# Expense Reimbursement System

Executive Summary

The Expense Reimbursement System (ERS) will manage the process of reimbursing employees for expenses incurred while on company time. All employees in the company can login and submit requests for reimbursement and view their past tickets and pending requests. Finance managers can log in and view all reimbursement requests and past history for all employees in the company. Finance managers are authorized to approve and deny requests for expense reimbursement.

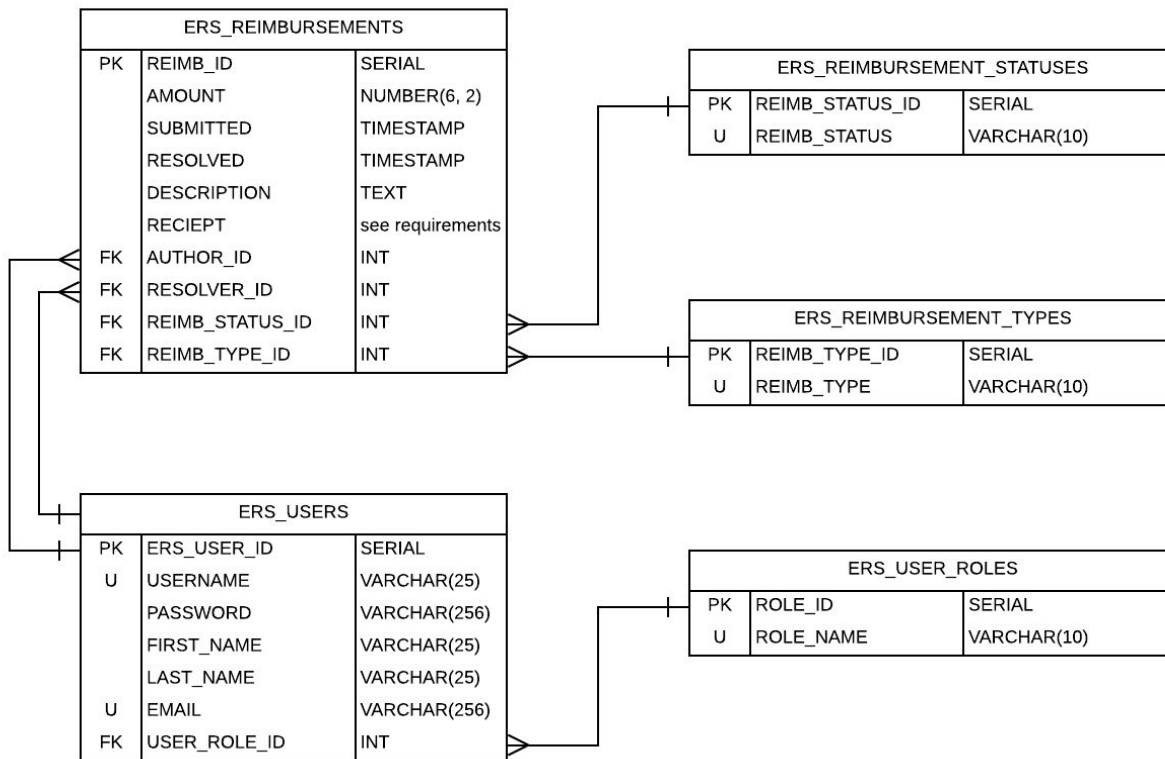## *Reimbursement Status State Flow Diagram*
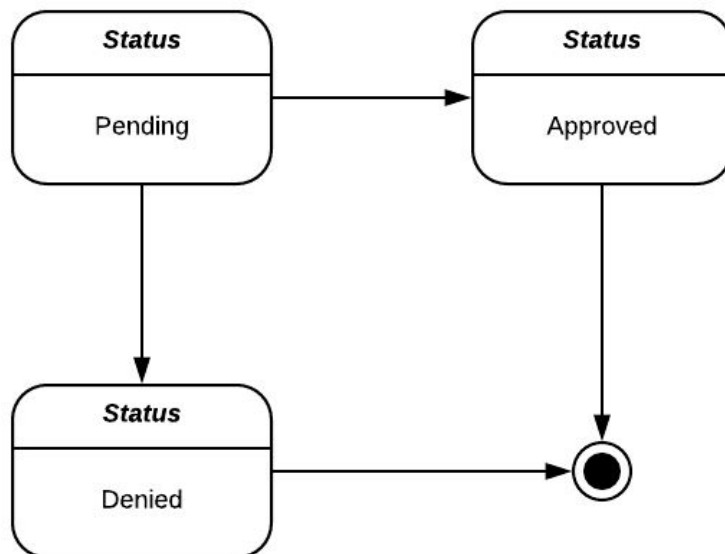
Reimbursement Types

Employees must select the type of reimbursement as:
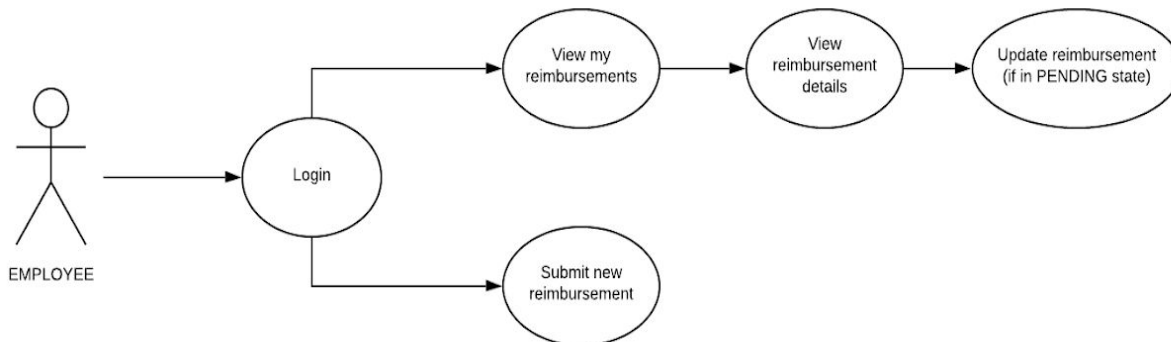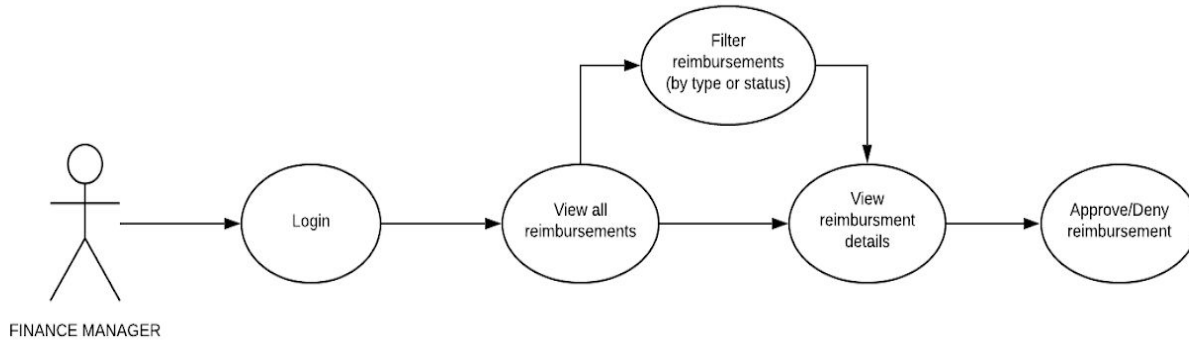
- LODGING
- TRAVEL
- FOOD
- OTHER

ERS Relational Model

ERS_REIMBURSEMENTS

	Column	Type
PK	REIMB_ID	SERIAL
	AMOUNT	NUMBER(6, 2)
	SUBMITTED	TIMESTAMP
	RESOLVED	TIMESTAMP
	DESCRIPTION	TEXT
	RECIEPT	see requirements
FK	AUTHOR_ID	INT
FK	RESOLVER_ID	INT
FK	REIMB_STATUS_ID	INT
FK	REIMB_TYPE_ID	INT

ERS_REIMBURSEMENT_STATUSES

	Column	Type
PK	REIMB_STATUS_ID	SERIAL
U	REIMB_STATUS	VARCHAR(10)

ERS_REIMBURSEMENT_TYPES

	Column	Type
PK	REIMB_TYPE_ID	SERIAL
U	REIMB_TYPE	VARCHAR(10)

ERS_USERS

	Column	Type
PK	ERS_USER_ID	SERIAL
U	USERNAME	VARCHAR(25)
	PASSWORD	VARCHAR(256)
	FIRST_NAME	VARCHAR(25)
	LAST_NAME	VARCHAR(25)
U	EMAIL	VARCHAR(256)
FK	USER_ROLE_ID	INT

ERS_USER_ROLES

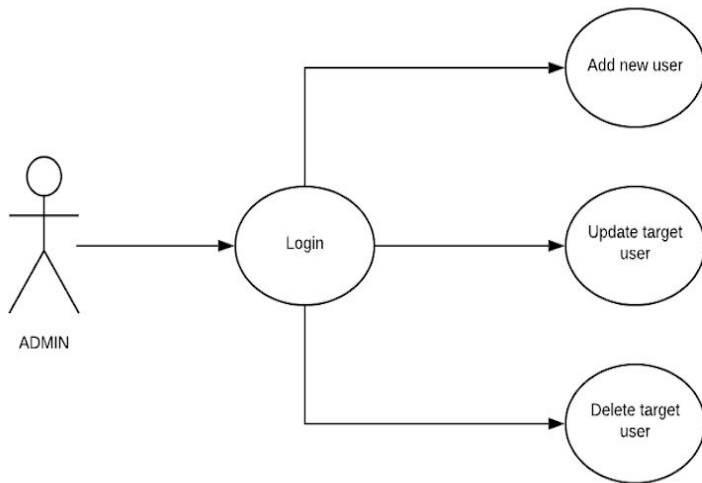|	Column	Type
PK	ROLE_ID	SERIAL
U	ROLE_NAME	VARCHAR(10)

Notes on the relational model

- (OPTIONAL) The receipt images can either be stored in one of two ways:

  1. As a BLOB data type within the database
  2. As a link that points to the object stored in an AWS S3 bucket (properly secured)

- Passwords should be hashed before being stored within the database

ERS Use Case Diagram

ADMIN

- Login
  - Add new user
  - Update target user
  - Delete target user

FINANCE MANAGER

- Login → View all reimbursements → View reimbursment details → Approve/Deny reimbursement
  - Filter reimbursements (by type or status)

EMPLOYEE

- Login
  - View my reimbursements → View reimbursement details → Update reimbursement (if in PENDING state)
  - Submit new reimbursement

Technical Requirements

<u>Persistence Tier</u>
- PostGreSQL
- AWS Simple Storage Service (optional for receipt image storage)

<u>Application Tier</u>
- Language: Java 8
- Authentication Strategy: JWTs or `HttpSession`

Non-Functional Requirements

<u>Persistence Tier</u>
- Database is deployed to an AWS RDS instance
- The provided relational model is adhered to
- If AWS S3 is leverage the bucket must be properly secured

<u>Application Tier</u>
- API is deployed to an AWS EC2 instance (optional)
- All methods are properly documented
- Service layer of application has a minimum of 80% unit test coverage
- API leverages a general purpose logging framework (e.g. Log4J)
- All passwords are hashed before being stored in the data source

<u>Operations Layer</u>
- Development workflow will be augmented by a CI/CD pipeline using Jenkins or AWS CodePipeline, CodeBuild, and Elastic Beanstalk.