



## A Minor Project Report on

## SMART CANTEEN MANAGEMENT SYSTEM: STREAMLINING FOOD ORDERING

## **Submitted by**

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# DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING M. KUMARASAMY COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to Anna University, Chennai) THALAVAPALAYAM, KARUR-639113.

**NOVEMBER 2024** 

## M.KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous Institution, Affiliated to Anna University, Chennai)

#### **BONAFIDE CERTIFICATE**

Certified that this Report titled "SMART CANTEEN MANAGEMENT SYSTEM: STREAMLINING FOOD ORDERING" is the bonafide work of ABINAYA DEVI.N (927622BEE001), AYYAPPAN.A (927622BEE010), HARIHARAN.S (927622BEE037), JANARATHINABABU.A (927622BEE304) who carried out the work during the academic year (2024-2025) under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other project report.

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#### **DECLARATION**

We affirm that the Minor Project III report titled "SMART CANTEEN MANAGEMENT SYSTEM: STREAMLINING FOOD ORDERING" being submitted in partial fulfillment for the award of Bachelor of Engineering in Electrical and Electronics Engineering is the originalwork carried out by us.

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#### VISION AND MISSION OF THE INSTITUTION

#### **VISION**

✓ To emerge as a leader among the top institutions in the field of technical education

#### **MISSION**

- ✓ Produce smart technocrats with empirical knowledge who can surmount the global Challenges.
- ✓ Create a diverse, fully-engaged, learner centric campus environment toprovide Quality education to the students.
- ✓ Maintain mutually beneficial partnerships with our alumni, industry, and Professional associations.

#### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

#### **VISION**

To produce smart and dynamic professionals with profound theoretical and practical knowledge comparable with the best in the field.

#### **MISSION**

- ✓ Produce hi-tech professionals in the field of Electrical and ElectronicsEngineering by inculcating core knowledge.
- ✓ Produce highly competent professionals with thrust on research.
- ✓ Provide personalized training to the students for enriching their skills.

#### PROGRAMME EDUCATIONAL OBJECTIVES(PEOs)

- ✓ **PEO1:** Graduates will have flourishing career in the core areas of Electrical Engineering and also allied disciplines.
- ✓ **PEO2:** Graduates will pursue higher studies and succeed in academic/research careers
- ✓ **PEO3:** Graduates will be a successful entrepreneur in creating jobs related to Electrical and Electronics Engineering /allied disciplines.
- ✓ **PEO4:** Graduates will practice ethics and have habit of continuouslearning for their success in the chosen career.

#### PROGRAMME OUTCOMES(POs)

After the successful completion of the B.E. Electrical and Electronics Engineering degree program, the students will be able to:

**PO1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

#### **PO3: Design/Development of solutions:**

Design solutions for Complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.

**PO4:** Conduct Investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6:** The Engineer and Society: Apply reasoning in formed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7: Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual and Team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.

**PO10:** Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11: Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

**PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAM SPECIFIC OUTCOMES (PSOs)

The following are the Program Specific Outcomes of Electrical and Electronics Engineering Students:

- **PSO1:** Apply the basic concepts of mathematics and science to analyze and design circuits, controls, Electrical machines and drives to solve complex problems.
- **PSO2:** Apply relevant models, resources and emerging tools and techniques to provide solutions to power and energy related issues & challenges.
- **PSO3:** Design, Develop and implement methods and concepts to facilitate solutions for electrical and electronics engineering related real-world problems.

Abstract (Key Words)	Mapping of POs and PSOs
Smart canteen, Online food ordering, Canteen	PO1, PO2, PO3, PO4, PO5, PO6, PO7,
management system, Digital menu, Advance	PO8, PO9, PO10, PO11, PO12, PSO1,
order placement, Secure online payments	PSO2, PSO3

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#### **ABSTRACT**

This project focuses on developing a website for efficient food ordering within educational institutions, aiming to streamline the ordering process and enhance canteen operations. The website will display the daily menu, allowing users to view available items, descriptions, and prices. Users can place orders in advance to avoid lunchtime delays, ensuring smoother service and managing demand more effectively. The website will integrate online payment options, such as digital wallets, UPI, and card payments, to facilitate secure transactions. After successful payment, a unique code will be generated for each order, which users can present at the canteen to collect their items. This code-based system reduces the need for queuing, helps manage rush times, and minimizes the chances of order errors. Overall, this website aims to enhance user convenience by simplifying the ordering process, reducing crowding, and supporting efficient canteen management

**CHAPTER 1** LITERATURE REVIEW

Paper 1

Title: Smart Canteen Management System using Naïve Bayes Algorithm

Author: P. Praneetha, Dr. K. Srinivasa Rao, G.S. Prabhu Kiran, P. Vasantha, P. Vasu, N. Charles

Bunny

**Year:** 2024

**Inference:** 

The "Smart Canteen Management System" project aims to revolutionize the traditional canteen

experience in educational institutions by leveraging modern technologies and automation. This

system offers an efficient and convenient approach to managing canteen operations, enabling

seamless transactions, improved resource utilization, and enhanced user experience for both

faculty members and students. It will bring numerous benefits, including reduced waiting times,

increased efficiency, improved inventory management, and enhanced user satisfaction .Here we

use Naïve bayes algorithm for classification used for classifier tasks. Every person eats at least

twice or three times daily, therefore during that time it can aid them without delaying their

schedule. This solution is made to be adaptable and may be customized to meet the particular

needs of various educational institutions. It aims to provide a modern and technologically

advanced dining experience in the school or college cafeteria, making it more convenient and

adaptable to the specific needs of each institution.

Paper 2

**Title: Smart Canteen System** 

Author: Ketan Bhekare, Chinmay Karandikar, Ganesh Kamble, Varsha Wangikar

Year:2019

2

**Inference:** 

The Project "Smart Canteen" allow the customers to register online, read and select the food

from menu card and order food online by just selecting the food that the user want to have using

web application. By using this application the work of the customer is reduced the benefit of

this is if there is a rush in the Canteen then there will be chances that the waiters will be

unavailable so the users can directly order the food online by using this web application. Many

peoples visit the canteen in their morning session, lunch break and recess so they have limited

time to eat and return to their respective work and colleges. So, this software helps them to save

there time and order food whenever they want without calling the waiter again and again.

Paper 3

**Title: Smart Canteen Management System** 

**Author**: Prathamesh Auti, Mohit Bawankar, Pranav Bochare, Vaibhav Harane, Nitisha K.

Rajgure

**Year:**2023

**Inference:** 

The Smart Canteen App is an innovative solution designed to enhance the canteen experience in

educational institutions and workplaces. It streamlines ordering, payment, and food pickup,

ensuring convenience and efficiency for both users and operators. With features like online

ordering, real-time order tracking, and secure cashless payments, the app eliminates long queues

and reduces manual work. Users can browse menus, customize orders to suit dietary needs, and

receive updates on their order status. The canteen staff manage orders via a web interface, while

an admin oversees operations for seamless coordination. This system not only saves time and

keeps operations organized but also boosts customer satisfaction and overall sales.

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Paper 4

Title: Smart Canteen and Cafeteria Management System using RFID Technology

**Author:** Authors: Harshada Menewar, Siya Bhandari, Prajakta Mahajan, Prof. Kiran Dange

**Year:**2023

**Inference:** 

The Internet of Things (IoT) has revolutionized various industries by connecting everyday objects and devices to the internet. IoT is a system that incorporates IoT-enabled devices, software, and sensors to automate canteen services. One of the latest applications of IoT is in the canteen industry. IoT canteen is an innovative approach to streamline the food ordering and delivery process in educational institutions, hospitals, and workplaces. The traditional system to manage meals in the canteen can be updated by using Internet of Things (IoT) involving RFID technology provides applications to gather information about a large number of the users by making it efficient to process the collected data and even encourages the use of e-cash. IoT provides transparency to admin by using the data effectively. This paper demonstrates how the system manages the canteen bills by introducing IoT in existing or traditional canteen management systems.

Paper 5

**Title: Smart Canteen Management System** 

**Author:** Sujata Joshi; Bivek Kasaju; Pratik Karki; Sagun Kant Aryal; Sujan Bhuwanji Chhetri

Year:2022

**Inference:** 

In today's fast moving world, there is a need of quick and efficient service in every sector of life for public in general. As we know, many employees and students use canteen and food facilities in their workplace and institutions on daily basis, there is a need to provide quick service at billing counters. This work is focused at developing an efficient smart canteen management system to counter the delays occurring during billing services. The proposed

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system is aimed at using radio frequency identification to detect and authenticate the users of the system to gain access as well as to automatically debit at the end of month or on low balance. This proposed system can be used in the large industries and universities and many government offices as it is less time consuming than the existing system. The results reveal that the proposed system offers cost effectiveness in addition to quick and easy to use service.

#### **CHAPTER 2**

#### PROPOSED METHODOLOGY

#### 2.1 FLOW CHART

The proposed system aims to create a mobile application that streamlines the food ordering process in the canteen by allowing users to pre-order their meals and make online payments. The mobile application will display the daily menu, enabling users to select their desired items and place orders in advance. Upon completing the payment, a unique code will be generated, which the users can present at the canteen to collect their meals during lunch hours. This system reduces the need for standing in long queues, minimizes waiting times, and helps manage the lunchtime rush more efficiently. Canteen staff will also receive real-time updates on orders, enabling them to prepare food in advance, thus improving overall operational efficiency and reducing food wastage.

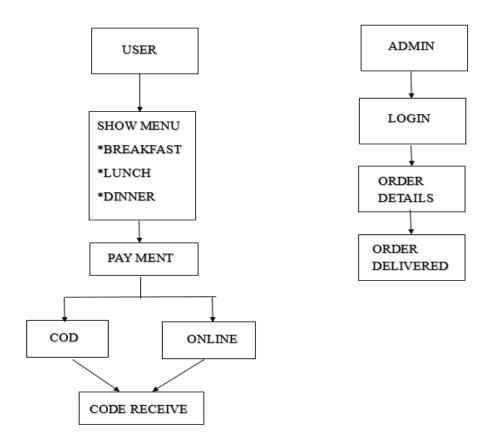


Fig 2.1 Flow chart

#### 2.2 DESCRIPTION

The Smart Canteen Management System is a web-based solution designed to streamline food ordering and enhance canteen operations within educational institutions. This platform allows users to browse a daily menu displaying available items, detailed descriptions, and prices, enabling informed choices. It simplifies the ordering process by enabling users to place orders in advance, ensuring smoother service and reducing lunchtime delays. Secure online payment options, including digital wallets, UPI, and card payments, are integrated to facilitate seamless transactions. Upon successful payment, the system generates a unique order code that users can present at the canteen to collect their items, eliminating long queues and minimizing errors. By optimizing peak-hour operations and supporting efficient canteen management, this system enhances user convenience, reduces crowding, and promotes a well-organized dining experience for all.

#### **CHAPTER 3**

#### SOFTWARE AND LANGUAGES

#### 1. HTML (HyperText Markup Language)

HTML is the standard markup language used to create web pages and web applications. It forms the backbone of a webpage, defining the structure and content of the site. HTML consists of elements or "tags," which are used to mark up text, images, links, forms, and other content to be displayed on a web page.

Use in the Canteen Management System Project: In this project, HTML is used to structure the content of the canteen management website. This includes:

- Creating the layout of the web pages: The homepage, menu page, order details page, and admin dashboard are all structured using HTML.
- Displaying dynamic content: HTML allows the system to display menu items, descriptions, and prices, as well as order details and user information.
- Building forms: HTML is used for creating forms where users can place their orders, select items, and enter payment information.

#### Features and Advantages of Using HTML:

- Easy to Learn and Use: HTML has a simple structure that is easy to learn, making it a popular choice for web development.
- Search Engine Friendly: Proper use of HTML tags helps search engines index the content of the website, making it SEO-friendly.
- Standardized: HTML is supported by all browsers, ensuring cross-browser compatibility.
- Scalable: HTML provides a flexible structure that can be adapted to any scale, from simple websites to complex applications.

## 2. CSS (Cascading Style Sheets)

CSS is a stylesheet language used to define the presentation of a web page, including layout, colors, fonts, spacing, and overall look and feel. CSS works in conjunction with HTML to separate the content (HTML) from the design (CSS).

Use in the Canteen Management System Project: In this project, CSS is used to:

- Style the web pages: CSS defines how the elements on the page (like menu items, buttons, and text) should appear visually.
- Make the website responsive: By using CSS media queries, the canteen website adapts to different screen sizes (desktop, tablet, mobile).
- Create user-friendly design: CSS ensures that the interface is visually appealing and easy to navigate for users.

Features and Advantages of Using CSS:

- Separation of Content and Style: CSS allows developers to separate the structure (HTML) from the design (CSS), making it easier to maintain and update the website's style.
- Improves Web Performance: With CSS, you can style many pages at once by linking a single CSS file to multiple HTML pages, improving load times.
- Responsive Design: CSS allows for media queries, which makes the website adaptable to various devices, ensuring that users have a good experience across all screen sizes.
- Customizable: CSS provides great flexibility in designing layouts and applying styles, allowing the website to be visually appealing and consistent

#### 3. JavaScript (JS)

JavaScript is a high-level programming language primarily used for creating dynamic and interactive elements on web pages. It allows you to add functionality to your website, such as user interactions, form validations, animations, and data handling.

Use in the Canteen Management System Project: In this project, JavaScript is used to:

- Create interactivity: For example, when a user adds an item to the cart, JavaScript dynamically updates the cart contents and total price without reloading the page.
- Handle order flow: JavaScript is used to manage the entire order process, from adding items to the cart to placing the order and processing payment.

- Form validation: JavaScript validates user inputs on forms, ensuring that the user enters correct information before submitting an order.
- Payment integration: JavaScript helps handle online payment interactions by calling APIs for payment gateways (if implemented).

#### Features and Advantages of Using JavaScript:

- Interactivity: JavaScript enhances the user experience by allowing for real-time interaction with the webpage (e.g., updating the cart, showing pop-ups, validating form data).
- Faster User Experience: JavaScript can update parts of a page without reloading it, making the application faster and smoother for the user.
- Extensive Libraries and Frameworks: There are many JavaScript libraries (like jQuery) and frameworks (like React or Angular) that simplify common tasks and allow for more complex web applications.
- Cross-Platform Compatibility: JavaScript runs on all modern browsers, ensuring that the functionality of the system is consistent across platforms.

#### 4. Visual Studio Code (VS Code)

VS Code is a lightweight, open-source code editor developed by Microsoft. It supports a wide range of programming languages and is highly customizable. With features like IntelliSense (autocompletion), debugging support, version control, and a vast library of extensions, VS Code has become a popular choice among developers for web and software development.

#### Use in the Canteen Management System Project:

- Code Writing: VS Code is used for writing HTML, CSS, and JavaScript code for the frontend part of the application.
- Server-Side Development: It is also used for writing and debugging Node.js code for the back-end, such as managing user orders and payment processing.
- Real-Time Collaboration: VS Code allows for real-time code collaboration with other developers through extensions like Live Share.
- Extension Support: VS Code supports various extensions that help with tasks like syntax highlighting, linting (error checking), and Git version control.

#### Features and Advantages of Using VS Code:

- Intuitive and User-Friendly: VS Code offers a clean interface and is easy to use, even for beginners.
- Extensibility: With numerous extensions, developers can tailor VS Code to their specific needs, such as adding support for different programming languages and frameworks.
- Debugging Tools: VS Code provides integrated debugging features, making it easier to identify and fix issues during development.
- Free and Open Source: VS Code is completely free, which makes it accessible to everyone, including independent developers and large teams.

#### 5. Node.js

Node.js is an open-source, cross-platform JavaScript runtime built on Chrome's V8 engine. Unlike traditional JavaScript that runs in the browser, Node.js allows developers to run JavaScript on the server-side. It is event-driven, non-blocking, and ideal for building scalable, real-time applications like web servers, APIs, and chat applications.

Use in the Canteen Management System Project: In this project, Node.js is used to:

- Handle the server-side logic: Node.js processes requests from users (e.g., placing orders, viewing the menu) and communicates with the database to fetch or store data.
- Manage payment processing: Node.js interacts with external APIs (like payment gateways) to process online payments and return confirmation to the user.
- Order Management: Node.js handles order placement, storing order details in the backend, and updating order statuses (e.g., pending, completed).
- Real-Time Operations: Node.js is well-suited for handling multiple concurrent requests, ensuring that the system can handle many users at once.

#### Features and Advantages of Using Node.js:

- Fast and Scalable: Node.js is highly efficient due to its non-blocking, event-driven architecture. It can handle multiple requests simultaneously, making it perfect for real-time applications.
- Single Language for Frontend and Backend: Node.js allows you to use JavaScript both on the client-side and server-side, streamlining the development process and reducing context switching.

- Extensive Ecosystem: Node.js has a rich set of libraries and modules available through the Node Package Manager (NPM), which helps in quickly building and scaling applications.
- Lightweight and Efficient: Node.js's non-blocking I/O and event-driven architecture make it highly efficient for handling I/O-heavy operations, such as processing orders or payment requests.

These four tools form the foundation of modern web development. Together, they help create functional, visually appealing, and interactive websites.

# CHAPTER 4 RESULT AND DISCUSSION

## 4.1 Customer login:

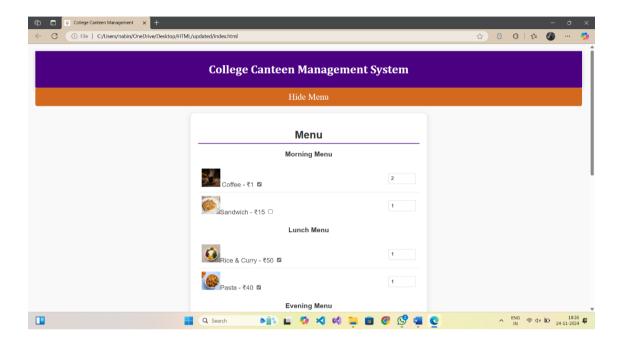


Fig 4.1 login page

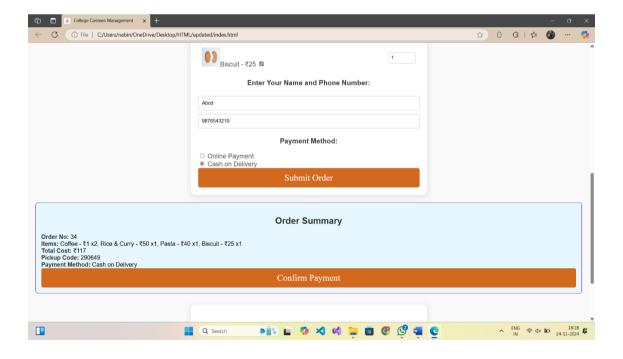


Fig 4.2 order details

#### 4.2 Owner login:

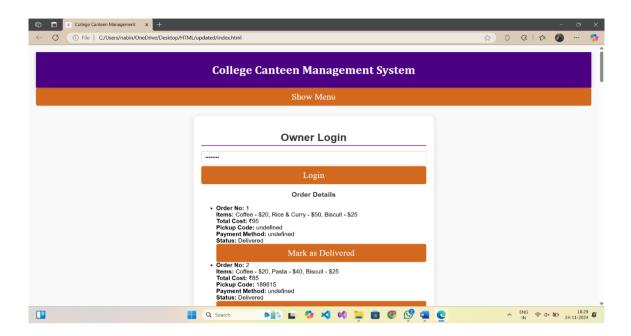


Fig 4.3 owner login

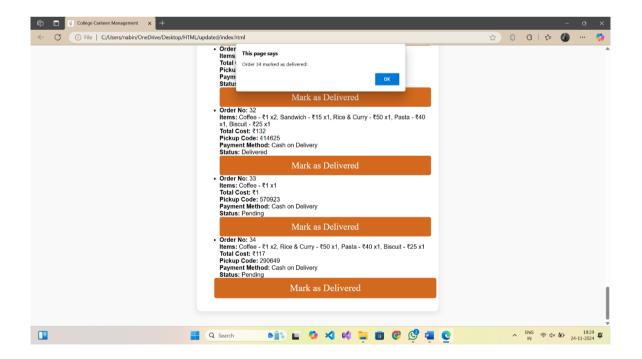


Fig 4.4 delivered details

#### 4.3 WORKING

The College Canteen Management System is a web-based application developed using HTML, CSS, and JavaScript, with local Storage utilized for storing and managing order details. This system simulates a real-time canteen ordering experience, allowing customers to browse a categorized menu, select items, and specify quantities. After entering their contact information, users can choose between online payment via Google Pay (UPI) or cash on delivery. Once the order is placed, the system generates a unique order number and pickup code, and the details, including the customer's name, order summary, and payment method, are saved in local Storage for future reference. The customer is presented with an order summary, including a total cost, before proceeding to payment. The admin section allows the canteen owner to log in and view orders placed for the current day. Orders can be marked as "Delivered," and the system updates both the UI and local Storage to reflect the changes. Orders are organized by date, allowing the owner to track and manage them easily. Local Storage helps persist the order data, maintaining order history, payment statuses, and tracking order numbers. The system also includes a payment flow where users are redirected to a payment gateway for online transactions, or they are prompted for cash on delivery. The system ensures a smooth user experience, from order placement to payment and delivery tracking. Technologies like JavaScript, local Storage, and Google Pay integration provide a seamless and interactive ordering system. Future improvements could include backend integration for more dynamic functionalities like inventory management, order history tracking, and customer analytics. This solution not only simplifies the canteen's operations but also enhances the customer experience by offering convenient ordering and payment options, while giving the owner full control over order management.

#### **CHAPTER 5**

#### **CONCLUSION**

The Smart Canteen Management System is a transformative platform designed to modernize and streamline canteen operations, providing a seamless dining experience for users and efficient management for operators. The system allows users to access the daily menu online, where they can view available food items with detailed descriptions and prices. This enables them to make informed choices and place their orders in advance, eliminating the need for standing in long queues during busy lunchtime hours. By allowing pre-orders, the system ensures smoother service, manages demand effectively, and saves valuable time for students and staff.

A key feature of this system is its integration of secure online payment options, including digital wallets, UPI, and card payments, which facilitate cashless and hassle-free transactions. Once payment is confirmed, the system generates a unique order code for each transaction. Users can present this code at the canteen to quickly collect their food, reducing crowding and minimizing the risk of errors. This innovative approach optimizes the entire ordering and pickup process, creating a more organized and efficient canteen environment. By simplifying operations and enhancing user satisfaction, the Smart Canteen Management System addresses the challenges of traditional canteens, making it an ideal solution for modern educational institutions and workplaces seeking to improve their food service experience.

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