Expense Tracker

Course: J2EE Business Components - ITE-5432-0NA

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Semester: 4th Semester

Project Title: Expense Tracker

Contents

1. Introduction

1.1 Purpose

This document outlines the planning and architectural design for a full-stack, Spring-based Expense Tracker Web Application. The system aims to provide international students with an intuitive, multi-currency expense tracking platform, offering AI-driven insights and data visualization for smarter financial management.

1.2 Scope

The project is structured into three main phases:

- **Phase I**: Planning and architecture design

- **Phase II**: MVP development using Spring Boot and Thymeleaf

- **Phase III**: Deployment using Podman with performance validation

Technologies used include Java 17+, Spring Boot, Spring MVC, Spring Data JPA, MySQL, REST APIs, and Podman containers

2. Business Case

2.1 Business Case Requirements

- ### Problem Statement
  International students often face difficulties in managing multi-currency expenses and tracking personal spending while studying abroad. This leads to budget mismanagement and financial stress.

- ### Target Audience
  - International students studying in different countries with diverse currencies.
  - Students seeking smarter ways to analyze and optimize personal finances.

- ### Proposed Solution
  A secure, multi-user web application built with Spring technologies that:

  - Tracks expenses with category and currency support

- Visualizes spending trends

- Offers admin tools for user management

- Provides AI-generated monthly summaries

- Scope
  Core Features (MVP):

    - Secure login and registration

    - Role-based dashboards (User/Admin)

    - CRUD for expenses

    - Filtering by date, category, and currency

    - REST APIs with Swagger documentation

  - **Optional Features**:

    - AI-powered insights (monthly summaries)

    - Charts

2.2 Business Case Justification

- Relevance

Directly addresses a common pain point for international students managing daily living costs abroad.

- Expected Outcome

  - Improved budgeting for students

  - Greater financial awareness and self-regulation

  - Admin tools to monitor user activity and manage the platform

- Feasibility

  - Achievable with the current team and timeline

  - Leverages proven Spring Boot and JPA technologies

  - Can be containerized using Podman for consistency in deployment

3. Functional Requirements

3.1 Authentication & Authorization

- Secure login and registration

- Role-based access for Admin and Users

3.2 Expense Management (CRUD)

- Add/Edit/Delete/View expenses with:

    o Category

    o Date

    o Currency

    o Notes

- Validations and user feedback

3.3 Admin Features

- View all users

- View individual user dashboards

- Delete user accounts

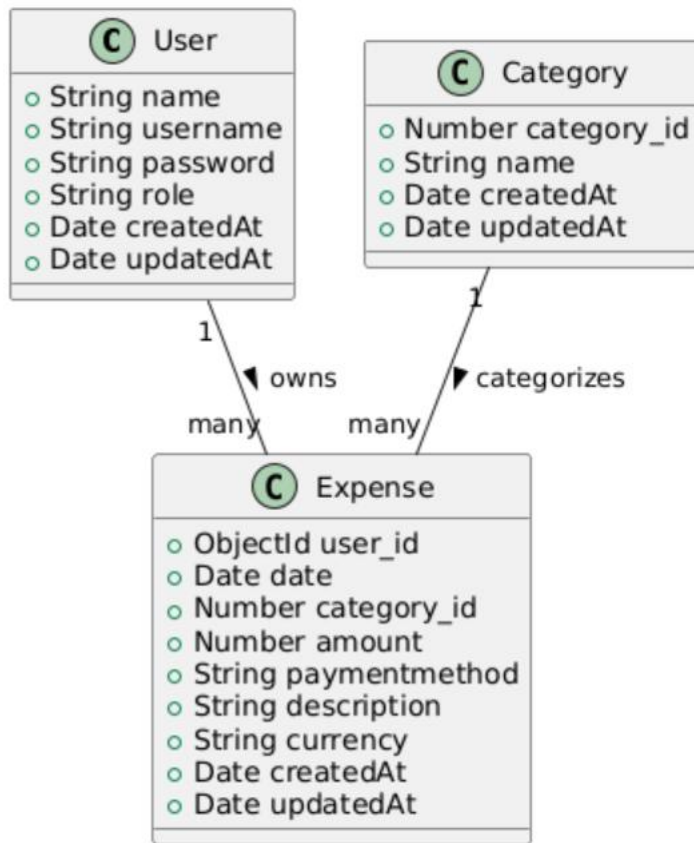## 3.4 Filters & Visualization

- Filter expenses by date, category, and currency

- Display category-wise and month-wise charts

3.5 AI Summary (Optional)

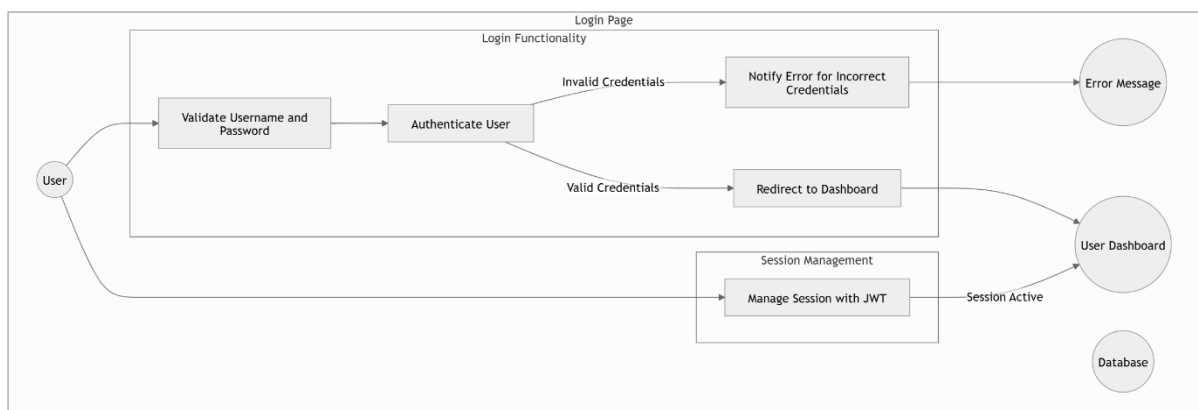- Generate a monthly summary using integrated AI services (mocked or optional)
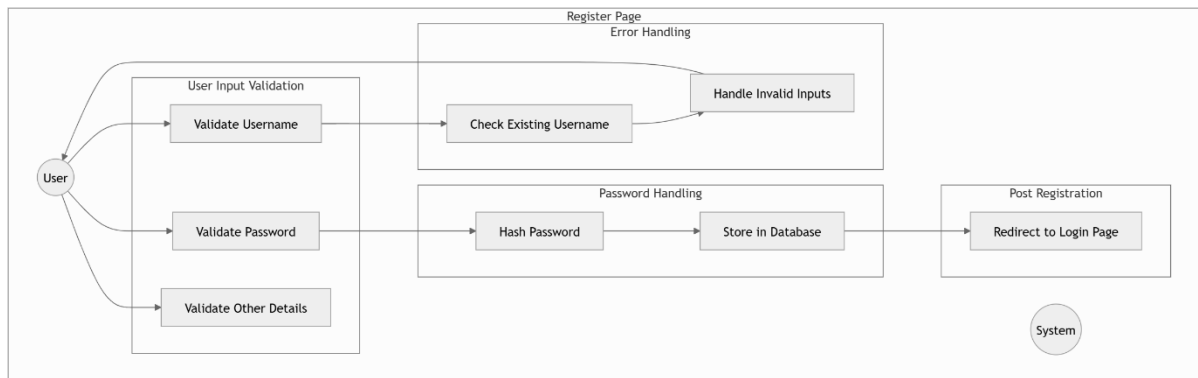
4. UML Diagrams
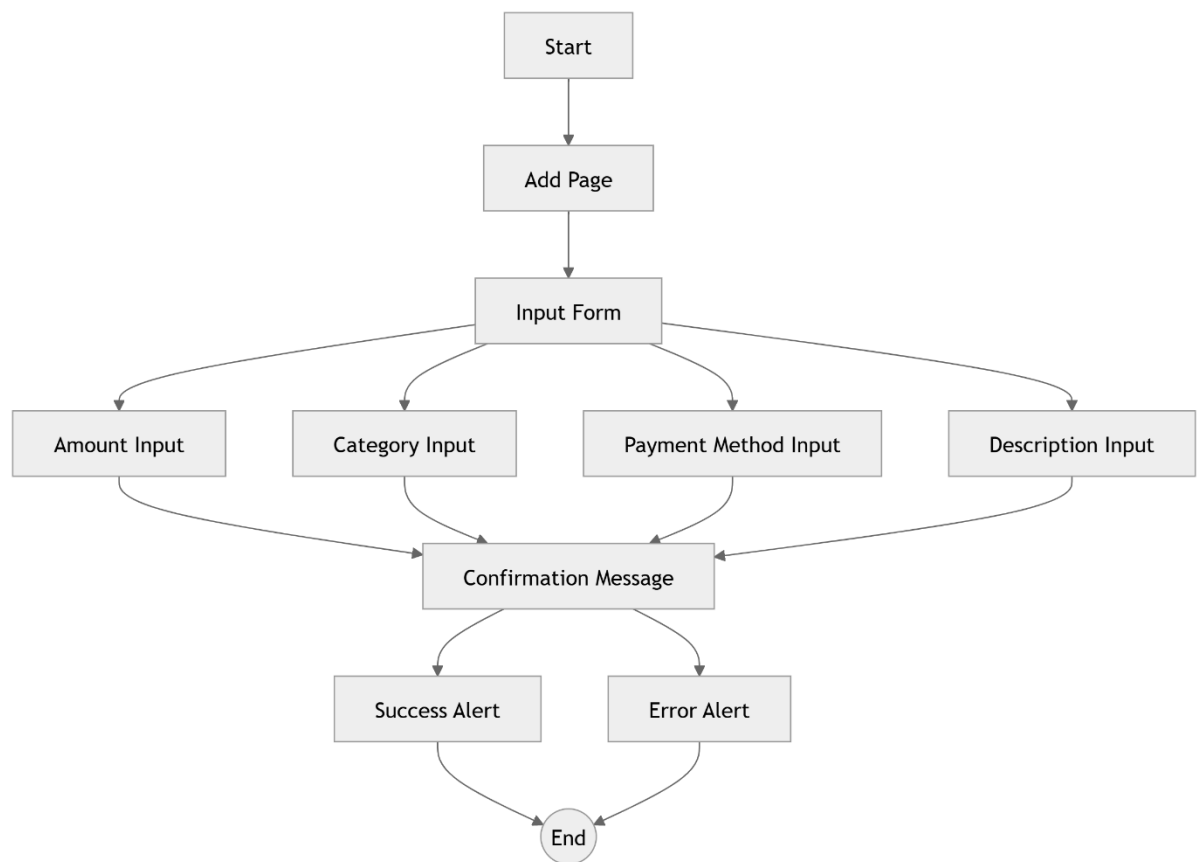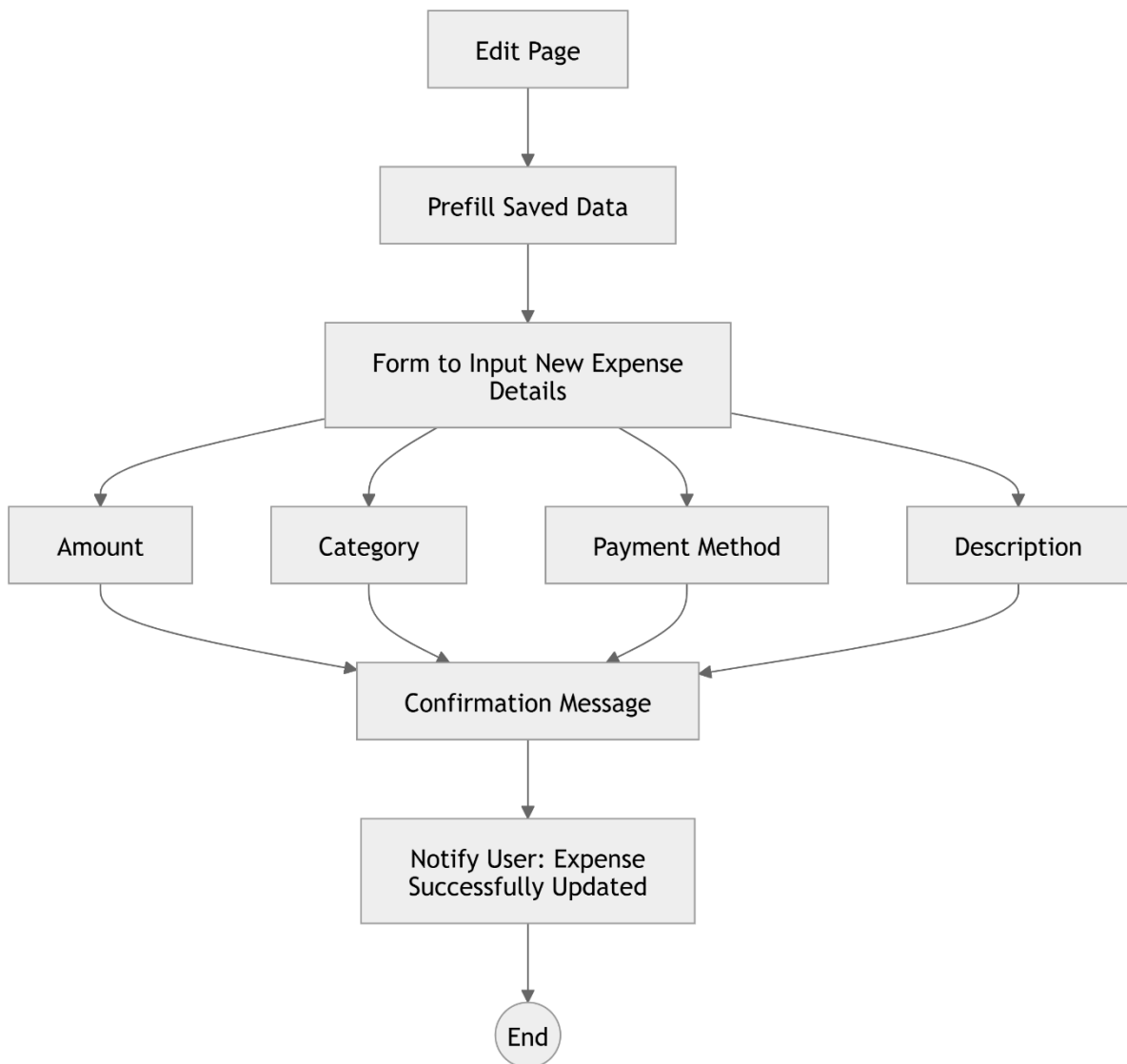
Class Diagram
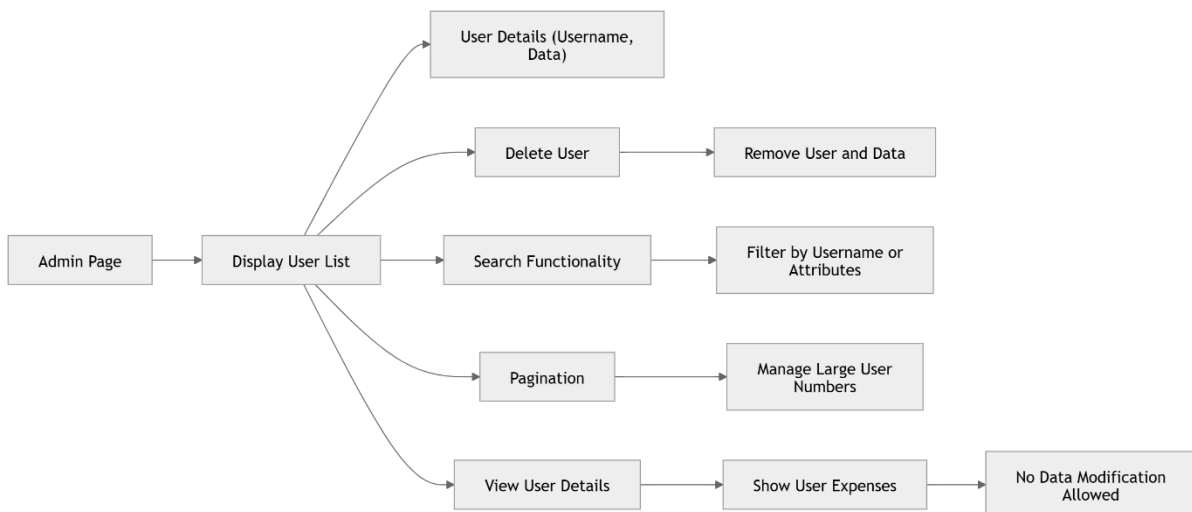

Sequence Diagram
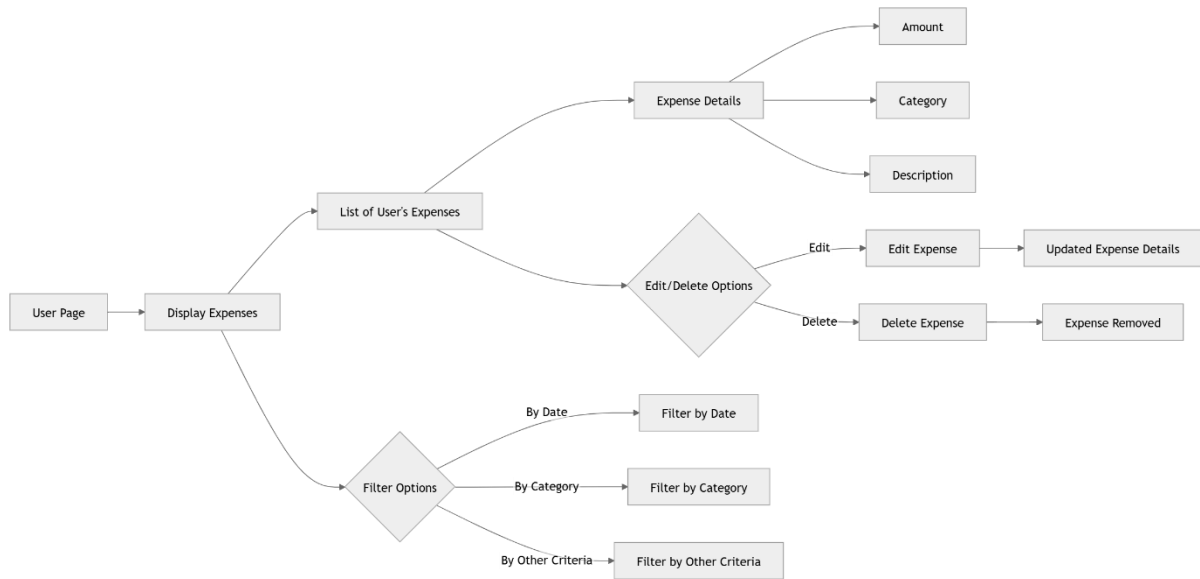
- **Login page**
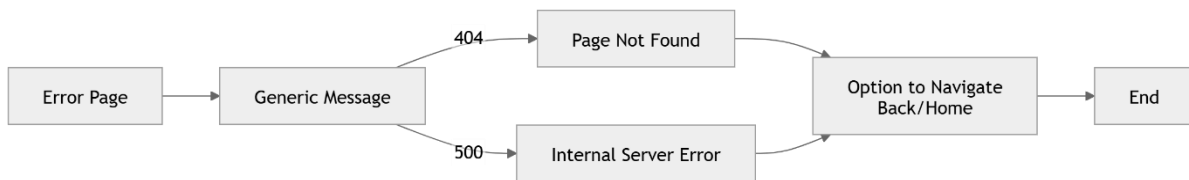
- Register page

- Add expense page

- Edit expense page

```
                      ┌──────────────┐
                      │  Edit Page   │
                      └──────┬───────┘
                             │
                      ┌──────▼───────┐
                      │ Prefill Saved│
                      │     Data     │
                      └──────┬───────┘
                             │
              ┌──────────────▼──────────────┐
              │ Form to Input New Expense   │
              │          Details            │
              └──┬────────┬────────┬────────┘
```

| Amount | Category | Payment Method | Description |

Confirmation Message

Notify User: Expense Successfully Updated

End

- View all users page (Admin Role)

Admin Page → Display User List

- User Details (Username, Data)
- Delete User → Remove User and Data
- Search Functionality → Filter by Username or Attributes
- Pagination → Manage Large User Numbers
- View User Details → Show User Expenses → No Data Modification Allowed

- View All expense page (User Role)

- Error page

5. Team Composition

Name	Student ID	Role
Urja Tej Bhemat	N01648980	Team Lead & Developer
Sameeha Shaik	N01649346	Developer
Kalwala Siddhartha Reddy	N01649317	Developer