ReserveWell
System-Wide Requirements Specification

Version History Table

Version	Date	Description
v1.0	4.11.2023	-
v1.1	8.11.2023	• Use cases are excluded from the requirements. • System Qualities are revised.
v1.2	25.11.2023	• Requirements are numbered to be referred from other documents.
v1.3	23.12.2023	• 2.5.3 is added.

1. Introduction

This document provides a comprehensive set of standards and requirements for the restaurant reservation platform, ReserveWell Application. The purpose of this document is to provide a detailed description of the functional and non-functional requirements that will guide the system's development, implementation, and testing.
With its user-friendly and quick reservation system, the ReserveWell Application responds to the demands of both restaurant owners and customers. This document's scope covers a number of issues, such as security, performance, usability, and functionality.

2. System-Wide Functional Requirements

2.1 User Support and Feedback:
2.1.1 The system should offer customer support through chatbot functionality, ensuring users can get assistance when needed.
2.1.2 Customers must have the option to provide feedback and rate their dining experiences, contributing to system improvements.

2.2 Integration with Restaurant Websites:
2.2.1 The system needs to integrate with individual restaurant websites to ensure reservation information is synchronized and up to date.
2.2.2 Reservation, payment, and capacity data should be seamlessly shared between the system and restaurant websites.

2.3 Security and Privacy:
2.3.1 The system should ensure the security of user data and protect sensitive information using industry-

standard encryption and access controls.
2.3.2 Users must have control over their data, including the ability to update or delete their information under appropriate authorization conditions.

2.4 Reliability and Availability:
2.4.1 The system must maintain high reliability, with minimal downtime during restaurant operating hours, aiming for at least 99.9% availability.
2.4.2 Regular maintenance and updates should be scheduled during non-operating times.

2.5 Scalability and Performance:
2.5.1 The system should handle a growing user base and maintain optimal performance, with a maximum response time of 3 seconds under standard (25 to 100 Mbps) internet connections.
2.5.2 Performance monitoring for memory consumption and response time optimization should be ongoing.
2.5.3 Number of concurrent users will be a thousand at maximum.

2.6 Feedback and Analytics:
2.6.1 The system must collect user feedback for continuous improvement and data-driven decision-making.
2.6.2 Users should provide feedback on their dining experiences within 10 seconds after a reservation or transaction.

2.7 Testing and Quality Assurance:
2.7.1 The system should undergo comprehensive testing, including unit and end-to-end tests, to identify and address issues before reaching users.
2.7.2 Continuous quality assurance processes must be in place.

2.8 Integration with External Services:
2.8.1 The system should integrate with external services such as payment platforms, Google Maps, and other relevant third-party systems.
2.8.2 Seamless integration with these services is crucial for system functionality.

2.9 User Training and Support:
2.9.1 The system should provide user support through chat and email, ensuring users can reach service assistants in under 5 minutes.
2.9.2 Training materials should be available for both customers and restaurant staff to ensure efficient system usage.

2.10 Localization:
2.10.1 The system should support multiple languages to accommodate diverse user segments, starting with English and expanding to other languages.
2.10.2 Cultural considerations should be considered for a seamless user experience.

3. System Qualities

3.1 Usability

The ReserveWell Application's usability is crucial to a simple and effortless user experience. The requirements that follow cover a range of usability issues:

3.1.1 ***Ease of Use:*** *The system needs to have a user-friendly interface that makes it simple for customers and restaurant managers to complete tasks with minimal effort. Actions should be straightforward, and user interfaces should be clear.*

3.1.2 ***Ease of Learning:*** *Users should only need a limited amount of training to become proficient with the application. Streamlined processes, clear labeling, and intuitive design will facilitate quick user training.*

3.1.3 ***Usability Standards:*** *The system should adhere to established usability standards and best practices. This entails maintaining consistent and intuitive navigation, employing clear and concise language throughout the interface, ensuring accessible fonts and responsive design for diverse users, implementing error prevention measures, and providing informative feedback. Additionally, compliance with accessibility standards, such as the Web Content Accessibility Guidelines (WCAG), is essential to create a reliable and user-friendly experience.*

3.1.4 ***Localization:*** *To accommodate a diverse user base, the system will support multiple languages and localized content. It should provide content and options relevant to the user's location and language preferences.*

3.2 Reliability

The ReserveWell Application's success depends mainly on its reliability, which ensures dependable and continuous performance. Aspects of reliability are considered by the following requirements:

3.2.1 ***Availability:*** *High availability is required of the system, with a minimum 99.9% uptime objective during restaurant working hours. To minimize downtime, maintenance procedures should be planned at off-peak hours.*

3.2.2 ***Frequency of Severity of Failures:*** *The system should routinely monitor and document all system errors and failures, categorizing them by type, frequency, and severity. This approach helps in identifying problems efficiently, aiming for resolution within an average of 24 hours from their occurrence.*

3.2.3 ***Recoverability:*** *The application is required to implement robust recovery measures to address system malfunctions and interruptions effectively. This includes the establishment of a data backup strategy where critical data is automatically backed up every 24 hours, with storage in both on-site and off-site locations, retaining historical data copies for at least 30 days. Redundancy is a vital component, ensuring N+1 redundancy for critical components and distributing traffic across multiple servers using load balancing. Failover mechanisms are set in place for swift response, automatically switching to backup servers within 30 seconds in case of a server failure, and database failover within 60 seconds, with network failover mechanisms ensuring uninterrupted connectivity even during network equipment failures.*

3.3 Performance

The ReserveWell Application's performance is essential to its responsive and effective operation. Performance attributes are addressed by the following requirements:

3.3.1 ***Response Time:*** *(For typical internet connections) the system should attempt a maximum response time of 3 seconds. To provide a great customer experience, quick reaction times are essential.*

3.3.2 ***Throughput:*** *An increasing user base should not result in a decrease in performance for the system.*

Concurrent user interactions, such as bookings, updates, and queries, must be supported.

3.3.3 ***Capacity:*** *To meet growing needs, the application must be scalable. Even at times of high utilization, resources should be dynamically allocated to preserve optimal performance.*

3.3.4 ***Startup and Shutdown Times:*** *The system should have quick startup and shutdown times that improve users' experience. User pleasure depends on quick starting and termination.*

3.4 Supportability

Supportability and maintainability ensure that the system can adapt to changing requirements and remain reliable. The following requirements address supportability aspects:

3.4.1 ***Adaptability and Upgrading:*** *Future improvements and upgrades should be supported by the system's design. Adjusting it to constantly changing technology and user requirements should be simple.*

3.4.2 ***Compatibility:*** *The program needs to work with a range of mobile devices and web browsers. To reach a wide user base, it should be tested and optimized for many platforms.*

3.4.3 ***Configurability:*** *Users should be able to set up their preferences within the system, including customers and restaurant managers. This covers things like food preferences, preferred meal hours, and preferred seating arrangements.*

3.4.4 ***Scalability:*** *As the user base expands, the system should be built to extend effortlessly. Equipment and resources should be scalable to accommodate rising demand.*

3.4.5 ***System Installation:*** *The installation process should be well-documented and straightforward for users and IT teams. Clear instructions and support should be available for system setup.*

3.4.6 ***Level of Support and Maintenance:*** *The application should provide user support through chat and email, ensuring quick response times. Additionally, maintenance operations, updates, and patches should be applied regularly to keep the system in optimal condition.*

These requirements in the "System Qualities" section ensure that the ReserveWell Application is not only user-friendly but also reliable, performant, and easy to maintain and upgrade to meet evolving user needs and technology standards.

4. System Interfaces

The ReserveWell Application requires a variety of interfaces to interact with users and external systems. These interfaces are essential for seamless operation, data exchange, and user engagement. The specific interface requirements are detailed in the following sections.

4.1 User Interfaces:

The user interfaces for the ReserveWell Application should be designed to meet user expectations, ensuring pleasant and efficient interaction.

4.1.1 Look & Feel:

The interface should reflect a modern, clean, and inviting aesthetic, with a focus on user-friendly colors and

a responsive design. The primary style should be minimalistic, with pastel colors. Interactions should be intuitive and visually appealing, encouraging users to explore the application.

4.1.2 Layout and Navigation Requirements:

- Major screen areas should be grouped logically, with distinct sections for customers and restaurant managers.
- Customer-facing screens should prominently feature restaurant listings, reservation details, and ratings.
- Restaurant manager screens should provide easy access to reservation management, table configurations, and performance analytics.
- Intuitive navigation menus and icons should guide users throughout the application.

4.1.3 Consistency:

- The user interface should maintain a consistent design language throughout the application to ensure predictability and ease of use.
- Elements such as navigation controls, screen area sizes, terminology, and data entry should follow standard conventions.
- The application should also maintain consistency with other related systems, facilitating data exchange and a unified experience.

4.1.4 User Personalization & Customization Requirements:

- Users should have the ability to personalize their experience based on preferences. This includes setting default dining locations, cuisine preferences, and notification settings.
- Restaurant managers should have the option to customize their restaurant's profile, including menu items, images, and reservation policies.

4.2 Interfaces to External Systems or Devices: The ReserveWell Application must interface with various external systems and devices to operate effectively and deliver value.

4.2.1 ***Software Interfaces:*** *The application should integrate with external software components, including:*

- Payment gateways for processing transactions securely.
- Location services for retrieving user location information.
- Social media platforms for user authentication and sharing features.
- Customer relationship management (CRM) tools for managing customer interactions.
- Booking and reservation systems to exchange data about restaurant availability.

4.2.2 ***Hardware Interfaces:*** *The software should support the following hardware interfaces:*

- Location services on mobile devices to determine a user's current location.
- Integration with restaurant hardware such as POS systems for updating reservation information.
- Compatibility with printers for generating reservation confirmations and invoices.

4.2.3 ***Communications Interfaces:*** *The ReserveWell Application should have the capability to communicate with various systems and devices through different communication channels, such as:*

- Internet-based communication with external services, including payment gateways and cloud-based storage.
- WebSocket connections for real-time updates and notifications.

These interface requirements ensure that the ReserveWell Application can effectively communicate with

users and external systems, providing a seamless and feature-rich experience while maintaining a consistent and user-friendly design.

5. Business Rules

Business rules are essential for governing various aspects of the ReserveWell Application's operations. These rules ensure that the application functions in accordance with business policies and requirements. They are organized into different rule classes, each of which represents a specific aspect of the business logic.

5.1 Reservation Management Rules:

This rule class encompasses rules related to the management of customer reservations, ensuring efficient and fair practices.

5.1.1 Rule 01 - Reservation Priority:

Description: If a restaurant is fully booked, prioritize reservations based on the following criteria:

- Customers with prior reservations should receive priority over walk-in customers.
- In case of multiple reservations for the same time slot, prioritize based on loyalty program membership, giving priority to loyal customers.
- If no loyalty membership is present, prioritize on a first-come, first-served basis.

5.1.2 Rule 02 - Maximum Group Size:

Description: Enforce a business rule to limit the maximum group size for online reservations:

- For fine-dining restaurants, the maximum group size is set to 8.
- For casual dining restaurants, the maximum group size is set to 12.
- Larger groups should be directed to contact the restaurant directly for special arrangements.

These business rules are crucial for maintaining fair reservation practices and ensuring the application's adherence to the restaurant's operational guidelines. They help in automating decision-making processes, such as reservation prioritization and group size limits, in a way that aligns with business requirements.

6. System Constraints

In this section, the constraints that have been mandated for the design, implementation, and deployment of the software project are outlined. These constraints are crucial in shaping the development process and ensuring that the software aligns with specific standards and limitations.

6.1 Third-party Components and Libraries:

- The software project may incorporate third-party components and libraries for specific functionalities, such as authentication, data visualization, and database management.
- All third-party components must meet security and licensing requirements. Comprehensive documentation and approval are necessary for integration.

6.2 Platform and Browser Support:

- The software should be compatible with modern web browsers, including but not limited to Google Chrome, Mozilla Firefox, Microsoft Edge, and Apple Safari.
- Responsive design principles must be followed to ensure a seamless user experience on both desktop and mobile devices.

6.3 Hardware and Resource Constraints:

- The software must adhere to resource limits, including server capacity, memory usage, and network bandwidth, as defined by the hosting infrastructure.
- Continuous monitoring and performance optimization are critical to maintain optimal resource utilization.

6.4 Data Security and Privacy:

- Stringent data security measures are to be implemented to safeguard sensitive user information.
- Compliance with relevant data protection regulations, such as GDPR, is mandatory to protect user privacy.

These system constraints serve as the guiding principles for the development of the software project, ensuring that it meets the specified standards and adheres to necessary limitations throughout its lifecycle.

7. System Compliance

7.1 Licensing Requirements

In this section, licensing requirements that the software must adhere to are adhered, including:

Usage License: The software shall only be used by authorized users with valid licenses.

Distributed Copies: Any distribution of the software must be accompanied by a copy of the software's end-user license agreement (EULA).

7.2 Legal, Copyright, and Other Notices

This part of the document addresses legal and copyright issues.

Copyright Notice: The software includes the following copyright notice: "Copyright © [Year], ReserveWell. All rights reserved."

Trademark Compliance: The software shall not use any third-party trademarks without proper authorization.

Warranty Disclaimer: The software carries a disclaimer stating that it is provided "as-is" without warranties of any kind.

7.3 Applicable Standards

Here, the applicable standards are referenced:

Usability Standards: The user interface of the software adheres to the ISO 9241-11 standard for usability.

Security Compliance: The software complies with the NIST Cybersecurity Framework to ensure data security.

Internationalization: The software follows the Unicode standard to support multiple languages and character sets.

8. System Documentation

This section outlines the requirements for system documentation, including user documentation, help systems, and the responsibilities associated with creating and maintaining them.

8.1 **User Documentation:** User documentation is an essential component of the system, providing guidance and support to users. The following requirements pertain to user documentation:

- **User Manuals:** The software shall have comprehensive user manuals available in both digital and printable formats.
- **Online Help:** An online help system shall be integrated into the software to assist users in real-time.
- **Tutorials:** Tutorials or guides should be provided to help users understand the software's functionality.
- **Responsibility:** The development team is responsible for creating and maintaining user documentation, ensuring that it remains accurate and up to date.

8.2 **Help Systems:** The software must offer help systems to aid users in navigating the system effectively. The requirements include:

- **Contextual Help:** The software shall provide context-sensitive help, delivering information relevant to the user's current task.
- **Search Functionality:** Users must be able to search for help topics using keywords.
- **Online Updates:** Help content should be updated regularly to reflect changes and improvements in the software.
- **Responsibility:** The responsibility for creating and maintaining help systems falls on the development and documentation teams.

8.3 **Help About Notices:** Help about notices offers information about the software version, copyright, and contact details. The following requirements apply:

- **Version Information:** The software's "Help About" section must display the current software version and release date.
- **Copyright Notice:** A copyright notice, including the software's copyright year and your company's name, should be present.
- **Contact Information:** Users must be provided with contact information for technical support or inquiries.
- **Responsibility:** The legal and documentation teams are responsible for maintaining accurate help about notices.

The system documentation is a critical component of ensuring that users can effectively utilize and troubleshoot the software. This section sets clear expectations and responsibilities for creating and updating this essential resource.