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Canteen Food Ordering System and Management

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Abstract- The Canteen Automation System allows the user to register for online ordering, enabling them to view the e-menu and order food from the web application. When an order is placed, it directly reflects on the screen in the kitchen, thus easing the process of cooking. The system saves considerable staff effort while highly improving efficiency. The major issue in universities canteens is huge crowd density during the peak hours of lunch time. In order to solve this problem, the Smart Canteen, which includes an online food ordering system and a virtual queue management system, was implemented for optimized operation and enhanced user experience.

Keywords: Online food ordering, Online payment gateway (Student id) , Digital menu display, Food wastage reduction, Menu planning.

I. INTRODUCTION

With the "Canteen Automation System," the college and institutional canteens make their food orders modern in a way where long wait times, paper token systems, and overcrowding are eliminated. They will now be using a web-based platform for administrators and a mobile application to totally get rid of queue formations. Admins will take an efficient approach to manage menus, update availability of foods, and oversee orders, while consumers can browse the e-menu, order their items remotely, and get a real-time notification of the orders. The system also helps the chefs instantly track orders to prioritize meal preparations and adjust menus based on demand, improving efficiency and reducing waste. With the help of automation and
real-time tracking, the system provides convenience and operation-smoothening that modifies staff and customers' dining experience.

II. LITERATURE SURVEY

The literature survey examines China's food safety crisis management, highlighting challenges like poor coordination, weak regulations, and low public participation. Unlike developed nations with robust systems, China faces issues in food production, processing, and oversight. To address this, the study proposes a pre-warning system for crisis detection, decision-making, and public communication. It emphasizes stronger regulations, ethical business practices, informed consumers, and active public supervision. Further research is needed to refine crisis management and enhance early warning mechanisms [1]. The literature survey reviews key studies, methodologies, and challenges in the field, highlighting their effectiveness and limitations. It identifies gaps in existing research and emphasizes the need for further studies. By synthesizing relevant findings, it provides a strong foundation for the research while suggesting new directions for exploration.[2]

The investigation describes cold-chain logistics about food in China. It also vilifies the inefficiency of such aspects like storage, transport, and distribution. Compared with the developed countries, China really shows restraint when it comes to refrigeration facilities and supply chain integration. Better planning, advanced technology, policy reforms, and industry- government coordination are emphasized in this study to improve their efficiency and sustainability in cold-chain logistics.[3] The Credit System of Food Safety (CSFS) in retail has been reviewed in the literature, emphasizing the role of IT in maintaining food safety and customer satisfaction. CSFS links food businesses, retailers, and consumers to provide

transparency, quality control, and trust. It offers real-time tracking, data management, and food safety monitoring, thereby increasing service efficiency.

The study found that CSFS improves customer confidence, generates loyalty, and strengthens the standards in the industry, emphasizing the basic framework for technology-driven food safety management.[4] Total emergency management literature review for food safety accidents pointing out weaknesses in the entire response system in China, including slow decision-making, poor coordination, and lack of risk prediction. A historical review of previous disasters such as the Sanlu milk scandal is conducted, and the author proposes a Total Emergency Management Model that covers prevention, response, and recovery along with real-time monitoring and collaboration for enhancing food safety and minimizing risks to public health.[5] The literature review focusses on the Post-Olympic Food Supply Chain Traceability Framework for improved food safety and transparency. It analyzes the traceability system of the 2008 Olympic Games in China, where costs, decentralization of production, and complexity in the supply chain were some problems noted. A generalized framework was proposed that utilizes RFID, barcodes, GPS, and databases to facilitate such monitoring and tracing. The study concludes that national implementation needs policy support, technology, and industry collaboration.[6] The literature survey looks at food safety from the perspective of supply chain, calling for collaboration among government, industries, and society. It has addressed and suggested a framework that covers regulatory gaps, contamination risks, and supervision challenges by integrating logistics with capital and information management for transparency and efficacy.

The study emphasized a technology-driven approach with active stakeholders' participation for enhanced food safety.[7] Be the literature survey that speaks of food safety from the perspective of their supply chain and also refers to collaboration by government, industries, and society. It would also mention regulatory gaps, risks of contamination, and supervision failures while developing a framework that would integrate logistics with capital and information management, thus increasing transparency and efficiency in an operation. This study will have a more technology-driven, stakeholder-collaborated approach to usability.[8]

A literature review examines a Canteen Consumptions Management System through CAN Bus and RFID technologies on enhancing decent efficiency and high security. The classic IC card systems are able to deliver only slower processing transactions and poorer security; on the contrary, the present system combines RFID (ZLG500A) and CAN Bus for rapid transactions and simultaneous data real-time transmissions. This study shows how automation will enhance operations at a canteen while minimizing manual work and improving user convenience.[9] Literature survey based on the HACCP approach to safety management system with respect to student canteens regarding hazard analysis, risk assessment, and critical control point in order to enhance the safety of food. Member activities include staff training, developmental work on process flow, hazard identification, remote monitoring, and record-keeping. Employee health, ingredient acceptance, and student satisfaction surveys are the elements measured and used in the study to enhance empirical insights for improvement. This study affirms that the benefits of HACCP in the canteens involve better hygiene, risk control, and effectiveness in operations. The literature survey analyses the best practices for large-scale food service organisations (HORECAs) in Thailand, while carrying out demand patterns, procurement procedures, cold-chain logistics, and food safety. Elements affecting forecasting, supplier selection, and their compliance with Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Points (HACCP) practices, as well as Queensland Health Service (QHS) standards, have been highlighted. Efficient inventory management coupled with real-time tracking has increased operational effectiveness, lowered production costs, and enhanced customer satisfaction, thereby serving as a model for other food service operators to follow.[10]

III. IMPLEMENTATION

Fig 1: Admin home page

This Canteen Food Ordering System and Management dashboard serve an efficient way of handling the business by showing the customer's number, food shops, menus, and orders in the system. Administrators are made to manage users and track orders in different sections. With quick access to customers, food shops, menus, and orders, the system improves the process of serving orders while reducing waiting times, thus increasing overall efficiency and being more relevant to canteens and cafeterias.

Fig 2: New Menu Updation.

The fig 2 shows the add new menu page of the canteen food ordering system. The admin is able to include a new food item by selecting a shop, entering the menu name, price, and uploading a food image. This function helps manage the menu efficiently, update the food items available, and ensure that customers get accurate pricing.

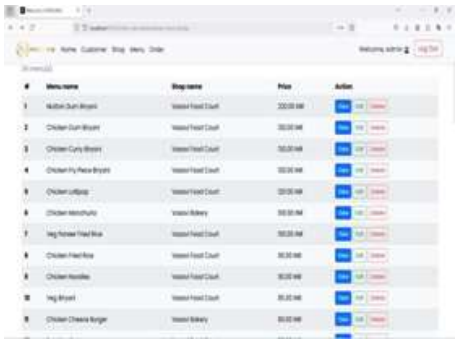

Fig:3 Menu viewing.

This figure displays the menu management page of the canteen food ordering system. It lists food items along with prices and associated food shops to the admin, giving the admin rights to view, edit, or delete menu items for smooth management of food options available. This helps keep the canteen menu updated and orderly.

Fig 4: User Registration.

This is the FOODCAVE system's sign-up page for user registration with username, password, user name, e-mail, gender and role (such as Student). To sign up, the user must accept the terms and conditions. This page is for creating new user accounts to access the system.

Fig 5: Items Selection by User.

This image is a Food Menu Page in the FOODCAVE system. This page will permit the users to look into the different food items available for sale: Lassi, Mixture, Panipuri, Samosa, Sweet Corn, Ginger Tea, Badham Tea, and Lemon Tea, along with their prices. Users can click on "Add to cart" buttons to pull those items in the cart. This page is useful for selecting foods and continuing the order process through the system.

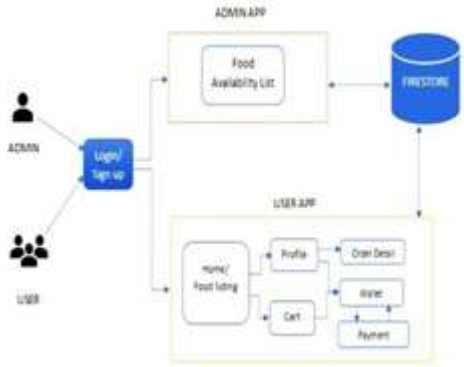

Fig 6: System Architecture.

The architecture diagram shows a food ordering system which contains two main applications: Admin App and User App. Both of them act on the Firestore database. The first step starts with both admins and users logging in or signing up. The Admin App is used by Admins to manage food availability and update the Food Availability List which is stored in Firestore. This is accessed by users through the User App. The User App allows users to browse the Home/Food Listing section to see what foods are available and to use the other features like Profile, Cart, Order

Details, and Wallet & Payment. Users can select food items in the Cart for checkout, and this payment would go through their respective Wallet for that transaction. The Firestore central database stores food availability, user orders, and payment details to allow the two-way interaction between Admin and User Apps.

IV. CONCLUSION & FUTURE ENHANCEMENT

The Canteen Food Ordering System and Management establishes automatic food ordering facility for students and staff of canteen, reducing human errors, providing real-time updates on orders and payments, and gives stock updates. Orders are also effectively processed, while reducing food wastage and ensuring stock of most popular items, providing students the convenience of a completely online ordering facility. Finally, the system will help management with their sales tracking, planning of menus and decisions on price, eventually yielding better customer service and financial management. Future improvements may include incorporating online push notifications, loyalty rewards, and various online payment option mobilization capabilities to the Canteen Food Ordering System, which could move towards a dedicated mobile app for even greater access and user-friendliness. QR code- based ordering could increase safety and convenience while making the system adaptive to modern needs by delivering food through table-side and contactless service.

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