

MessMate: Designing a Smart Campus Dining System with Real-Time Menu

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ABSTRACT:

The main aim of the Mess Mate is to provide clean and fresh food to the students/teachers of the organization and to stoop food wastage. Thus, there arises a need to create software that will make the entire Mess Menu Management an automated system. This system enables functionalities such as student/staff registration, daily meal viewing, menu scheduling, etc., the Mess Mate System reduces the workload of staff and ensures smooth operations. Overall, the Mess Mate System provides a reliable, scalable, and user-friendly platform to simplify mess operations for both administrators and users. The Mess Mate helps the user to access all the Meal details of the mess without having to visit the mess physically and to apply for leave. It also option for days scholar student/teachers to purchase an online token for the latest meal and also for Hostel residents receive real-time menu updates and notifications. This application is free of cost for the users. Individuals who wish to use any functionality of the mess can simply log in to the app and have everything on their fingertips. It uses the internet to update all user queries and put it across to the admin. Using the information provided by all the users the admin can take decisions and the inventory for the mess can be managed. The aim of this android based mobile application project is to offer comprehensive information portal about hostel mess menu.

Keywords — Software, Android Application, Mobile Application, Online System, Internet-based, Free of Cost, Mess Menu Management System.

I. INTRODUCTION

Efficient management of mess facilities is essential in institutions like schools, colleges, and hostels, where a large number of individuals rely on timely and nutritious meals. MessMate is a application offers a centralized interface where mess administrators can upload daily menus for breakfast, lunch, snacks, and dinner, making them instantly accessible to students. Day scholars can generate token and collect their food without delay. Hostel students get the benefits of a current time notification and updates of the menu of mess. Mess Mate system provides the menu details for all time of meal in a day like; breakfast, lunch, dinner etc.

The admin can pin any message on the front of the page which indicates any information regarding mess like menu update, mess timing

update. Developed using HTML, CSS, JavaScript, Node.js and MySQL, the application operates on local servers, ensuring reliability and accessibility without requiring significant infrastructure investments. The system's role-based access design allows administrators, supervisors, and students to seamlessly perform their respective tasks, making it user- friendly.

II. LITERATURE REVIEW

The digitalization of the campus services get hyped in the recent years, but mess menu systems lag behind and remain highly underdeveloped and fractured. Meal tokens and cash payments make college system slow and less effective.

Wireless food ordering through amrt phones helps admins and users communicate better. Orders made from phones are sent to the

kitchen and cashier, with instant updates in the main system. It helps avoid human errors and improve speed and do the work effectively.

This application is made to combine all modules into a single system. All features like meal, attendance tracking, feedback and billing all are integrated into one platform. Likewise, for mess management, this system handles online tokens and menu scheduling easily and effectively. According to Bhandari (2017), food waste in hostel is mainly due to bulk cooking. Her research on NDRI students shows the need of better management. She suggested that portion control and awareness can minimize the wastage of food. This study helps hostels to maintain the waste of food and daily updates on children.

The wireless mess mate system was developed to include a student feedback feature for the mess environment. This system helps mess administrators to update daily menu and manage tasks wisely. Students can use their smartphones to send the instant feedback. This helps in transparency, satisfaction and good service improvement in the mess system.

- **Real-time menu broadcasting:** Menus are usually printed and fixed so it is not able to update it instantly.
- **Integrated with tokenization:** provides a smooth and easy token generation system for students.
- **Mobile-First Design:** The majority of current tools are desktop-centric and not aligned with student mobility.

MessMate fills these gaps through the convergence of full-stack web development and a student-centric approach to design. It supports real-time menu revisions, tokenized automatic creation, and responsive interfaces all specially adapted to the distinctive dynamics of hostel mess management. An automated food ordering system is proposed

which will keep track of user orders smartly. Basically, they implemented a food ordering system for different type of restaurants in which user will make order or make custom food by one click only. This is accepted in a Mess Mate system to keep the full and automated track of the hostel mess menu for the hostels, staff, teachers and day Scholler's.

III. PROPOSED

METHODOLOGY

Mess Owner and User create the MessMate account on web portal and login as their requirements.

- Every mess owner and user having own login credentials, and they can login to system with that credential.
- Every mess owner having own dashboard where they can update the menus.

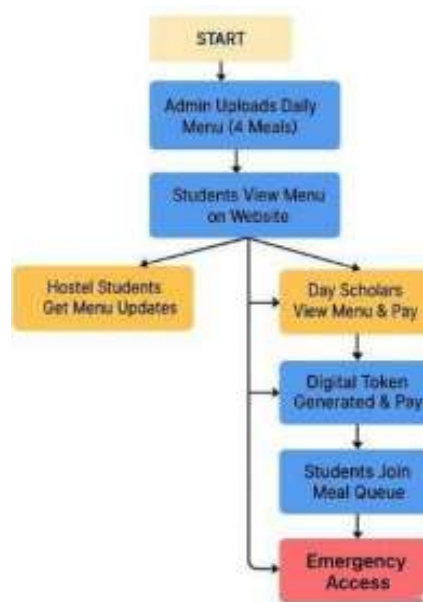


Fig I. Messmate System Flow Diagram

- Mess owner can also be able to verify the token and after token verification that token has been discarded.
- Mess owner will also be able to see the dashboard in which how many tokens are generated, the count for the meal,

count for the total token are provided in graphical interface

- Student logs into MessMate via mobile or desktop and views the daily menu for breakfast, lunch, snacks, or dinner
- If the person does not belong to the hostel, they can tap the button generate token displayed on the app, receive a digital token instantly, and show the token at the Mess counter to collect the meal and after verification that token will be discarded.

Fast Menu Update when admin change the menu the student panel will reflect the menu within few second so that latency is less

Digital Wallet Integration Users can maintain digital wallets within the application for seamless transactions, reducing dependency on external payment gateways for frequent users.

Feedback and Rating Mechanism Registered users can provide ratings and feedback for meals, helping mess owners improve service quality and enabling other students to make better choices.

IV. Modular Architecture

The Mess mate system is designed in modular approach to make it more scalable, easy to maintain and adapt to changes, following best practice for hostel and mess management systems.

This system adopts the Three-tier architecture using HTML, CSS and JavaScript for user interface, node.js for backend and MySQL for data Management. This allows smooth integration and role-based access to the admins, students and day scholars.

In our design shown in Fig. 2, the main modules are:

- **Student Portal**
- **Admin Dashboard**
- **Backend servers**
- **Database Layers**
- **Token generation**

All modules work together through secure APIs.

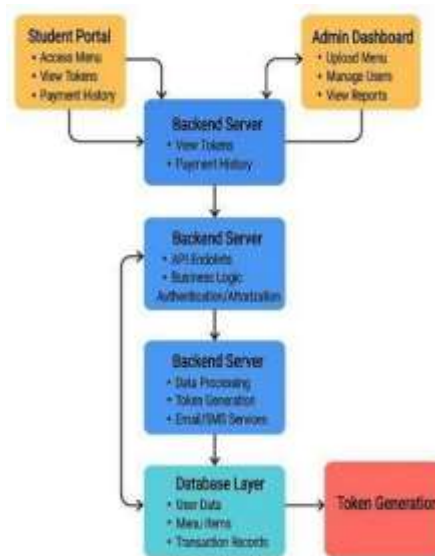


Fig 2. Module Description

- 1). **Admin Dashboard:** This admin dashboard provides complete control like: upload and modify menu, manage user accounts, monitor token usage.
- 2). **Student Portal:** This is designed for the students to interact with mess systems easily like: view men.
- 3). **Backend Servers:** The backend is divided into three layers:
 - Layer1:** Handles user request like view token and checking menu.
 - Layer 2:** Manages the main APIs, user presentations and business logics.
 - Layer 3:** Responsible for validations like token generation and sending notifications.
- 4). **Database Layer:** It stores and manages all data securely like user details and menu

management.

5). Token Generation: Manages token activation and deactivation.

V. RESULT

The mess mate system makes mess operations easier by automating tasks like meal booking and feedback collections. It minimizes the manual work for staff and lets all the students quickly view menu of the meal, generate tokens, book meals and it helps to improve overall experience. In conclusion, this enhances operational efficiency, reduces errors and provide better experiences for both users and staffs, making it useful to provide all the mess services effectively and easily available for the students and staffs.

Metric	Description	Target Value
Menu Update Latency	Time for menu to reflect across devices	< 5 seconds
Payment Success Rate	% of successful transactions	> 98%
Token Generation Time	Time from payment to token issuance	< 3 seconds
System Uptime	Platform availability	> 99.5%
User Satisfaction	Feedback from students	> 4/5 rating

The admin panel is the main panel for managing user registrations and updating daily menus. It reduces the manual effort which is previously required for menu management for the hostel mess. In future, meal scheduling is automated using user preference and meal timing and Implement notification system that sends real time alerts and updates to users via email, SMS, or app notifications about meal timings, menu updates and important information.

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