SCHOOL OF TECHNOLOGY

BACHELOR OF SCIENCE APPLIED COMPUTING PROJECT

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SYSTEM REQUIREMENTS SPECIFICATION

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Table of Contents

1. INTRODUCTION 4

1.1 PURPOSE 4

1.2 SCOPE 4

1.2.1 What the system will do: 4

1.2.2 What the system will not do: 5

1.3 Definitions, Acronyms, and Abbreviations 5

1.4 OVERVIEW 5

2 GENERAL DESCRIPTION 7

2.1 System Functionality 7

2.2 System Functionality 7

2.3 User Characteristics 8

2.4 General Constraints 8

2.5 Assumptions and Dependencies 9

3 SPECIFIC REQUIREMENTS 10

3.1 Functional Requirements 10

3.1.1 Outputs and Inputs 10

3.1.2 Processing 10

3.1.3 Responses to Abnormal Situations 11

3.1.4 Methods for Data Transformation 11

3.2 User Interface Requirements 11

3**.2.1 User Interfaces:** 11

3**.2.2 Hardware Interfaces:** 11

3.2.3 Software Interfaces: 12
4 APPENDICES 13
4.1 Survey Results 13
4.1.2 Restaurant Owner Interviews 13
4.1.3 Customer Questionnaires 13
4.2 Sample Data 14
4.3 Glossary of Terms 15

1. INTRODUCTION

1.1 PURPOSE

The goal of this System Requirement Specification (SRS) document is to provide a clear and detailed understanding of the Restaurant Booking System. This document outlines the system's specific requirements and functionality, providing a detailed blueprint for its development.

The project's core objective is to develop an innovative Restaurant Booking System to streamline the process of reserving tables, thereby enhancing the dining experience for customers. This SRS will outline the system's specific requirements, both functional and non-functional, to offer clear direction to the key stakeholders involved in the project.

1.2 SCOPE

The scope of the **Restaurant Booking System** is precisely defined to distinguish what the system will and will not do. This section outlines the system's primary functionalities, both functional and non-functional, as well as its inherent limitations.

1.2.1 What the system will do:

Functional Features:

1. Table Reservation: Users can easily browse and reserve restaurant tables for specific dates and times, ensuring a smooth and efficient reservation process.

2. User Registration: Diners can create personal accounts within the system, granting them access to manage their reservations efficiently and conveniently.

Non-Functional Features:

1. User-Friendly Interface: The system has an intuitive and user-friendly user interface that was designed with ease of use in mind. This feature ensures

that users can navigate the system easily and make reservations without difficulty.

2. Performance: The system is designed to meet the demands of a large number of concurrent users, ensuring optimal performance even during peak reservation periods. It is intended to maintain exceptional responsiveness and efficiency throughout its operation.

1.2.2 What the system will not do:

While the Restaurant Booking System provides a variety of useful features, it is important to understand its limitations and what it does not provide:

Food Ordering and Menu Management: The system is solely for table reservations. It will not make food ordering, menu management, or other food-related services easier. The primary goal remains to provide customers with an efficient booking process.

Real-Time Menu Updates: No real-time updates on restaurant menu items, pricing, or other food-related information will be provided by the system. Any changes to the menu, such as additions, deletions, or pricing changes, will not be reflected in real time by the system.

1.3 Definitions, Acronyms, and Abbreviations

In order to facilitate a clear and consistent understanding of this document, the following definitions and acronyms are essential. These definitions aim to ensure that all project stakeholders interpret this document in a uniform manner.

1. **SRS:** System Requirement Specification
2. **API:** Application Programming Interface

1.4 OVERVIEW

The Restaurant Booking System SRS document contains a structured summary of the requirements for the system. It provides a clear understanding of the

system's perspective, functionality, user characteristics, constraints, and dependencies. This document is organized as follows:

1. Chapter 1 introduces the document's purpose, scope, definitions, and provides an overview of its contents.
2. Chapter 2 describes the general aspects of the system, including its perspective, functionality, user characteristics, constraints, and dependencies.
3. Chapter 3 delves into specific functional requirements, input and output descriptions, and user interface requirements.
4. Chapter 4 includes appendices with supplementary documents, survey results, sample data, and references.

2 GENERAL DESCRIPTION

2.1 System Functionality

The Restaurant Booking System will be a stand-alone application designed to simplify the process of making restaurant table reservations. It will also use APIs, ensuring seamless communication and data exchange. With this integration, the Restaurant Booking System will be able to retrieve restaurant data such as table availability and reservation information.

To provide a comprehensive view of the system's interaction with its surroundings:

The Restaurant Booking System will primarily serve as a stand-alone application, allowing users to browse restaurants, view table availability, and make reservations.

The system will access restaurant data, such as menu details, and real-time table availability, via external APIs, ensuring accurate and up-to-date information.

2.2 System Functionality

The Restaurant Booking System will offer a wide range of functionalities designed to enhance the user experience when booking tables in restaurants.

These functionalities will include:

1. User-Friendly Web Application: A user-friendly web application that allows customers to make restaurant reservations conveniently from their devices, reducing the reliance on phone calls or in-person visits.
2. Real-Time Table Availability: Providing real-time information on table availability to customers, ensuring they have accurate and up-to-date data when selecting reservation times.
3. Efficient Reservation Process: Streamlining the reservation process to improve efficiency for both customers and restaurant staff, minimizing manual effort and potential errors.
4. Convenience Enhancement: Enhancing the convenience of making reservations by eliminating the need for phone calls and offering an accessible online booking platform.

2.3 User Characteristics

The System caters to a wide range of users, each with their own set of characteristics, expectations, and needs:

1. **Customers:**

   Customers are the primary users of the System. They are diners looking to make restaurant reservations. Users range in technical expertise, from skilled computer users to those who are unfamiliar with online booking systems. For smooth reservations, the system must accommodate both groups by providing a user-friendly interface.

2. **Restaurant Employees:**

   Managers and waitstaff in restaurants interact with the System to manage reservations and oversee table allocation. Because their technical knowledge may differ, the System should provide an intuitive and efficient interface for staff to handle bookings effectively.

2.4 General Constraints

The System operates within specific constraints that are critical to its reliable and secure performance:

1. **Hardware Limitations**

   The System is designed to work within the hardware constraints of the hosting environment. It should operate efficiently and responsively within the hardware constraints specified, which may include limitations on processing power, memory, and storage.

2. **Regulatory Policies**

   The System is subject to regulatory policies that govern data access and modification. These policies ensure data privacy and security for both customers and the restaurant. Compliance with these policies is critical for retaining user trust.

3. **Safety and Security Considerations**

   The primary concerns are safety and security. The system must be designed to protect user data, prevent unauthorized access, and ensure

the security of online transactions. Implementing security measures is critical for maintaining user trust and data integrity.

2.5 Assumptions and Dependencies

The successful development and operation of the System rely on specific assumptions and dependencies:

Assumptions

1. Users have access to devices with internet connectivity for using the web application.
2. Customers are willing to adopt an online reservation system for restaurant bookings.
3. The restaurant's policies and procedures can be adapted to integrate with the System's functionality.

Dependencies

The System depends on the availability of internet access for users to access the web application.

It relies on the hosting environment (web server or cloud platform) for deployment and availability.

3 SPECIFIC REQUIREMENTS

3.1 Functional Requirements

3.1.1 Outputs and Inputs

The System has specific requirements for input sources, output destinations, quantities, units of measurement, and timing.

1. Inputs are primarily provided by two sources: When making reservations, customers enter information into the web application. When managing reservations and table allocation, restaurant staff enters input data.
2. Output Destinations: Outputs are directed to restaurant customers and staff. Customers receive outputs when they receive reservation confirmations, and staff receive outputs to efficiently manage bookings.
3. Quantities and Units of Measure: The System processes quantities related to reservation times, table availability, and user data. The units of measurement vary depending on the data being processed, such as date and user information.

3.1.2 Processing

The processing requirements involve several key aspects:

1. Validation of Input Data: The System should be capable of validating input data to ensure it adheres to specified formats and criteria. For instance, it should validate reservation times to prevent errors related to time format or date selection.
2. Exact Sequence of Operations: The System should execute a precise sequence of operations to process reservation requests. This sequence includes authenticating users, checking table availability, confirming reservations, and updating availability information.
3. Responses to Abnormal Situations: In case of errors, the System must provide clear and user-friendly responses to alert customers. For example, if a reservation cannot be made due to unavailability, the System should notify the customer and suggest alternative times.
4. The system executes a sequence of operations, including:

1. User authentication
2. Reservation data storage

3.1.3 Responses to Abnormal Situations

The system is designed to handle abnormal situations effectively. For instance, if a user attempts to make a reservation for a time slot that is already booked or enters invalid data, the system will display alert messages to guide the user on the correct course of action.

3.1.4 Methods for Data Transformation

The system employs algorithms to transform user inputs e.g., reservation time and guest count into suitable outputs e.g., table allocations

3.2 User Interface Requirements

3.2.1 User Interfaces:

1. The System's user interfaces include web pages for customers to make reservations.
2. Customers use forms and web pages to select reservation details, provide personal information, and confirm bookings.
3. Restaurant employees have access to interfaces for viewing reservation schedules, managing bookings, and updating table availability.

3.2.2 Hardware Interfaces:

1. Customers and restaurant employees require devices with standard hardware capabilities, such as internet connectivity, display screens, and input mechanisms (such as a keyboard or touch screen).
2. To ensure efficient performance, the System's hosting environment (web server or cloud platform) should meet specific hardware requirements, such as sufficient RAM, processor speed, and available disk space.

3.2.3 Software Interfaces:

1. The System operates as a web-based application, accessible through various web browsers on different operating systems.

   The software stack includes:

   1. **Operating System:** The system should be compatible with a range of operating systems, including but not limited to **Windows and macOS**.
   2. **Web Framework:** The system employs **React** for the frontend, which is a **JavaScript** library for building user interfaces. The backend is developed using **Node.js** and **Express.js.** Data is stored and retrieved from a **MongoDB** database.

4 APPENDIX

4.1 Survey Results

4.1.2 Restaurant Owner Interviews

Objective: To gather insights from restaurant owners regarding their reservation management challenges and expectations from the new system.

1. **Survey Date:** September 2023
2. **Survey Participants:** Restaurant owners and managers

Summary of Key Findings:

Reservation Management Difficulties:

Challenge 1: 75% of restaurant owners cited the current reservation management process as inefficient, resulting in overbooking and errors.

Challenge 2: 90% of respondents expressed concern about the lack of real-time information on table availability, which has an impact on customer satisfaction.

Challenge 3: 68% of respondents mentioned difficulties with the manual reservation process, such as missed reservations and data inaccuracies.

The New System's Expectations:

Expectation 1: 85% of participants stressed the importance of real-time table availability checks to help customers make informed reservations.

Expectation 2: 70% of respondents indicated a desire for a more efficient reservation process that reduces manual workload.

Expectation 3: 95% expressed an interest in using data analytics to improve decision-making and operational efficiency.

4.1.3 Customer Questionnaires

Objective: To gather insights from restaurant owners regarding their reservation management challenges and expectations from the new system.

1. **Survey Date:** September 2023
2. **Survey Participants:** Customers who frequently dine at restaurants

Summary of Key Findings:

Recent Reservations:

85% of respondents said the current reservation process is inconvenient because it often requires multiple phone calls.

The lack of real-time table availability information irritated 72% of respondents.

When making reservations, 64% of people said they encountered errors and inaccuracies.

New System Expectations:

For convenient reservations, 92% of participants expected a user-friendly web application.

The importance of real-time table availability updates was emphasized by 80% of respondents.

Sixty-eight percent of respondents said the new system should streamline the reservation process and reduce errors.

4.2 Sample Data

Reservation Details

Reservation ID	Customer ID	Reservation Date	Table ID
1	101	2023-10-15	3
2	102	2023-11-1	2
3	103	2023-11-10	2

Customer Information

Customer ID	Customer Name	Email
101	John Doe	Johndoe@gmail.com
102	Lisa Johnson	Lisajohnson@gmail.com

103	Jane Doe	Janedoe@gmail.com

Table Availability

Table Id	Table Number	Capacity	Occupied
1	01	2	True
2	02	4	False
3	03	6	True

4.3 Glossary of Terms

1. **SRS (System Requirement Specification):** A formal document that outlines the functional and non-functional requirements of the Restaurant Booking System and serves as a blueprint for its development.
2. **UI (User Interface):** The graphical or visual components of a system with which users interact, such as web forms, menus, and screens.
3. **UX (User Experience):** The overall experience of a user while interacting with the system, which includes usability, accessibility, and user satisfaction.
4. **API (Application Programming Interface):** A set of rules and protocols that enable different software applications to communicate and share data with one another.
5. **Database:** A database is a structured collection of data that is organized and stored electronically, containing information such as customer details, reservation records, and table availability.
6. **Front-end:** The front-end of a system is responsible for presenting data to users and facilitating their interactions. The web application built with HTML, CSS, JavaScript, and React is included in this project.

7. **Back-end:** The server-side component of the system that handles request processing, data storage and retrieval, and business logic management. It is built with Node.js, Express.js, and MongoDB.
8. **Reservation**: A reservation is a reservation made by a customer to reserve a table at a restaurant for a specific date and time.
9. **Availability Check:** A feature that allows users to check the availability of tables at a restaurant in real time for a specific reservation time
10. **Overbooking:** When a restaurant accepts more reservations than it has available tables, it creates potential problems and customer dissatisfaction.