

**Palestine Technical University – Kadoorie**

**College of Engineering and Technology**

**Department of Computer Systems Engineering**

**Course name:**

**Software Engineering**

**Project title:**

**DESIGNING CANTEEN MANAGEMENT SYSTEM FOR STUDENTS AT PALESTINE TECHNICAL UNIVERSITY – KADOORIE IN TULKARM**

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Abstract

**Canteen automation system is an application for manual work in the canteen.**

**This app will help the canteen workers to get an idea of ​​the orders on that particular day.**

**This will also help avoid confusion with orders as they will be submitted digitally.**

**We need an app like this to manage this massive and unorganized crowd.**

**Canteens need to plan and manage menus effectively to meet diverse customer preferences and dietary requirements.**

**A cafeteria system helps simplify menu planning and management by providing the tools to create, update and customize menus based on customer requests.**

**Users will be able to place orders digitally, and customers will be happy after using this application because it is easy to use and saves time and effort.**

**1. Introduction**

**1.1 Purpose**

**The purpose of this Software Requirements Specification (SRS) document is to detail the requirements for the University Canteen Automation System (**CMS**). This document aims to provide a comprehensive guide for the development team to design, build, and implement a mobile application that automates the canteen operations at the university. The** CMS **will streamline the process of ordering food, managing payments, and gathering feedback, thereby enhancing the overall experience for students and staff.**

**1.2 Scope**

**The** CMS **is a mobile application developed using the Flutter framework, intended to operate on both Android and iOS devices. It is designed to facilitate various canteen operations, including digital food ordering, payment processing using university account credits, and feedback collection. The system will benefit students by allowing them to place orders conveniently and benefit canteen staff by simplifying order management and menu updates. The primary goal is to improve efficiency, reduce errors, and enhance user satisfaction within the university's canteen services.**

**1.3 Definitions, Acronyms, and Abbreviations**

CMS**: Canteen Management System**

**UI: User Interface**

**API: Application Programming Interface**

**DBMS: Database Management System**

**Flutter: An open-source UI software development kit created by Google**

**iOS: iPhone Operating System**

**1.4 References**

**IEEE Standard 830-1998: IEEE Recommended Practice for Software Requirements Specifications**

**1.5 Overview**

**This document is organized into the following sections:**

**Introduction: Provides an overview of the purpose, scope, and structure of the document.**

**Overall Description: Describes the general factors that affect the product and its requirements.**

**System Features: Details the specific features and functionalities required in the UCAS.**

**External Interface Requirements: Defines the user, hardware, software, and communication interfaces.**

**Other Requirements: Includes performance, security, and other system attributes**

**2. OVERALL DESCRIPTION**

**2.1 PRODUCT PERSPECTIVE**

The CMS is a standalone application that integrates with the university’s existing account management system. It will provide a user-friendly interface for students to place orders, make payments, and provide feedback, while also helping canteen staff manage orders and menus efficiently.

**2.2 PRODUCT FEATURES**

****The major features of the CMS database system as shown in below **[entity relationship model](https://en.wikipedia.org/wiki/Entity%E2%80%93relationship_model" \t "_blank)** (**ER model**)

**2.3 USER CLASS and CHARACTERISTICS**

The Canteen Management System (CMS) will support two types of user privileges: Customers (Students) and Employees (Canteen Staff). Customers will have access to customer functions, while employees will have access to both customer and canteen management functions.

**Customer (Student)**

Customers are the primary users of the CMS. They are students who can place orders, make payments, and provide feedback. Customers can perform the following functions:

make a new order: Order individual items from the menu.

Order Confirmation: Review and confirm the order.

Cancel an Existing Order: Cancel an order before it is processed by the canteen.

View Order History: Check past orders and their details, including status, items, and payment information.

Provide Feedback: Submit feedback on orders and overall canteen service, including ratings and comments.

**Employee (Canteen Staff)**

Employees are responsible for managing orders, updating menu items, and viewing feedback. They have access to both customer and management functions. Employees can perform the following functions:

**All Customer Functions.**

**Manage Orders:**

View All Orders: See a list of all orders placed by customers.

Update Order Status: Change the status of orders (e.g., pending, in progress, completed).

View Customer Order Details: Get detailed information about customer orders, including items ordered,and payment status.

**Manage Feedback:**

View All Feedback: See feedback submitted by customers.

Respond to Feedback: Address customer concerns or comments if needed.

**Administrative Functions**

**Manage Menu**

Add/Delete Menu Items: Update the menu by adding new items or removing existing ones.

Update Item Details: Modify details of menu items, such as name, price, and description.

Update Item Availability: Change the availability status of items (e.g., available, out of stock).

**Manage Canteen Information**

Add/Delete Canteens: Add new canteen locations or remove existing ones.

Update Canteen Details: Modify details of canteen locations, such as name and address.

**View Reports**

Daily Sales Report: Generate a report of total sales for a specific day.

Order Statistics: View statistics on orders, such as the number of orders placed, popular items, and peak order times.

Customer Activity: Get a list of active customers and their order history

**2.4 OPERATING ENVIRONMENT**

The University Canteen Automation System (CMS) will operate as a mobile application developed using Flutter, making it accessible on both Android and iOS devices. The system will require the following components:

**Client Side:**

Mobile devices running on Android or iOS operating systems.

The Flutter app will be installed on these devices, providing a responsive and intuitive user interface.

**Server Side:**

A backend server running a web server to handle requests from the mobile app.

A Database Management System (DBMS) to store and manage data, such as user information, orders, menu items, and feedback.

**Client-Side Requirements**

Supported Operating Systems:

Android: Version 6.0 (Marshmallow) and above.

iOS: Version 11.0 and above.

**Development Framework:**

Flutter: The mobile app will be developed using the Flutter framework, ensuring a consistent and high-quality user experience across both Android and iOS platforms.

**Server-Side Requirements**

Web Server: A web server (e.g., Apache, Nginx) to serve API requests from the mobile app.

Database: A robust DBMS (e.g., MySQL, PostgreSQL, MongoDB) to manage and store application data.

APIs: RESTful APIs or GraphQL to facilitate communication between the mobile app and the server.

**2.5 DESIGN and IMPLEMENTATION CONSTRAINTS**

Compliance with University IT Security Policies: The system must adhere to the university's IT security policies, ensuring the protection of sensitive data and compliance with relevant regulations.

Integration with University Account Management System: The system must integrate seamlessly with the university’s existing account management system for authentication and payment processing.

Technology Stack: The system will be developed using the following specific technology stack:

Frontend: Flutter framework for cross-platform mobile app development.

Backend: Node.js or Django for server-side processing.

Database: PostgreSQL or MongoDB for data storage.

APIs: RESTful APIs or GraphQL for communication between the mobile app and the server.

Hosting: Cloud-based hosting services such as AWS, Google Cloud, or Azure for scalability and reliability.

**2.6 ASSUMPTION DEPENDENCIES**

Active University Accounts: It is assumed that students have active university accounts with sufficient credits to make purchases through the canteen system.

University IT Infrastructure: The university’s IT infrastructure must support the necessary integrations, including authentication services, payment gateways, and data synchronization.

Staff Training: It is assumed that canteen staff will receive adequate training to use the system effectively, including managing orders, updating menu items, and handling customer feedback.

Internet Access: Reliable internet access is available for both students and canteen staff to ensure real-time data synchronization and seamless operation of the mobile app.

1. **Nonfunctional Requirements**
   1. **Performance Requirements :**

The system must be interactive, and the delays involved must be less. So, in every actionfi response of the system, there are no immediate delays. In case of opening windows forms, of popping error messages and saving the settings or sessions there is delay much below 2 seconds. In case of opening databases, sorting questions and evaluation there are no delays and the operation is performed in less than 2 seconds for opening, sorting, computing, posting 95% of the files. Also, when connecting to the server the delay is based editing on the distance of the 2 systems and the configuration between them so there is high probability that there will be or not a successful connection in less than 20 seconds for sake of good communication.

• Safety: Information transmission should be securely transmitted to server without any changes in information.

• Reliability: As the systems provide the right tools for discussion, problem solving it must be made sure that the system is reliable in its operations and for securing the sensitive details.

• Availability: If the internet service gets disrupted while sending information to the server, the information can be sent again for verification.

• Security: The main security concern is for users account hence proper login mechanism should be used to avoid hacking. The tablet id registration is way to spam check for increasing the security. Hence, security is provided from unwanted use of recognition software.

• Usability: As the system is easy to handle and navigates in the most expected way with no delays. In that case the system program reacts accordingly and transverses quickly between its states.

• Scalability: The system is able to accommodate growth in the number of users and amount of data. It is also capable of handling increased transaction volumes.

• Compatibility: The system is capable of running on different hardware and software platforms. It is also able to interact with other systems such as accounting or inventory management systems.

• Maintainability: The system is easy to update and maintain. It has a modular design that allows components to be easily replaced. It also contains clear and detailed documentation.

* 1. **Safety Requirements :**

Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Refer to any external policies or regulations that state safety issues that affect the product's design or use.

* 1. **Security Requirements :**

Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements. Refer to any external policies or regulations containing security issues that affect the product.

* 1. **Software Quality Attributes :**

Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible.

At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.

**-** Availability :​The Cafeteria Ordering System shall be available to users on the corporate Intranet and to dial-in users 99.9% of the time between 5:00am and midnight local time and 95% of the time between midnight and 5:00am local time.

**-** Robustness :​If the connection between the user and the system is broken prior to an order being either confirmed or canceled, the Cafeteria Ordering System shall enable the user to recover an incomplete order.