profit/loss. Besides loss revenue, restaurants also have to bear the additional cost of food preparation and extra manpower also dealing with the frustration of walk-in diners turned away (CNA, n.d.).

On the other side of the table, a survey done by Rakuten in 2022 (Hirschmann, n.d.) revealed that a whopping 61% of Singaporeans did not regularly make reservations while dining out. A common reason cited was because the restaurant/dining place did not have a proper systematic booking system in place.

To bridge the gap between restaurant owners and diners, we are proposing The Restaurant Booking System (RBS) which aims to enhances dining experiences by providing a seamless online reservation solution for diners and restaurant managers. It offers intuitive interfaces for easy booking, modifications, and management of reservations, ensuring operational efficiency and customer satisfaction in a scalable and secure environment. Also, offering insightful reports based on the data available from historical bookings to allow restaurant management to better plan out their resources and better utilized the space.

## Problem Statement

Restaurants often struggle with managing reservations efficiently and dealing with no-shows by diner, leading to customer dissatisfaction and loss of revenue due to overbooking or underutilization of space. Our Restaurant Booking System (RBS) aims to solve these issues by offering a web-based application for diners and a management interface for restaurant staff, enabling real-time booking, updates, and cancellations. Targeting restaurant managers and diners, RBS will streamline the reservation process, improve operational efficiency, and enhance the dining experience. Restaurant managers can also generate reports based on historical bookings and better plan out their resources.

## Objectives

The objective of the Restaurant Booking System is to streamline the reservation process for both diners and restaurant staff, enhancing operational efficiency and customer satisfaction through an intuitive, real-time booking interface.

1. Streamline reservation process for both diners and restaurant staff
2. Enhancing operational efficiency
3. Improve customer satisfaction through an intuitive, real-time booking interface
4. Using data available to provide insightful reports to restaurant staff

## System Requirement Specifications (SRS)

## Requirements Elicitation

The team have adopted the following methods of elicitation:

**Interviews**

* **Description:** One-on-one conversations with stakeholders to gather detailed information about their needs and expectations.
* **Participants:** Restaurant Managers, Restaurant Staffs, Diners
* **Process:**
  1. Schedule interviews with key stakeholders.
  2. Prepare a set of open-ended questions.
  3. Conduct interviews, taking detailed notes.
  4. Summarize and analyze the information gathered.

## User Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement ID** | **Function** | **Priority** | **Rationale** |
| FR-001 | Search for Restaurants | High | Enable diners to search for restaurants by name. |
| FR-002 | View Restaurant Details | High | Allow diners to see basic details like restaurant hours, menu, and available time slots. |
| FR-003 | Make Reservation | High | Diners can book a table for a specific date & time, and number of guests, with the reservation immediately confirmed via a simple confirmation page. |
| FR-004 | Reservation Dashboard | High | A simple interface that shows all current and upcoming reservations |
| FR-005 | Manual Reservation Entry | High | Staff can enter reservations made via phone or in-person directly into the system. |
| FR-006 | Basic Reporting | High | Generate simple reports that show the number of reservations per day. |
| FR-007 | Admin View | High | Restaurant account creation, activation, deactivation, and amending the existing reservation. |
| FR-008 | Interactive Calendar |  | Diners can use an interactive calendar to see available slots and book more easily. |
| FR-009 | Modification and Cancellation |  | Enable diners to modify or cancel their reservations online. |
| FR-010 | Review and Ratings |  | After dining, users can rate their experience and leave feedback directly through the system. |
| FR-011 | Reminder |  | send the reminder to the user 1 day before. |
| FR-012 | Table Management |  | Tools to manage table layouts and visualize how reservations fill the restaurant space. |
| FR-013 | Customer Management |  | Track customer preferences and visit history for tailored services. |
| FR-014 | Enhanced Notifications and Alerts |  | Automated alerts for booking changes, cancellations, and reminders for upcoming reservations. |
| FR-015 | Advanced Reporting and Analytics |  | Detailed analytics on booking patterns, and customer demographics. |

## Scope

The scope of this project includes the development and integration of the following features and is separated into 2 phases.

## ****Phase 1: Basic Functionality****

**Diners:**

* **Search for Restaurants**: Enable diners to search for restaurants by name.
* **View Restaurant Details**: Allow diners to see basic details like restaurant hours, menu, and available time slots.
* **Make Reservation**: Diners can book a table for a specific date & time, and number of guests, with the reservation immediately confirmed via a simple confirmation page.

**Restaurant Staff:**

* **Reservation Dashboard**: A simple interface that shows all current and upcoming reservations.
* **Manual Reservation Entry**: Staff can enter reservations made via phone or in-person directly into the system.
* **Basic Reporting**: Generate simple reports that show the number of reservations per day.
* **Admin View**: Restaurant account creation, activation, deactivation, and amending the existing reservation.

### Functional Requirements Phase 1

**Diners**

|  |  |  |
| --- | --- | --- |
| **Items** | **Interface** | **Descriptions** |
| Search for Restaurant | Search by the restaurant name | * **Functionality**: Users can search for restaurants by name or location using a simple search bar. * **Validation**: Real-time checks to ensure search inputs are valid (e.g., non-empty, correct character types). |
| View Restaurant Details | Restaurant detail page | * **Functionality**: Displays basic details such as restaurant hours, menu, and available time slots. * **Data Display**: Information is directly fetched and displayed from the restaurant’s database entry. |
| Reservation | Restaurant detail page | * **Functionality**: Users can book a table by selecting the date, time, and number of guests. * **Confirmation**: Immediate on-screen confirmation message after booking, with minimal details like time, date, and booking ID. |
| Reservation detail page | * Display the booking detail information such as restaurant name, date & time, number of people (adult & child), * Ask the customer to input required info such as first name & last name, phone number, email address, and customer message for any special request. * Check T&C and redirect to the Confirmation page, check and confirm the booking. |
| Confirmation SMS | SMS | * Reservation confirmation message |

**Restaurant Staff**

|  |  |  |
| --- | --- | --- |
| **Items** | **Interface** | **Descriptions** |
| Reservation | Dashboard | * **Functionality**: Shows a list of all current and upcoming reservations. * **Data Handling**: Ability to refresh in real-time to show new or modified bookings. |
| Manual Reservation | Dashboard | * **Functionality**: Staff can manually input reservations made via phone or in-person. * **Validation**: Checks for conflicting reservations before confirming. |
| Reporting | Report | * **Functionality:** Generate simple reports on daily bookings and availability. * **Validation: ?** |
| User Account Creation | User Management | Restaurant manager role  Restaurant staff role |

### Non-Functional Requirements Phase 1

|  |  |
| --- | --- |
| **Items** | **Descriptions** |
| Performance | * **Response Time**: The system should load any page within 2 seconds under normal operation conditions. * **Capacity**: Handle up to 100 concurrent users without performance degradation. |
| Usability | * **User Interface**: The interface must be intuitive and easy to navigate for users with minimal training. |
| Reliability | * **Availability**: The system should be available 99% of the time, excluding planned maintenance. * **Recovery**: In case of failure, the system should be able to recover and restart within 2 minutes. |
| Security | * **Data Protection**: Ensure all personal and payment information is encrypted. * **Access Control**: Implement role-based access control to ensure users can only access functionalities pertinent to their role. |
| Scalability | * The system should be designed to easily scale up to handle an increased load of up to 500 concurrent users by adding additional resources without major changes to the architecture. |

## ****Phase 2: Additional Functionality****

**Diners:**

* **Interactive Calendar**: Diners can use an interactive calendar to see available slots and book more easily.
* **Modification and Cancellation**: Enable diners to modify or cancel their reservations online.
* **Reviews and Ratings**: After dining, users can rate their experience and leave feedback directly through the system.
* **Reminder**: send the reminder to the user 1 day before.

**Restaurant Staff:**

* **Table Management**: Tools to manage table layouts and visualize how reservations fill the restaurant space.
* **Customer Management**: Track customer preferences and visit history for tailored services.
* **Enhanced Notifications and Alerts**: Automated alerts for booking changes, cancellations, and reminders for upcoming reservations.
* **Advanced Reporting and Analytics**: Detailed analytics on booking patterns, and customer demographics.

### Additional Functional Requirements Phase 2

**Diners**

|  |  |  |
| --- | --- | --- |
| **Items** | **Interface** | **Descriptions** |
| Interactive Calendar | Restaurant detail page | * **Functionality**: A dynamic calendar for easier date selection, showing real-time availability. * **Data Interaction**: Calendar updates based on the selected month to show available and unavailable days. |
| Modification and Cancellation | My Reservation | * **Functionality**: Allow users to modify or cancel their reservations through their user account. * **Validation & Confirmation**: Real-time validation of changes and instant confirmation messages. |
| Reviews and Ratings | Restaurant detail page | * **Functionality**: Users can rate their dining experience and leave feedback for each reservation they have completed. * **Data Handling**: Reviews are stored and linked to the specific restaurant within the database. |

**Restaurant Staff**

|  |  |  |
| --- | --- | --- |
| **Items** | **Interface** | **Descriptions** |
| Table Management | Dashboard | * **Functionality**: Visual tool for managing table layouts and reservation placements. * **Data Interaction**: Dynamic updating of table availability based on current reservations. |
| Advance Customer Management | Customer Management | * **Functionality**: Track customer preferences and history for offering personalized services. * **Data Utilization**: Use of historical data to send targeted promotions or suggest preferred booking times. |
| Noti and Alert Enhancement |  | * **Functionality**: Automated alerts for reservation changes, upcoming bookings, and operational notifications. |
| Reporting and Analytics | Report | * **Functionality**: Detailed reports on customer behavior, peak times, and revenue statistics. |

### Non-Functional Requirements Phase 2

|  |  |
| --- | --- |
| **Items** | **Descriptions** |
| Performance | * **Efficiency**: Improved caching mechanisms to reduce load times and database queries for frequent operations. * **Load Balancing**: Implement load balancing to distribute user load evenly across servers. |
| Usability | * **Localization**: Support multiple languages to cater to a diverse user base, enhancing the system’s usability in non-English speaking regions. |
| Reliability | * **Data Backup**: Automated daily backups and a clear, tested backup restoration procedure. |
| Security | * **Regular Audits**: Conduct security audits bi-annually to identify and rectify vulnerabilities. * **Advanced Authentication**: Implement multi-factor authentication for accessing sensitive areas of the system. |

## User Activity Diagram

[https://lucid.app/documents/embedded/67c364a2-e3f9-4c75-9d5a-37bef9b744cf?invitationId=inv\_360925f3-e9ce-442c-83c0-b76fa042254b#](https://lucid.app/documents/embedded/67c364a2-e3f9-4c75-9d5a-37bef9b744cf?invitationId=inv_360925f3-e9ce-442c-83c0-b76fa042254b)

## Implementation & Testing

## Documentation

## Github

## Meeting Minutes

## Database ERD

**A computer screen shot of a computer

Description automatically generated**

# References

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