MIT | Academy of Engineering

(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

DESIGN THINKING PROJECT : SECONDARY RESEARCH

Project Name: Smart Mess Management System

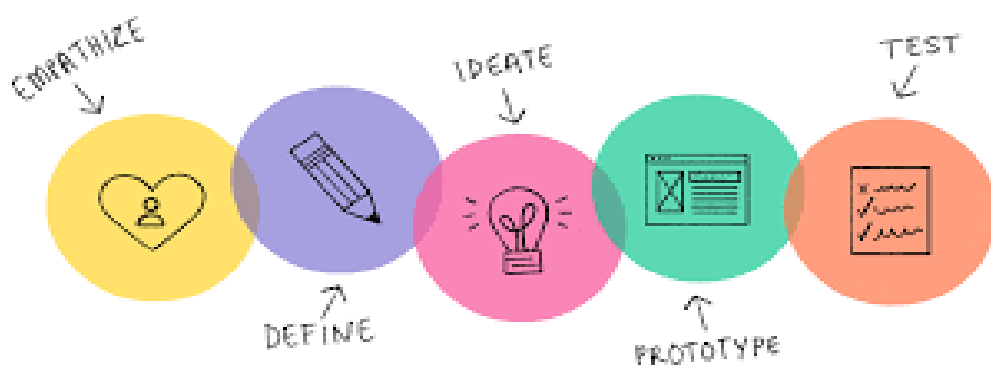**Domain**: College Mess/Canteen

Group Name: Arjuna

Group no: 4

Group Members:

1) CS8-54 Arnav Shende
2) CS8-56 Aryan Medigeri
3) CS8-58 Dhanraj Chopda
4) CS8-60 Shrawani Ragmahale

Under the Guidance of:

P. R. Hatte Sir and N. B. Totla Sir

Let's see what our survey says :

Survey from Enrolled users:

- Many students expressed that they felt their money was wasted when they couldn't attend meals.

- Most students supported the idea of a system that would allow them to notify the mess of their absence in advance and digital enrolment system
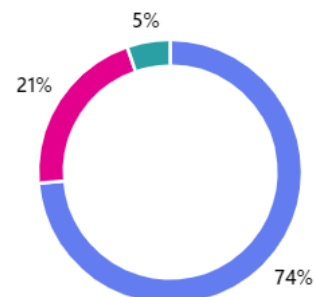
Survey result through Microsoft Forms:

15. Have you ever experienced financial loss as a result of missing meals under the current mess plan?

- Yes   11
- No   8

42%

58%
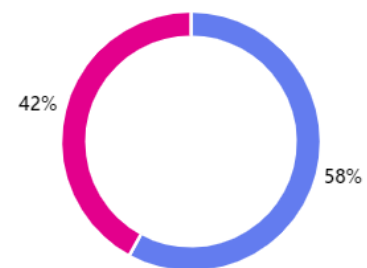
10. Would you find it useful to notify the canteen in advance if you are not dining on specific days?

- Yes   14
- No   4
- Maybe   1

5%

21%

74%

Survey from Mess Authorities:

- Through interviews with mess managers, we discovered that they faced challenges in tracking the meal consumption of individual students, as the current system did not provide real-time data.

- The mess also struggled to manage supplies efficiently, often preparing too much food or running short due to poor tracking of meal attendance and supply records.

- Mess staff expressed interest in adopting a smart system to improve meal tracking and supply management, believing it would make operations easy and reduce food wastage.

By this survey we found that there exists a gap between mess service and digital automation. To fill the gap and boost mess efficiency and user experience we were prompted to take up this problem and find its solution under our **Design Thinking** Project

Introduction to Problem:

The mess plans in college canteens right now face various challenges. They lack flexibility, forcing students to lose money for missed meals, and there is no efficient system to keep track of meal consumption and mess supplies or notify staff about the planned absences. This results in poor communication and problems over meal usage. Additionally, the canteen often over-prepares food due to unpredictable attendance, leading to significant food wastage and inefficient resource allocation. Lastly, the rigid structure of the plans offers very little room for customization, failing to cater to students' varying needs.

Traditional method of managing college mess

For user enrolment and food monitoring, our college mess currently uses a conventional pen-and-paper approach. Based on their receipt and admission date, students are given an enrolment number at the time of enrolling. Students must give the mess staff this number in order to use the food service, and they will physically enter it in a logbook three times a day—during breakfast, lunch, and Dinner

Even though this technique has worked well for us over the years, it frequently causes misunderstandings and mistakes when figuring out how many meals each student has consumed overall. Keeping track of every student's record by hand can be difficult, time-consuming, and prone to errors, particularly when the school sees a lot of kids every day. This has made it challenging to guarantee precise billing and effective

Problems faced by Users by doing more dept research:

1. Waiting for long ques in mess during peak hours
2. Complicated method to enrol for mess service
3. Not notified about nearing mess plan expiration date
4. Difficult to find seat during peak hours

Figure 1 Current situation in mess during peak hours

5. No refund or adjustment for the missed meals
6. No provision for the user to inform mess about their absence

Challenges faced by the mess after researching and consulting local mess services

- Inadequate management system to maintain records of user.
- Difficult to take decisions due to lack of Data-Driven-Decision system
- Unable to maintain record of each user properly due to use of traditional method and unexpected human error.
- Time-consumption due to lack of automation.
- Lack of contact between mess and users to share important information.
- Wastage of food due to over preparation.
- Unable to properly track the supplies from supplier due to absence of automation.

What is the solution to this problem?

- **Track Meal Consumption**: Assign each student a unique enrolment number and track the number of meals they consume digitally. This ensures that meals are recorded accurately, and students get the full value of their meal plans.
- **Advance Notifications for Absences**: Allow students to notify the mess in advance when they won't be dining. This reduces food waste and ensures students don't lose money on missed meals.

- ✅ **Efficient Supply Management**: By digitally tracking mess supplies managing mess becomes easy & accurate. This digital system ensures the mess prepares the right amount of food and manages inventory efficiently, reducing wastage and shortages.

Our solution to this problem:

We are introducing a JavaScript driven Smart Mess Management System. Here we have developed a system where it can digitally enrol a user, generate a 4-digit unique enrolment number, and track their meal service count.

Procedure of the solution:

1. User has to enrol himself in Mess from our website by filling the form
2. He/she will receive a 4-digit unique enrolment number at the same time and NFC is generated.

3. User has to share the unique enrolment number with the mess manager at the time to access the meal service

4. The manager will enter the enrolment no in our website and CLICK on the add service button

5. When the user is 10, 5 &2 meals away from its expiration a SMS and E-Mail will be posted regarding renewing the mess plan

6. User can also inform the mess manager about their absence so that their share of food is not prepared (This is efficient when the number of users skipping the meal is large)

Benefits of the Smart Mess Management System:

- **Flexibility for Students:** The system lets students create their own meal plans, which helps them eat healthier and feel better overall.

- **Efficient Meal Tracking:** Better communication and tracking of meals mean students can focus on their studies without worrying about food.
- **Reduced Food Waste:** The system helps cut down on extra food preparation and waste, promoting more sustainable eating habits.
- **Enhanced Resource Allocation:** Using resources wisely aligns with environmentally friendly practices.
- **Unique Enrolment System:** A secure enrolment process helps keep meal management accountable and clear.
- **Real-Time Notifications:** Using new technology for instant updates makes operations run more smoothly and improves service quality.
- **Data-Driven Insights:** Analysing data helps improve food service management and leads to smarter decisions.

This Digital Tech in which there is a transition from traditional method to Digital method to maintain and manage record proved to be useful and efficient

This advanced technology is so effective that prestigious universities like **Harvard** use it to reduce food waste and optimize inventory management.

Harvard University Smart Mess Model:
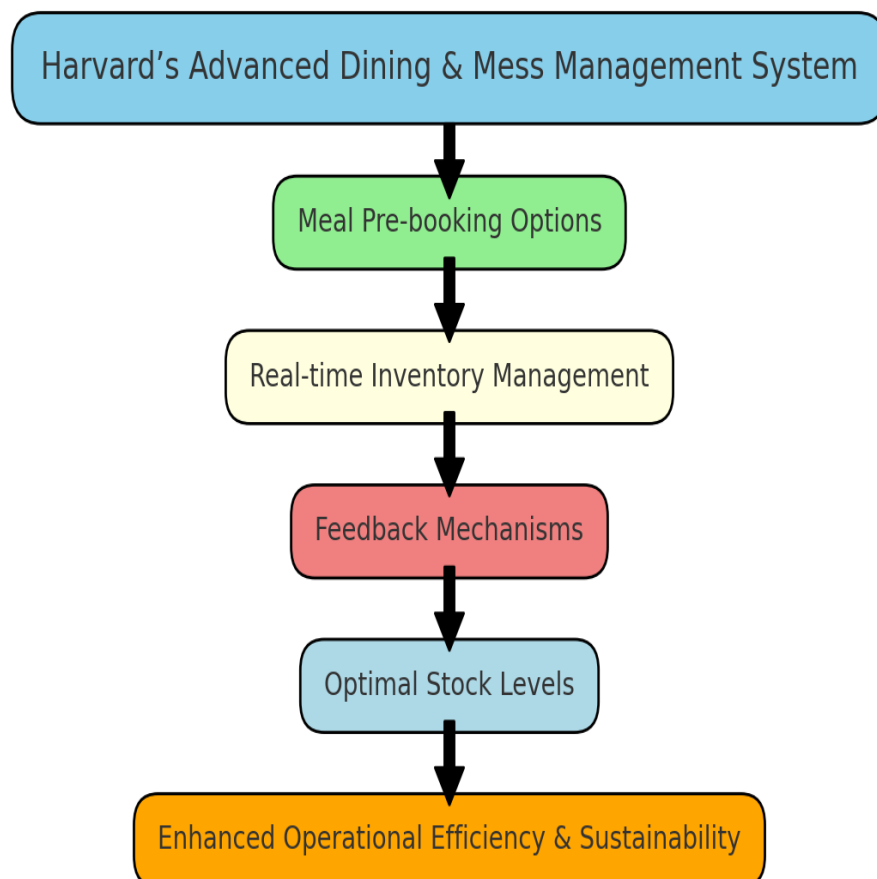
Analysis of Harvard University Smart Mess system and our Smart Mess system :

Our system takes good ideas from meal tracking systems used in university canteens all over the world. By looking at how these meal plans work, we see important features, like RFID technology, that help keep track of meals accurately. For example, Harvard University uses this technology to waste less food and make students happier.

However, when we looked at these systems, we found some problems. Many systems don't let students tell the staff ahead of time when they will eat, which could help reduce food waste. This is a great opportunity for us to improve things. By using ideas from these systems, we can help students plan their meals better and create a more user-friendly experience.

Reference 1   Reference 2

Likert Scale:

Feature	Our System	Score	Harvard's System	Score	Comments
New User Enrollment	Our system creates user profiles with unique IDs and NFC tags.	10	Harvard's system doesn't enroll users, but it handles large-scale campus operations efficiently.	7	Our system focuses on individual users, while Harvard's system is designed to manage thousands of students in a sustainable way.
Tracking Records	We track attendance, supplies, and inventory for the mess.	10	Harvard tracks campus-wide waste and recycling, leading to impressive sustainability results.	9	Both systems do excellent tracking, but Harvard's large-scale data helps the entire campus become more eco-friendly.
User Interaction	Users can report absences and get reminders about meal plans by SMS/email.	9	Harvard educates students about sustainability and promotes waste reduction through various initiatives.	6	Our system offers direct communication, while Harvard focuses on educating the entire campus about sustainable practices, which has a broader positive impact.
Managing Supplies & Inventory	We keep track of food supplies and inventory in the mess.	9	Harvard's waste management system efficiently handles campus-wide recycling and waste processing.	8	Our system excels in mess-specific inventory management, but Harvard has a highly efficient waste management system that supports the entire campus.
Making Decisions Based on Data	Our system helps the mess staff make better choices using data.	9	Harvard uses waste and sustainability data to continuously improve its eco-friendly strategies.	9	Both systems use data smartly—ours for managing a mess, and Harvard's for making the campus greener and more sustainable.
Communication with Staff	Users can contact mess staff directly through our system.	8	Harvard's system provides resources to connect students with sustainability officers and initiatives.	7	While our system allows users to contact mess staff directly, Harvard has a broader communication strategy to engage students in eco-friendly practices.

Conclusion:

The JavaScript-driven mess management system we developed makes running a mess easier by automating important tasks like enrolling new users, tracking attendance, and managing supplies. This reduces mistakes and makes the system more efficient. It also reminds users when their meal plans are about to expire, tracks food supplies, and gives useful data that helps mess staff make better decisions. The system improves communication between users and staff, making things run more smoothly. Overall, it simplifies daily mess operations, helps reduce food waste, and ensures better use of resources.

Thank you

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~