**Software Requirements Specification (SRS)**

**Project Name:** Menu.X  
**Version:** 1.0  
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**Author:** [Your Name]  
**Status:** Finalized for Development

**1. Introduction**

**1.1 Purpose**

This document provides a detailed description of the software requirements for **Menu.X**, a digital ordering and AI-powered menu management platform. It outlines the system's functionality, performance, design constraints, and external interfaces to ensure clear communication among stakeholders and guide the development process.

**1.2 Intended Audience**

* **Development Team:** To understand the technical requirements and design specifications.
* **Quality Assurance Team:** To develop test cases and ensure the system meets the specified requirements.
* **Stakeholders:** To verify that the system aligns with business objectives and user needs.

**1.3 Intended Use**

This SRS serves as the foundation for the system's design, implementation, and testing phases. It ensures that all parties have a shared understanding of the system's capabilities and constraints.

**1.4 Scope**

**Menu.X** aims to provide a comprehensive digital solution for restaurant owners and diners. The system will include:

* **Menu Management:** Tools for creating, updating, and managing digital menus.
* **Diner Interface:** A mobile-responsive platform for diners to view menus and place orders.
* **Smart Ordering System:** Real-time order updates and bill requests.
* **AI Features:** Menu digitization, sales forecasting, and personalized recommendations.
* **Analytics Dashboard:** Insights into sales trends, popular items, and peak service hours.

**2. Overall Description**

**2.1 Product Perspective**

**Menu.X** is a cloud-based platform leveraging Firebase for backend services and third-party AI APIs for advanced features. It is designed to be scalable, secure, and user-friendly, catering to the needs of modern restaurants and their customers.

**2.2 Product Features**

* **Secure Authentication:** Email/password and Google login options.
* **Menu Management:** CRUD operations, drag-and-drop reordering, and AI-assisted menu creation.
* **Diner Interface:** Mobile-optimized menu viewing and ordering.
* **Smart Ordering System:** Real-time order tracking and bill requests.
* **AI Features:** OCR-based menu upload, sales forecasting, and personalized recommendations.
* **Analytics Dashboard:** Visual representation of sales data and performance metrics.

**2.3 User Classes and Characteristics**

* **Restaurant Owners:** Require comprehensive tools for menu management and business insights.
* **Managers:** Need access to operational data and order management features.
* **Diners:** Seek a seamless and interactive dining experience.

**2.4 Operating Environment**

* **Frontend:** Responsive web application compatible with modern browsers (Chrome, Firefox, Safari).
* **Backend:** Firebase cloud services.
* **AI Integration:** Third-party APIs for OCR, forecasting, and recommendations.

**2.5 Design and Implementation Constraints**

* **Budget Constraints:** Limited to free-tier services for Firebase and AI APIs.
* **OCR Accuracy:** Dependent on the quality of AI models and menu designs.
* **Team Size:** Solo development with reliance on external services.

**3. System Features**

**3.1 Menu Management**

**Description:**  
Allows restaurant owners to create, update, and manage their digital menus.

**Functional Requirements:**

* **FR1:** The system shall allow users to add, edit, and delete menu items.
* **FR2:** The system shall support drag-and-drop reordering of menu items.
* **FR3:** The system shall provide an AI-assisted menu creation tool for digitizing physical menus.

**Non-Functional Requirements:**

* **NFR1:** The menu management interface shall be responsive and user-friendly.
* **NFR2:** The system shall handle up to 100 menu items per restaurant.

**3.2 Diner Interface**

**Description:**  
Provides diners with a mobile-optimized platform to view menus and place orders.

**Functional Requirements:**

* **FR1:** The system shall display the restaurant's digital menu.
* **FR2:** The system shall allow diners to place orders and request the bill.

**Non-Functional Requirements:**

* **NFR1:** The diner interface shall load within 3 seconds.
* **NFR2:** The interface shall be compatible with smartphones and tablets.

**3.3 Smart Ordering System**

**Description:**  
Enables real-time order tracking and bill requests.

**Functional Requirements:**

* **FR1:** The system shall provide real-time updates of diner orders to restaurant staff.
* **FR2:** The system shall allow diners to request the bill digitally.

**Non-Functional Requirements:**

* **NFR1:** The system shall process orders with a latency of less than 2 seconds.
* **NFR2:** The system shall support simultaneous orders from up to 50 diners.

**3.4 AI Features**

**Description:**  
Integrates AI capabilities for menu digitization, sales forecasting, and personalized recommendations.

**Functional Requirements:**

* **FR1:** The system shall use OCR to digitize physical menus.
* **FR2:** The system shall provide sales forecasts based on historical data.
* **FR3:** The system shall offer personalized menu recommendations to diners.

**Non-Functional Requirements:**

* **NFR1:** The OCR feature shall achieve an accuracy rate of at least 90%.
* **NFR2:** The AI models shall be updated quarterly to improve performance.

**3.5 Analytics Dashboard**

**Description:**  
Offers insights into sales trends, popular items, and peak service hours.

**Functional Requirements:**

* **FR1:** The system shall display revenue trends over time.
* **FR2:** The system shall highlight popular and underperforming menu items.

**Non-Functional Requirements:**

* **NFR1:** The dashboard shall update data in real-time.
* **NFR2:** The dashboard shall be accessible to authorized users only.

**4. External Interface Requirements**

**4.1 User Interfaces**

* **Restaurant Dashboard:** A web-based interface for menu management and analytics.
* **Diner Interface:** A mobile-responsive web page for menu viewing and ordering.

**4.2 Hardware Interfaces**

* **Server:** Firebase cloud infrastructure.
* **Client Devices:** Smartphones, tablets, and desktop computers.

**4.3 Software Interfaces**

* **Firebase:** Backend services for authentication, database, and hosting.
* **AI APIs:** Third-party services for OCR, forecasting, and recommendations.

**4.4 Communication Interfaces**

* **HTTPS:** Secure communication between client and server.
* **WebSockets:** Real-time updates for order tracking.

**5. System Attributes**

**5.1 Reliability**

* **R1:** The system shall have an uptime of 99.9%.
* **R2:** The system shall recover from failures within 5 minutes.

**5.2 Availability**

* **A1:** The system shall be available 24/7, excluding scheduled maintenance.

**5.3 Security**

* **S1:** The system shall encrypt sensitive data using AES-256.
* **S2:** The system shall implement role-based access control.

**5.4 Maintainability**

* **M1:** The system shall support modular updates without downtime.
* **M2:** The system shall provide logging for troubleshooting.

**5.5 Portability**

* **P1:** The system shall be deployable across multiple regions.

**6. Appendices**

* **A1:** Glossary of Terms
* **A2:** Acronyms and Abbreviations
* **A3:** References