

Design Document

for

Travel Allowances and Bill Reimbursement

Version 1.0

Course: CS253

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Prepared by:

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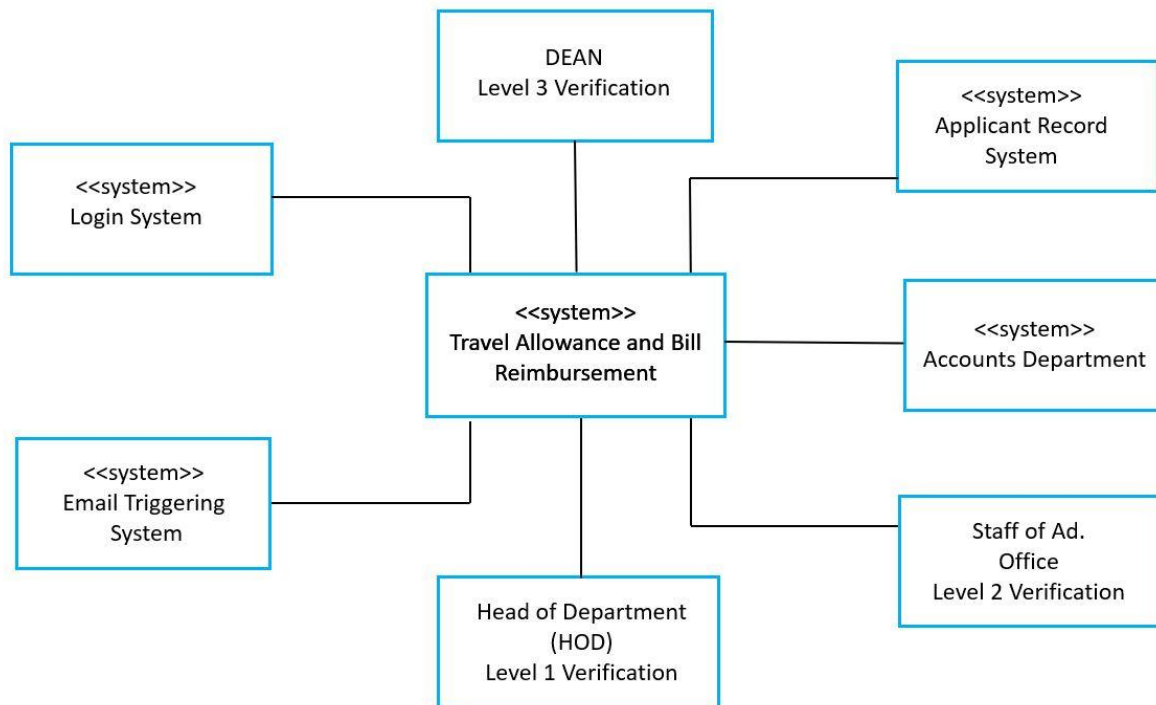
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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Draft Type and Number	Full Name	Information about the revision. This table does not need to be filled in whenever a document is touched, only when the version is being upgraded.	00/00/00

1. Context Design

1.1 Context Model



1.2 Human Interface Design

We can divide the interfaces into two types:

- User interface

The user interface consists of firstly, the login page, which looks like the one below:

TA Bill Forward

Select Bill Type TA Bill ▼

Select Bill Sub Type TA Bill ▼

Sanction No	Sanction Date	Bill-ID	Gross Amount	Net Amount	Action	Document Upload
TABill- 259	01/01/2022	5419636	20000	20000	<input type="checkbox"/>	UPLOAD

Forward

DOCUMENT LIST

Upload Documents

Choose File

No file chosen

Submit

Exit

- **Admin Interface**

The admin interface will have the same kind of design as the bill forward one displaying all the pending applications along with the proofs uploaded by the user.

The application has to be approved on multiple levels, maybe Head of Department on the first level, Staff at the Office on the second stage and the Dean at the third stage, all having similar interfaces.

The user will be notified of the status of the application on the Dashboard of User Interface. It will show “Application Approved Successfully” when all stages of verification have been completed and “Rejected” with some remarks if there is any discrepancy in the verification process.

Then, in case of Accepted applications, the payment will be done to the user’s bank account and a mail regarding the same will be sent to the user.

2. Architecture Design

We have used 2 architecture strategies to structure our project -the Layer Architecture and the Pipe and Filter mechanism. The flowchart for them is given below:

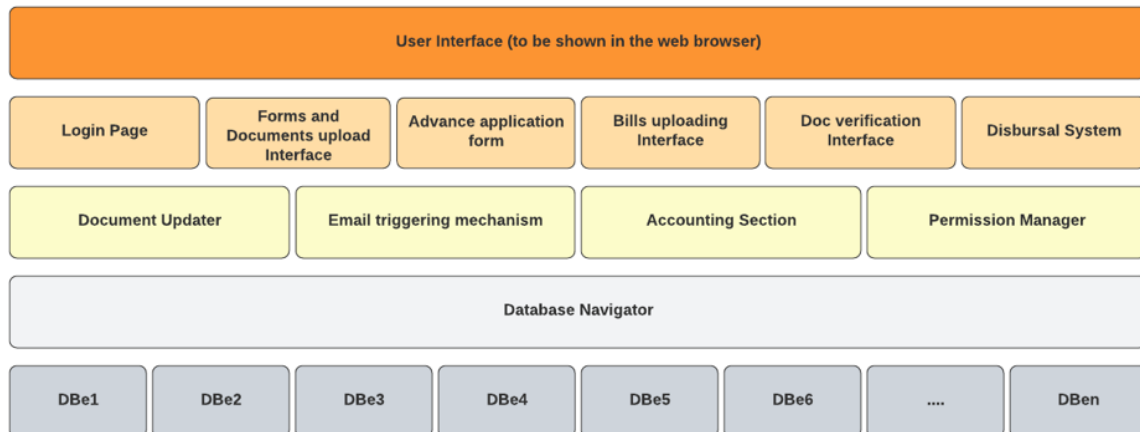


Figure: Layer Architecture

In the layer architecture, different permissions will be granted to the corresponding classes of users. For eg, the access to verify documents should only be with the admin. Hence we will use a permission manager in the third layer. The submitted documents will be stored in a database indexed by the roll number/PF number. The email trigger will also be used in the third layer. To find out the involved parties, a database navigator will also be required. At the second level, we have the various interfaces that are required by our project.

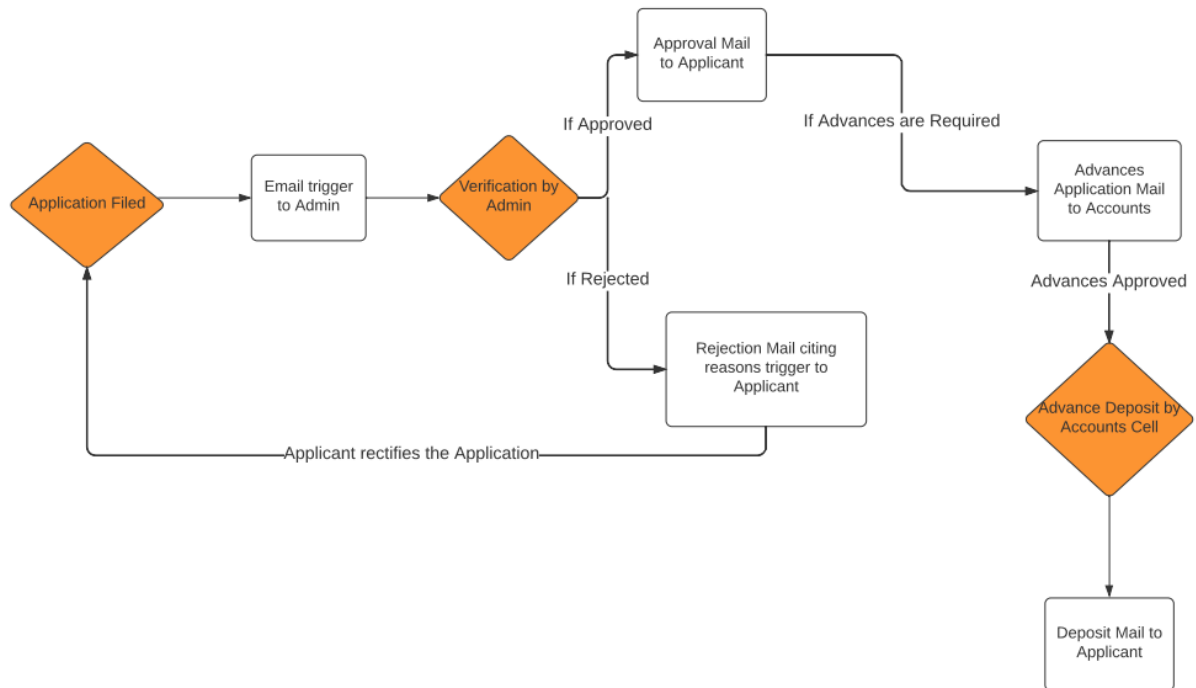


Fig: Pipe and Filter mechanism for document verification/advances before the journey

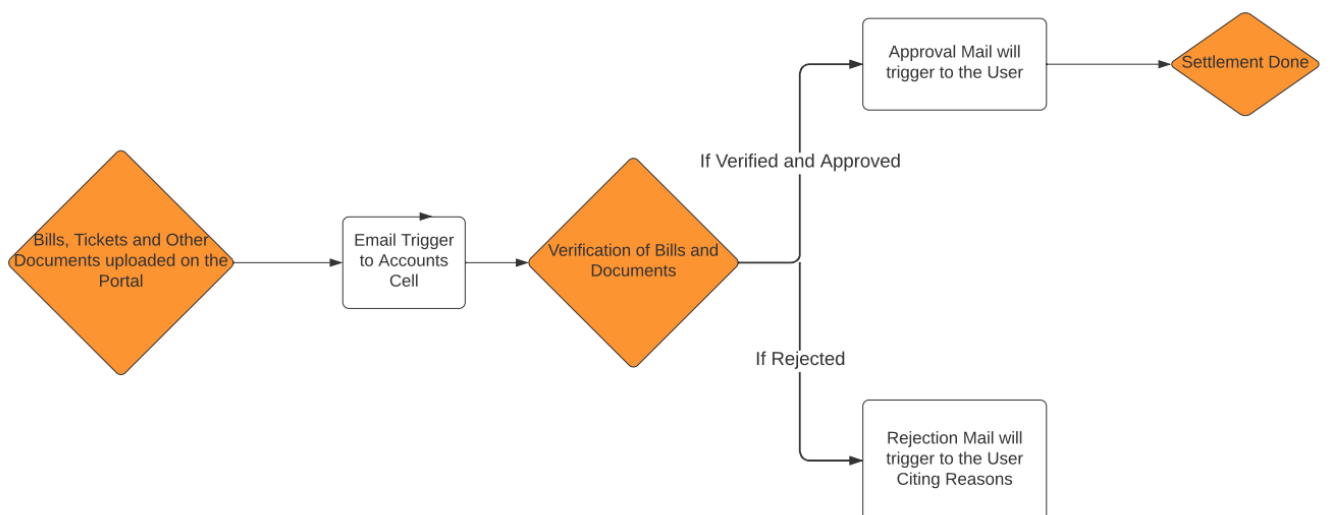
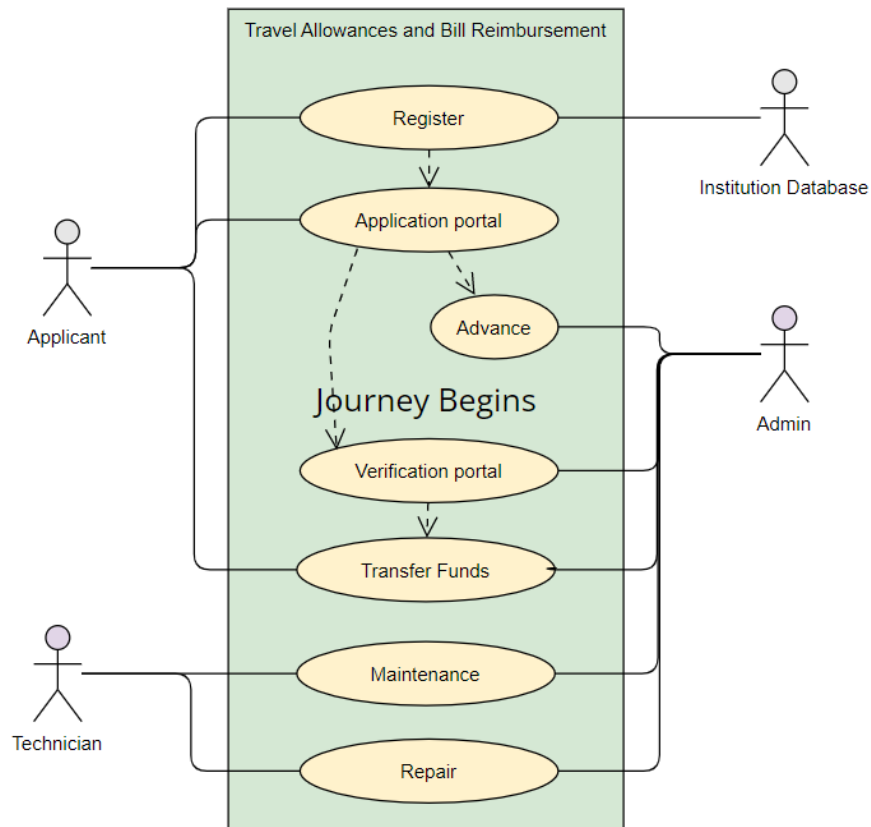


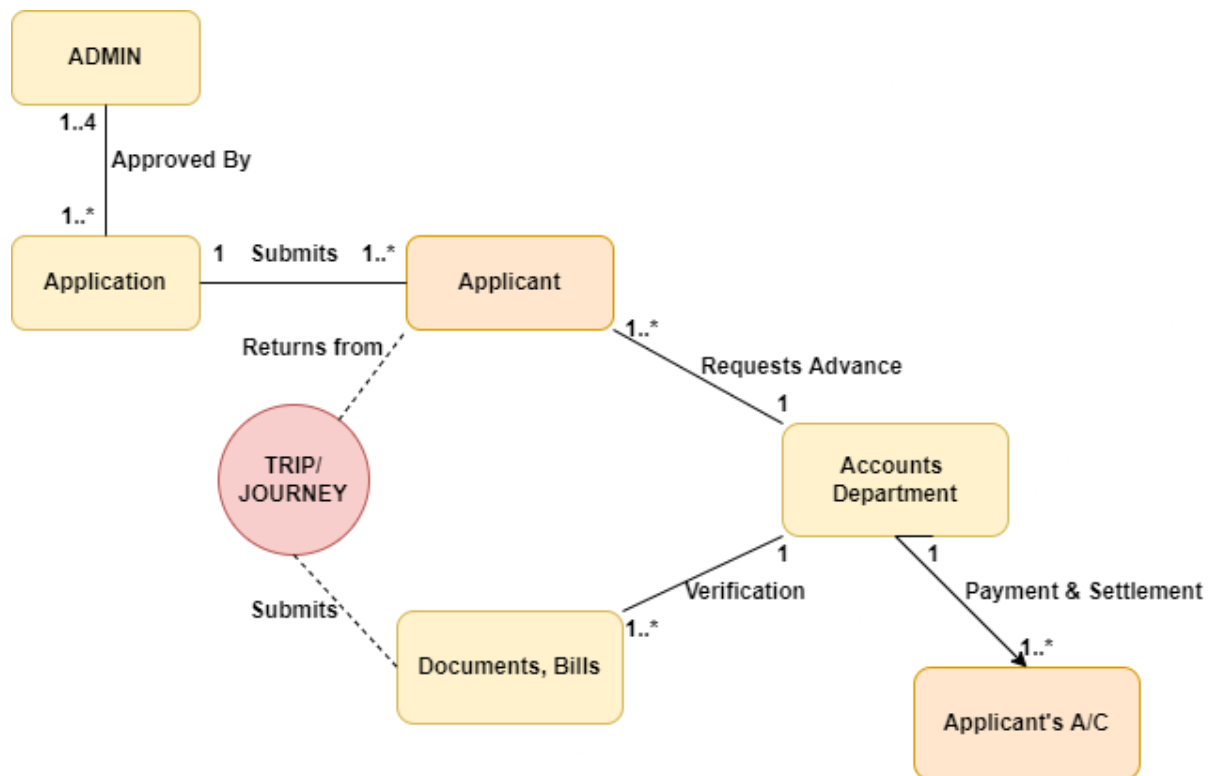
Fig: Pipe and Filter mechanism for bill verification post the journey

3. Object Oriented Design

3.1 Use Case Diagrams



3.2 Class Diagrams

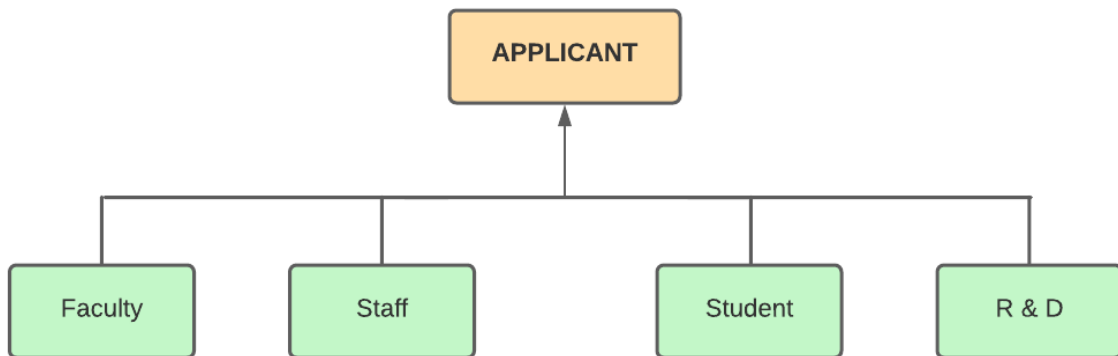


Brief overview of the various associations of the classes:

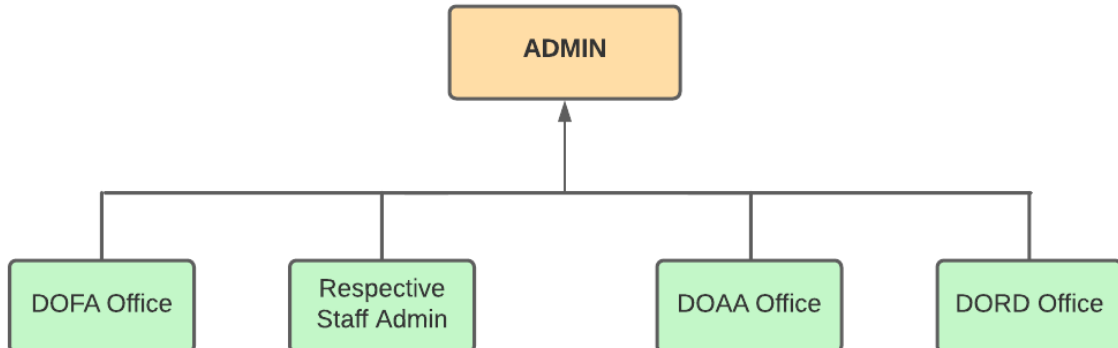
- **Applicant — Application:** The applicant submits a single application (Travel application/Leave application), and there are multiple applications submitted by various applicants.
- **Application — ADMIN:** The applications are approved(or rejected) by various levels of Administration(Upto 4 in our case), and the Admin approves(or rejects) multiple pending applications.
- **Applicant — Accounts Dept.: (Before Journey begins)** The applicant submits a request for some Advance amount to the Accounts Department, and the Accounts Dept. receives multiple Advance requests from various applicants.
- **Applicant — Documents,Bills: (After Journey)** The applicant submits various documents and bills of the expenditure as proof of the money spent in the journey.
- **Documents,Bills — Accounts Dept.:** The documents and bills submitted by the applicant are verified by the Accounts Department, and the Accounts Department verifies multiple documents and bills.
- **Accounts Dept. — Applicant's A/C:** The accounts dept. transfers amount(Travel Allowance) to the Applicant's Account.

Generalization Hierarchy:

- **Applicant** class has four subclasses as shown. They are based on the different types of beneficiaries of our facility. The application of each of the subclasses is verified by different entities.

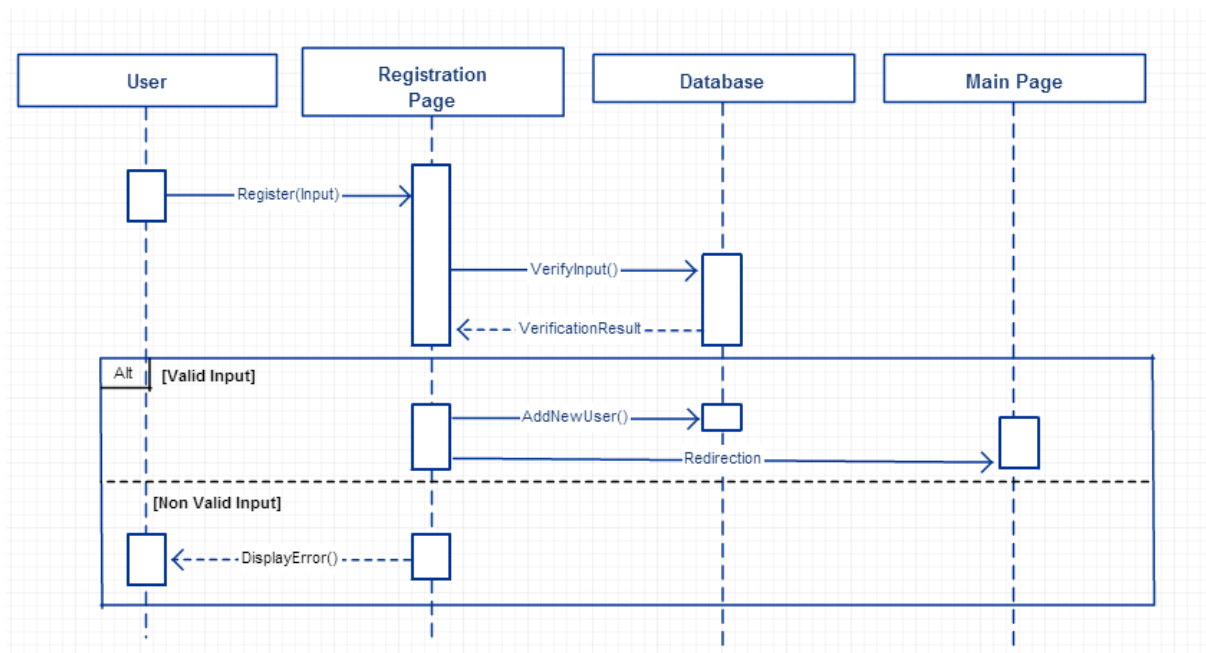


- **Admin** class also has four subclasses corresponding to respective applicants they handle. The application forms of Faculty, Staff, Student, R&D are respectively verified by DOFA Office, Staff Admin, DOAA office and DORD Office.

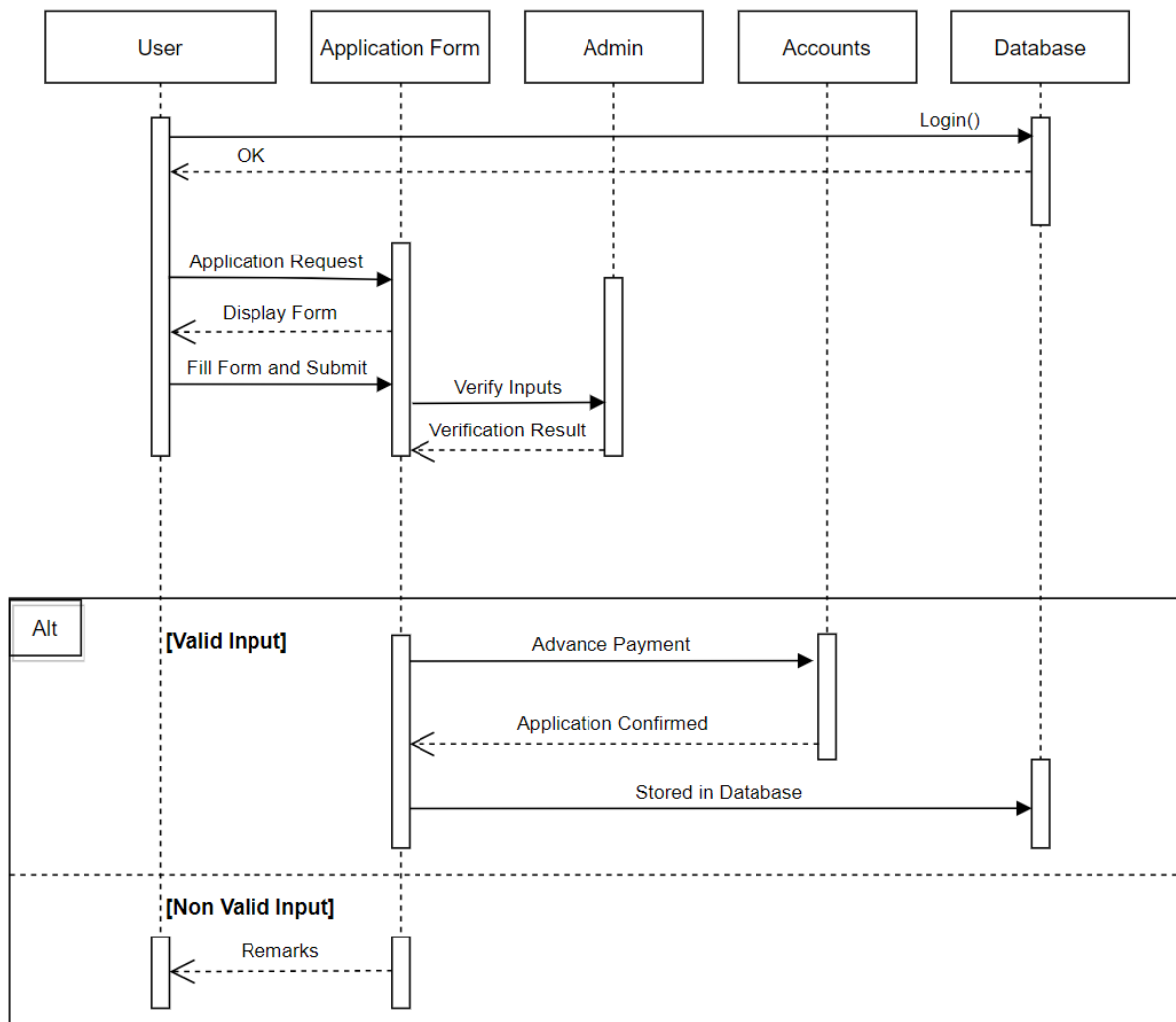


3.3 Sequence Diagrams

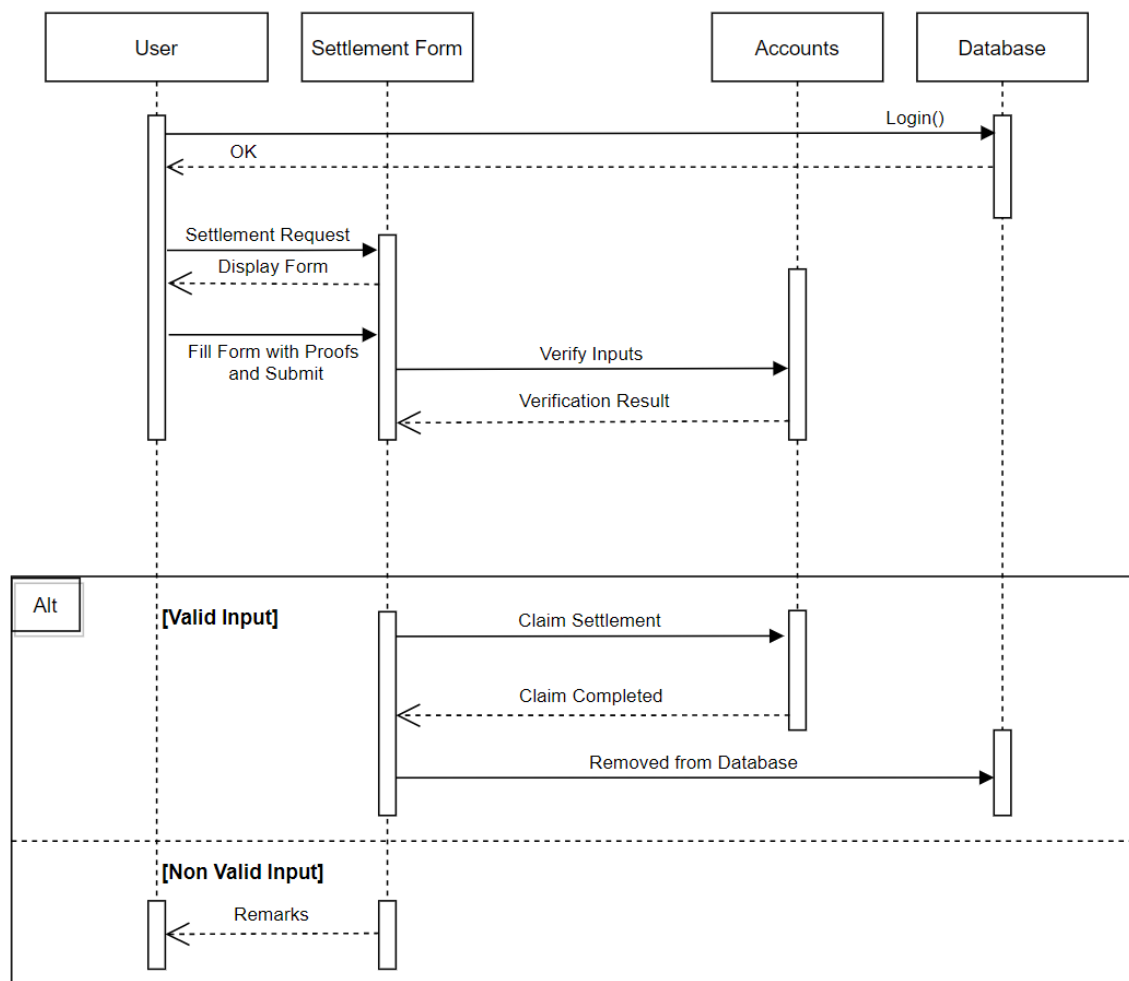
Registration:



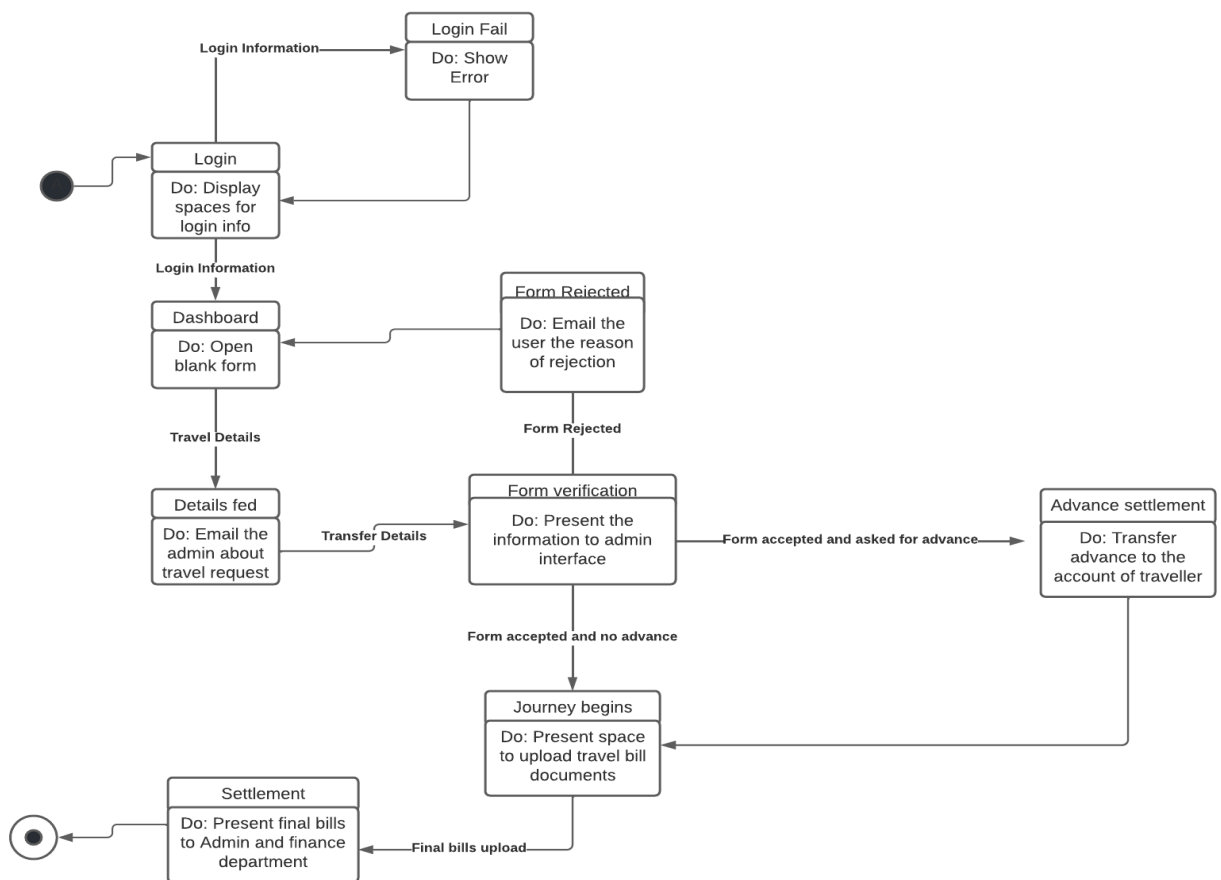
Approval and Advance Application:



Settlement :



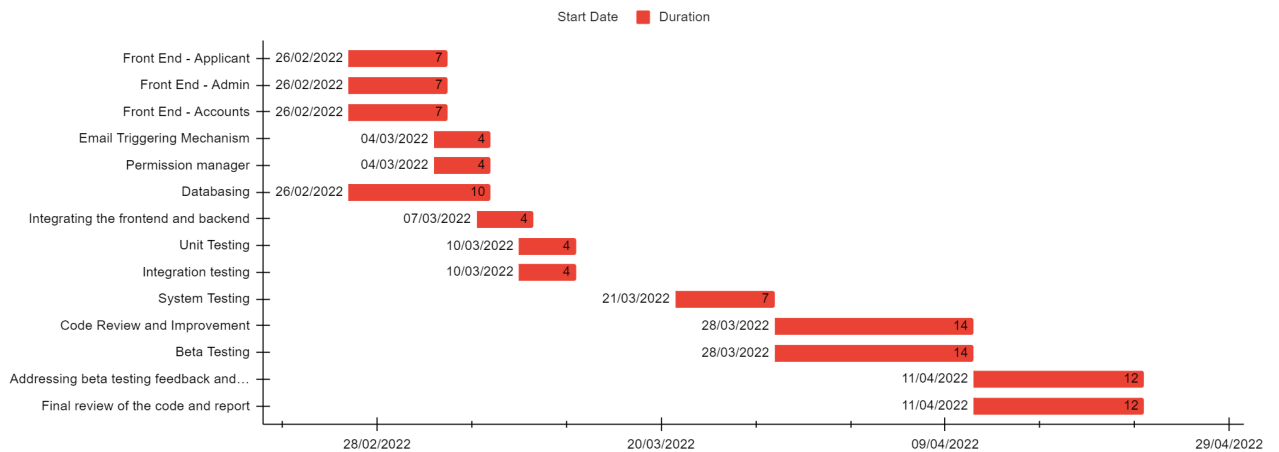
3.4 State Diagrams



STATE	DESCRIPTION
Login	The system is ready to take in login information from the user. UI ready to take login input from user.
Login fail	The system fails to enter the user dashboard. UI shows error.
Dashboard	The system enters the user interface. UI shows blank form for user to fill.
Details fed	The details are fetched from the user interface and transferred to the admin for verification. UI displays successfully fetched details.
Form verification	The travel details are presented to the admin. The UI of admin displays info taken from the user.
Form rejected	Form rejected from admin and email triggered to user. The UI of the user shows the reason for rejection.
Advance settlement	Form accepted from user and advance transferred to user.
Journey begins	Form accepted from admin and advance received by user. UI of user shows space for final travel bill submission
Settlement	Present final bills to the admin and finance department for reimbursement. UI of user shows the details of money received

STIMULUS	DESCRIPTION
Login Information	The user has entered the roll/PF number and corresponding password.
Travel details	The user has entered the details and reasons for travel.
Transfer details	The system transfers the travel details from user to admin and email triggered to admin
Form accepted and advance	The admin accepted travel details and advanced transfers to users.
Form accepted and no advance	The admin accepts form his side
Final bills upload	The user has uploaded the final hotel and fooding bills on the portal.

4. Project Plan



The Gantt Chart

Tasks	Start Date	End Date	People Responsible
Front End - Applicant	26/02/2022	04/03/2022	Naman, Mohit
Front End - Admin	26/02/2022	04/03/2022	Naman, Shrey
Front End - Accounts	26/02/2022	04/03/2022	Praveen, Shrey
Email Triggering Mechanism	04/03/2022	07/03/2022	Yash, Praveen, Arnab
Permission manager	04/03/2022	07/03/2022	Mohit, Nishant, Mandar
Databasing	26/02/2022	07/03/2022	Arnav, Akhil, Kushagra, Mandar, Praveen
Integrating the frontend and backend	07/03/2022	10/03/2022	Whole Team
Unit Testing	10/03/2022	13/03/2022	Nishant, Mohit
Integration testing	10/03/2022	13/03/2022	Yash, Nishant
System Testing	21/03/2022	27/03/2022	Yash, Mohit
Code Review and Improvement	28/03/2022	10/04/2022	Naman, Arnab, Mandar, Praveen
Beta Testing	28/03/2022	10/04/2022	Whole Team
Addressing beta testing feedback and correcting errors	11/04/2022	22/04/2022	Kushagra, Akhil
Final review of the code and report	11/04/2022	22/04/2022	Akhil, Shrey, Kushagra, Mandar

Responsibilities

5. Other Requirements

<This section is [Optional](#). Please provide any other details that are suitable for being included in the design document .>

Appendix A - Group Log

11/02/2022: Zoom Meet with Nikhil Kumar Singh, Teaching Assistant

We discussed some of our doubts regarding the Design Document. We were unsure about the project plan and the TA helped us identify various tasks in our project.

Details of other unofficial meets aren't included as we met offline and completed the document together.