Requirements Specification according to the IEEE 830 standard

Project Title: Waiter and Cash Automation System (SAMC)

22 de Decembre de 2024

Summary

The Waiter and Cash Automation System (SAMC) is a modern digital solution designed to streamline the operations of restaurants by automating the ordering and payment processes. Through QR code integration at each table, customers can access a user-friendly interface to browse the menu, customize orders, and complete payments efficiently.

This system benefits restaurant staff by providing real-time order notifications, inventory updates, and financial reporting capabilities, ensuring a smooth and error-free workflow. By minimizing manual processes, SAMC enhances customer satisfaction, reduces wait times, and optimizes resource utilization.

Key Features:

- **Digital Menu:** Customers can explore the menu and make selections directly from their mobile devices.
- **Payment Flexibility:** Supports both cash and bank transfer options.
- **Real-Time Notifications:** Orders are promptly communicated to the kitchen and billing systems.
- **Feedback Collection:** Customers can rate their experience, helping restaurants improve service quality.

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1. Introduction

This section provides an introduction to the Software Requirements Specification (SRS) document. It consists of several subsections: purpose, system scope, definitions, references, and an overview of the document.

1.1. Purpose

The purpose of this SRS document is to define the requirements for the Waiter and Cash Automation System (SAMC). It is intended for:

- **Restaurant Owners/Managers**: To improve operational efficiency and customer satisfaction.
- **Restaurant Staff**: To streamline the process of managing orders and payments.
- **Customers**: To enhance their dining experience by reducing wait times and enabling seamless payments.
- **Development Teams**: To provide a detailed guide for implementing the system.

1.2. System Scope

The Waiter and Cash Automation System (SAMC) will provide the following functionalities:

- **What the system will do:**
    - Enable customers to place orders digitally via QR codes on tables.
    - Allow payments through cash or bank transfers.
    - Generate real-time updates for inventory and sales records.
    - Facilitate customer feedback collection to improve services.
- **What the system will not do:**
    - It will not manage physical tasks such as food delivery or table cleaning.
    - It will not handle cash collection directly.
- **Benefits and Goals:**
    - Improve efficiency in order management and payments.
    - Minimize human errors in accounting and inventory updates.
    - Increase customer satisfaction through reduced waiting times and ease of use.

1.3. Definitions, Acronyms and Abbreviations

- SAMC: Waiter and Cash Automation System.
- QR Code: A machine-readable code used for accessing the system's menu.
- Order: A request for food and/or beverages by a customer.
- Inventory: A real-time record of available food items.

1.4. References

- User Manual for the Order Management System (PMS), Version 2.3, XYZ Software Solutions, 2022.
- Technical Specifications for the Secure Payment System (SPS), Version 1.1, ABC Financial Services, 2023.
- Personal Data Protection Regulation (NPDP), National Data Protection Agency, 2021.

1.5. Document Overview

This document is structured as follows:

1. **Introduction**: Overview, purpose, and scope.
2. **General Description**: High-level description of the system's functionality and context.
3. **Specific Requirements**: Detailed functional, non-functional, and design requirements.
4. **Appendices**: Supporting materials and references.

2. General Description

This section describes factors affecting the product and its requirements, providing a broader context for understanding the specific requirements outlined in Section 3.

2.1. Product Perspective

The SAMC is part of a larger restaurant management ecosystem. It integrates with:

- Existing Kitchen Systems: Sends real-time order notifications for food preparation.
- Billing Systems: Processes payment records and generates receipts.
- Mobile Platforms: Operates on Android and iOS devices.

2.2. Product Features

- Digital Menu: Customers access the menu via QR codes and make selections.
- Flexible Payment Options: Supports cash and bank transfers.
- Inventory Management: Automatically updates availability based on orders.
- Service Feedback: Collects customer ratings for service improvement.

2.3. User Characteristics

- ✓ Customers: General dining users with basic smartphone proficiency.
- ✓ Restaurant Staff: Employees with minimal technical expertise. Training Will be provided.
- ✓ Administrators: Managers who oversee system operations and analytics.

2.4. Restrictions

- ✓ Compatibility: Works only with Android and iOS devices.
- ✓ Programming Language: Developed using JavaScript for optimal cross-platform support.
- ✓ Internet Dependency: Requires stable internet connectivity for real-time operations.

2.5. Assumptions and Dependencies

- ✓ Assumes a consistent menu structure across all tables.
- ✓ Relies on the restaurant's existing Wi-Fi network for QR code accessibility.

2.6. Future requirements

- ✓ Integration: Possible expansion to integrate with loyalty programs and third-party delivery services.
- ✓ Enhanced Features: Adding multi-language support and analytics dashboards for better insights.

3. Specific Requirements

This section provides a detailed description of the functional and non-functional requirements for the Waiter and Cash Automation System (SAMC). Each requirement is structured to allow developers and testers to design, implement, and verify the system effectively.

3.1. External Interfaces

This subsection describes user, hardware, and communication interfaces for SAMC:

- **User Interface:**
  - ✓ Mobile-friendly design compatible with Android and iOS.
  - ✓ Accessible via QR codes on tables.
  - ✓ Menu display with dish descriptions, prices, and availability.
  - ✓ User-friendly payment confirmation and feedback submission screens.
- **Hardware Interfaces:**
  - ✓ Kitchen display system to show real-time orders.
  - ✓ POS (Point of Sale) system for payment validation.
- **Communication Interfaces:**
  - ✓ Wi-Fi-enabled QR code scanning for menu access.
  - ✓ Integration with the restaurant's billing and inventory systems.

3.2. Functions

The following are the key functional requirements for SAMC:

ID	Function	Priority	Description
F01	Digital Menu Access	High	Customers can scan a QR code to access a categorized menu, view dish details, and check availability.
F02	Order Placement	High	Allows customers to add items to their order, customize options, and confirm their selection.
F03	Payment Processing	High	Supports payments via cash (code generation) or bank transfer (receipt validation).
F04	Inventory Management	Medium	Automatically updates the availability of menu items based on orders placed.
F05	Notification System	High	Sends real-time order notifications to the kitchen system for preparation.
F06	Feedback Collection	Medium	Enables customers to rate their experience and provide feedback after their meal.

3.3. Performance Requirements

- Standards**:** The system must comply with data encryption and user authentication standards.
- Programming Language: Developed in JavaScript for frontend and backend functionality.
- Compatibility**:** Supports Android and iOS devices with responsive design for various screen sizes.
- Security**:** Implements encryption for sensitive data such as payment details and login credentials.

3.4. Desing Constraints

This subsection outlines the limitations and restrictions that influence the design decisions for the Waiter and Cash Automation System (SAMC):

- **Programming Standards:**
  - ✓ The system must adhere to current web development standards, including HTML5, CSS3, and JavaScript.
  - ✓ All sensitive data must comply with encryption protocols such as AES-256.
- **Hardware Limitations:**
  - ✓ Compatible only with mobile devices (smartphones and tablets) operating on Android and iOS.
  - ✓ Requires a stable Wi-Fi network to ensure seamless communication between the user and backend systems.
- **User Authentication:**
  - ✓ Login credentials are mandatory for staff access to administrative functions.
  - ✓ Customers can use the system without authentication for menu access and order placement.
- **Data Security:**
  - ✓ Payment information must be encrypted during transmission and storage.
  - ✓ Adherence to data privacy regulations, such as GDPR or local equivalents, is required.
- **System Integration:**
  - ✓ The system must integrate seamlessly with existing kitchen display systems and billing software.
- **Real-Time Processing:**
  - ✓ The design must support instant order updates to kitchen displays and inventory adjustments.

3.5. Other requirements

This subsection specifies additional requirements not covered in other sections:

- **Accessibility:**
  - ✓ The interface must be accessible to users with basic smartphone proficiency.
  - ✓ Include text resizing options and high-contrast modes for better usability.
- **Language Support:**
  - ✓ Provide bilingual support (English and Spanish) for menus, error messages, and feedback screens.
- **Audit Logs:**
  - ✓ The system should maintain logs of all orders, payments, and feedback for accountability and performance tracking.
- **Offline Functionality:**
  - ✓ Limited offline functionality to allow menu browsing and temporary order caching until the connection is restored.
- **Error Notifications:**
  - ✓ Display user-friendly messages for errors such as unavailable menu items or payment failures.

4. Appendages

This section includes supplementary information and supporting documents for the SAMC:

4.1 Input/Output Formats

- **Input Formats:**
  - ✓ QR code scans direct users to a mobile-friendly menu interface.
  - ✓ Customers select items, customize orders, and input payment details.
- **Output Formats:**
  - ✓ Receipts (digital or printable) include order details, payment confirmation, and feedback acknowledgment.

- ✓ Reports for daily sales, inventory updates, and customer feedback summaries.

4.2 Cost Analysis Results

- **Initial Development Costs:**
  - ✓ Estimated at $0 due to in-house development as a project.
- **Hardware Requirements:**
  - ✓ Two tablets for staff use ($200 each).
  - ✓ Two Wi-Fi access points ($50 each).
- **Projected Benefits:**
  - ✓ 95% reduction in order errors.
  - ✓ 25% faster customer service times.

4.3 Development Environment Constraints

- **Development Tools:**
  - ✓ Frontend: JavaScript.
  - ✓ Backend: Node.js with database support from MongoDB.
- **Testing Environment:**
  - ✓ Simulated restaurant settings for end-to-end testing.
  - ✓ Compatibility checks on Android and iOS devices.

4.4 Supporting Documentation

- User manual for customers and staff.
- Installation guide for system setup.
- Maintenance and troubleshooting documentation.