Software Requirements Specification

for

Mess Automation System

Version 0.1

Prepared by

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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
0.1	Archisha Singh Ashutosh Agrawal Chandaka Hemanth Kumar Charugundla Chethan Mansi Singh Mokshagna Prattipati Prapti Dagli Sanjay Sawan H N	First draft	27/01/2023

Introduction

1.1 Product Scope

This product aims to automate various operations of the hostel messes at IIT Kanpur. The software provides convenient and faster access for students to mess services.The mess managers can update the daily menu and other extra options in the meals. The application would make it easy for the students and other users to buy extra meals/options in meals. Students can also view their monthly expenses and dues and file complaints regarding mess issues. Any modern web browser can access the application.

The main goals and benefits of the application are as follows:

- to digitalise the previously practised primitive mess activities (such as logging the complaints on paper,buying of mess coupons etc).
- to view the daily menu.
- to provide a better platform for students to track their monthly mess expenses.

1.2 Intended Audience and Document Overview

Intended viewers:
As we start the design , developers would use this document to communicate and proceed. Then at the time of testing ,testers would use this document .It can then be used to form a user manual using some subset of SRS.

Sections and Organisation:
The SRS starts with sections that describe its importance and how to use it, then it moves forward with the overview and functionality of the product. Then it covers a guide towards the interfaces which make it easier for a user to understand how they need to interact with the product, covering some use cases to wind up.

Sequence for Important Sections:

- A Developer or a Tester can start reading the document with focus on overview (2.1), functionality (2.2), design and implementation (2.3), interfaces (3.1) and functional requirements (3.2).
- A user should focus on the scope (1.1), overview (2.1) and functionality (2.2), and then the specific requirements, going through the sections 3.1.1, 3.1.3 and 3.2

1.3 Definitions, Acronyms and Abbreviations

API	Application Programming Interface
SOTA	State of the Arts

ACID	Atomicity, Consistency, Isolation, Durability
SRS	Software Requirements Specifications

1.4 Document Conventions

Formatting Conventions:
- This document is written with Arial font of size 11 with single spacing and 1-inch margins.
- Words highlighted with bold in the same font space represent terms whose explanations are either given in footnotes or separately in the same section.
- Italics highlight has been used for comments.
- Underline has been used for headings in subsections.
- Bullet point ordering has been used as a listing typesetting tool.

Naming Conventions:

Students : Any potential users who books food/extras using the web app
Managers : Check the transactions and verify it.
Users : Students and Managers
Guest : One who orders and pays instantly via any supported payment method with temporary login.

1.5 References and Acknowledgments

We'd like to acknowledge the help of our TA, Mr. Archit Gupta, for their valuable input in the creation of this document. We also would like to thank Prof. Indranil Saha for providing the SRS template and teaching the concepts.

Overall Description

2.1 Product Overview

Mess Automation System is a web application that will digitize and automate various operations of the hall mess.Since all the transactions will be digitized, manual ledgers will no longer be required. Students no longer have to deal with the hassle of standing in a queue to book extras. Admins can see whether a transaction of a particular student is due or cleared. Guest login enables the user to buy food coupons (e-receipts) for the intended hall.

2.2 Product Functionality

The product should have the following functionality for the mess manager and mess secretary:

- create accounts of hall residents and fill in the mess details.
- details could contain mess bills, mess dues, list and price of extra items provided in mess, daily mess menu, rebate form, contact number of the mess manager, etc.
- add/remove/edit the food items in the menu as the month changes.
- edit the mess bill if it has some calculation mistake.
- notify the resident if he/she has remaining mess dues.
- reply to complaints regarding taste and quality of food.
- view the list of orders of extra items and decide the quantity in which the extra items will be made, so there is no wastage of food.
- access accounts of all residents.

The product should have the following functionality for the hall residents:

- access only his/her account.
- sign in to the account with username and password.
- check the list of previous and current orders of extra items.
- check the total mess bill including extras till that date.
- check the mess menu of a particular day.
- place/cancel/edit order for extra items.
- book ticket for non-resident.
- apply for a rebate.
- complain regarding the quality and taste of food, and regarding the mess bill if it has some error.
- view the extra items and their prices.

2.3 Design and Implementation Constraints

Hardware Limitation:
We need a computer/mobile and an internet connection for this application to build and execute.

Software Specifications:
We need an internet browser like Google Chrome, Brave, Mozilla Firefox etc and an Operating system that runs on 64 bit architecture for this application and its dependencies to run smoothly.

2.4 Assumptions and Dependencies

We plan to use multiple components with an already prevalent technology stack. The assumptions that plan to have to keep the service working are:

● Our services would be best served on modern web browsers as we are designing with some of the modern web browsers in mind. If someone is using the older versions of web browsers, then the interface might not be efficient.
● The backend services would be hosted on Heroku. Hence, Heroku Web Services should be working for smooth conduct.
● The same is true for the database, hence Heroku must be working
● Since the internet would play a major role in all of this, it is assumed that the users have a reliable internet connection.
● The frontend has also been hosted on Heroku, hence Heroku Web Services must be working

The efficient working of the project would depend on the contribution of the technology stack we are using, which means that the uptime of Heroku web services and other services such as mailing servers would affect the time taken for the users to complete a transaction, hence affecting the efficiency of the program. The internet connection would also play some role in all of this, the better the internet connection, the better the things would work.

Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

1. Homepage

The Home page will contain the application name and logo on the top left, and a sign-in button at the top right. The users can click on the button and proceed to the sign-in menu to sign in to their account. A user can also do a guest login but the transaction has to be settled immediately..

Mess Automation System

Sign In

Guest Login

2. Sign-in

The sign-in window will ask for the email and password of the user. The user can enter their email and password in the appropriate text fields and click on the Sign-in button at the bottom to sign in to their account.The user will be asked whether they want to sign-in as a student or as a incharge and they can select their roles and then proceed to sign-in.

Sign In

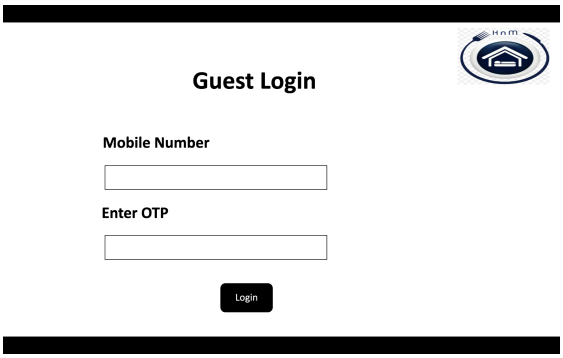
Email

Password

Sign In

*3.*Guest login

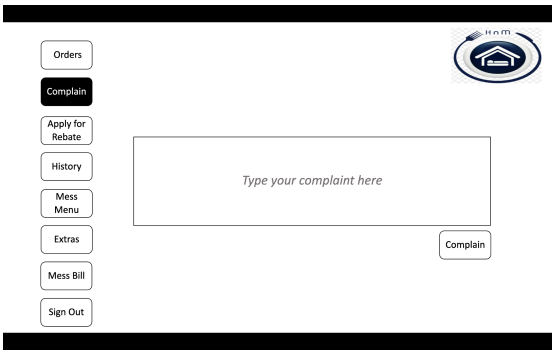
This page will ask user for their phone number ,there will be a dialogue box to enter the sent OTP and after clicking on login button the user will be verified and will be successfully logged in as a guest.



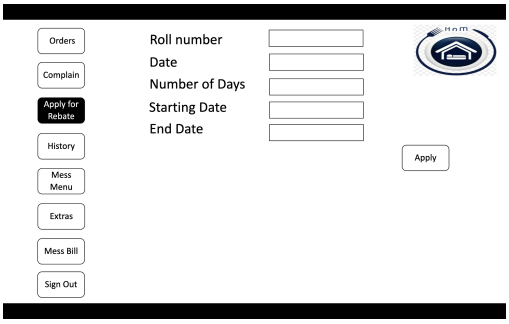
4.Student's interface

- Orders
  This window will contain a list of all the current orders of a student and columns for quantity and price of all the corresponding items.

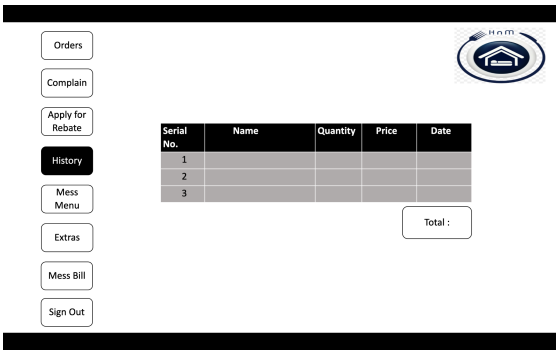
- Complaint
  The student can type his complain in the space provided and hit the submit button.User can also check on manager's reply and status of complaint in the status column.



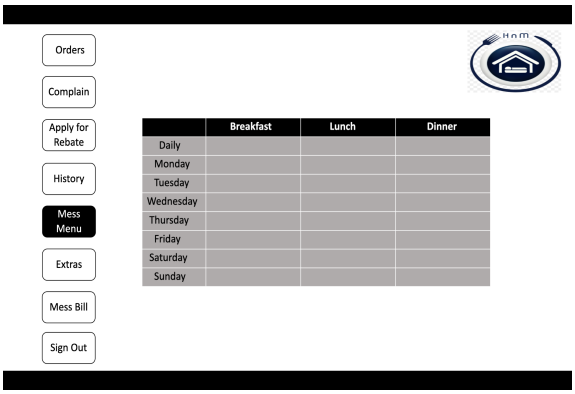
- Apply for rebate
  In this page the student will be asked his roll no,date,starting date and end date to apply for his rebate,after filling all the details in the respective dialogue boxes and clicking on the apply button the student will have successfully applied for his rebate.



- History
  Here the student can track his expenses , there will be columns for item name,quantity,price and date of purchase,and the total expenses will be displayed at the bottom.

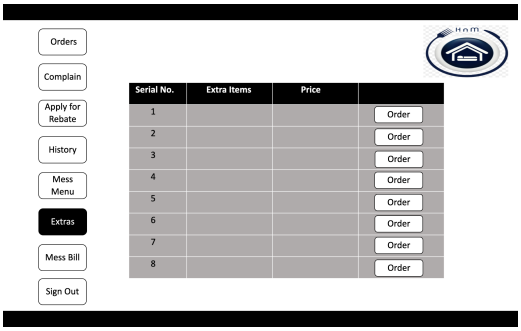


- Mess menu
  This page will display the current mess menu.



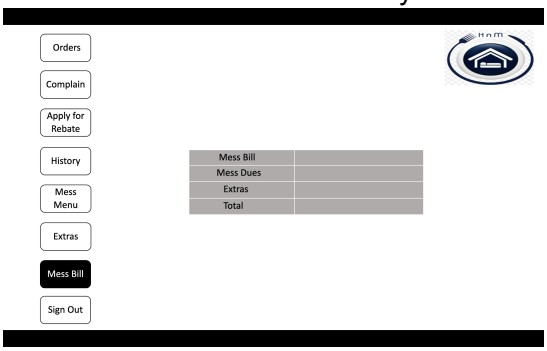
- Extras

  Here students can book extras , the list of extras and their prices will be displayed , and we can add items to cart by clicking on the order button in front of them and also regulate the quantity using the '+' and '-' buttons on order.



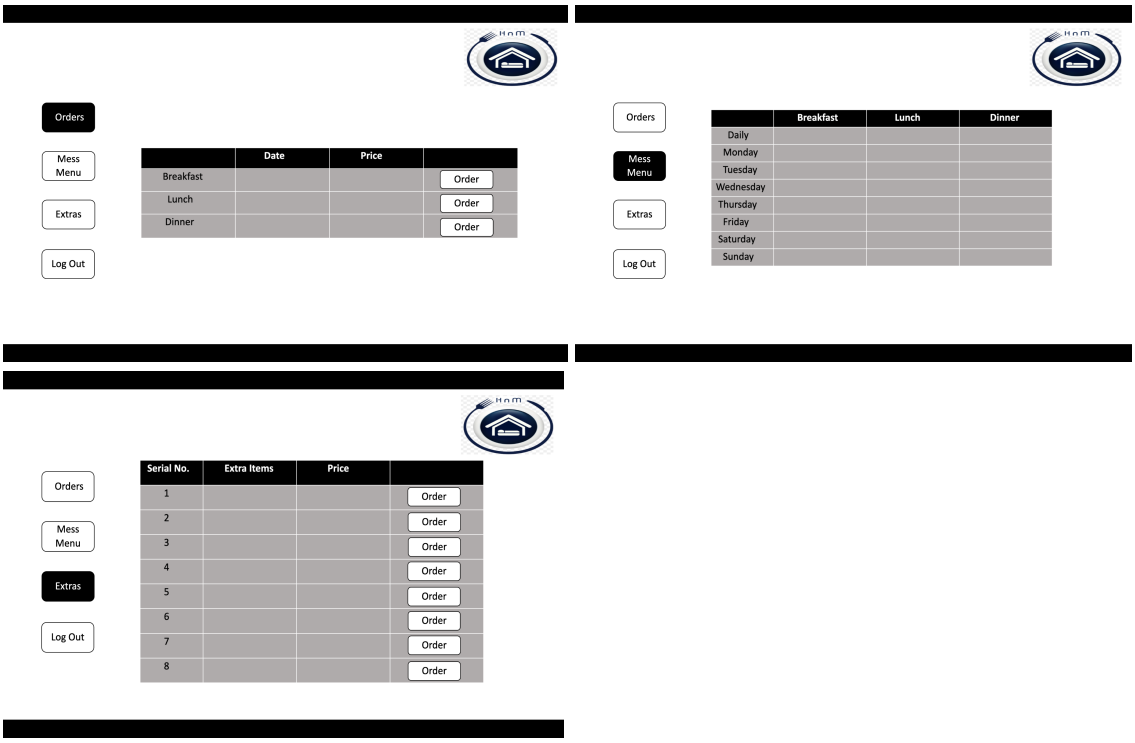
- Mess bill and dues

  Students can view their monthly mess bills and mess dues here.



5.Guest's interface

The guest can only be able to see the Mess menu,extras and orders tab of the normal student login.



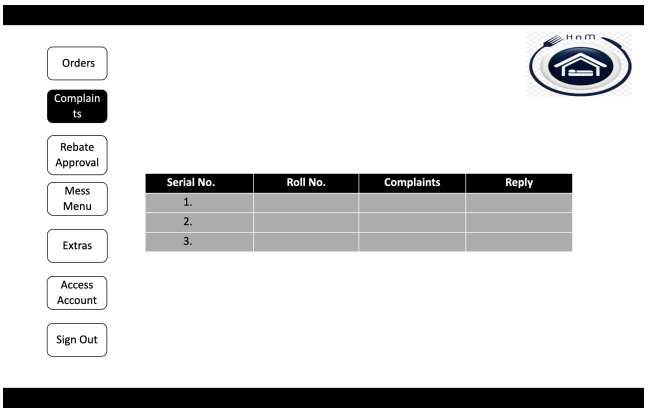
6.Manager's interface

- Orders

  Here the mess manager can view the current orders and clear them after issuing .

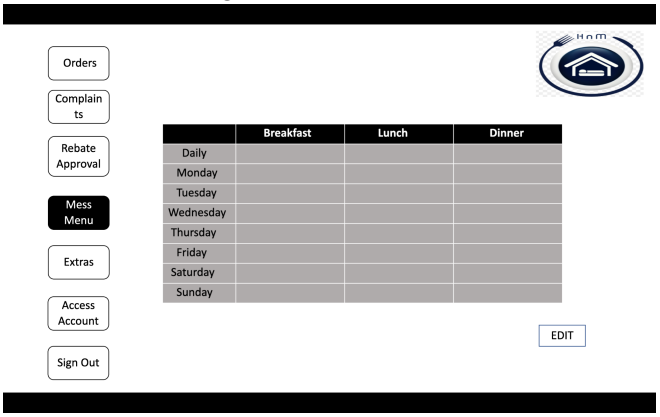
- Complaints

  This page contains columns for the serial no , student details and the complaint lodged by him . Manager can reply and update about the status in the reply column.

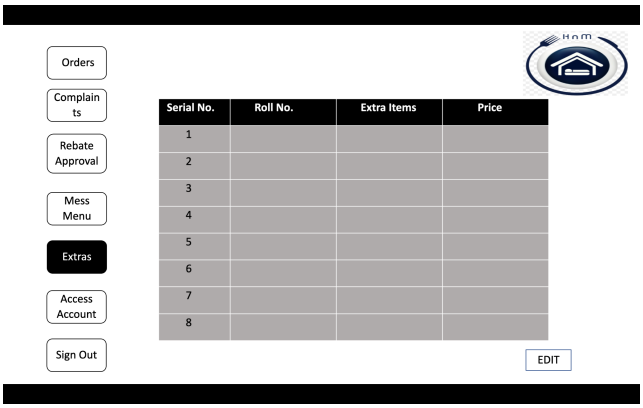


- Rebate approval
  This page contains the list of rebate requests. The manager can view and approve the requests.

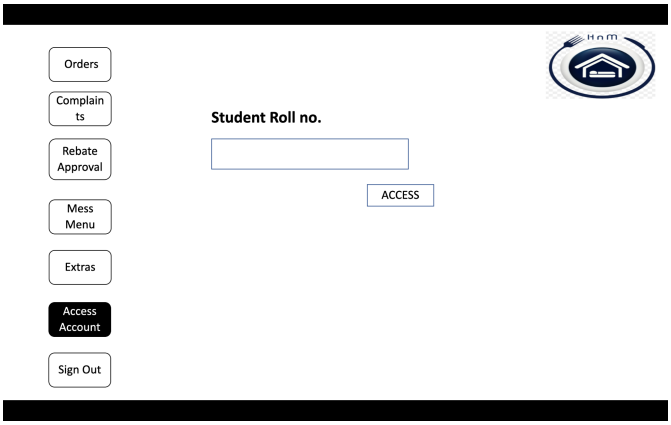
- Mess menu
  This window would have the mess menu displayed , by clicking on the edit button one can access and change the contents of the menu.



- Extras
  This window contains the list of extras available. Manager can view and edit the list.



- Access account
  Manager can enter the roll number of the student and access their accounts.



3.1.2 Hardware Interfaces

There are no hardware interfaces involved in the project. No additional hardware required.

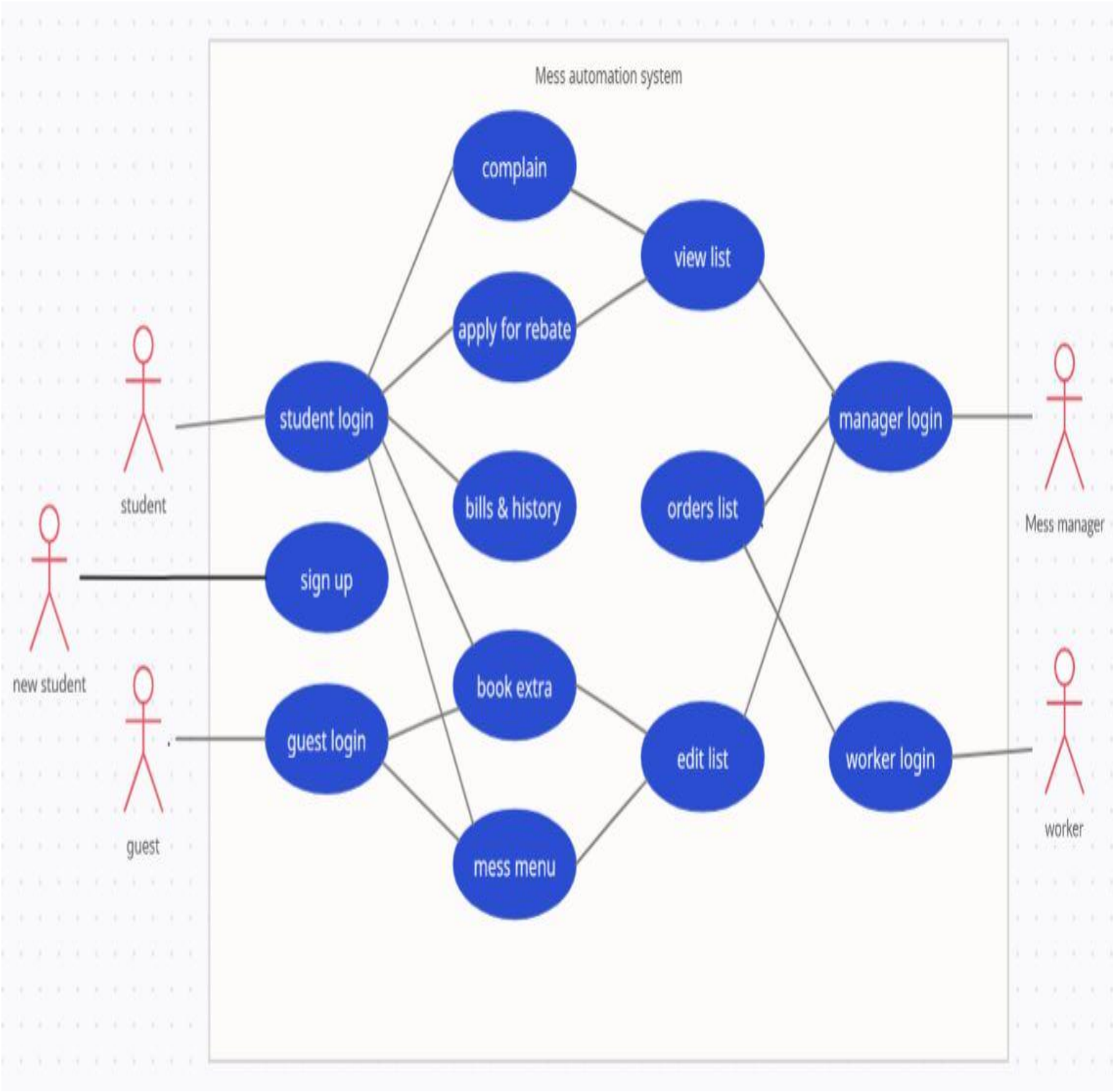
3.1.3 Software Interfaces

There are no software interfaces involved in the project. No third party installations required.

3.2 Functional Requirements

1. Hall Manager can make his/her account (manager_id=create_account(email-id,pswd)
2. Hall manager can access his/her account via email and password.(sign_in(email-id,pswd)
3. Hall manager can upload mess menu/extras available for current month. (Upload_mess_menu (manager_id, mess-menu(image))
4. Hall manager can upload extras price/basic mess charge of current month. (Upload_extras (manager_id))
5. Hall manager can upload mess rebate form. (Upload_rebate_form (manager_id))
6. Hall manager can access the acount of all the students (access_students (manager_id, student-roll_no.)
7. Hall managers can update the month dues of students (update_information (manager_id, student-roll_no.)
8. Hall manager can see all the order placed for a particular day(see_order(manager-id)
9. Hall manager can reply to the complaints raised by the hall residence. (Reply_complaints(manager_id)
10. A hall resident can access his/her account using his/her username and pswd. (User_id=sign_in (roll_no., pswd)
11. A hall residence can see his/her mess dues. (See_mess_dues(user_id)
12. A hall residence can see current month menu(get_menu(user_id)
13. A hall residence can see extra available and its price for a specific day. (See_other_details(user_id)
14. A hall residence can book extras. (Book_extras(user_id)
15. Other residents can book mess food using guest login(Guest_login(mobile_number,)
16. A hall residence can complain about the food(complain(user_id)).
17. A hall residence can apply for mess rebate. (Mess_rebate(user_id)).

3.3 Use Case Model



3.3.1 Use Cases

S.No	#1
Author	Ashutosh Agrawal
Purpose	Student registration and account creation
Requirement Traceability	Student Name,Roll No, Hall detail,Email id
Priority	High
Preconditions	Student name,roll no, hall and email id should be correct
Post Conditions	After email verification,student is registered in the database
Actors	Student's device
Exceptions	Incorrect email/ roll no
Includes	None
Notes/Issues	Roll no is mandatory for user registration

S.No	#2
Author	Sawan H N
Purpose	Browse regular Menu and Extras available.
Requirement Traceability	Mess menu and Extras list
Priority	High
Preconditions	Menu and Extras Items list should be complete and according to availability.
Post Conditions	Access to mess menu and extras list available
Actors	User's device,mess menu and extras list.
Exceptions	Item details are not complete.

Includes	Use case #1
Notes/Issues	Items list has to be visible.

S.No	#3
Author	Sanjay Kumar
Purpose	Mess Manager registration and account creation
Requirement Traceability	Institute Email ID,Hall detail
Priority	High
Preconditions	Institute E-mail ID should be valid/correct
Post Conditions	After email verification,Manager is registered in the database
Actors	Mess Manager's device
Exceptions	Incorrect/ Invalid Email
Includes	None
Notes/Issues	Manager must be able to register with their Institute E-mail ID only

S.No	#4
Author	Sanjay Kumar
Purpose	Menu Updation by Mess Manager
Requirement Traceability	Menu list and item to be added/removed
Priority	High
Preconditions	Mess Manager must be registered by Institute Email ID.

	List of items must be available.
Post Conditions	Mess Menu list is updated
Actors	Mess Manager and Menu list
Exceptions	None
Includes	Use case #3
Notes/Issues	None

S.No	#5
Author	Sanjay Kumar
Purpose	Checkout and Booking Extra for valid user
Requirement Traceability	User should be registered
Priority	High
Preconditions	Users must be Registered. Guests have to pay in advance. Items must be available.
Post Conditions	After placing the order a E-receipt is provided to the user and this is also reflected in the placed orders list at corresponding extras counters.
Actors	Register User, valid guest and placed orders list.
Exceptions	One or more of the items is no longer available
Includes	Use case #1 Use case #3 Use case #4 Use case #6

Notes/Issues	E-receipt is verified at the extra's counter.

S.No	#6
Author	Chandaka Hemanth Kumar
Purpose	Guest user login using phone number and OTP verification
Requirement Traceability	Phone number
Priority	medium
Preconditions	None
Post Conditions	User is now logged-in and be able to book items
Actors	User's device
Exceptions	phone number should be valid
Includes	none
Notes/Issues	OTP could not be sent for any reason. Phone number validity to be checked.

S.No	#7
Author	Charugundla Chethan
Purpose	Applying for rebate
Requirement Traceability	User details, start and end dates of rebate
Priority	medium
Preconditions	Users must be registered
Post Conditions	User is now listed in the students rebate list.
Actors	User's device

Exceptions	None.
Includes	Use case #1
Notes/Issues	Only applicable to students.

S.No	#8
Author	Charugundla Chethan
Purpose	Add item to cart
Requirement Traceability	Item chosen
Priority	medium
Preconditions	Users must be registered and items must be available.
Post Conditions	Cart now has the required item listed in it.
Actors	User’s device and items list.
Exceptions	Item is not available.
Includes	Use case #1 Use case #2
Notes/Issues	Item availability might change during processing the order.

S.No	#9
Author	Charugundla Chethan
Purpose	Making a complaint
Requirement Traceability	Detailed information regarding the issue
Priority	medium

Preconditions	Users must be registered
Post Conditions	User's complaint is now registered and visible to the mess manager under the complaints section.
Actors	User's device and manager's complaints section.
Exceptions	None.
Includes	Use case #1
Notes/Issues	Complaint should be such that it can be sorted out.(i.e.., should make sense and relevant)

S.No	#10
Author	Charugundla Chethan
Purpose	Viewing net dues/bills
Requirement Traceability	User must be registered
Priority	medium
Preconditions	Users must be registered.
Post Conditions	Access to net dues.
Actors	User's device and net dues/bills list.
Exceptions	User is new i.e.., no payment/bills history
Includes	Use case #1
Notes/Issues	Not applicable for guests.

4 Other Non Functional Requirements

4.1 Performance Requirements

Performance of the application depends on some factors like

● APIs: The application is expected to have a traffic of over 5K users. The APIs should be scalable enough to support this traffic. The IITK community is about 10K. We expect 25% of this to be our target audience.

● Concurrency: The database read/write operations should respect the ACID properties as there would be multiple users accessing the same API at the same time so there shouldn't be any concurrency issues

● Latency: It is preferable that API requests take less than 200ms to fulfill, so that the App runs smoothly. This is quite close to the standard expected latency in industry.

4.2 Safety and Security Requirements

Safety Requirements:

● Privacy: The email id provided by the user should not be disclosed in any form without the consent of the user. Same applies for other personally identifiable user data.

● Mandatory login: All users must create a login account before placing orders for extras and mess coupons except for the case of Guest login.This ensures the authenticity of users.

Security Requirements:

● Confidentiality: Only the respective students and the authority in charge of the mess can see the student's transaction details.

● Integrity: The software should not corrupt the transaction history for the students and in-charge. The data associated with the mess in-charge should not be damaged.

● Encryption: All sensitive information such as passwords should be stored in an encrypted format using SOTA encryption schemes.

4.3 Software Quality Attributes

4.3.1. Availability

The web application will be available and accessible to every user inside the campus. This web application can be operated by any resident/mess management committee without any restrictions.

4.3.2. Consumability

A user-friendly interface will make the use of the application quite intuitive for the customers using it for the first time. The menu can be used to compare the prices of the items and “Add to Order” feature makes it easier for the customers to place orders. The naming of the various menus/windows/options inside the application will be done in a manner that they are most likely self-explanatory.

4.3.3. Correctness

Correctness can be achieved by asking the mess management to maintain the menu by updating the correct prices of the food/extras provided by them. Further, the menu and the prices will be checked by the mess management after each month to ensure correctness.

4.3.4 Interoperability

The operation of this application will not interfere with any other application operating simultaneously on the device. While purchasing items, users can simply add the product to the order, operate any other application simultaneously, and resume ordering from the Recent screen/browser tabs. This will ensure the interoperability of the application.

Appendix A – Data Dictionary

Will be updated after the outline of the class diagram in the next sprint.

Appendix B - Group Log

Since the beginning of the project, our entire team has been very enthusiastic.We have formed a Whatsapp group for effective communication.

Meeting minutes	Agenda
9 Jan 2023 7:00-8:00 pm	Brainstormed different project ideas and finalised 2-3 ideas.
11 Jan 2023 10:00-11:00 am	After intensive discussion on the finalised ideas, We decided to go with a web application for Mess Automation as our project.
16 Jan 2023 9:00-9:30 am	A short meeting on SRS document discussion
18 Jan 2023 6:00-7:00 pm	Introductory meeting with TA and work delegation in the team to work on several sections of the SRS.
26 Jan 2023 5:00-6:00 pm	Updated TA with our current progress and final discussion on the remaining few sections of SRS.