Software Requirements Specification

for

CampusPay

Version 1.3

Prepared by
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Course: CS253

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Contents

Revisions

Version	Primary Author(s)	Description of Version	Date Completed
1.0	Aditya Bangar Akshat Rajani Harsh Bihany Pulkit Gopalani	Initial Version of the document. A brief outline of Section 1.1 was written to get an overview of the scope.	Jan 22, 2023
1.1	Aditya Bangar Akshat Rajani Harsh Bihany Kalika Monil Lodha Pratham Sahu Pulkit Gopalani Ravija Chandel Shantanu Kolte Siddhant Jakhotiya	A change was proposed regarding the mechanism to facilitate transactions- instead of linking directly with the bank, an in-app wallet was suggested. All sections were filled in based on functionality discussed so far.	Jan 27, 2023
1.2	Aditya Bangar Akshat Rajani Monil Lodha Pratham Sahu Ravija Chandel Siddhant Jakhotiya	Based on the discussion with the TA mentor, a few edits were made before the release of the final document.	Jan 27, 2023
1.3	Shantanu Kolte Siddhant Jakhotiya	Changes to the document aligning it with the final software expectations and improving consistency and accuracy	Mar 31, 2023

1 Introduction

1.1 Product Scope

The project aims to solve a common problem faced by the campus community, especially students, and those who make payments at the end of the month to different vendors. Almost all students residing on campus avail various facilities like Hall canteen, Hall mess, laundry etc. However, maintaining a track of payments and paying for these facilities becomes cumbersome due to "accounts" maintained everywhere, and clearing dues on the last day of semester is often a task in itself. Also, we are left handicapped on various occasions when bank servers are down or when we hit the transaction limit.

To solve this, we propose a unified portal for the campus where students (customers) and vendors can register, make instant transactions, add dues, clear existing dues and maintain an account of transactions. For example, instead of maintaining paper registers, the canteen owner can set up his account and add any customers to his "organization". Any transaction recorded on paper could be recorded digitally on the portal, and the balance would add up (until the customer clears the dues). The customer can either use the wallet (maintain balance upfront, similar to PayTM wallet), or pay directly from ~~a registered UPI~~ the user wallet to clear dues. The portal will also facilitate peer to peer transactions (student to student). The utility of this feature is for situations wherein multiple friends purchase certain items together and only one student pays directly to the vendor. This saves the hassle of maintaining a record of the payments for the students. The software will also enable easier tracking of monthly expenses. ~~dividing them up into categories like Food, Utilities etc.~~ The app would also give a dashboard view with all recent transactions for vendors to verify payments quickly during rush hours and also provide vendors an option to request clear dues from the users.

1.2 Intended Audience and Document Overview

The intended users are the whole campus community, in particular for hostellers and vendors having a business on campus. The document can also be referred by the developer team to review features and functionality during the entire development process. It will also be useful to any team that may want to work upon any sort of changes/up-gradation of the software.

The remaining subheadings of Section-1 provide relevant terms used throughout the document. Familiarization with these terms would be essential to understand the document.

Section-2 provides an overview of the software, its functionality, constraints and assumptions. This would provide an idea regarding the actors and major components involved in the usage of the software, the technologies used in the development.

Section-3 explores the detailed requirements of the software. There are a few pictorial representations of the interface of the software and different interactions and planned features.

Section-4 highlights the non-functional requirements of this software. Since this software deals with finances, it must have robust security. This, and other performance requirements are detailed in this section.

Users can understand the features of the software by going through Sections 2.1 and 2.2.
For the team developing/improving the software, it is imperative to go through all the sections in the order that they have been written in this document. Testers may read Section-2 (2.2 and 2.3) and all sections from Sections 3.2 to 4.1 to understand the functionalities that they need to test.

1.3 Definitions, Acronyms and Abbreviations

For the purpose of this document, these terms mean the following:

- Super account/admin: An account that can view and edit the details of all accounts.
- ~~User~~ Customer: Any student or faculty or administration who wishes to buy these commodities or services from the vendors.
- Vendor: Any person/organization registered with the institute and authorized to sell commodities or provide services (for eg. Canteen owners, washerman/washerwoman, shops providing stationery etc.).
- Organization: A list of all the customers that a vendor has had a transaction with, which can be viewed.

Standard web-app based terms have been used like frontend, backend, framework, WebScripting, database.

Abbreviations used are:

- API : Application Programming Interface
- CC : Computer Centre
- CSS : Cascading Style Sheet
- HTML : Hyper Text Markup Language
- IITK : Indian Institute of Technology, Kanpur
- IMAP : Internet Message Access Protocol
- OTP : One Time Password
- SMTP : Simple Mail Transfer Protocol
- SQL : Structured Query Language
- SRS : Software Requirement Specification
- UPI : Unified Payments Interface

1.4 Document Conventions

1.4.1 Formatting Conventions

The font used throughout this document is Arial.

- Titles have font size 18 and are in bold.
- Section headings have font size 14 and are in bold.
- Subsection headings have font size 12 and are in bold.
- Body text has font size 11.
- All text in red denote additions that were made to the SRS after the initial submission.
- All text that has been striked-through denotes deletions in the SRS after the initial submission.

1.4.2 Naming Conventions

All headings have been named as per the standard template of SRS of IEEE. Certain sections have been divided into subsections/bulleted lists for easier readability.

1.5 References and Acknowledgments

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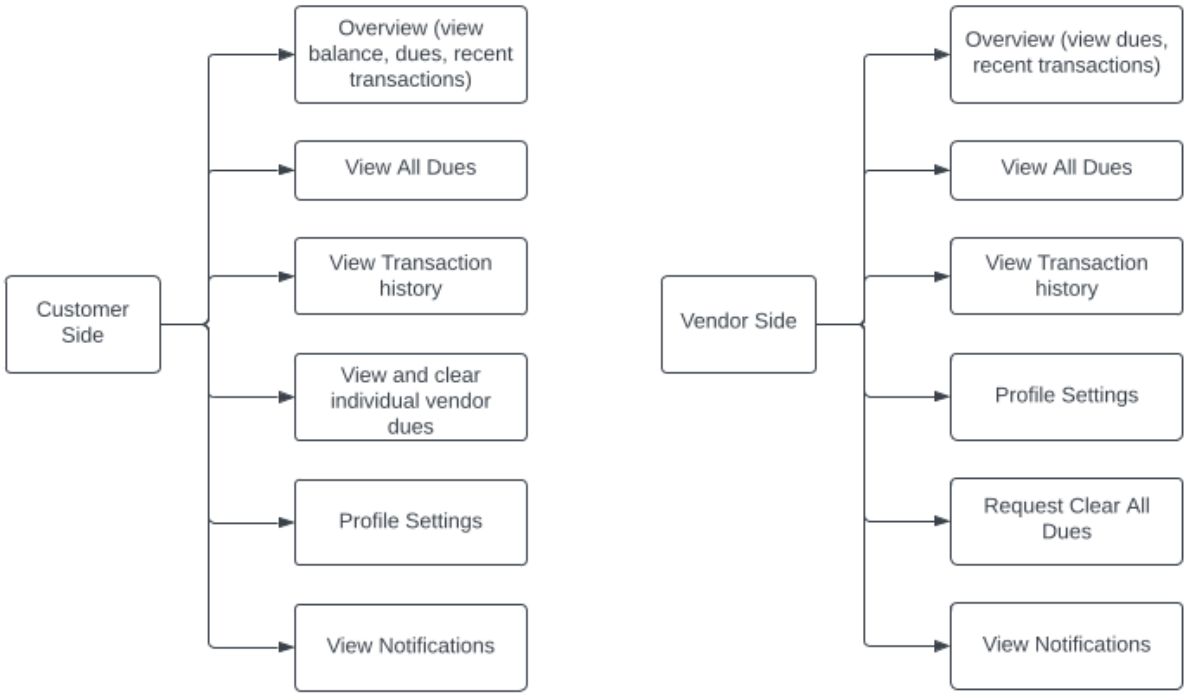
https://igotanoffer.com/blogs/tech/latency-throughput-availability-system-design-interview -
Referred for latency and availability inputs of similar systems

https://lucid.app/documents#/dashboard -
To create use case UML diagram
To create wireframes

2 Overall Description

2.1 Product Overview

The product was conceptualized for making expense tracking and payments on campus simpler and convenient for buyers as well as vendors. This is a self-contained product, to address issues faced by the campus community regarding all kinds of monetary transactions such as hall dues, canteen payments etc. The idea is to eliminate the need for multiple payment platforms and provide a single integrated platform for both the vendors and customers to keep a track of all financial transactions as well as provide an efficient means of handling them. Our platform keeps track of dues pending at various vendors (e.g. hall canteen, mess, hall general store) and allows the customer to clear these dues at any time, hassle free. In addition, the platform can be used to make instant payments to any registered user. All of this is achieved through wallet functionality, deployed by other apps (e.g. PayTM), but with campus specific functions as above. Our ultimate goal is to simplify the no-dues clearance process for students on campus by integrating our app with the no-dues clearance systems of all halls and vendors. This will eliminate the current manual process and make transitioning between halls and leaving campus after graduation a hassle-free experience. By digitizing this process, we aim to make it more efficient, transparent, and user-friendly for all students.



2.2 Product Functionality

[Please note: The following functions have been discussed in more detail in Section 3.2 later.]

- Customer and vendor registration (profile management). All CRED features pertaining to a profile are supported.
- Wallet (deposit / withdraw money), pay immediately to anyone on the portal through wallet through a unique user ID.
- Maintain accounts with registered vendors, clear dues anytime.
- ~~Transaction Verification – report suspicious transactions.~~
- Default prevention - impose limit on transaction going above wallet balance
- ~~Hall specific No-dues clubbed together for convenience (includes Mess, Electricity etc.)~~
- Alert user about pending dues ~~mandate payment at end of semester; auto-pay facility to avoid delays in payment~~
- ~~Vendors can manage registered customers, accept / decline customer registration requests to their organization and impose a limit on the amount of dues pending.~~
- User friendly interface which displays wallet balance, pending dues, recent transactions, accounts with vendors

2.3 Design and Implementation Constraints

Specific technologies used: Django as a backend framework, ReactJS as a frontend framework.
Language requirements: Python, JavaScript and SQL. WebScripting languages like HTML, CSS.
Security considerations: In-built form security provided by the django framework.
Databases to be used: SQL database (like SQLite)

2.4 Assumptions and Dependencies

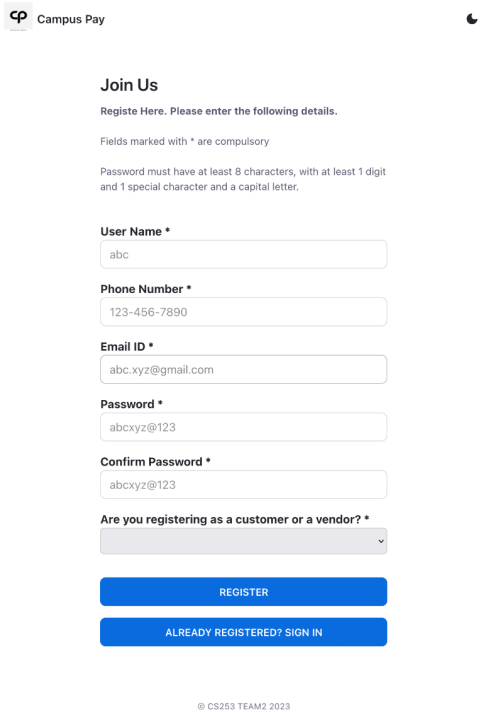
- We assume that the database for customers and authorised vendors will be provided by the authorities (eg. CC) to prevent malicious use of the softwares by external vendors and non-students/non-professors.
- We assume that a third-party access will be given in the process of adding money to the wallet to make it a hassle-free process which the web-app aims to achieve.
- We assume that the vendor and the customers will have access to smartphones and an internet connection to access the web-application.
- We assume that the vendors and customers will be provided a one time training to operate the web-application. This can be made available in the form of a tutorial.
- The web browser being used must be compatible with the latest versions of ReactJS, Django and SQLite.

3 Specific Requirements

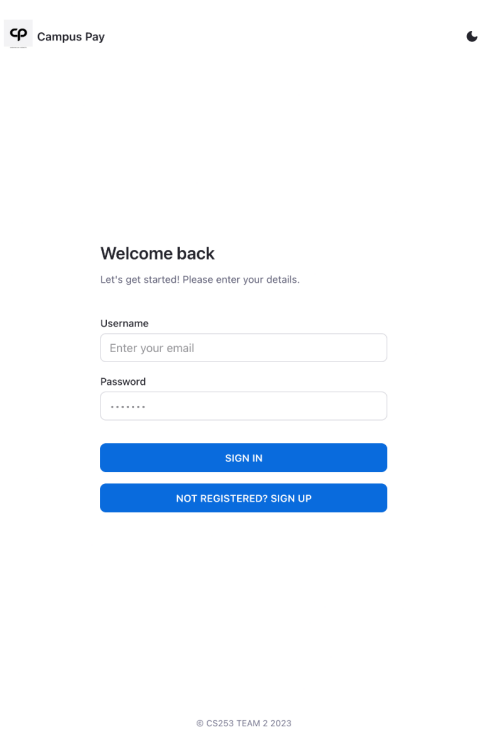
3.1 External Interface Requirements

3.1.1 Customer & Vendor Interfaces

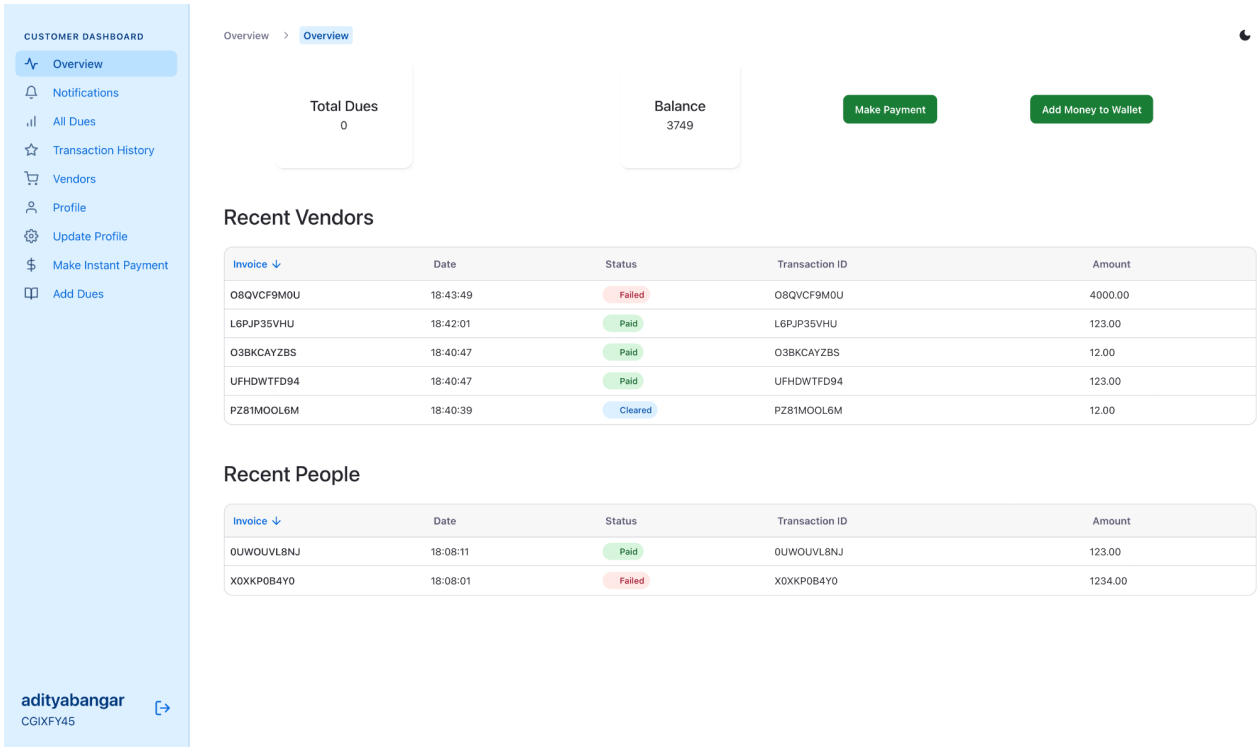
Registration Page for a New User



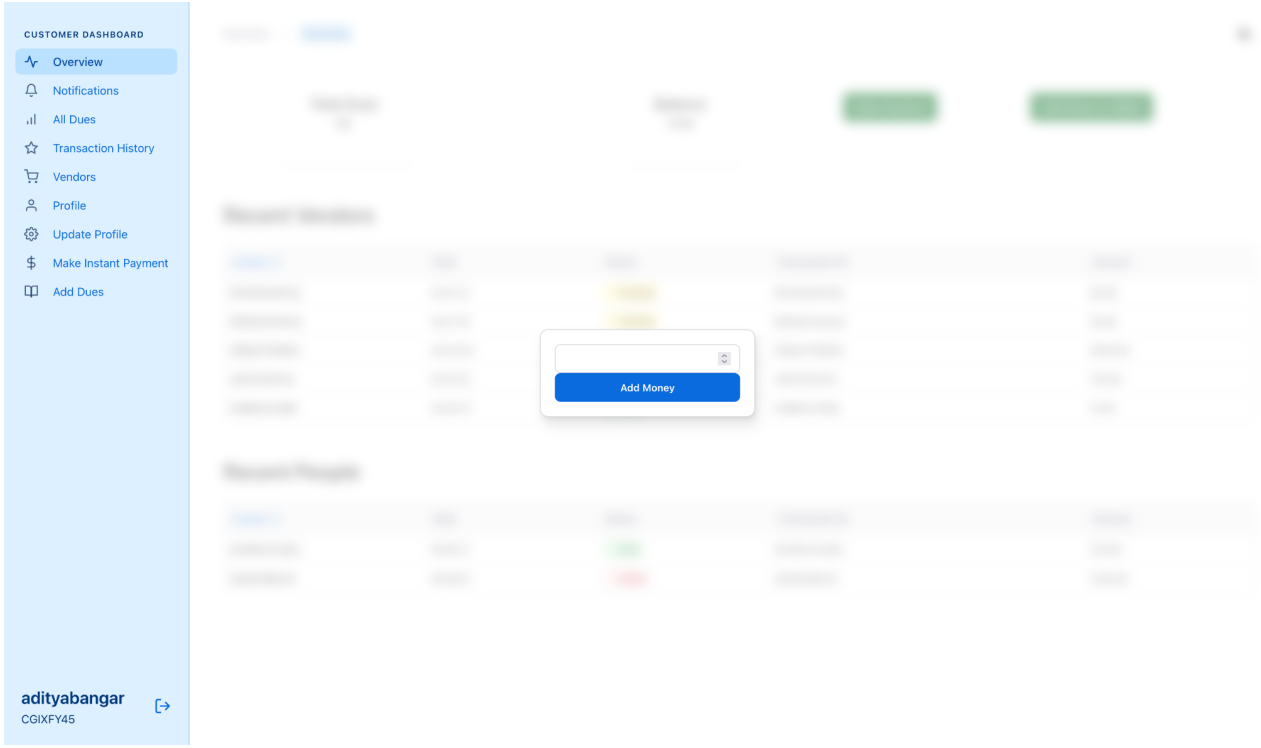
SignIn Page



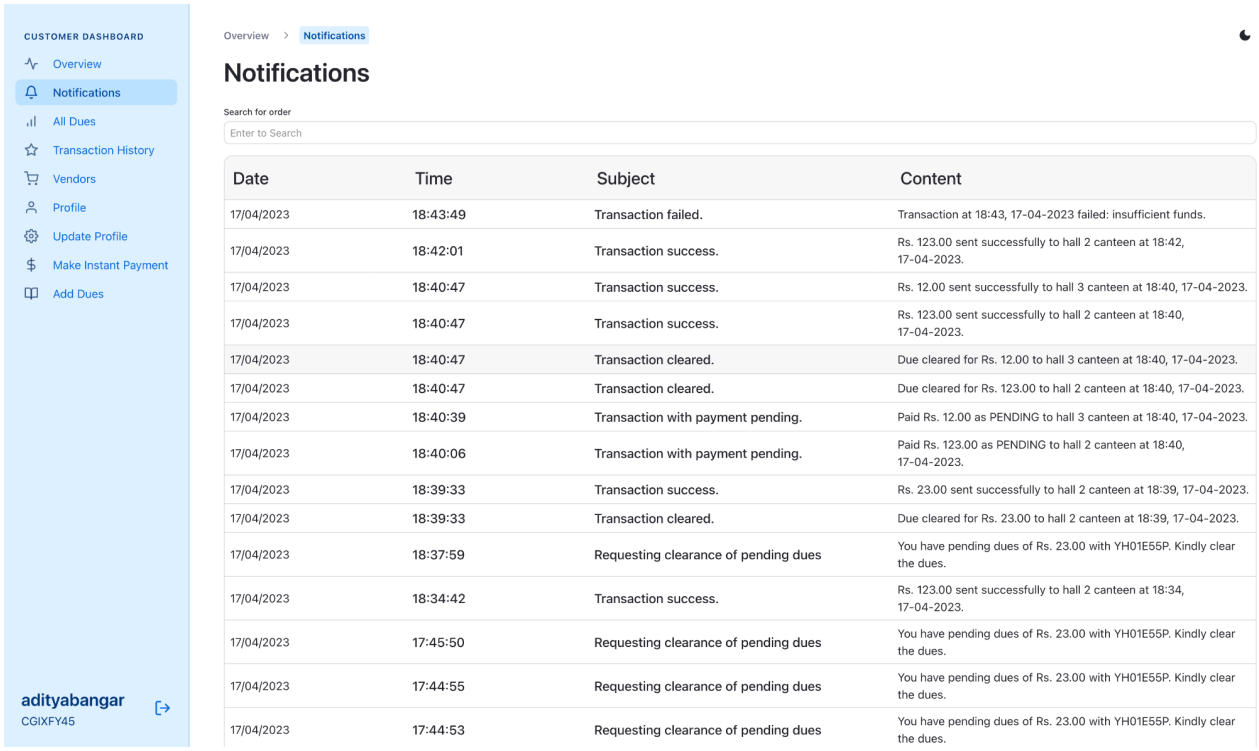
Customer Overview Page



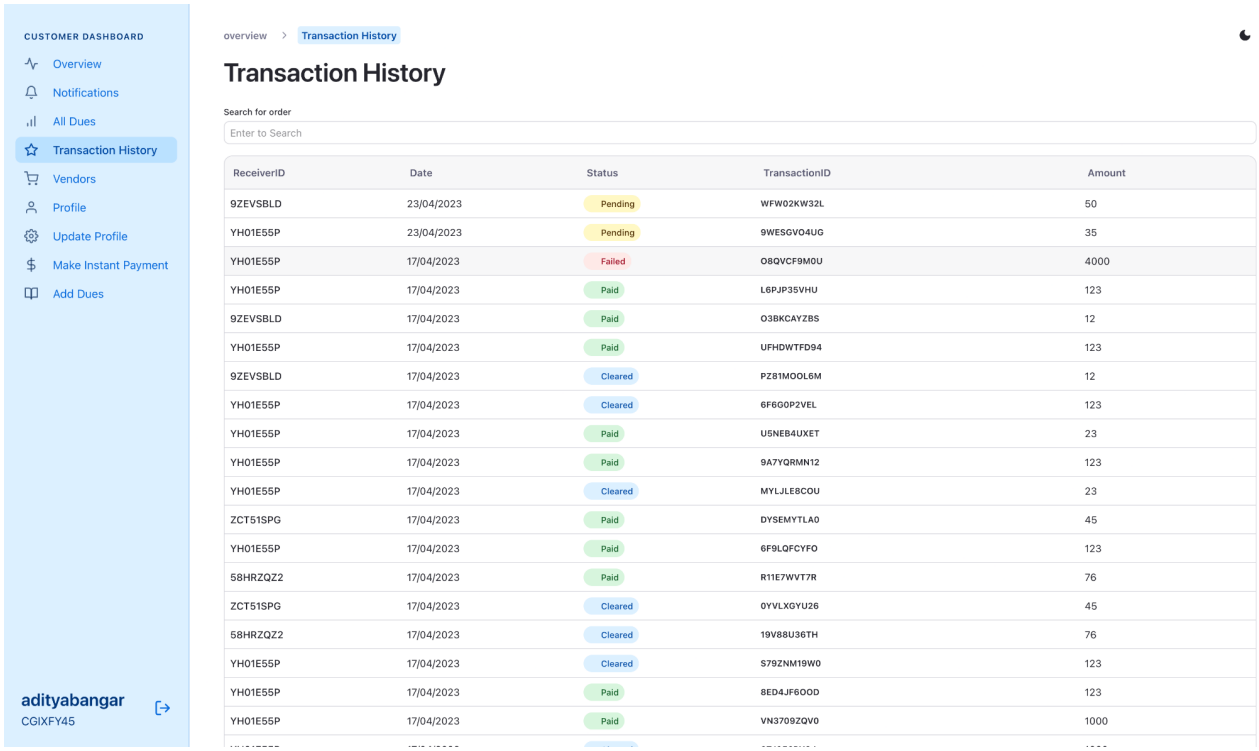
Prompt shown to add money to wallet, after the ‘Add Money’ button is clicked.



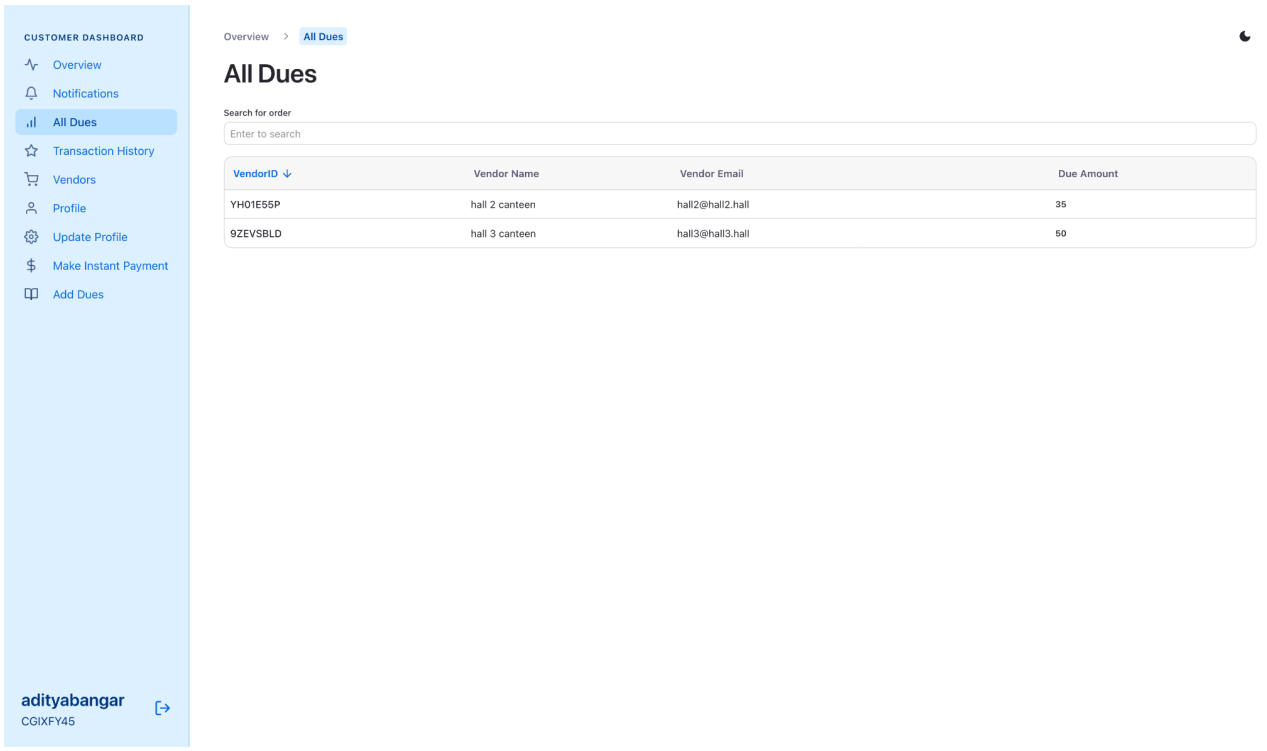
Customer Notifications Page



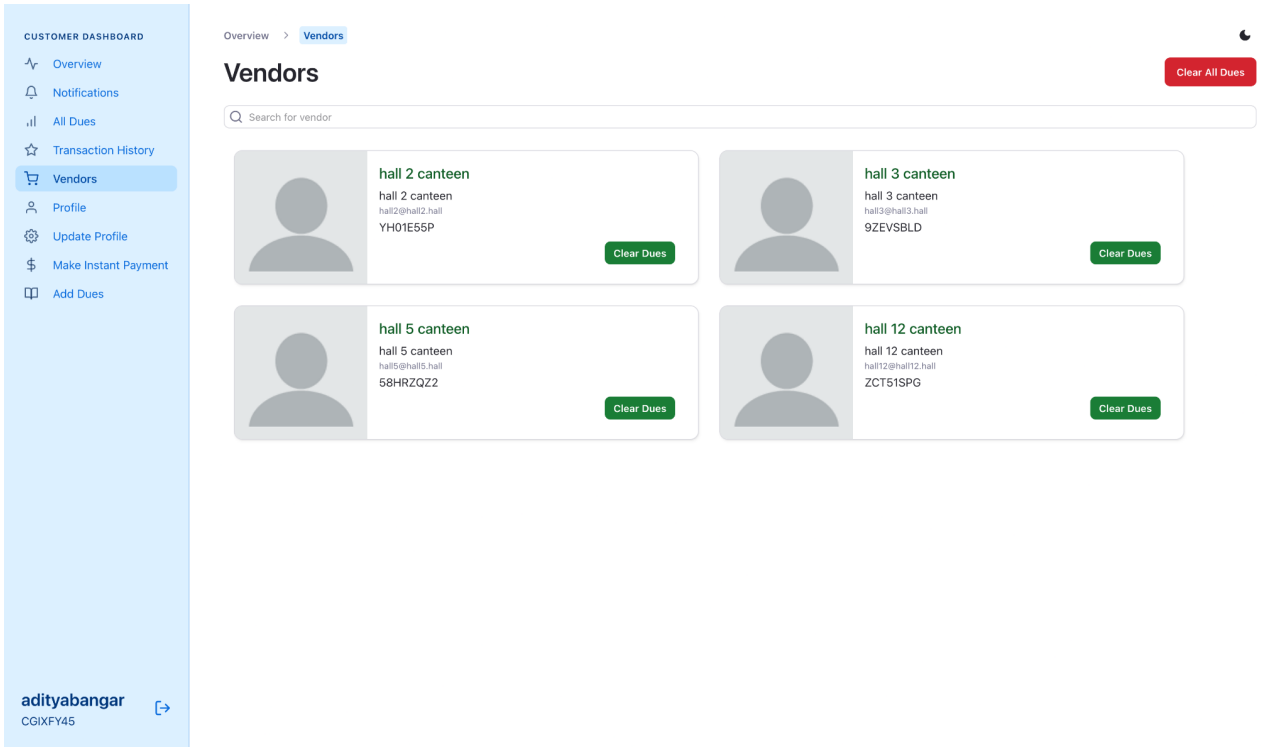
Customer Transaction History Page



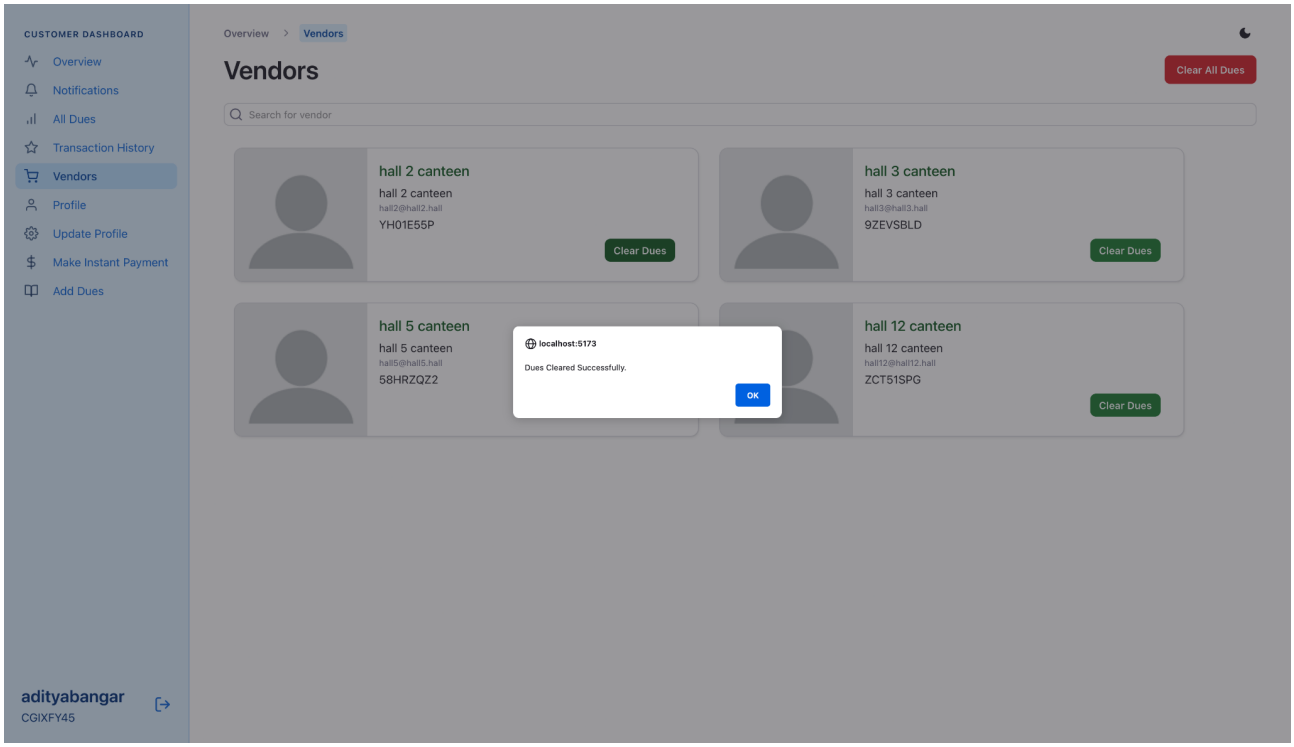
Customer All Dues Page



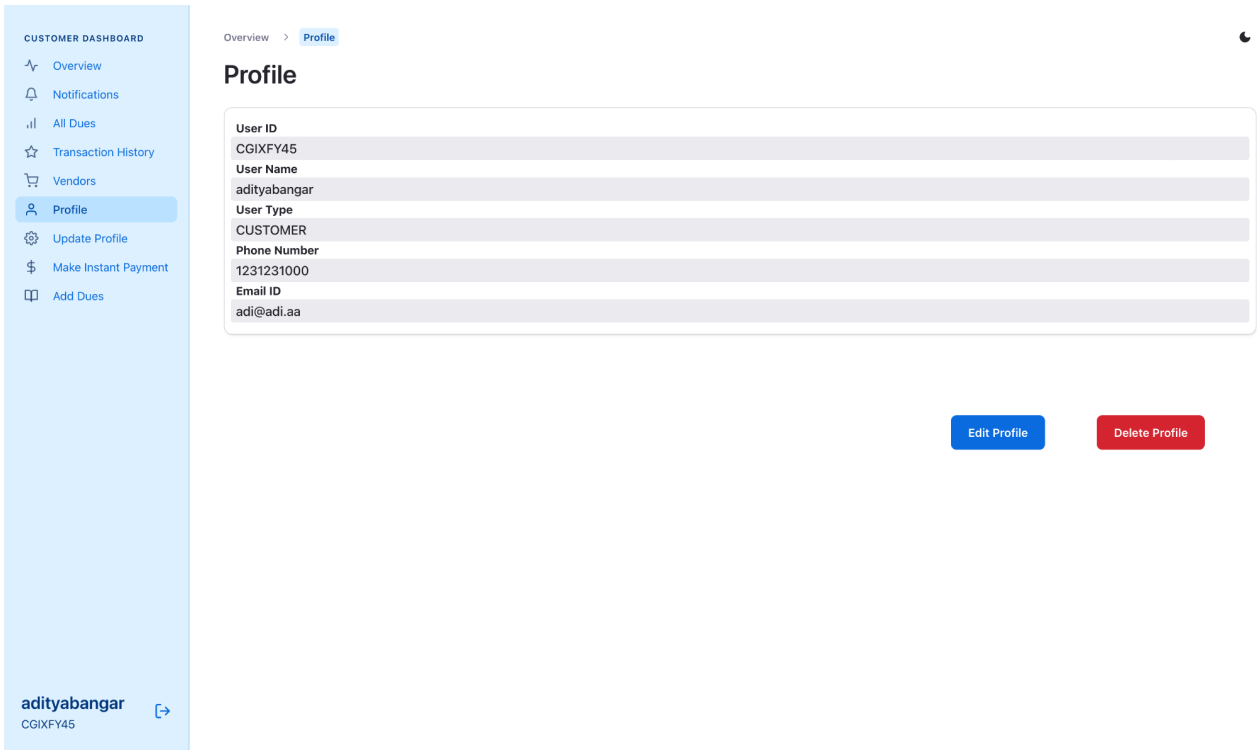
Customer Page showing all list of Vendors with whom business has been done before



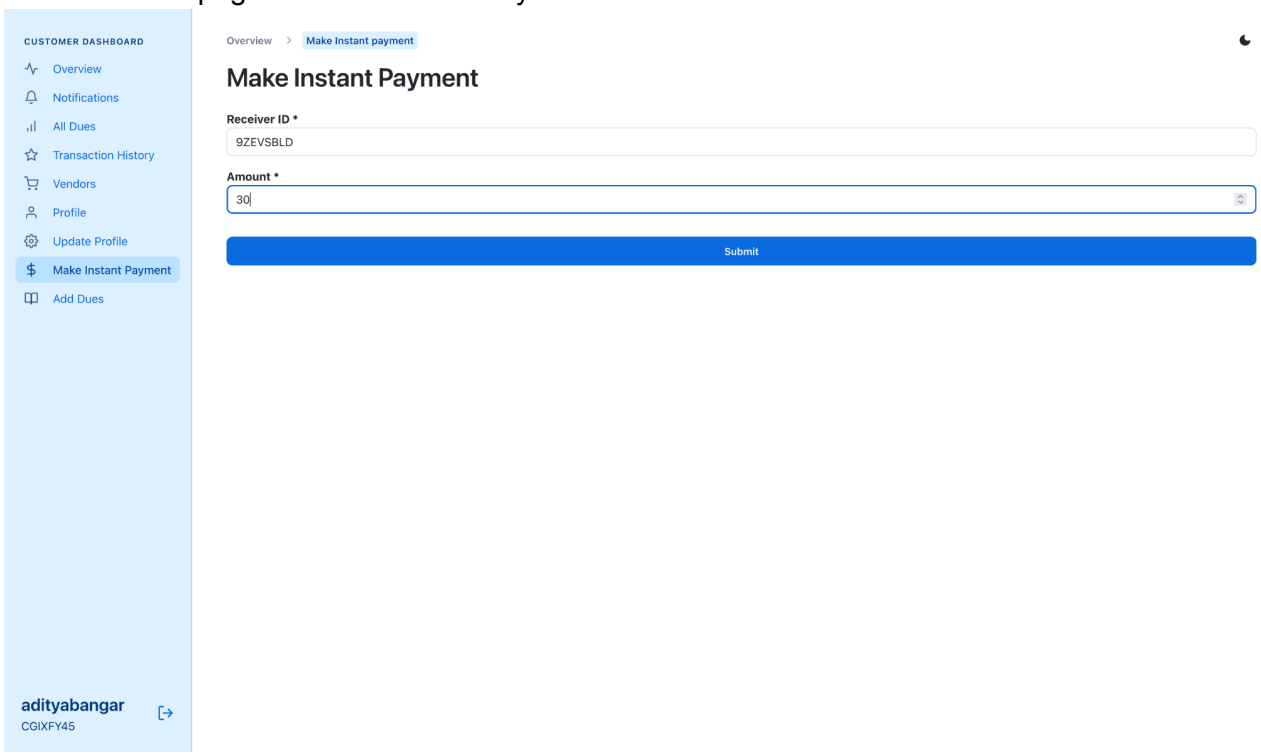
Notification shown after clicking ‘Clear All Dues’ or ‘Clear Dues’ button against individual vendor.



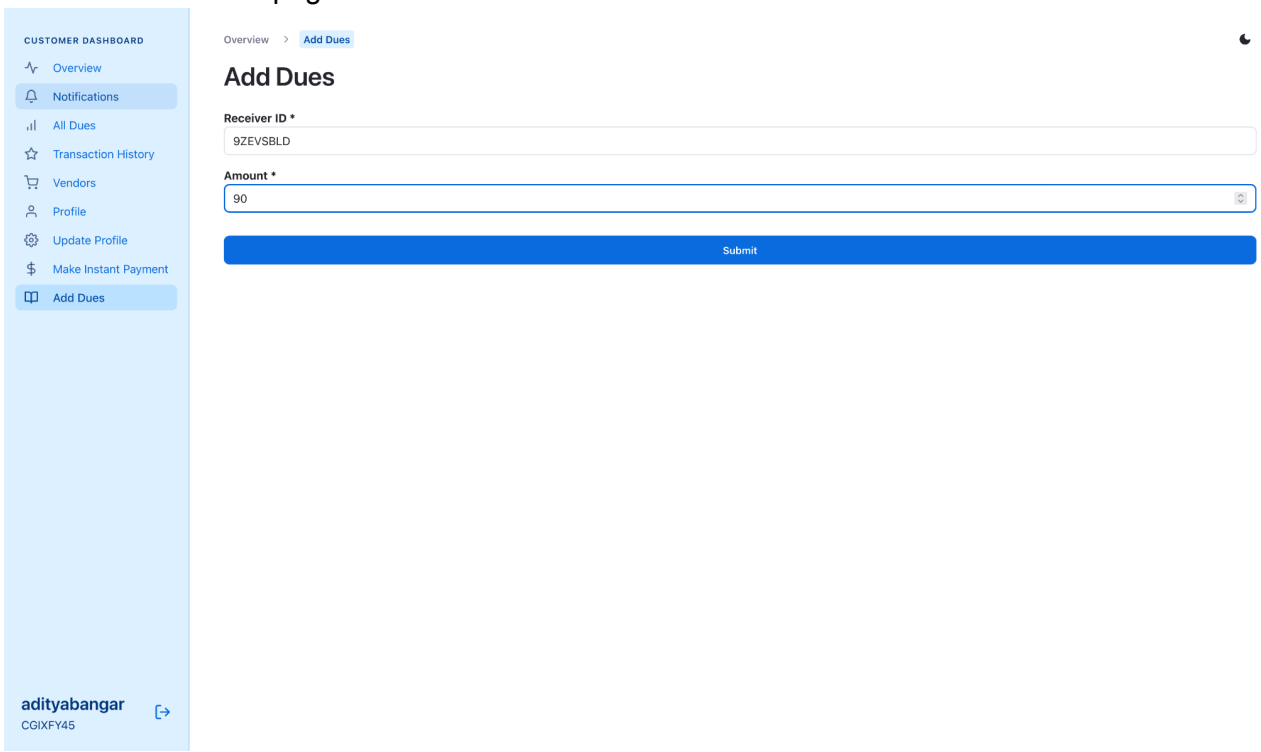
Customer Profile Page



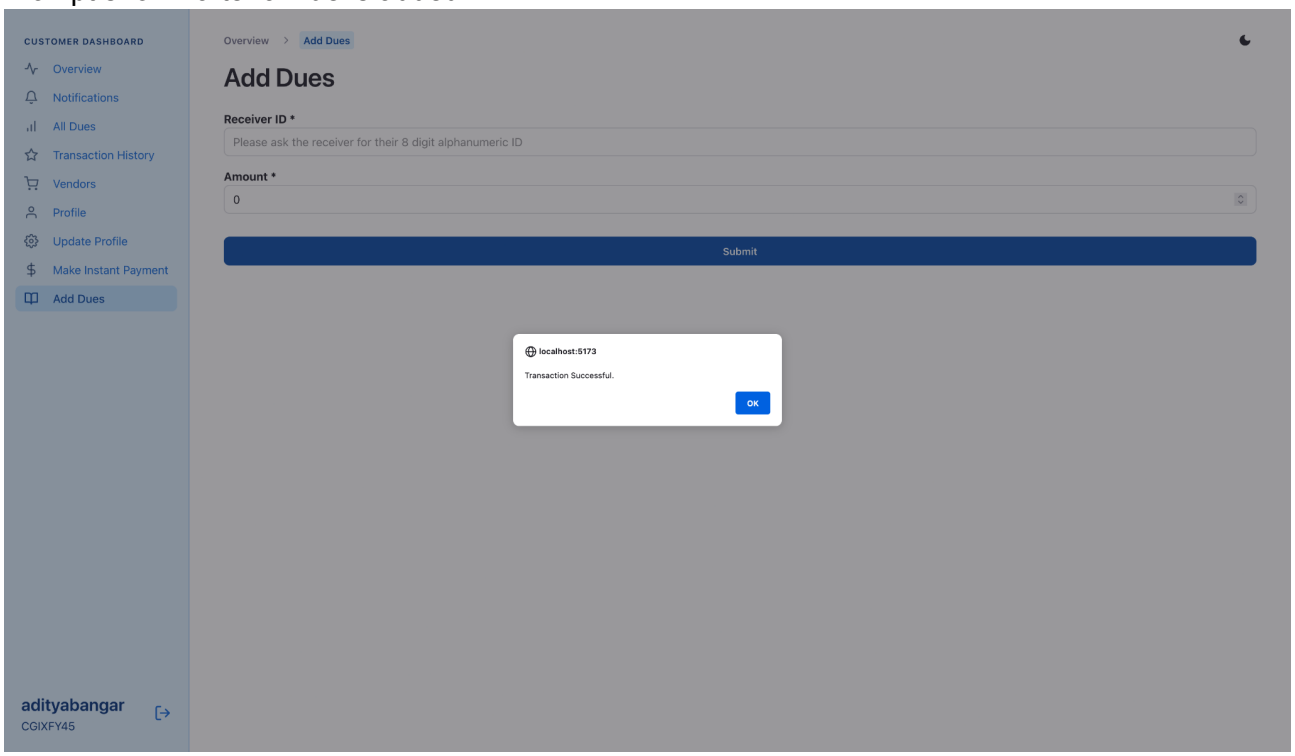
Customer side page to Make Instant Payment



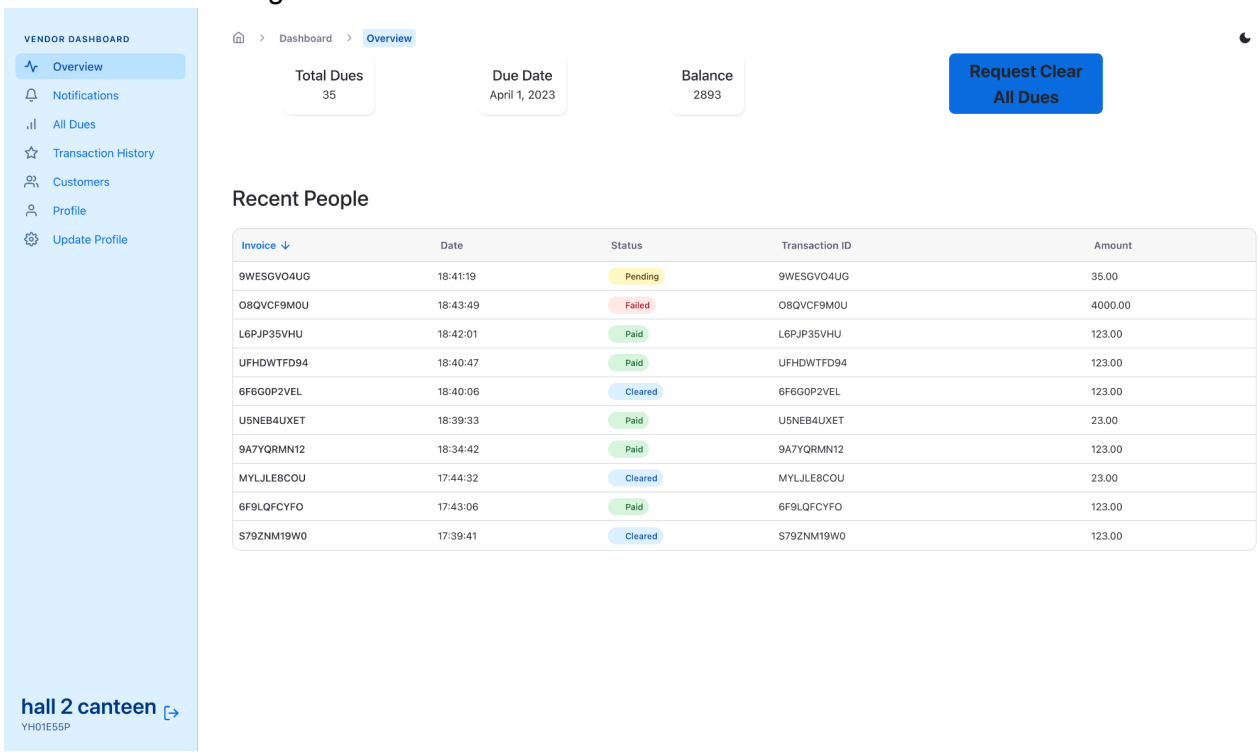
Customer Add Dues page



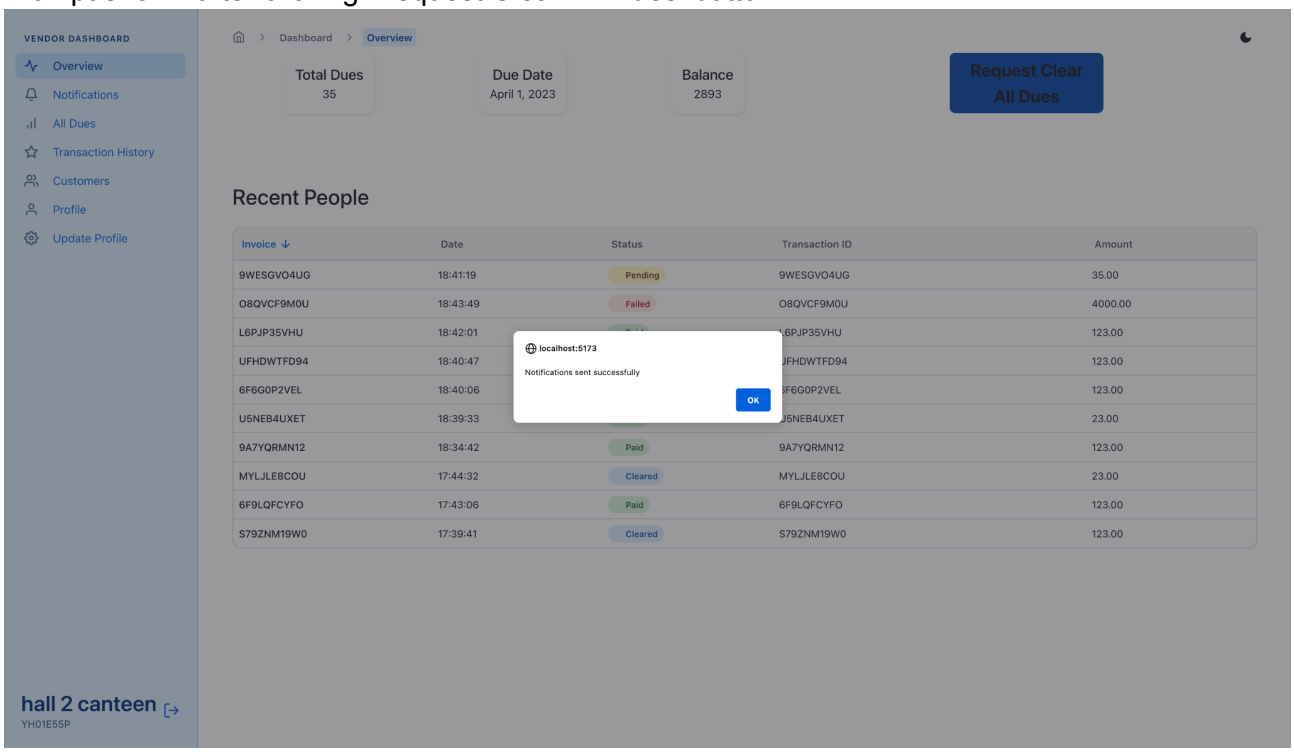
Prompt shown after a Due is added.



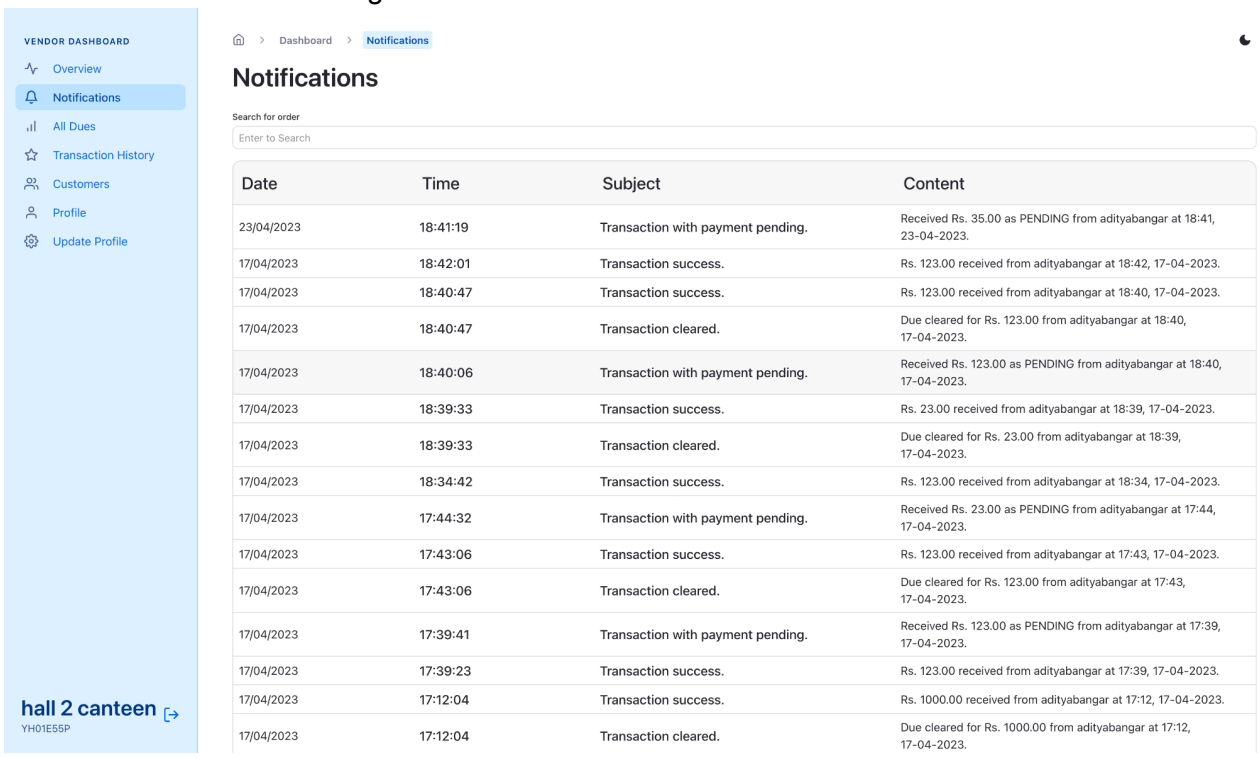
Vendor Overview Page



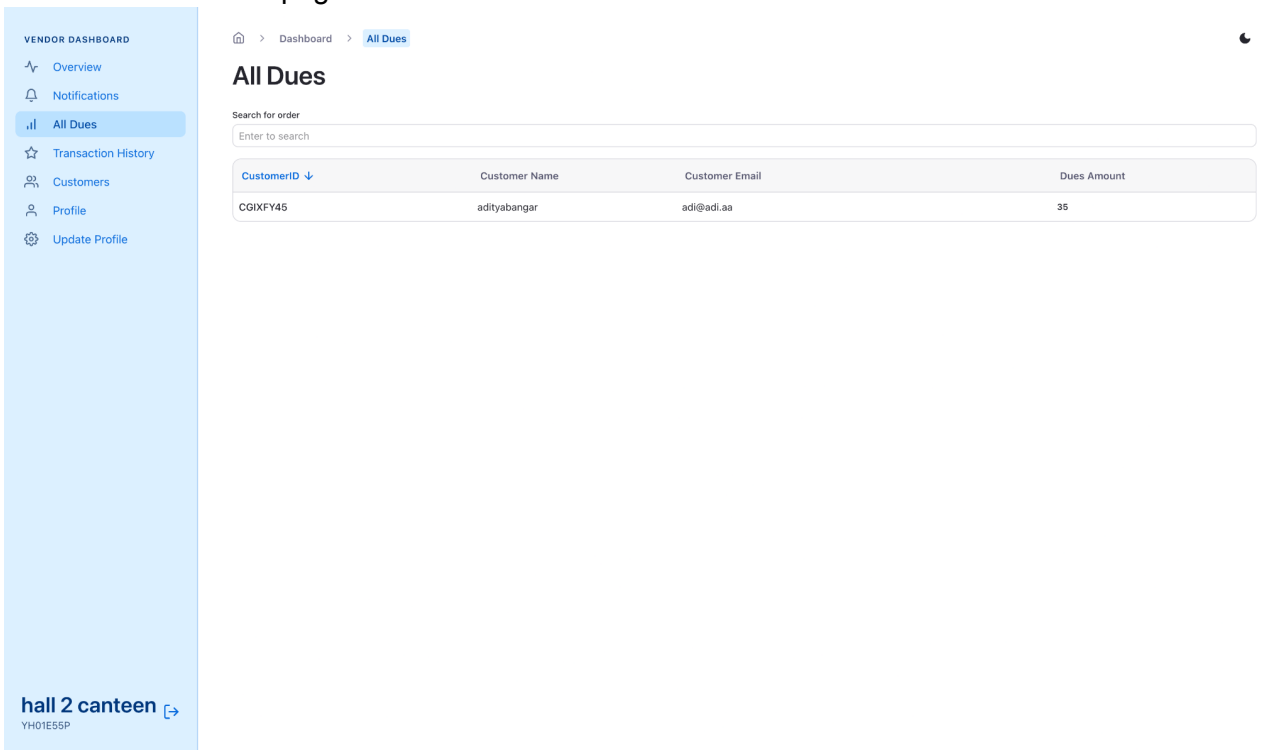
Prompt shown after clicking ‘Request Clear All Dues’ button



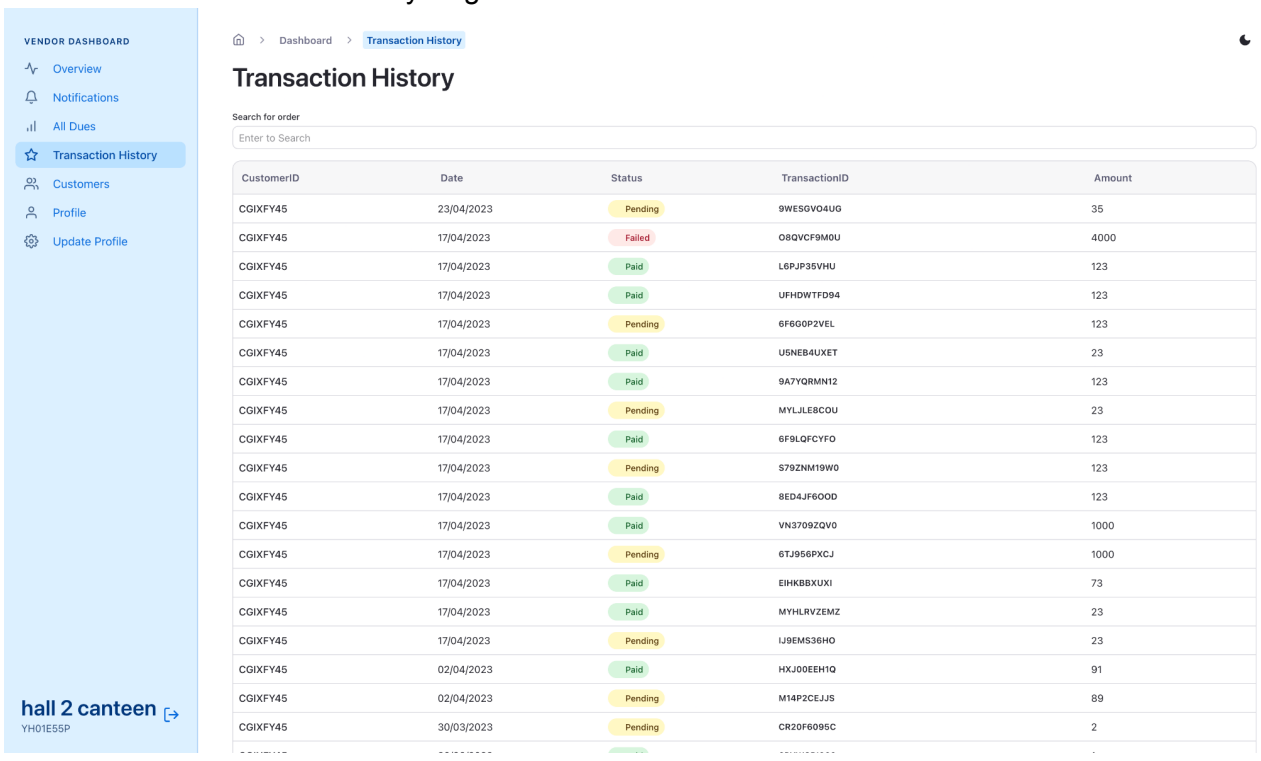
Vendor side Notifications Page



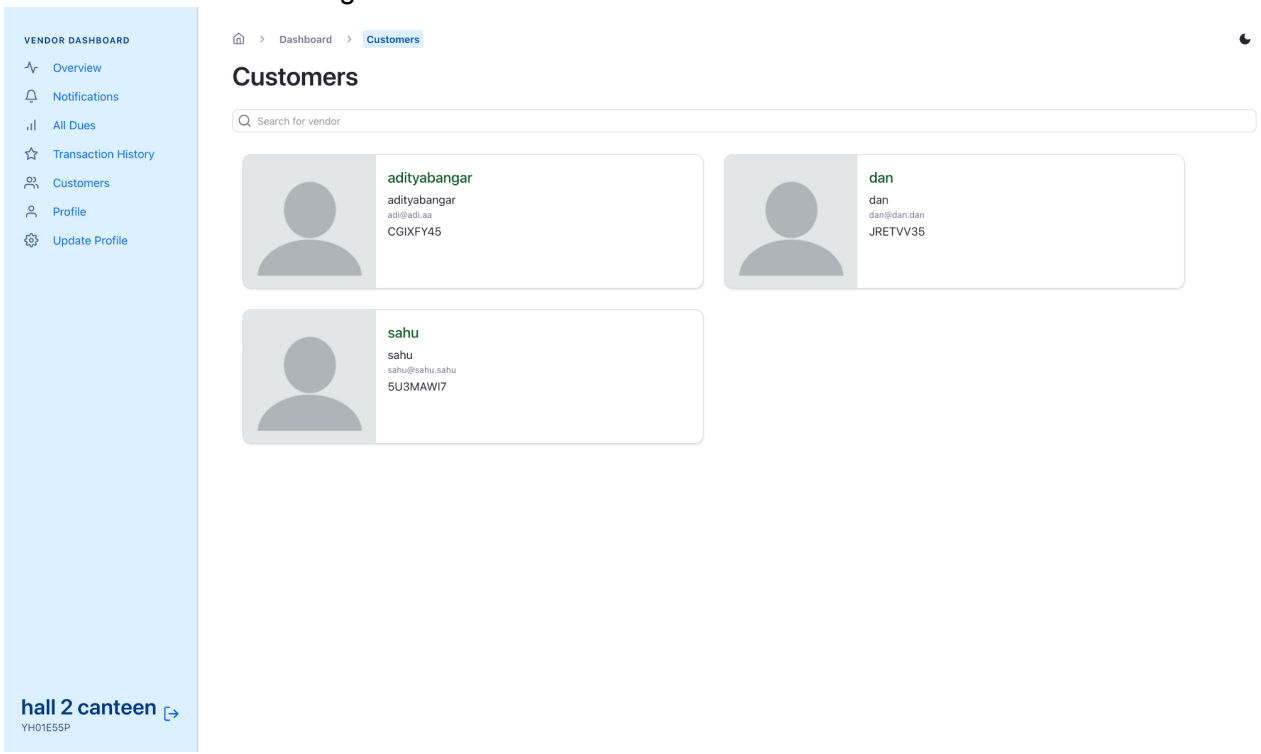
Vendor side All Dues page



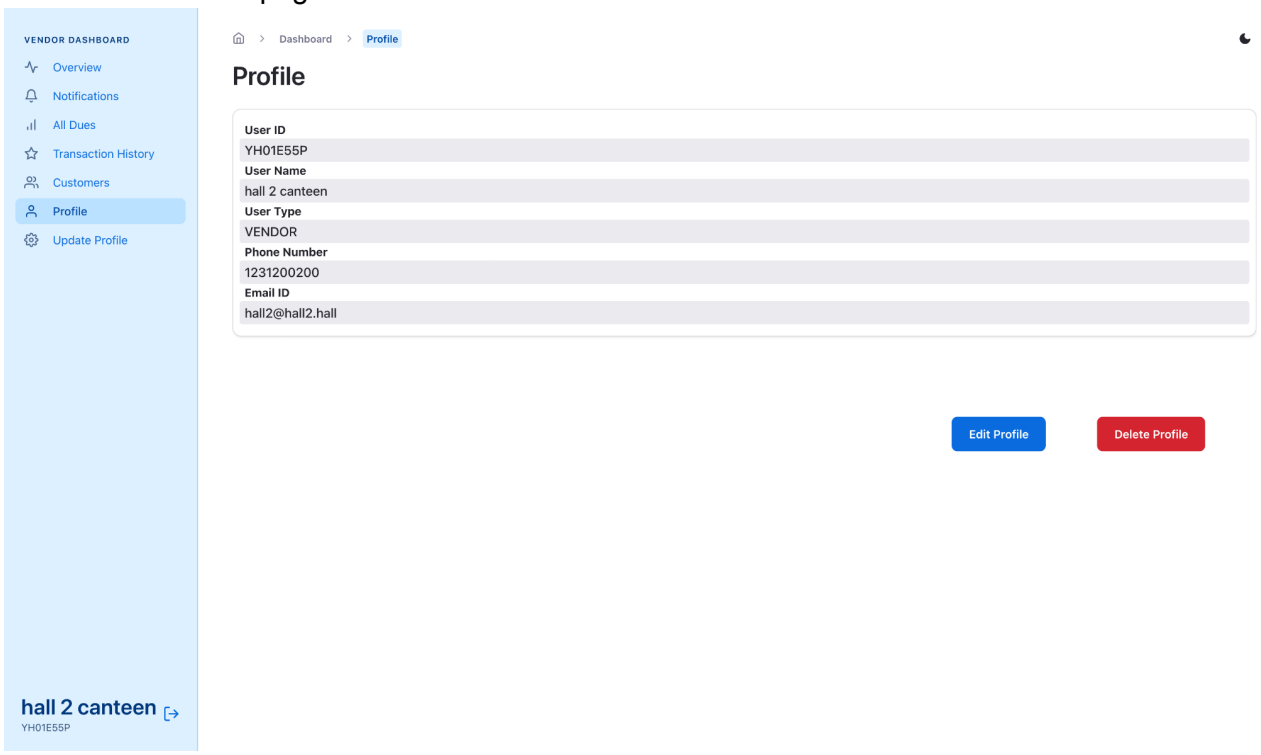
Vendor Side Transaction History Page



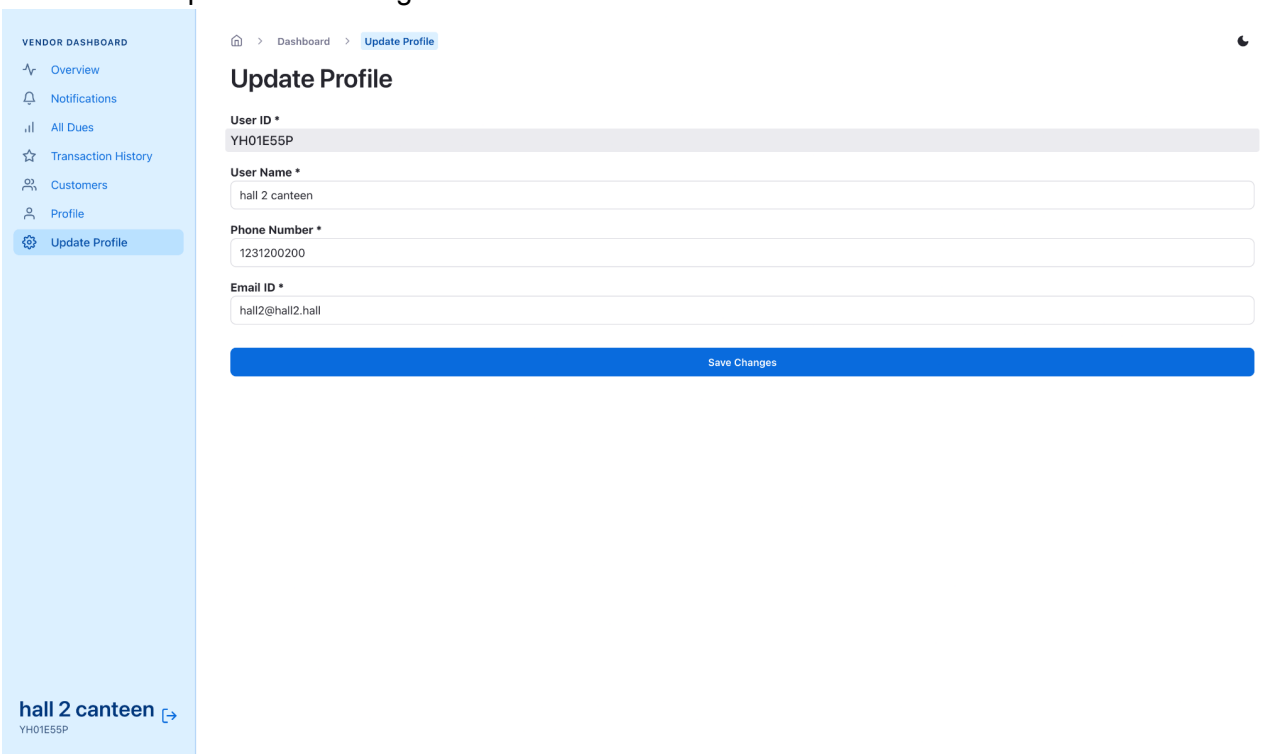
Vendor Side Customer Page



Vendor Side Profile page



Vendor Side Update Profile Page



The user interface of the software will be web-based and user-friendly. Allowing users to access the software via any modern web browser like Google Chrome, Mozilla Firefox, etc. Users have to log in/create an account via their mobile number and email and a password. No two users can be registered with the same mobile number or email ID or username. Each user will then be allotted a unique 8 digit ~~4-digit~~ alpha-numeric ID just after registration. After signing in, they will be able to view their respective dashboards based upon user type.

Vendors-

- The overview page will mainly display the total amount of dues of the customers, current wallet balance, due date to pay the balance, a button to request to clear all dues and the recent transactions (top 10).
- When a vendor 'requests clear all dues', a notification is sent to all customers who have pending dues with that vendor.
- In the left panel there will be options like notifications, profile, transaction history, all dues and customers (to view customers who have pending dues) and profile options.
- A vendor will receive a notification everytime he is credited an amount by the user/whenever a due is added.
- A list of pending dues and all transactions can be viewed.
- Vendors will also have the feature of updating their profile to change fields like phone number, email ID.

Customers-

- The overview page will mainly display the total amount of dues of the customers, the current balance. It will also have buttons to initiate a transaction and add money to the wallet. A customer can also view their 5 recent transactions with vendors and non-vendors.
- ~~It will display the total amount spent by the customer in all categories.~~
- In the left panel there will be options like notifications, profile, transaction history, all dues, vendors and people on the app.
- There will also be an indicator to display the total balance available in the ~~bank~~ wallet.
- A customer can view all of their pending dues, the details of vendors that they have pending transactions with.
- A customer can initiate transactions of 2 types- add it as a due or pay instantly.
- They also have an option of updating their profile.

3.1.2 Hardware Interfaces

Since the application must run over the internet, all the hardware shall be required to connect to the internet, which will be the hardware interface for the system. As for e.g. Wi-Fi, Ethernet Cross-Cable, etc. Any smartphone or PC with proper internet connection will serve the purpose.

3.1.3 Software Interfaces

Any modern mainstream browser such as Google Chrome, Brave, Firefox. In our web application the various buttons at the frontend connect with the backend via api calls, for example, the registration page does a POST request to the backend which updates entries in the database. Login and logout also does a POST request. The Dashboard and other pages on loading do a GET request to the server which serves the pages to be shown to the user. The pay button does an UPDATE request on the backend which changes the amount of money in the wallets of the users participating in the transaction. It also POSTs a transaction to the transaction history of the vendor and user and sends both of them a notification regarding the transaction. There are other GET and POST requests involved for example, to view and update the profile. The corresponding pages can be referred to in the screenshots attached above.

3.2 Functional Requirements

3.2.1 Feature #1 [Customer and vendor registration]

The first registration for anyone would be as a user of the platform. We plan to collect basic information in this registration, for example, Name, Mobile Number, Email ID, ~~Relevant Campus Information~~ and password. In case the user wishes to register as a vendor, there would be an option to do so, subject to admin verification. ~~physical verification~~

We cannot have two accounts associated with the same mobile number as well as email ID.

3.2.2 Feature #2 [Wallet facility]

Every user is provided a Wallet (similar to PayTM), which can be used for transactions on the platform. In the current project, we have abstracted out the wallet recharge / withdrawal process since that would require actual banking transactions. Every user will be assigned a unique 8-character ~~4-character~~ alphanumeric code upon registration, which can be used for instant payments (eg. payments can be made directly by entering this 8 digit ~~4 digit~~ code and payable amount).

3.2.3 Feature #3 [Dues management]

~~Each user can register with a vendor on the platform, to start an account at their establishment. Once the vendor approves this registration, pending dues will be displayed on both ends. A user can add / remove vendors through the platform (removal allowed only if there are no pending dues).~~Once a due has been added between two given users, pending dues will be displayed on both ends. Dues can be updated ~~both by the vendor as well as~~ only by the customer. A customer cannot have total dues exceeding 1L (a parameter that can be updated).

3.2.4 Feature #4 [Instant Payment]

In addition to accounts in Feature #3, customers can also pay other users (including vendors) instantly using their wallet. This is similar to the facility provided in wallets like PayTM. A user cannot instantiate a transaction of an amount greater than their current wallet balance. If a user tries to do so, a transaction is posted to the transaction history with status 'failed' and a notification is sent to the user that initiated the transaction.

3.2.5 Feature #5 [~~Hall specific~~ Vendor wise dues management]

~~Various dues corresponding to the hall of residence of a user, including Mess, Electricity, Canteen, General store will be clubbed together for convenience.~~Various dues corresponding to the vendors will be displayed together for convenience along with some vendor details. ~~The No-Dues certificate required at the end of each semester will be generated automatically and sent to the Hall Office once these dues are cleared by the customer via linking with Pingala.~~

3.2.6 Feature #6 [Transaction History]

Both kinds of users can view their transaction history. Since only customers can make transactions, customers can view their transactions with vendors as well as non-vendors and vendors can view their transactions with all the customers.

3.2.7 Feature #7 [Pending Dues Alert~~,Autopay~~]

~~Users will be alerted about their pending dues on the platform, at time intervals specified by the user themselves.~~Vendors can request due clearance at times like semester-end, or before mid-semester recess for canteens. ~~Users can also enable an autopay feature through which dues will be cleared automatically at given time intervals, provided the wallet has sufficient balance~~

3.2.8 Feature #8 [Other Notifications]

Every time a transaction is made, the sender receives a notification regarding its status (successfully made/failed). If successful, the receiver also receives a notification about the same.

3.2.9 Feature #9 [Default prevention]

~~To prevent cases of default when the customer does not pay their dues by the stipulated deadline, we plan to impose a restriction on the dues possible to be accumulated by a customer. There will be a minimum balance required in every customer's wallet in case they wish to add a due for some vendor. This minimum balance will be relaxable till a fixed grace amount (e.g. Rs. 200). This means that, for a current wallet balance of Rs. X, one can add dues up to Rs. X+200, after which the platform will not allow any more dues to be added. W.r.t. feature #7, if the user does not pay their dues by the admin specified deadline, the pending amount will be deducted automatically from their wallet. Remaining dues (< Rs. 100) will be added to the institute pending dues for the user.DD~~

3.2.10 Feature #10 [Vendor privileges]

~~A vendor can add a customer to his organization by entering his details~~. ~~Vendors can set an upper limit for pending dues, after which no transactions would be allowed.~~ A vendor can also easily view all the customers that they have pending dues with and request a clear due thus making due management easier on the vendor side.

3.2.11 Feature #11 [Customer's User Interface]

The User Interface (UI) will display Wallet balance and pending dues on all pages the customer visits, tentatively on the left hand side. On the landing page, the most recent transactions will be displayed to the customer. Further, on clicking one of the transactions (which includes vendor details), the customer will be shown the most recent transactions corresponding to the vendor they clicked on. There will also be options to add or remove vendors, deposit or withdraw money from the wallet, instant payments.

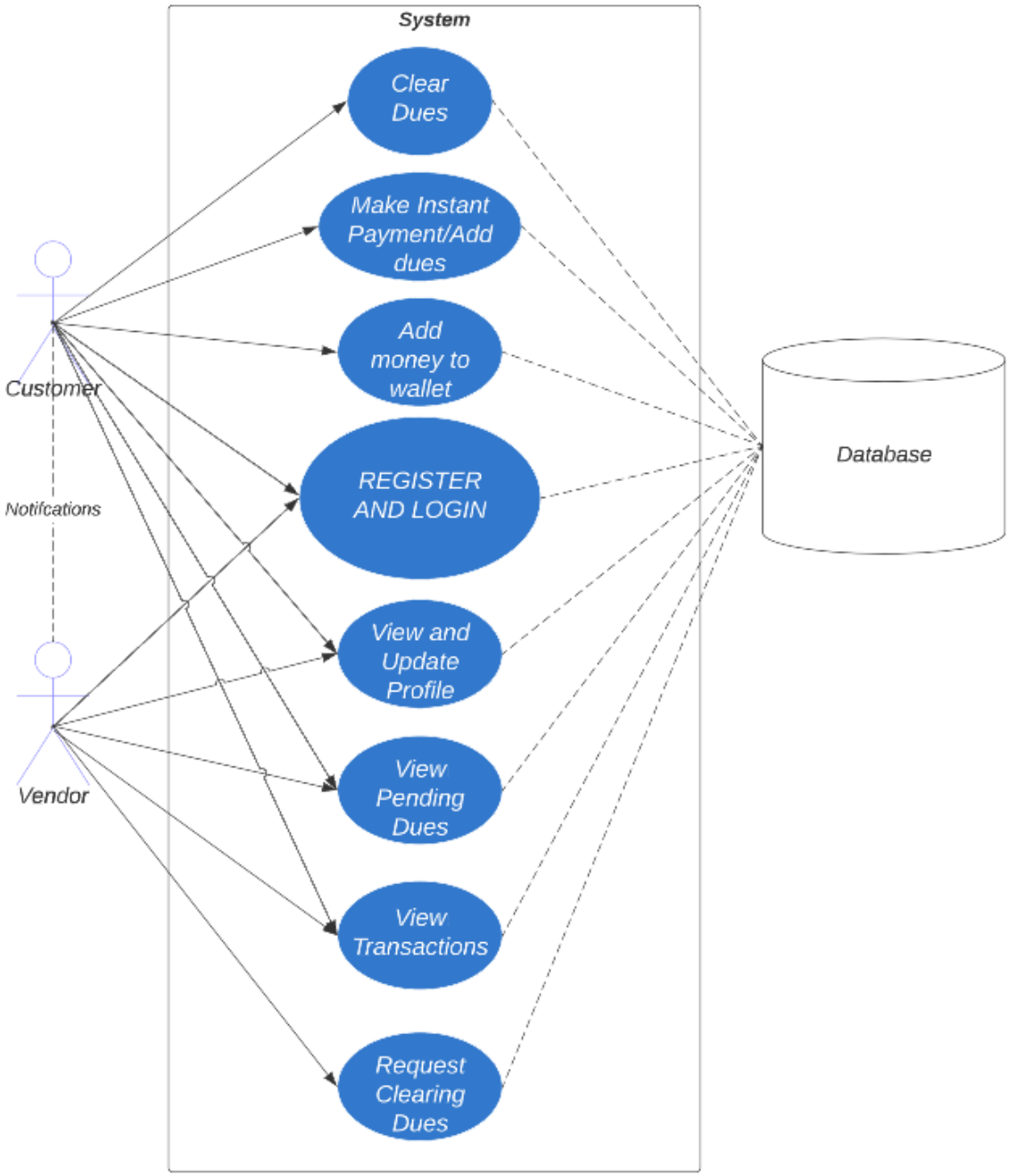
3.2.12 Feature #12 [Viewing and Updating Profile]

Both the vendor and the customer can view their profile details and update it as well. They also have the option of deleting their profile. When a user sends a request to delete their profile, it is checked that they have no pending dues and then their profile is successfully deleted.

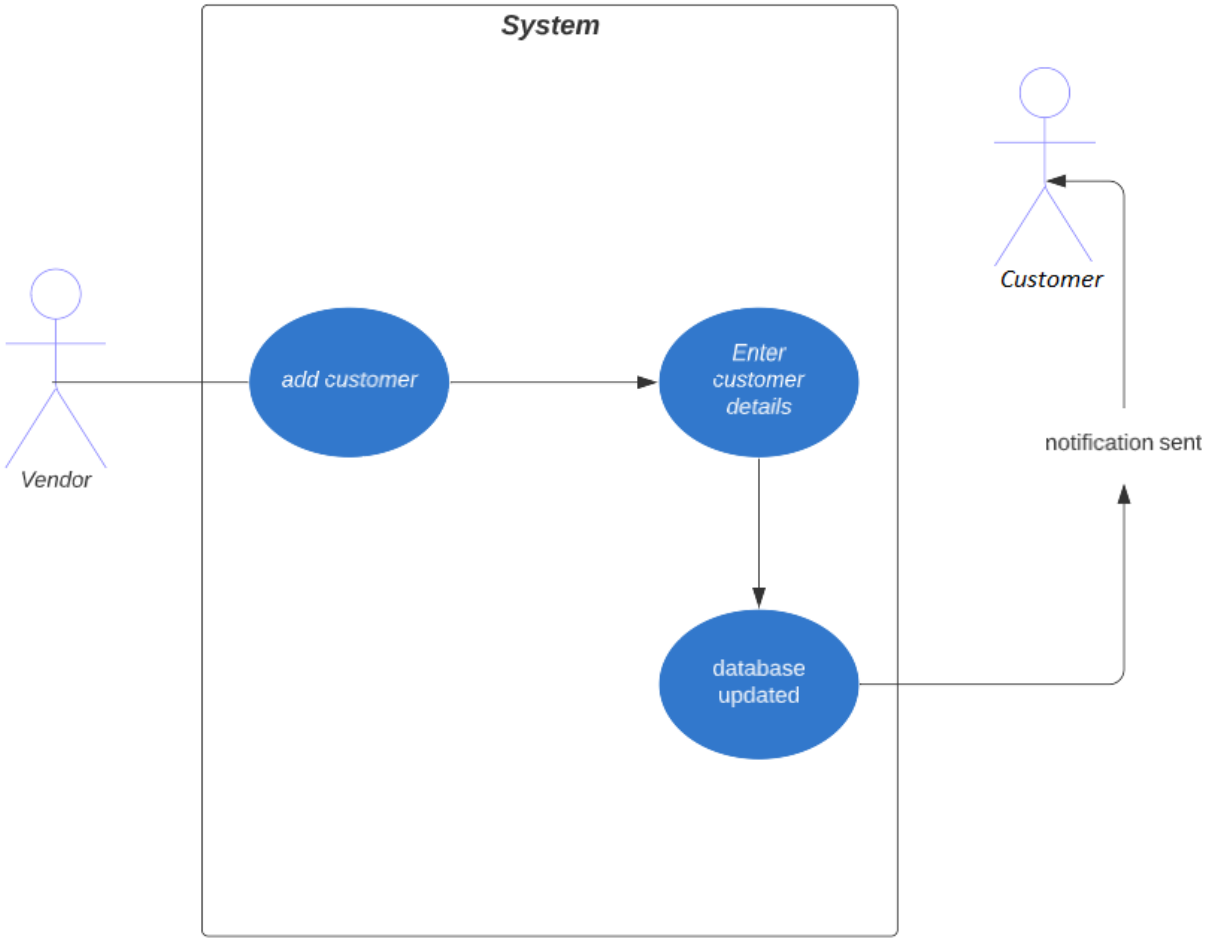
3.2.13 Feature #13 [Light and Dark Theme Toggle]

A feature to cater to all of our users since studies have proven that light mode is clearer and quicker to understand for people with normal or corrected vision whereas dark mode allows people with visual disorders to perform better.

3.3 Use Case Model



3.3.1 U1 : Customer getting added to the customer list of a vendor



Purpose - Vendor has to add the customer (one time operation) to his list with whom he wishes to maintain an account.

Requirements Traceability – Feature #10 (Vendor Privileges)

Priority - Low (can be automated, need not be explicitly done)

Preconditions - The customer being added must be registered on the app.

Post conditions - The customer will be able to maintain dues with the vendor after successful registration.

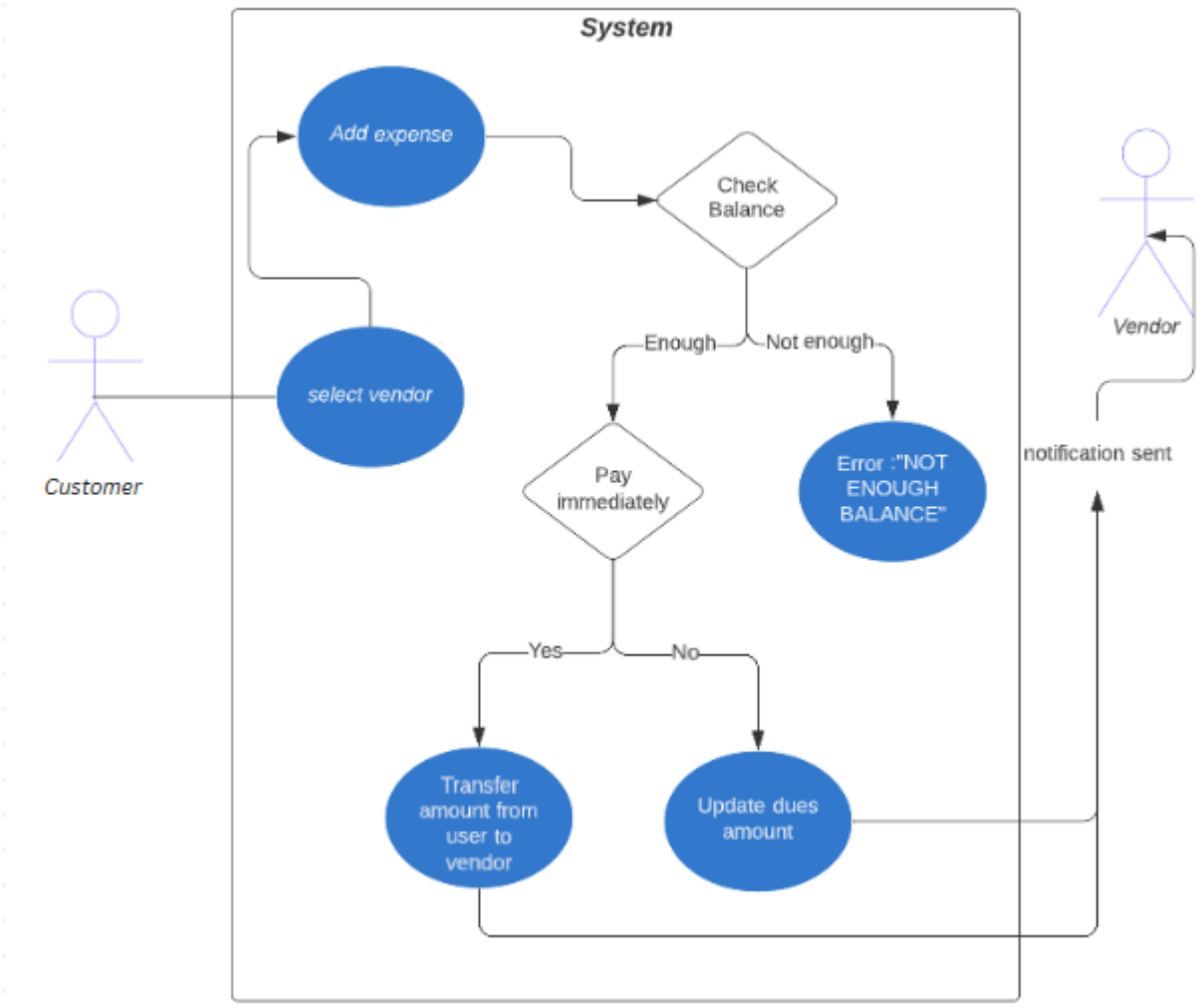
Actors – Vendor, Customer

Exceptions - NA

Includes (other use case IDs) - NA

Notes/Issues - It has been implemented such that the process is automated once a customer makes their first transaction with a vendor.

3.3.2 U2: Customer adding an expense as dues



Purpose - Customers can add an expense anytime he/she buys commodities from a vendor, without paying them instantaneously. Its main objective is to decrease redundancy of multiple payments to the same vendor within a specified period.

Requirements Traceability – Feature #3 (Dues Management)

Priority - High

Preconditions - 1. The customer must be registered with the vendor beforehand.
2. The due cannot exceed 1L.

Post conditions - The total dues will be updated in the databases and will be displayed to both customer and vendor.

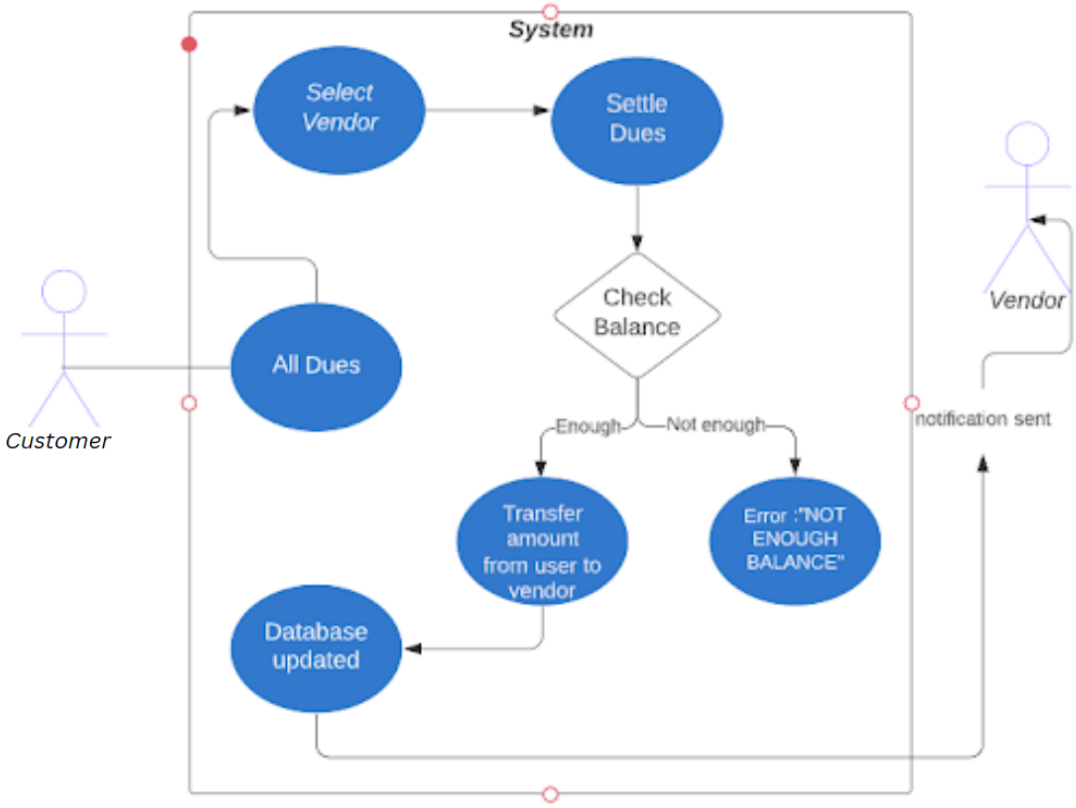
Actors – Customer

Exceptions -NA

Includes- NA

Notes/Issues - NA

3.3.3 U3: Customer settling his/her dues



Purpose - A customer can settle his existing dues with a vendor as per his own convenience.

Requirements Traceability -Feature #2 (Wallet Facility) , #3 (Due Management), #7 (Pending Dues Alert)

Priority - High

Preconditions - 1) The dues category must not be empty.

2)The customer should have enough wallet balance.

Post conditions -

1) The dues of that particular vendor will be settled and money would be transferred from the customer's account to the vendor's wallet and the database will be updated.

2) The vendor will receive a notification that the customer has cleared all their dues.

3) A new transaction will be created with an amount equal to the total due of that customer with that vendor with status ‘cleared’ and added to the transaction history of both the sender and the receiver.

Actors – Customer

Exceptions - NA

Includes - NA

Notes/Issues - NA

3.3.4 U4: User making instant payment

Refer diagram of U2

Purpose - Apart from adding dues for an expense (as in U1), a customer can also pay instantly using his/her wallet.

Requirements Traceability – Feature #2 (Wallet Facility), Feature #4 (Instant Payment)

Priority - High

Preconditions - Sufficient wallet balance is required as per Feature #9

Post conditions -

1) The wallet amount of both sender and receiver will be updated in the databases.

2) Both users receive a notification that the payment has been made. A transaction is added to the transaction history of both sender and receiver

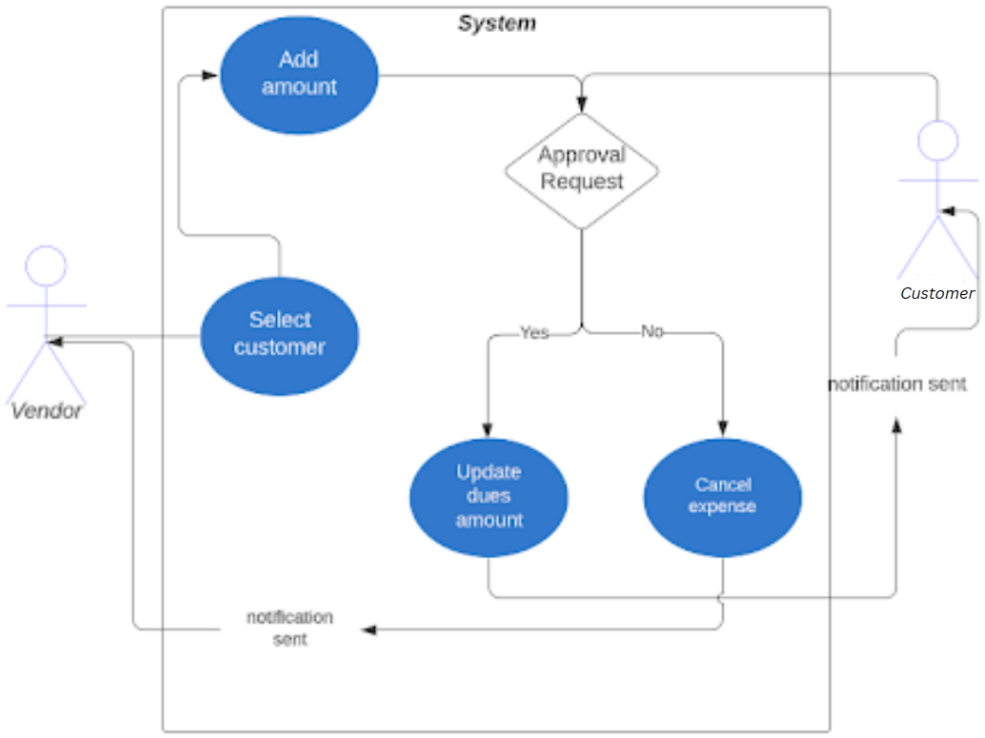
Actors – Customer

Exceptions - NA

Includes- NA

Notes/Issues -NA

3.3.5 U5: Vendor reminding for a pending due



Purpose : Vendor can remind the customer if he hasn't cleared the dues for a long time or if he is in need of urgent money.

Requirements Traceability – Feature #3(Dues Management), #7 (Pending Dues Alert)

Priority - High

Scenario - Vendor can request the customer to clear up his pending dues.

Post conditions - The customer will receive a notification if the vendor has sent a reminder.

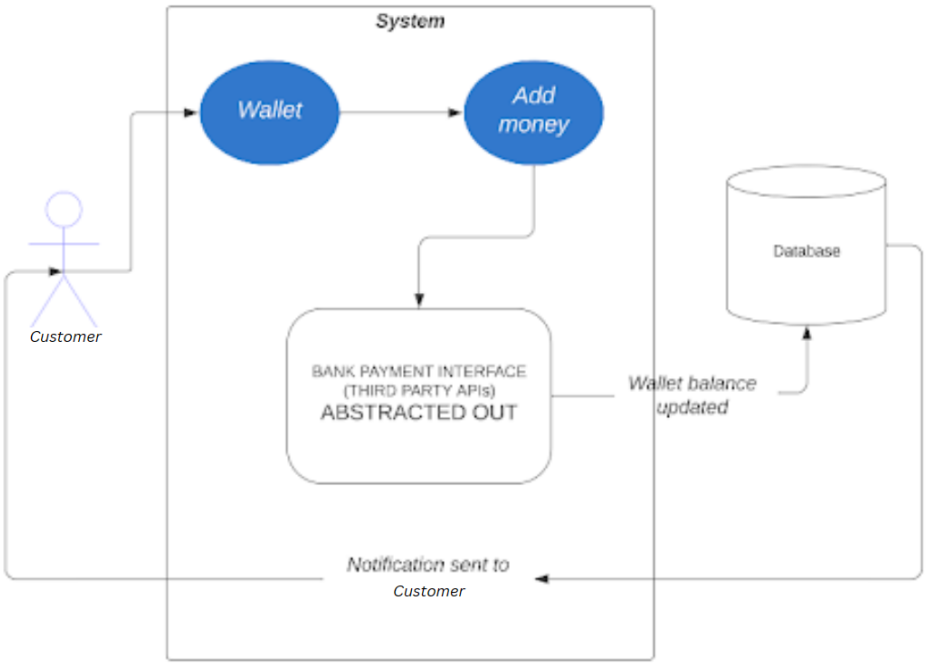
Actors – Customer,Vendor

Exceptions - N.A

Includes -NA

Notes/Issues - The remainder notification -NA

3.3.6 U6: Customer adding money to wallet (abstracted out)



Purpose - Customer can recharge the wallet by any amount using bank account

Requirements Traceability- Feature #2(Wallet Facility)

Priority - Low

Preconditions - Customers must be signed in to the system, have sufficient balance in their bank account.

Post conditions - The updated amount will be stored in the database and displayed to the user under the wallet section.

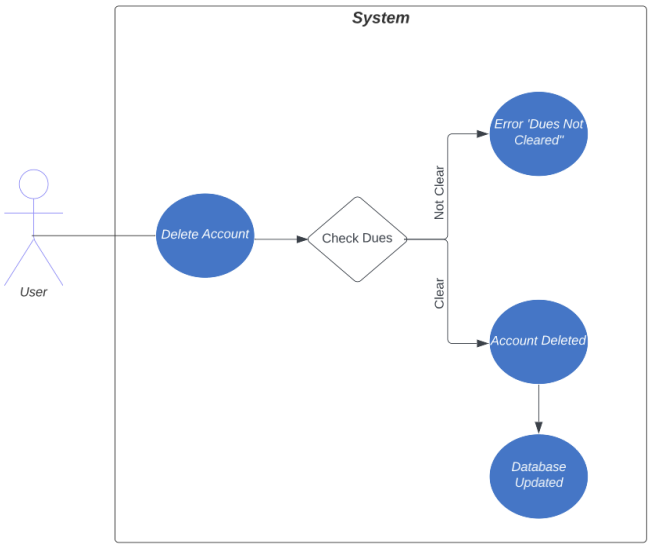
Actors – Customer

Exceptions - Payment may be declined due to server issues from the bank side or if the transaction limit has been exceeded.

Includes NA

Notes/Issues - Due to resource constraints and security concerns, we'll not link bank accounts to the wallet, for the scope of the project.

3.3.7 U7: User deleting his account



Purpose - User can delete his account (if all dues are cleared) when he wants to discontinue using our platform. (eg. when a person graduates from college)

Requirements Traceability – Feature #9

Priority - Medium

Preconditions - 1) All dues pertaining to all vendors must be cleared.

Post conditions - 1) The details of the user would be removed from the database.

Actors – User

Exceptions - NA

Includes- NA

Notes/Issues -NA

4 Other Non-functional Requirements

these are things feasible for application to handle since this we have completed implementation and testing.g

4.1 Performance Requirements

- The system should be able to respond to user requests in a timely fashion within 5s to ensure consistent operations.
- The system should be able to display error messages and save session settings within 5s.
- The system should update the user logs and interface after interaction within 5s to ensure no lag in the operations.
- The system should be able to retrieve information from the databases within 5s.
- The system should update the used databases within 5s to ensure smooth operations.
- In case of crashing, the system should have a recovery time within 10s.
- The system should have high availability (99.99%) and minimal downtime.
- The system should be able to cater to a huge number of concurrent users (~300 users) and transactions without crashing. This is based on an estimate of the expected load on the system, which is calculated as follows: There are roughly 30 vendors on campus, each with a continuous inflow of customers (eg. canteens, EShop). During peak hours, it is expected that around 5 customers will try to pay simultaneously at each vendor, resulting in a load of 150 concurrent users. However, we want to ensure that the system has sufficient capacity to handle unexpected spikes in usage and provide a buffer for future growth, which is why we are targeting a capacity of 300 concurrent users.
- The system should have proper storage to handle the data of all the students and vendors (~15000) of IIT Kanpur.
- The system should comply with relevant financial regulations and standards.
- The technicalities of implementation of the above stated requirements will be mentioned in the design document.

4.2 Safety and Security Requirements

- ~~Registration for customers will take place using their institute email address or any other institute approved identification code.~~
- Registration for vendors can only occur after approval from the institute. In the software, this has been abstracted out, and the vendor can register freely in order to test other systems with less hindrance.

- Authentication will be required by any user to log in to their account after the initial registration.
- A user has access to their transaction history and dues and shouldn't have access to any other person's transaction history and dues.
- Administrators can only perform administrative tasks on pages they are privileged to access. Customers and vendors will not be allowed to access the administrative pages.
- The database should not be accessed by anyone except the superuser to allow addition of money to the customers wallet (also this functionality exists for demo purposes only, if the app goes into production no one can change money in anyone's wallet).

4.3 Software Quality Attributes

4.3.1 Availability and Scalability

~~This application will be made to clients with a IITK email ID which will be used for verification. The vendors will be verified by the institute before an account is made.~~ Vendors who wish to register on our platform will be subject to verification by the institute/administrator before their account is made (As explained above, this feature is abstracted out).
The app will be scalable to include all students, staff and vendors currently residing/operating on campus and the database will be updated each year to include new students and remove outgoing students.

4.3.2 Maintainability

The application should use continuous integration so that features and bug fixes can be deployed quickly without operational downtime. The website will be available for use 99.9% of the time and bug fixes will be deployed during times of least use.

4.3.3 Reliability

Based on the limited number of users (~15000 users) and database specifications, the web application will be able to perform with stability.

4.3.4 Latency

The latency of React and Django when there are ~3000 users will depend on several factors such as the complexity of the application, the resources available on the server, and the network infrastructure. It is not possible to provide a definitive answer without more information about the specific application and its deployment environment. However, in general, it is safe to say that the latency will increase as the number of users increases and the application becomes more heavily loaded. It is important to note that both React and Django are highly customizable, and the

performance of an application built with them can be optimized through various techniques such as caching, load balancing, and database optimization.
Based on similar systems and load input, the web application should take less than 5000 ms to load under standard operating conditions and medium load (~3000 users).

5 Other Requirements

Some third party vendor requirements are as follows –

- Request the IITK CC for access to their student database ~~SMTP and IMAP servers for Email ID verification and OTP delivery.~~
- We do not work with real money and for simulation will add money to each user's wallet using a super account. However, if time permits, we will make use of a publicly available API (e.g. RazorPay) to facilitate transfer of money from a 'real' bank account to the wallets.
- We also assume that the linking of these dues to the Students' Pingala Account for their 'No Dues' certificate is abstracted out. However, if time permits, we will use a mock API of Pingala to outline the process of updating no-dues on Pingala.

Appendix A – Data Dictionary

Sr. No.	State Variable	Shown in Use Case #	Actor	Possible State#1	Possible State#2	Input	Output
1	Check Balance	3.3.2	Customer	Enough	Not enough	When user adds expense	Prompt to ask the user to pay immediately or an error message saying "not enough balance".
2	Check Balance	3.3.3	Customer	Enough	Not enough	When user chooses to settle dues	Either transfer the due amount to the vendor or display an error message saying "not enough balance".
3	Pay Immediately	3.3.2	Customer	Yes	No	When user adds expense	Either transfer amount from user to vendor or update the dues list.
4	Wallet Balance	3.3.2	Customer	Enough	Not enough	When customer adds expense as dues	Add expense to user's Pending Dues tab else display "Not enough balance"
5	Wallet Balance	3.3.3	Customer	Enough	Not enough	When customer wants to clear his dues	Deduct amount from Customer's wallet when he wants to clear his dues and add it that of all vendors who he owes money to else display "Not enough balance"
6	Wallet Balance	3.3.4	Customer	Enough	Not enough	When user wants to instantly pay	Deduct amount from customer's wallet balance and add it to that of the vendor, else display "Not enough balance"

7	Notification List	3.3.5	Vendor	-	-	When Vendor wants to remind Customer of their pending dues	Customer gets a notification in their notification list which urges them to clear their dues
8	Transaction List	3.3.4	Customer	-	-	When Customer wants to make instant payments	List is updated if payment is done else an error message is shown
9	Dues List	3.3.2	Customer	-	-	When Customer wants to add an expense as dues	Dues List as well as Pending Dues for the customer is updated.
10	Dues List	3.3.2	Vendor	-	-	When Customer wants to add an expense as dues	Vendor to whom the customer now owes dues is notified, and the dues list at the vendor's side is updated
11	List of associated vendors(for Customers)	3.3.2	Customer	-	-	When customer wants to add an expense as dues	Pending Dues for customer is updated with the new transaction. Similarly for the vendor
12	List of associated vendors(for Customers)	3.3.3	Customer	-	-	When customer wants to settle his dues	Customer can view how much he owes to each vendor on his list
13	List of associated vendors(for Customers)	3.3.4	Customer	-	-	When the customer wants to make an instant	Customer can instantly pay to any vendor available in his Vendors List

						payment	
14	List of associated customers(for vendors)	3.3.5	Vendor	-	-	When vendor wants to remind his customers for their pending dues	Customer receives notification about paying his pending dues
15	Profile	3.3.7	Customer /Vendor	-	-	When user wants to delete his profile	Allow user to delete his account and information from database provided all their dues have been settled

Some other processes have been described without the use of state variables in this version of the document. The details for those will be included in the design document.

Appendix B - Group Log

- 7th January-
  - The whole team met for the first time and finalized the idea of CampusPay.
  - The team brainstormed on the idea and formulated the big picture for the application and its working.
- 13th January-
  - Pratham, Aditya and Harsh met to discuss the framework stack to be used in developing the web application. Django, ReactJS and Postgres were decided as the base stack being used.
- 18th January-
  - Entire group met with the TA for the first time to get started on the SRS documentation and get approval for the frameworks that were decided.
  - The initial idea that was finalized was to have an app that can maintain records and facilitate transactions *directly from the bank* on a month-to-month basis (or as and when required by the user). Some discussion was made about the security measures required for this implementation.
- 21st January-
  - Aditya, Kalika and Harsh discussed the overall user interface and schemas for the web application.
- 22nd January-
  - Monil, Harsh,Pulkit and Aditya met to discuss the functionality, features and a general idea of wireframes. The idea to facilitate transactions from the bank was discarded and an in-app wallet based approach was finalized.
  - The other group members were briefed about the same.
- 23rd January -
  - Akshat and Monil met to discuss developments about use case models.
  - Siddhant wrote 1.1 based on the latest discussion of the group.
  - Kalika made the design of the wireframes.
  - Aditya wrote 2.1 based on discussion of the group.
- 24th January -
  - The entire group met online with the TA to discuss the non-functional requirements.
  - Siddhant finished 1.2 while referring to other sections that had been completed by others.
  - Kalika completed the 3.3 section with the wireframes, its descriptions , software and hardware interfaces.
  - Pratham and Aditya discussed the assumptions and software third-party requirements required to be incorporated in the application
  - Pratham completed 2.4 and 4.3 based on the group meeting.
  - Shantanu completed section 4.2 based on the group meeting
  - Ravija completed section 4.1 based on the group meeting.
- 27th January
  - Harsh added the general use case diagram for section 3.3.
  - Akshat andMonil completed the use case description in section 3.3.1 to 3.3.6. Also added the UML diagrams for each use case in section 3.3.
  - Team meet with TA Mentor.
  - Aditya and Kalika discussed the changes in the software interface and updated it.

    - Pratham updated latency parameters of the application based on inputs from the team and TA.
    - Siddhant filled in the 'Revisions' table and completed Sections 1.3, 1.4, 5 and Appendix A. Also proofread the entire document and suggested minor corrections to the team for the same.
- 2nd March
    - Ravija made changes in sections 3.2.10 and 3.3.7 in accordance with the suggestions given by the TA.
- 31st March
    - Shantanu and Siddhant edited the entire document based on feedback from the TA.
    - Monil updated the use-case diagrams.