**B.M.S. COLLEGE OF ENGINEERING BENGALURU**

Autonomous Institute, Affiliated to VTU


Lab Record

# Object Oriented Modelling and Design

*Submitted in partial fulfillment for the 6th Semester Laboratory*

Bachelor of Technology

in

Computer Science and Engineering

*Submitted by:*

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# B.M.S. COLLEGE OF ENGINEERING

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING


## *CERTIFICATE*

This is to certify that the Object-Oriented Analysis and Design(20CS6PCOMD) laboratory has been carried out by Omar Abdulla Sherief(1BM20CS209) during the 6th Semester Jan-May-2023.

Signature

Dr SEEMA P

Department of Computer Science and Engineering
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To design an efficient system for an hotel management

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(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an hotel management system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the hotel management system, different sectors available in the hotel and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: The aim behind this system is to fecilitate the user with all the features such room bookings, foods, cost updations for days and nights, Parking etc..

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of rooms available , the cost s updated time to time, food information, payment information of the customers and all the required data processing is done through the same system accurately .

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

(5)Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## Class Diagram

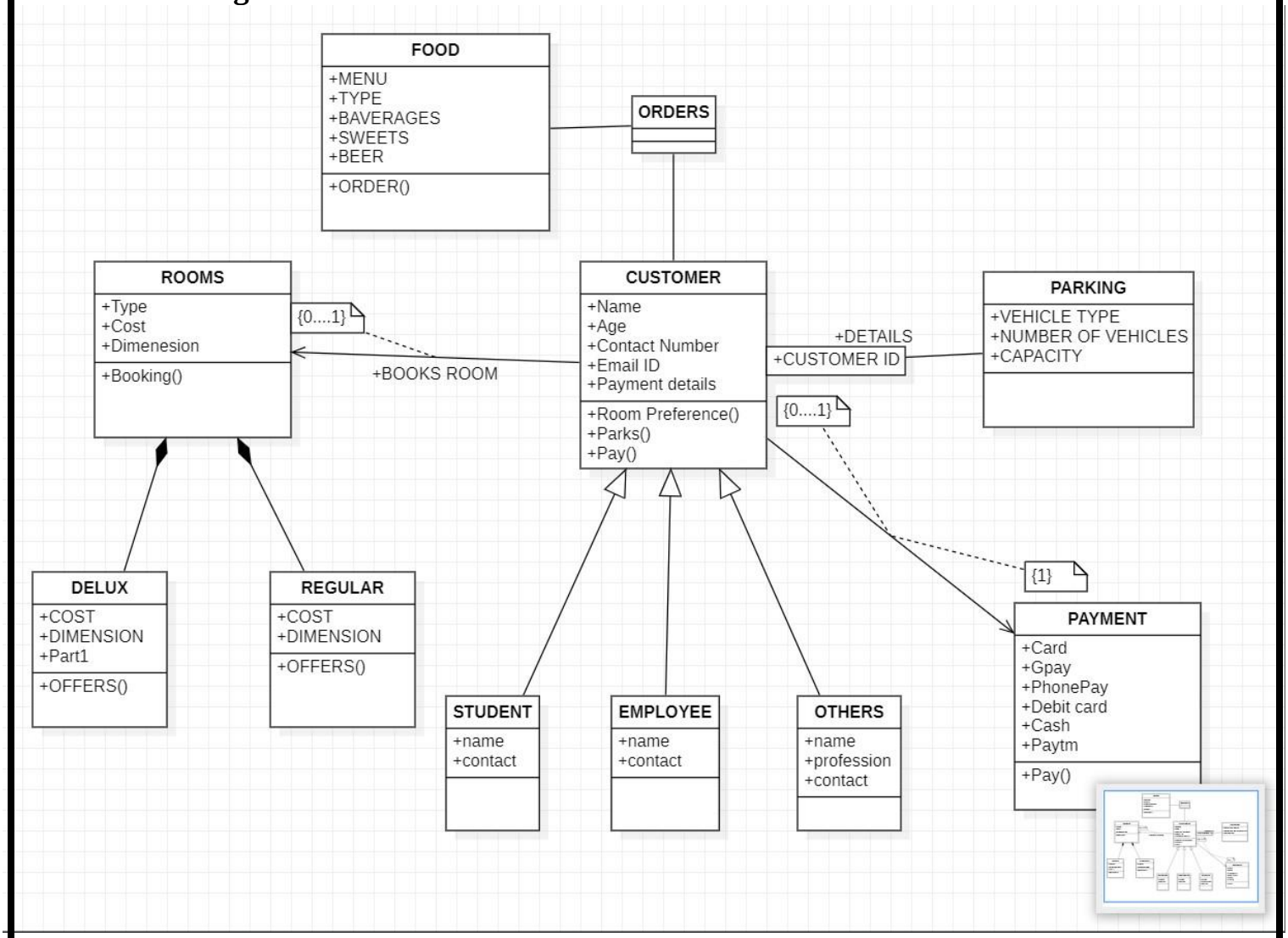



Fig 1.1

The Hotel management staff can use the well efficiently developed system for accepting bookings and makes it very convenient for the customer's usage also .

## 1.3 State Diagram

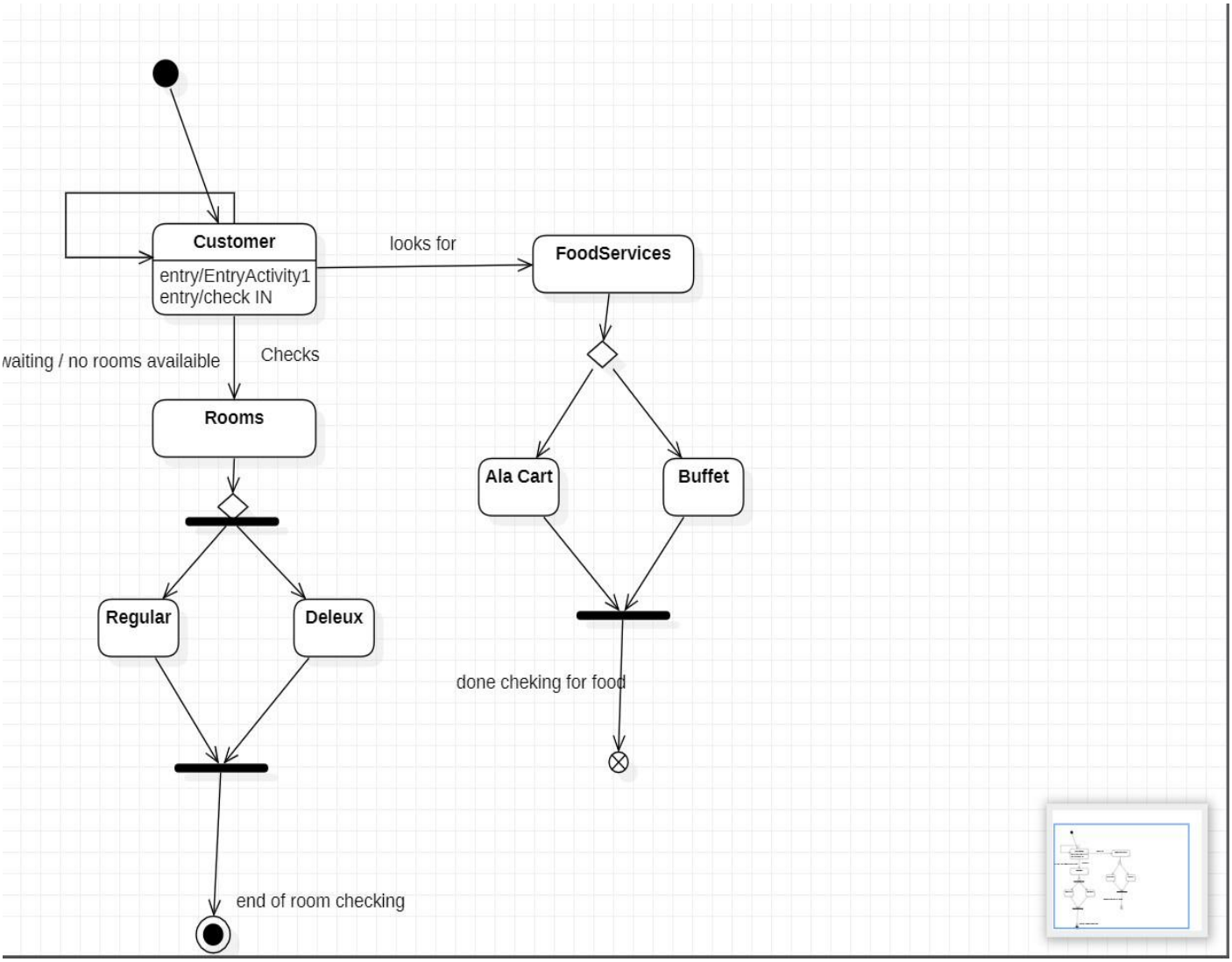



Fig. 1.2

The above state diagram gives a brief description of how the different procedures work in a hotel management system. The customer first starts with the check in process then checks for the available rooms which has two options deleux and regular.The customer also checks for fodd services which further devided into Ala cart and Buffet and then the process ends there are entry activities also included

## 1.4 Use Case Diagram

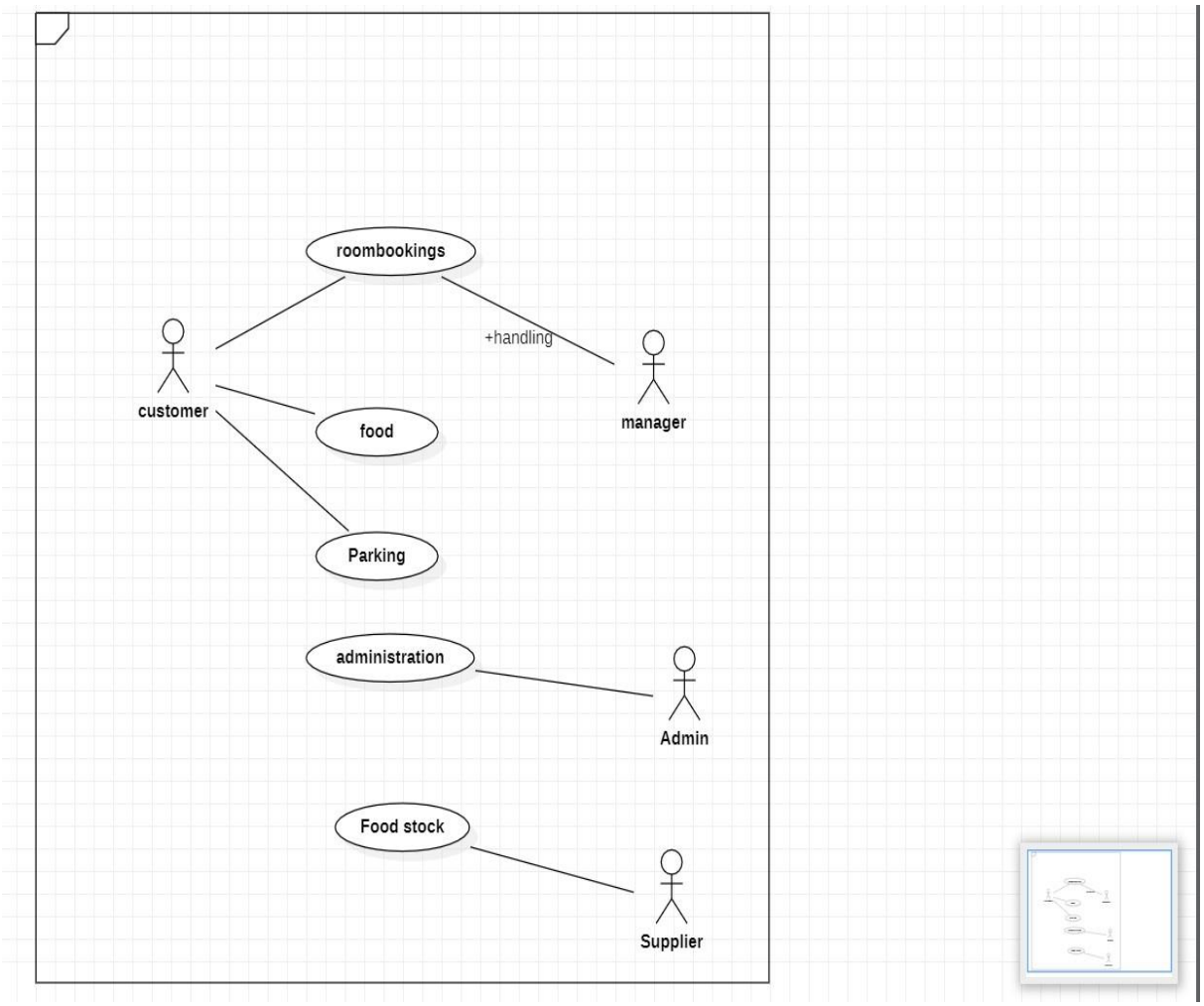



Fig 1.3

**Actors:**

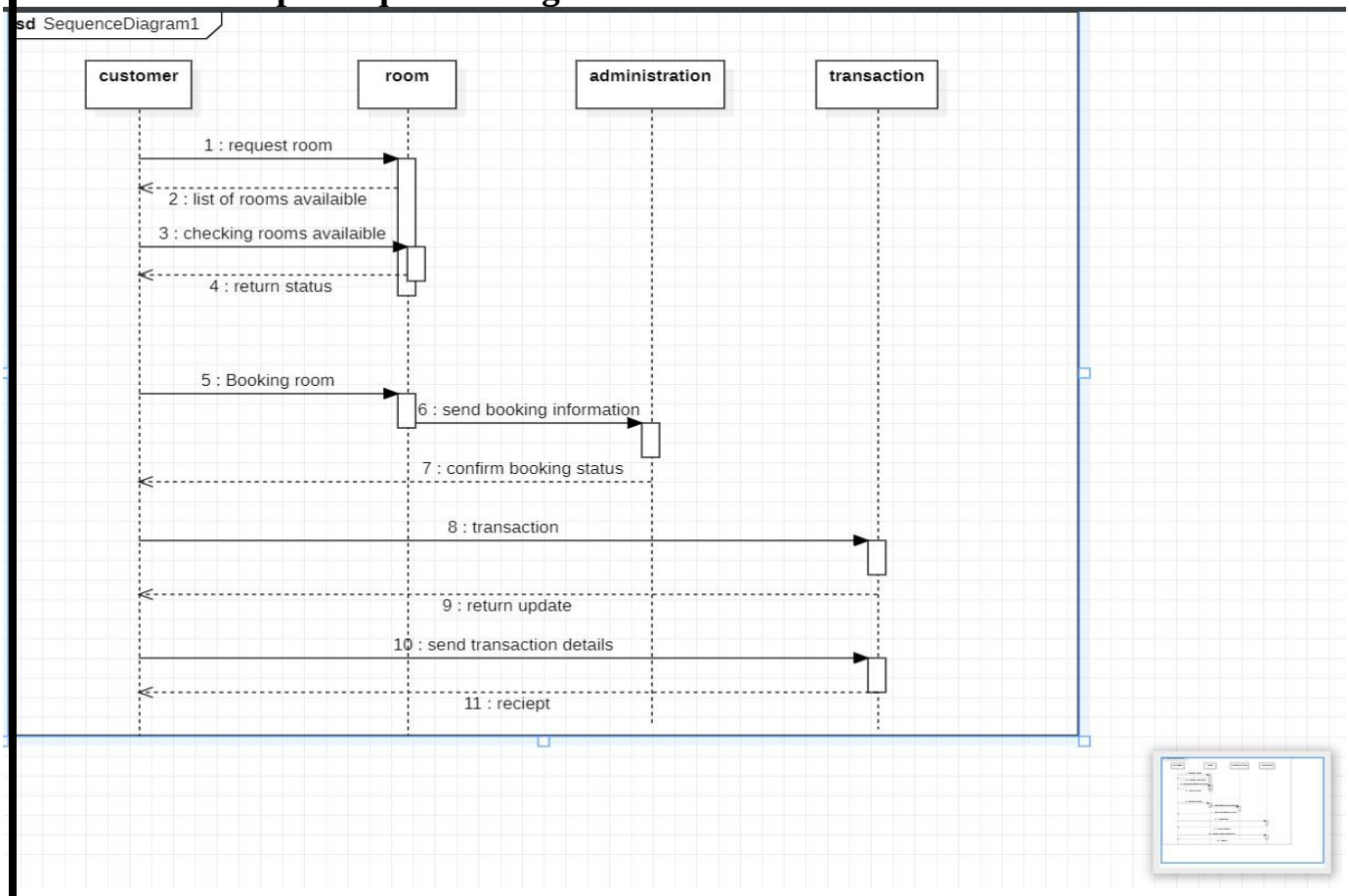
Admin: the person who manages everything,Customer: A person who uses the system . Supplier: A person who is responsible for supply.

**Use Cases:**

Manage details: the admin can update, insert or delete the data.Room Bookings: displays the bookings of customer. Booking details: various details related to subject is displayed.

## Sequence Diagram

### 1.4.1 Simple Sequence Diagram




The above sequence diagram gives us the steps in accessing the rooms ,food details and transaction's of the customer from the database if the login was successful.

## 1.5 Activity Diagram

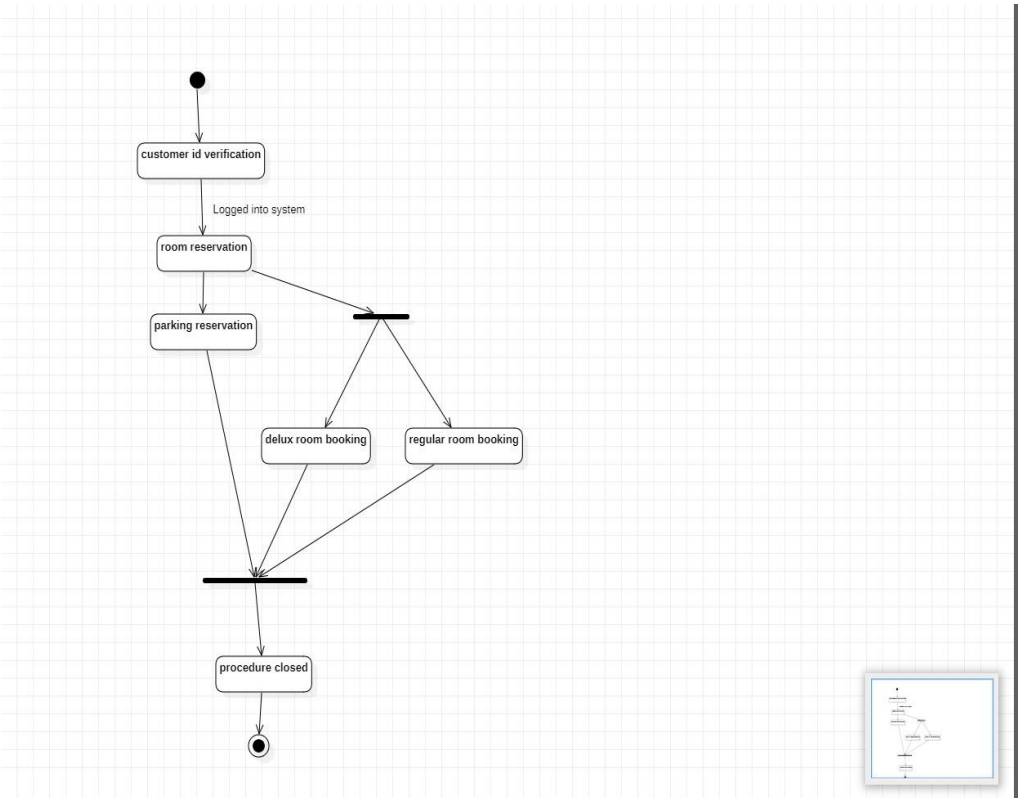



Fig 1.8

The activity diagram shows the sequence of steps involved in displaying the details as viewed by the staff. The staff first need to login and if successful various options are displayed. The staff can register for course,view customer list or logout.

# 2. CREDIT CARD MANAGEMENT SYSTEM

## 2.1 Problem statement

The To design an efficient system for a credit card processing

## 2.2 Software Requirement Specification

(2) Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an credit card system works and to ease the process of transactions.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the credit card processing system, different sectors available in the system and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provided by the system in detail.

(2)General Description: The aim behind this system is to fecilitate the user with all the features such depositing money in bank , withdrawing cash, checking bank balance , international money transfers , etc…..

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the updates done on the various applications that are linked to this credit card system,tells on the bank balance of the system,validates the login credentials of the user appropriately by checking the database

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. The interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure. Enough capacity of the system to store all the important details of the customers.

(8)Prilemenary Schedule and Budget: The project will require a of budget of 30530rs.

## Class Diagram

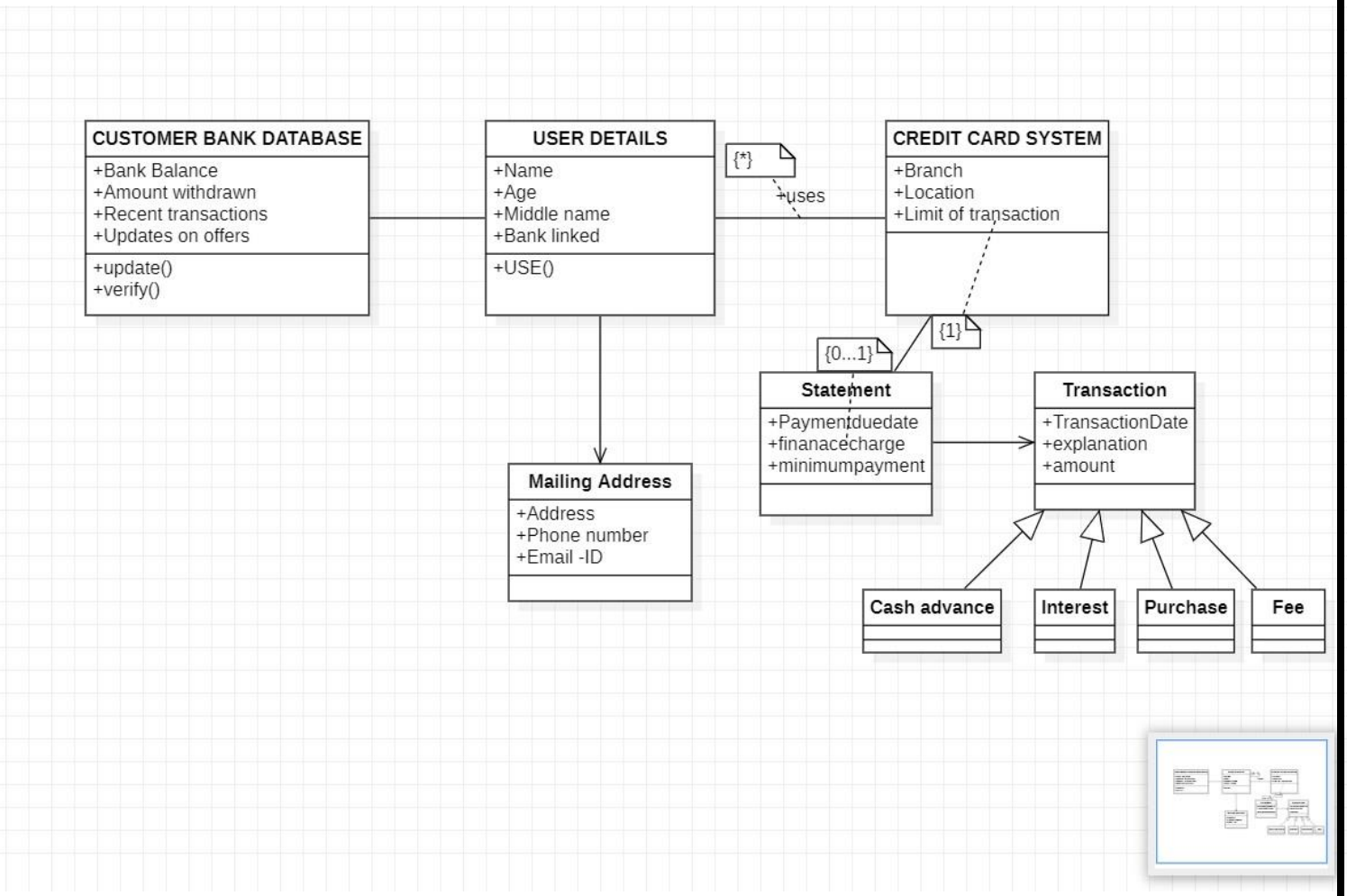



Fig 2.1

The above class diagram is of a credit card processing system which has 6 main classes and 4 generalized classes which are subclasses of the main class called “transaction".This class diagram provides different features such as mailing address to the customer withdrawing money as a reminder.Bank database having customer details etc….

## 2.3 State Diagram

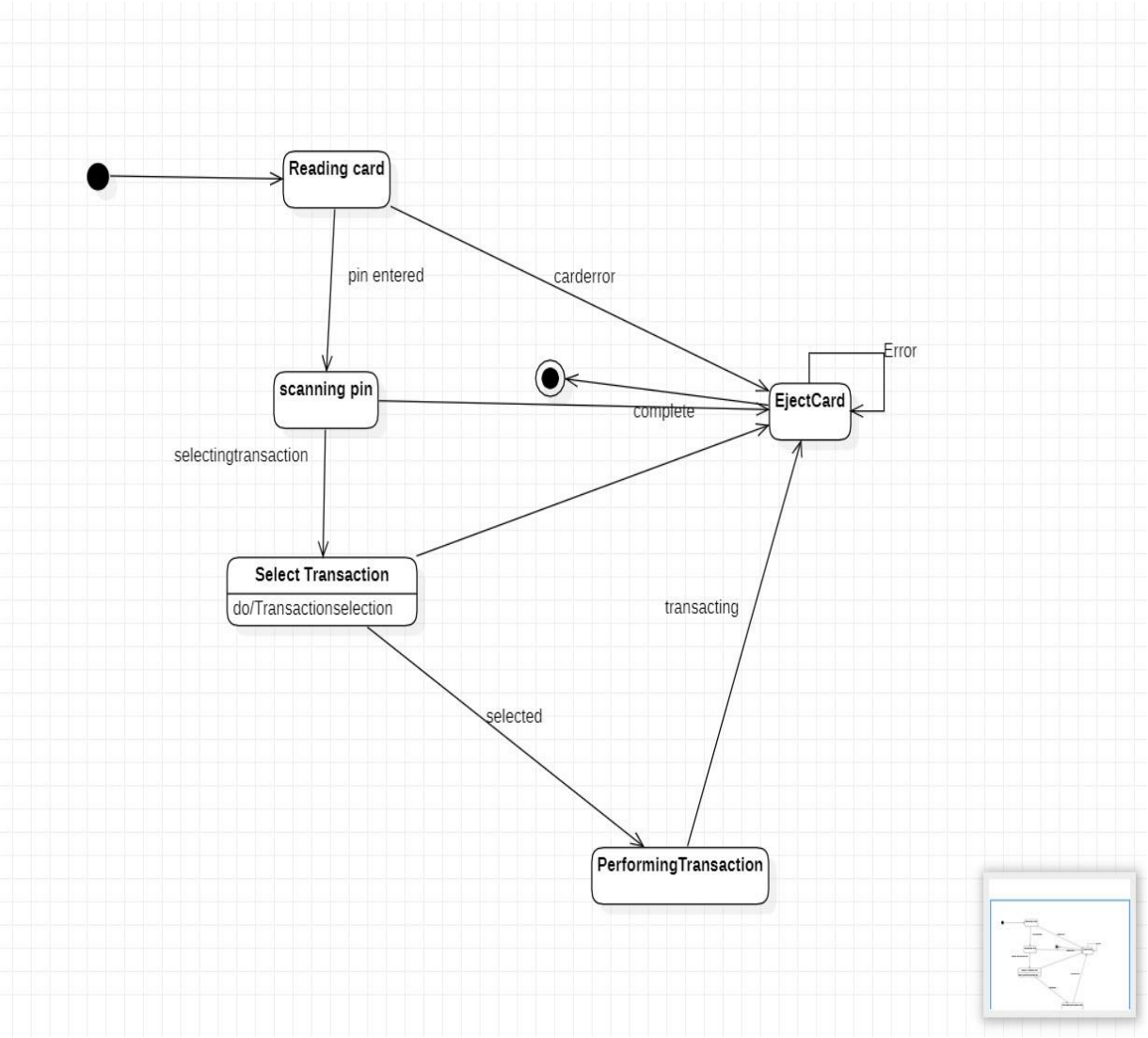
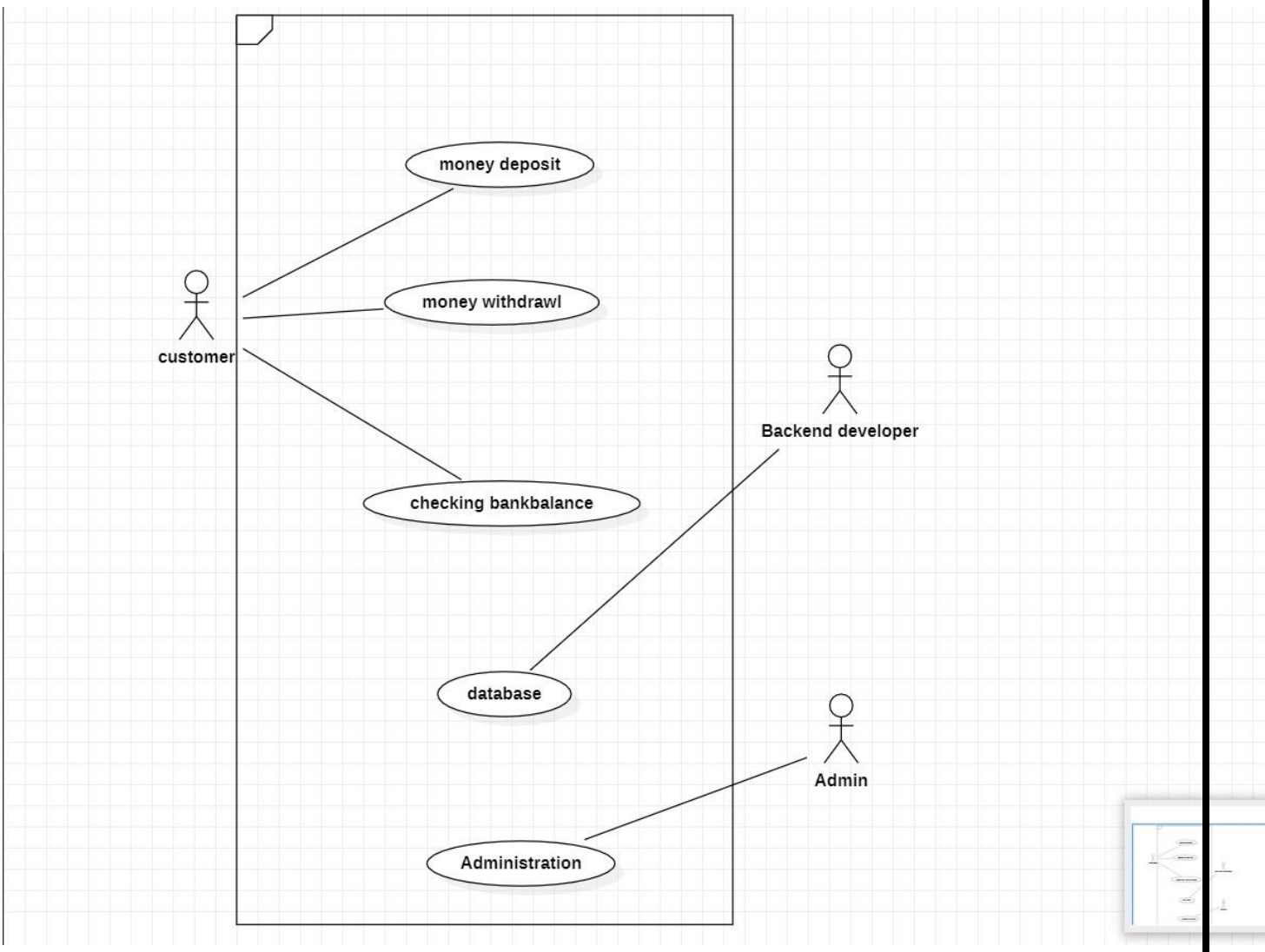



Fig 2.3

The above state diagram gives the different states the system goes through when a customer performs some action with card processing system. Such as when the customer inserts the card the atm starts reading it then customer might either withdraw or deposit cash depending upon its requirements

## 2.4 Use Case Diagram




**Actors:**

Admin: the person who manages the whole system

Backend Dev : the person who manages the

allotees

Customer : the person who uses the Credit card

processing system

**Use Cases:**

Admin : allows actor to update delete or add informationLogin :

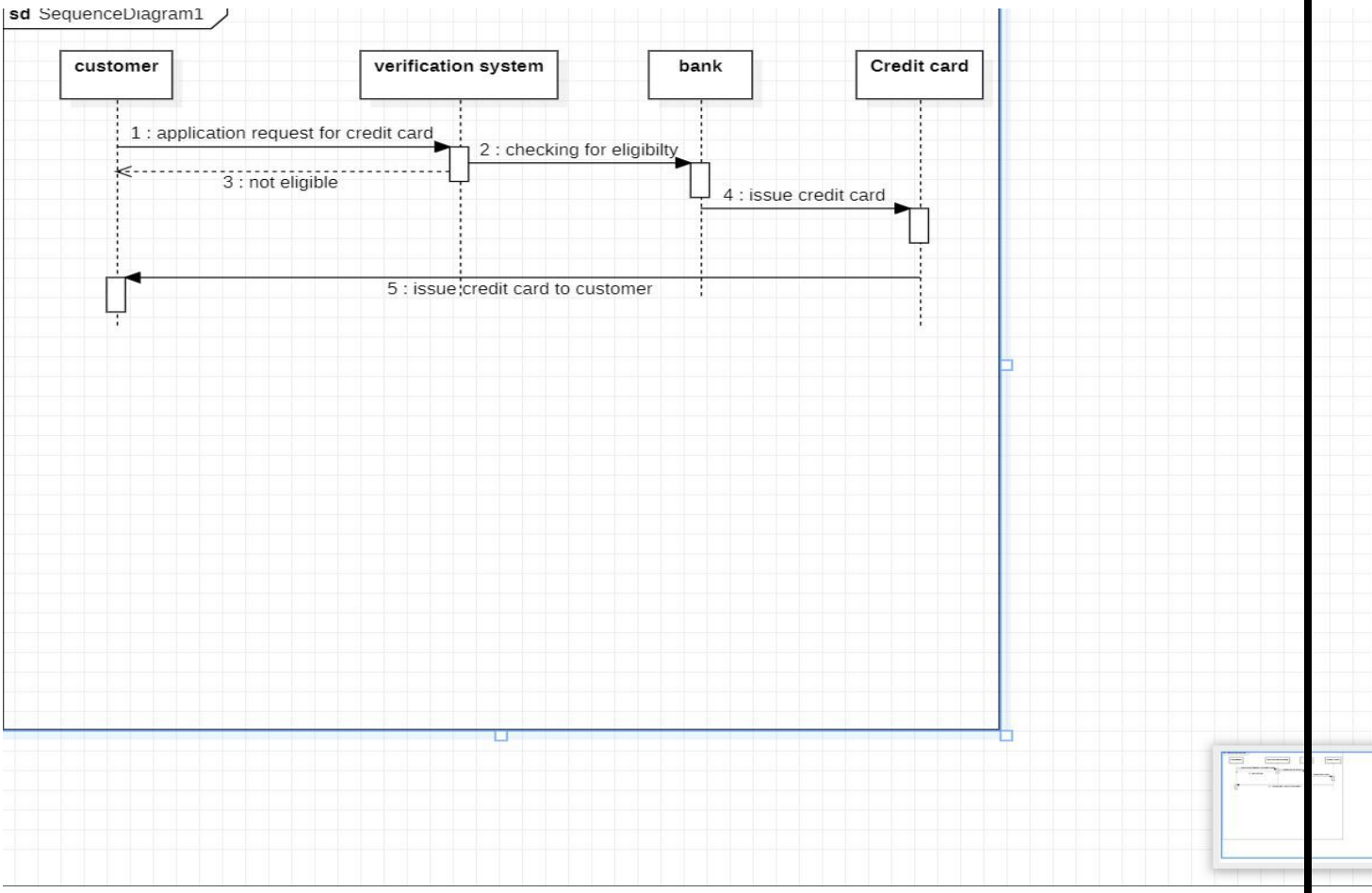
allows actors to login into the system.

Select Option(Withdraw,Deposit): the cutomer can select the

option they wish to stay in.

## 2.5 Sequence Diagram

### 2.5.1 Simple Sequence Diagram




The above sequence diagram give the steps involved in a customer logging in, selecting an option ,which is verified in the database and the payment for the same is made by the customer or money is withdrawn.

## 2.6 Activity Diagram

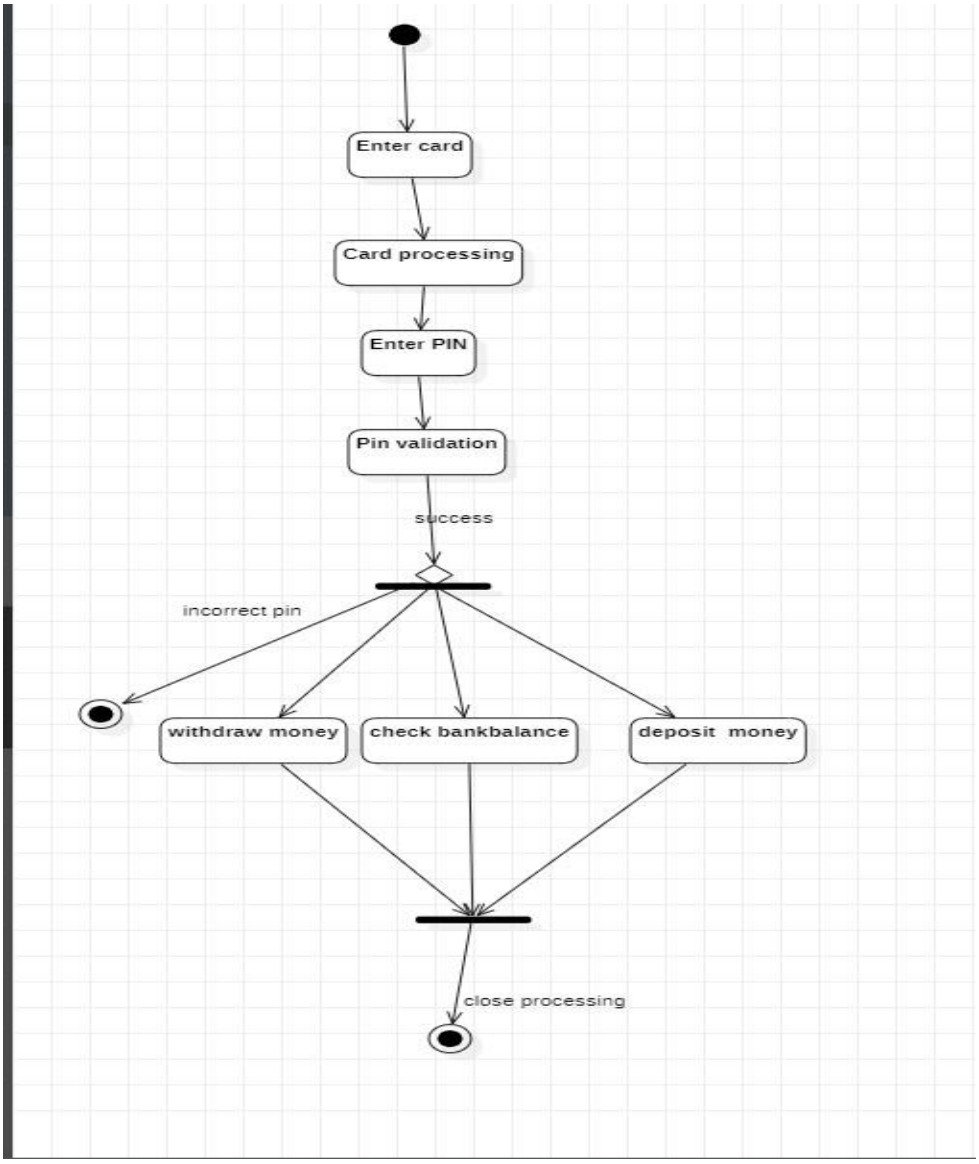



Fig 2.8

The above Activity diagram give the steps involved in a customer logging in, selecting an option ,which is verified in the database and the payment for the same is made by the customer or money is withdrawn.

# 3. LIBRARY MANAGEMENT SYSTEM

## 3.1 Problem statement

To design an efficient system for an Library management

## Software Requirement Specification

(3) Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an hotel management system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the Library management system, different renewal options and buying options available in the library and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: The aim behind this system is to fecilitate the user with all the features such order bookings, renewal,membership,cost updates,etc…

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of books available , the cost updated time to time, book information, payment information of the customers and all the required data processing is done through the same system accurately .

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

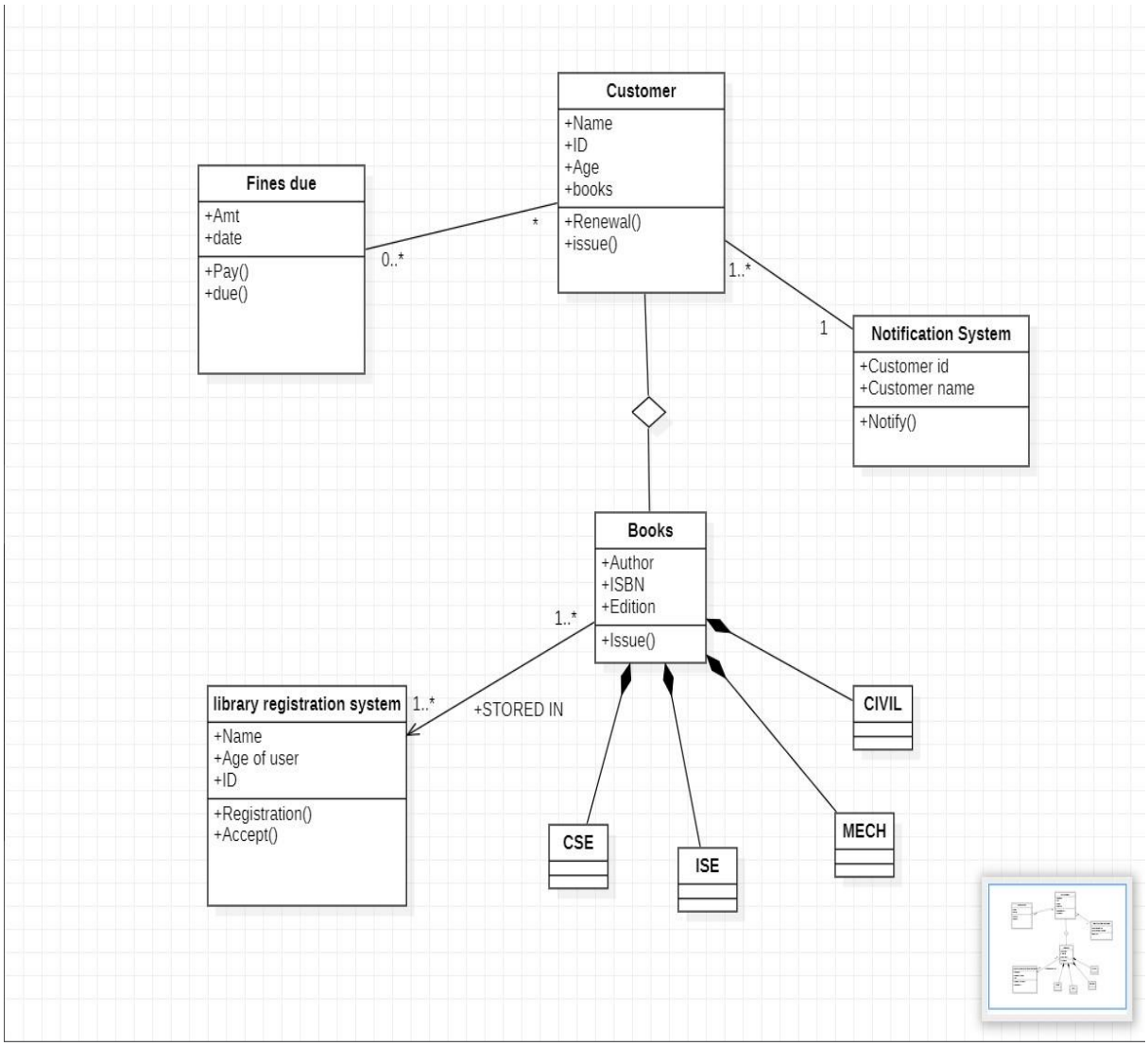
(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

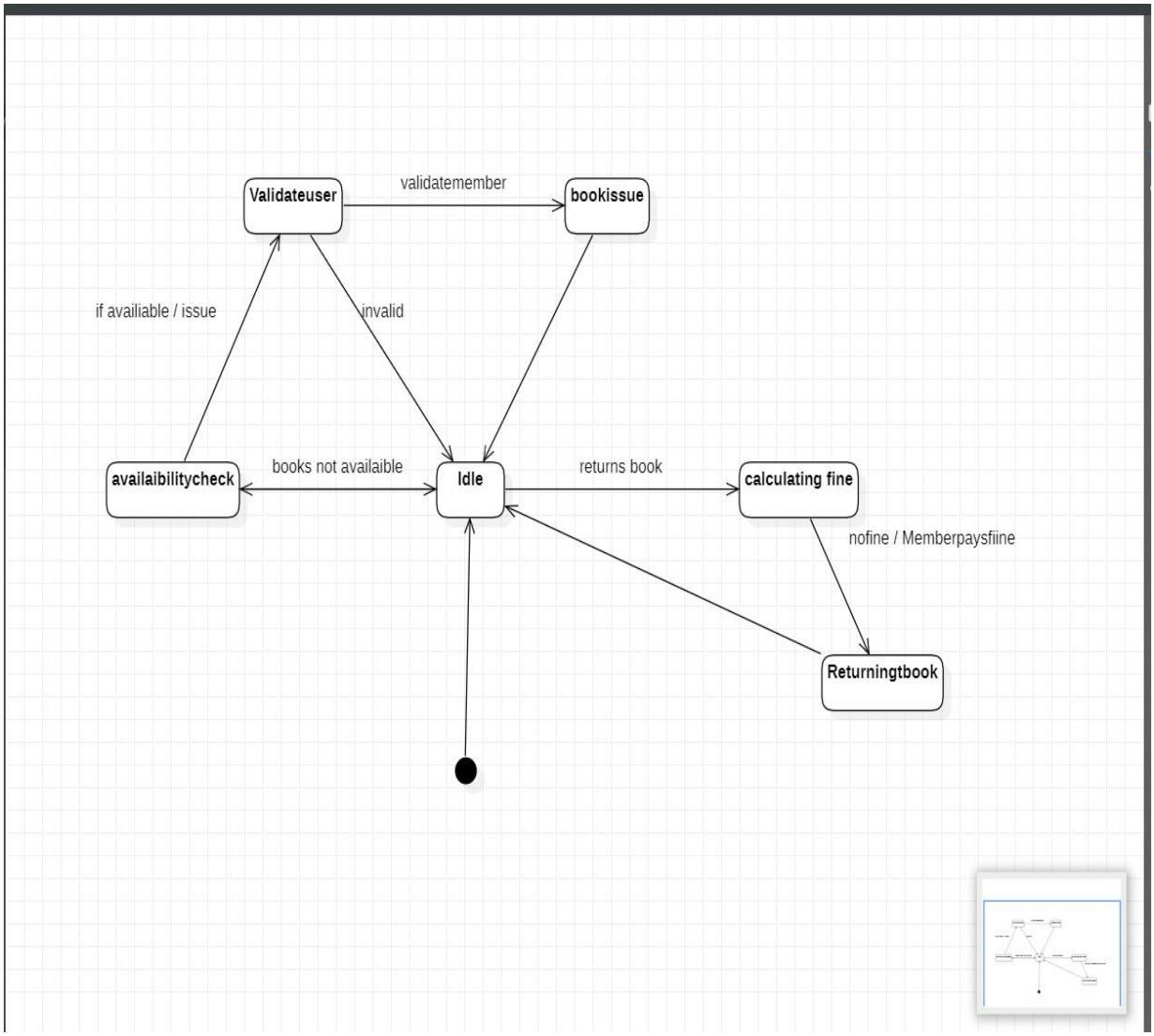
(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## 3.2 Class Diagram



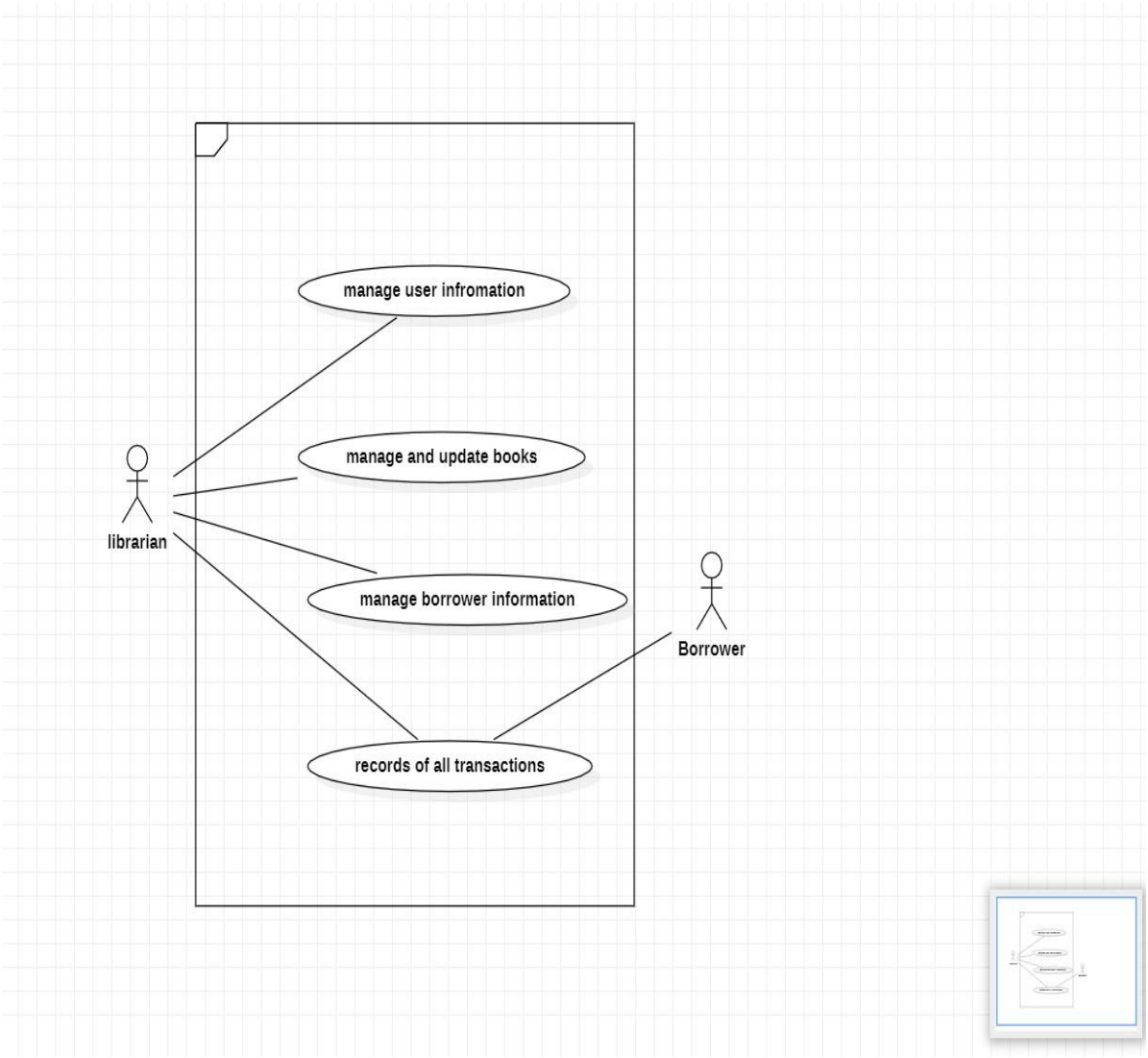

The above class diagram gives a brief description about the library management system.About how the users can either buy books or hire books only if they have valid ID card.The library provides books to 4 departments such as CSE, ISE, MECH and CIVIL

## 3.3 State Diagrams




The state diagram above gives us the states involved in purchasing a book and placing the order for the same. If the book is not returned in time then there is state where the user/Customer should give fine.

## 3.4 Use Case Diagram




**Actors:**

Customer: a person who purchases the products

Retailer: a person who sells the products

Stock person : a person who keeps check of the stock

Supplier: a person who supplies the products

**Use Cases:**

Purchase item: allows a user to purchase any product

Make payment: accepts the payment

Supply Books: keeps track of the stock

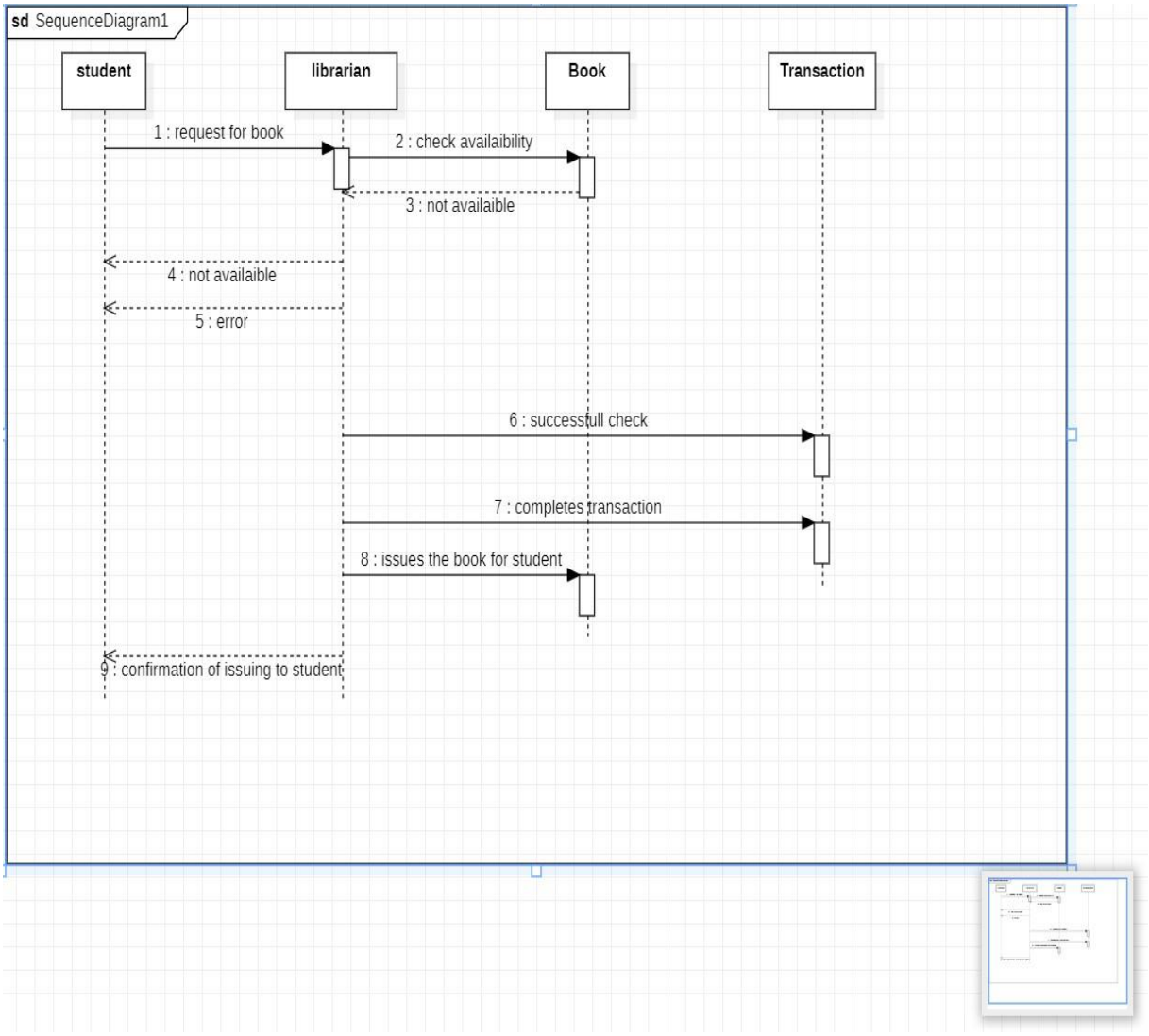
supplied

Update stock: the stock list is updated by the stock person

Order goods: the products coming to an end are ordered

Prepare bill: a bill for products purchased is made

## 3.5 Sequence Diagram




Contact seller for purchase/sale

Seller confirms purchase/sale

Confirmed purchase/sale order

Check available balance in case of purchase order

Purchase/sale order possible

Purchase/sale order approved

Purchase/sale of stock confirmed and approved.

## 3.6 Activity Diagram

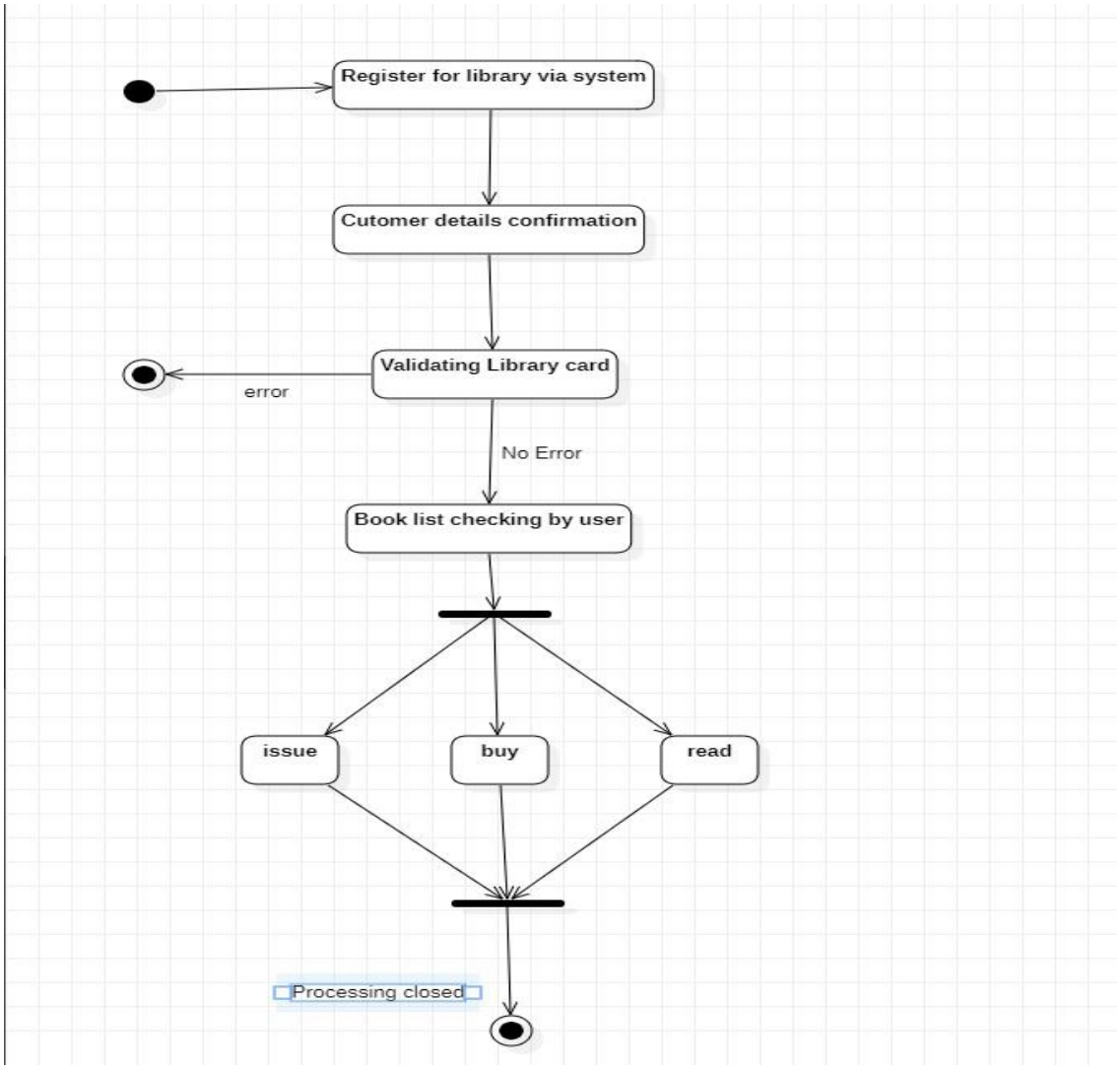



Fig 3.8

The state diagram above gives us the states involved in purchasing an product and placing the order for the same. There is first an inventory check ,where is stock of products is noted and if the stock is less than minimum an order is placed by first searching for suitable trader .

# 4. STOCK MAINTAINENCE SYSTEM

## 4.1 Problem statement

To design an efficient system for an Stock management

## 4.2 Software Requirement Specification

(4) Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an Stock management system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the stock management system, different sectors available in the hotel and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: Different kinds of applications are linked to this platform such as coin dcx etc..

Provides stock fecelities like stock updates,ups and downs etc…

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of stocks available , the costs updated time to time, stock information, payment information of the customers and all the required data processing is done through the same system accurately .

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## 4.3 Class Diagram

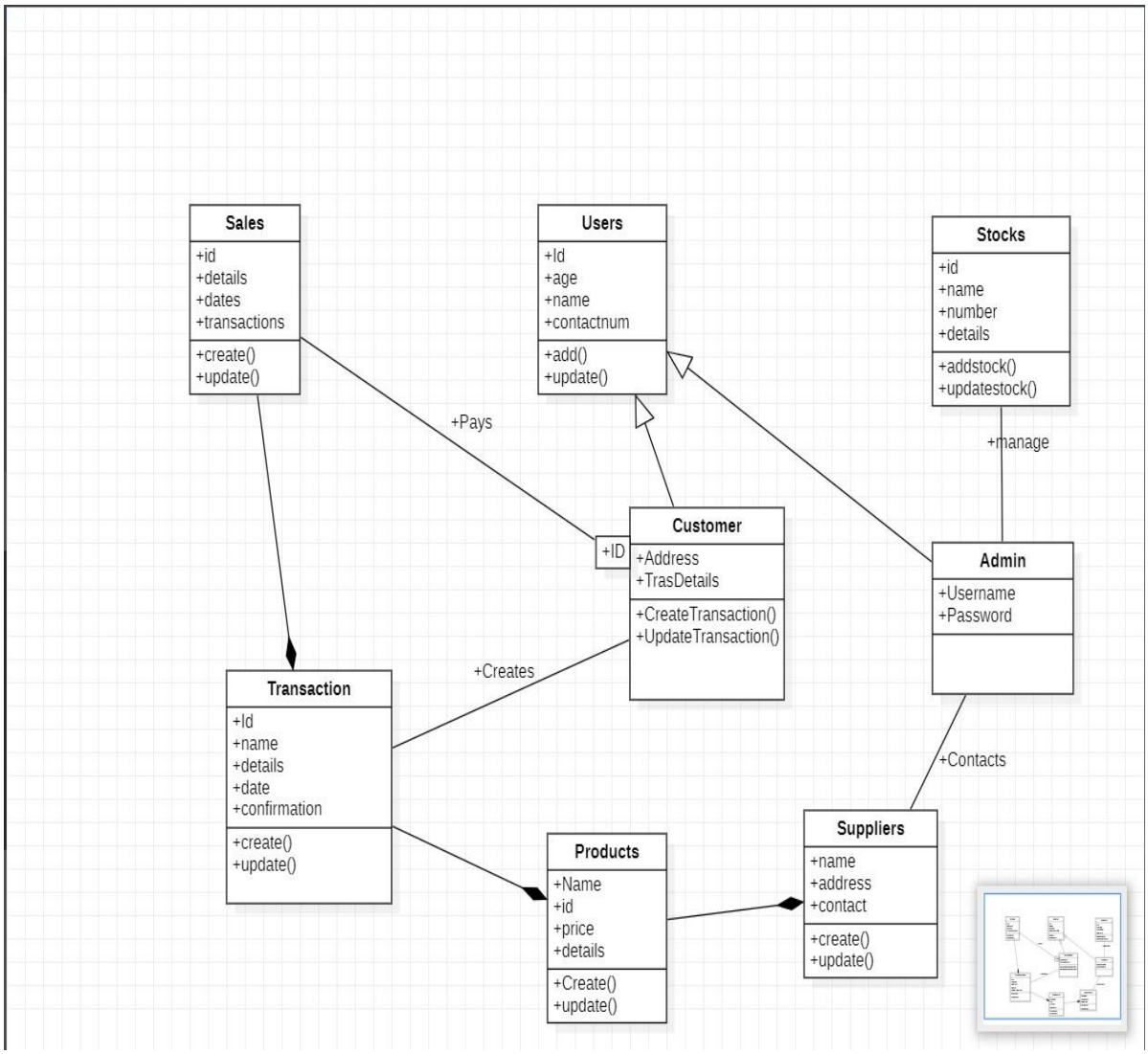
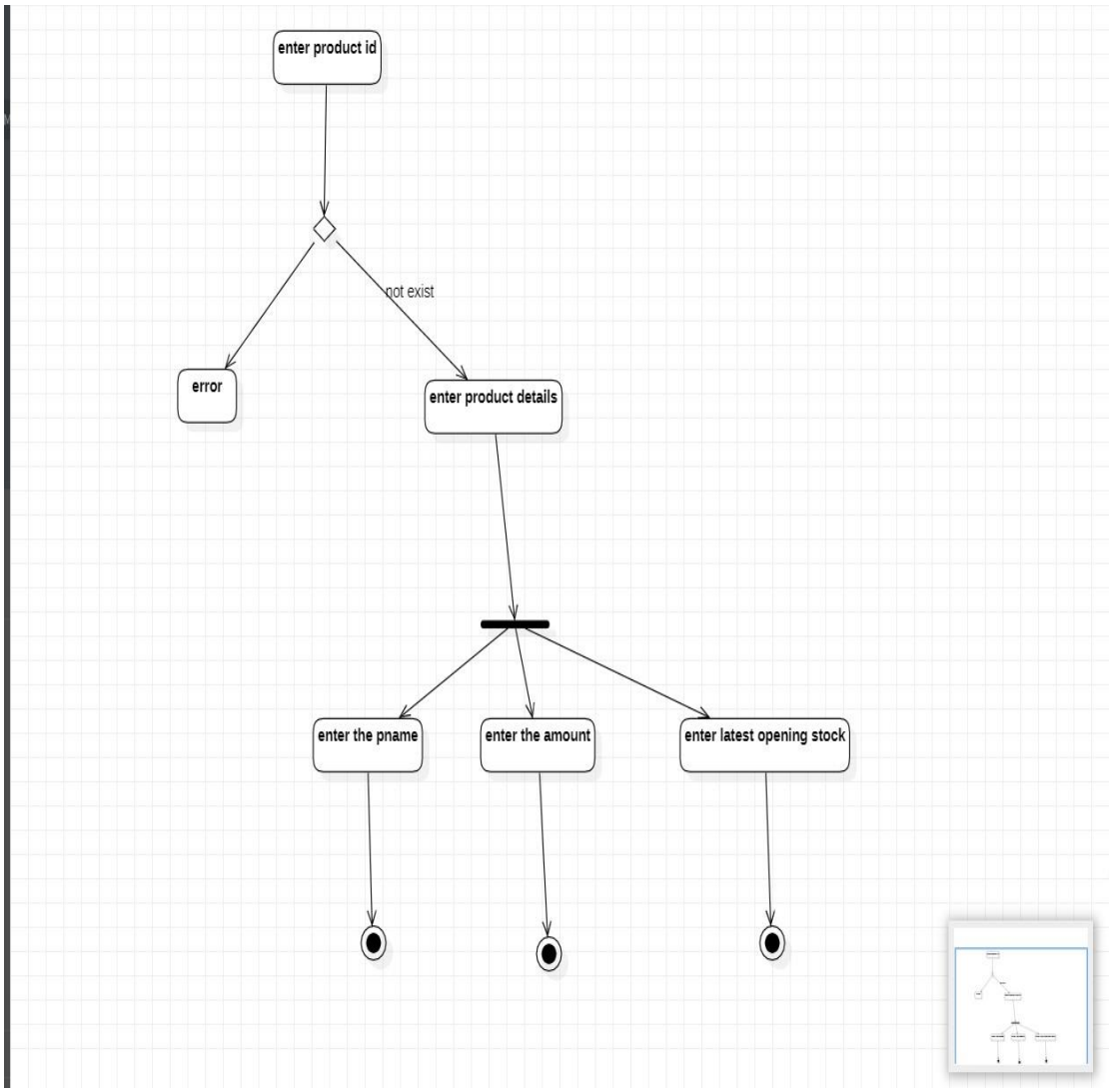



Fig 4.1

The stock maintainence system is build to give details and information regarding different stocks the user can purchase and what is the availaibility of the stock. And it also tells the price/rate of buying the stock Also has a transaction system regarding stock purchases.

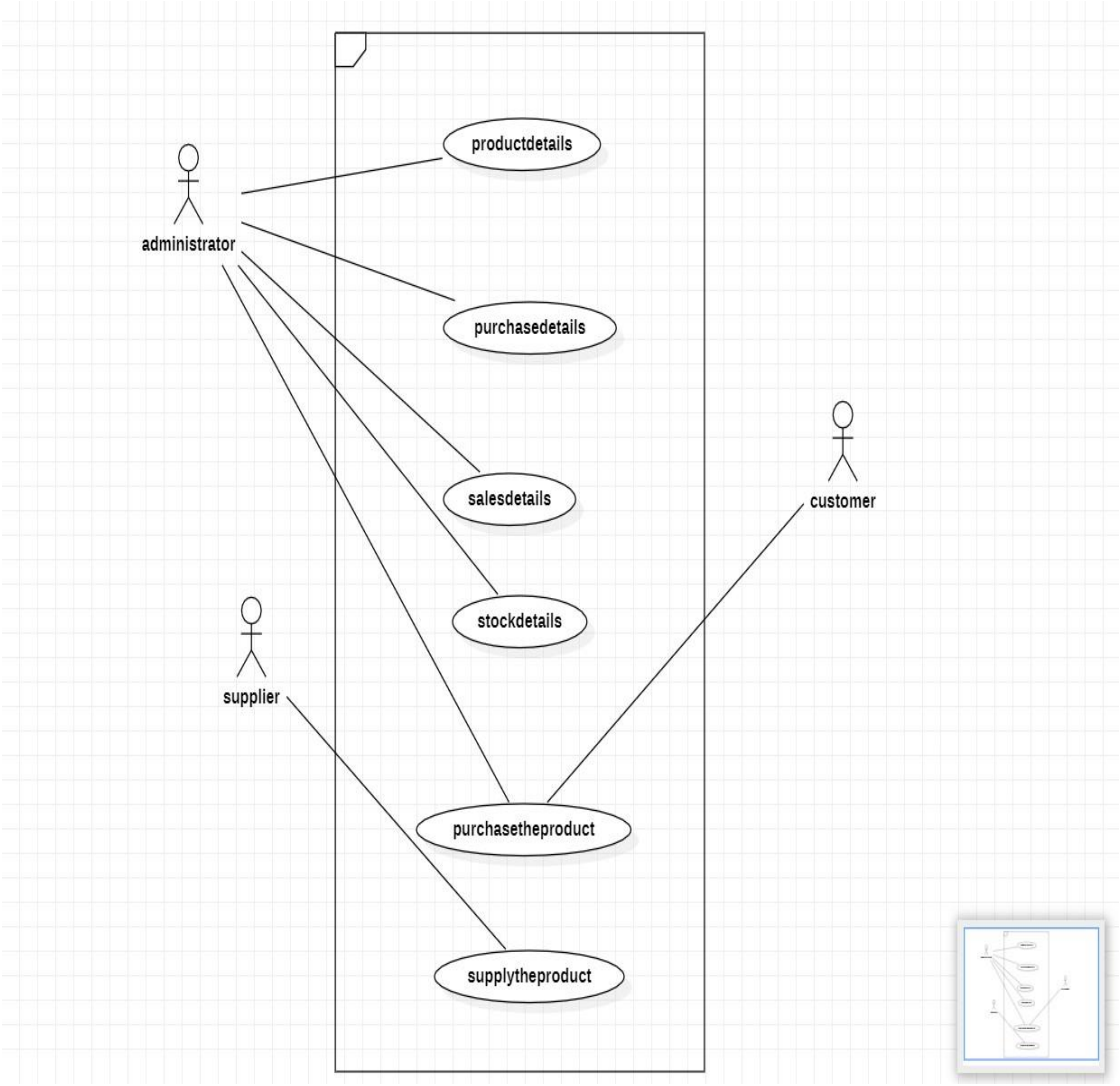
## 4.4 State Diagrams




Initially stock maintainence system is build to give details and information regarding different stocks the user can purchase and what is the availaibility of the stock. And it also tells the price/rate of buying the stock Also has a transaction system regarding stock purchases.

It also represents different states the maintainence system goes through when a stock is purchased

## 4.5 Use Case Diagram




**Actors:**

Customer :a person who uses the coffee vending machine

Supplier : a person who maintains the stock

System Admin : a person who maintains the machine

**Use Case:**

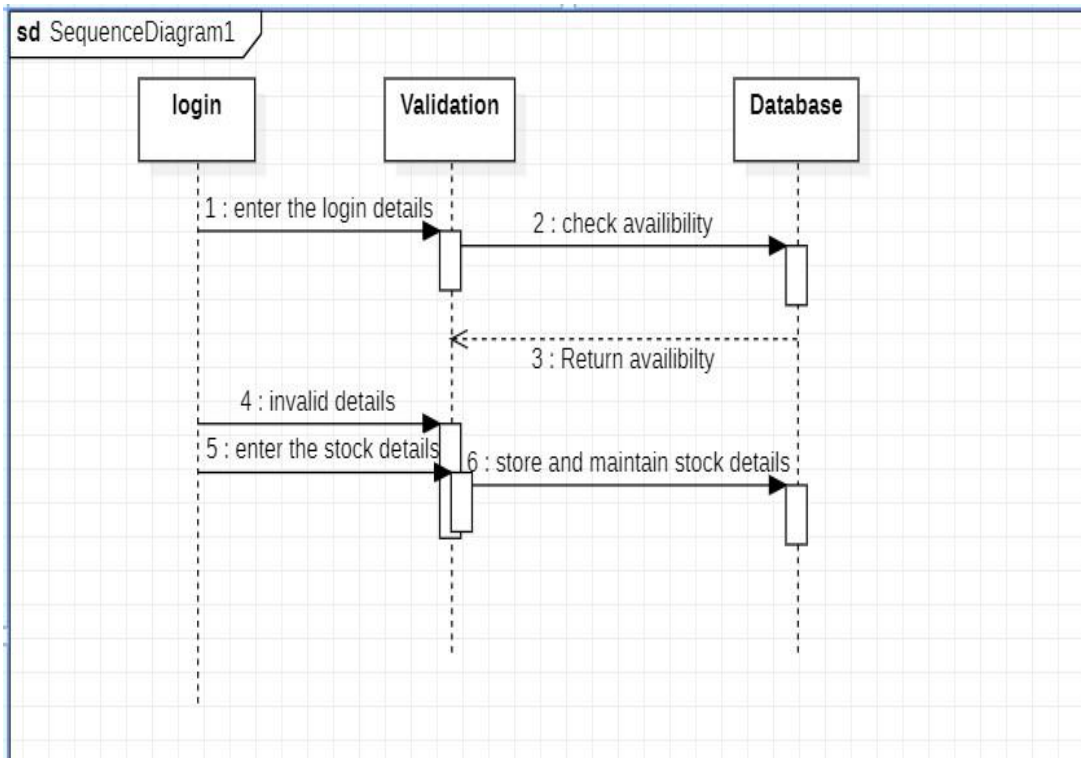
Display payment details : displays the payment details

Request stock : allows user to order their stocks

payment : accepts money for the coffee

## 4.6 Sequence Diagram

### 4.6.1 Simple Sequence Diagram




The sequence diagram tells the steps in ordering a particular stock from a stock maintainence machine and informing the maintainance incharge and solving any anomalies if any.

## 4.7 Activity Diagram

### 4.7.1 Simple Activity Diagram

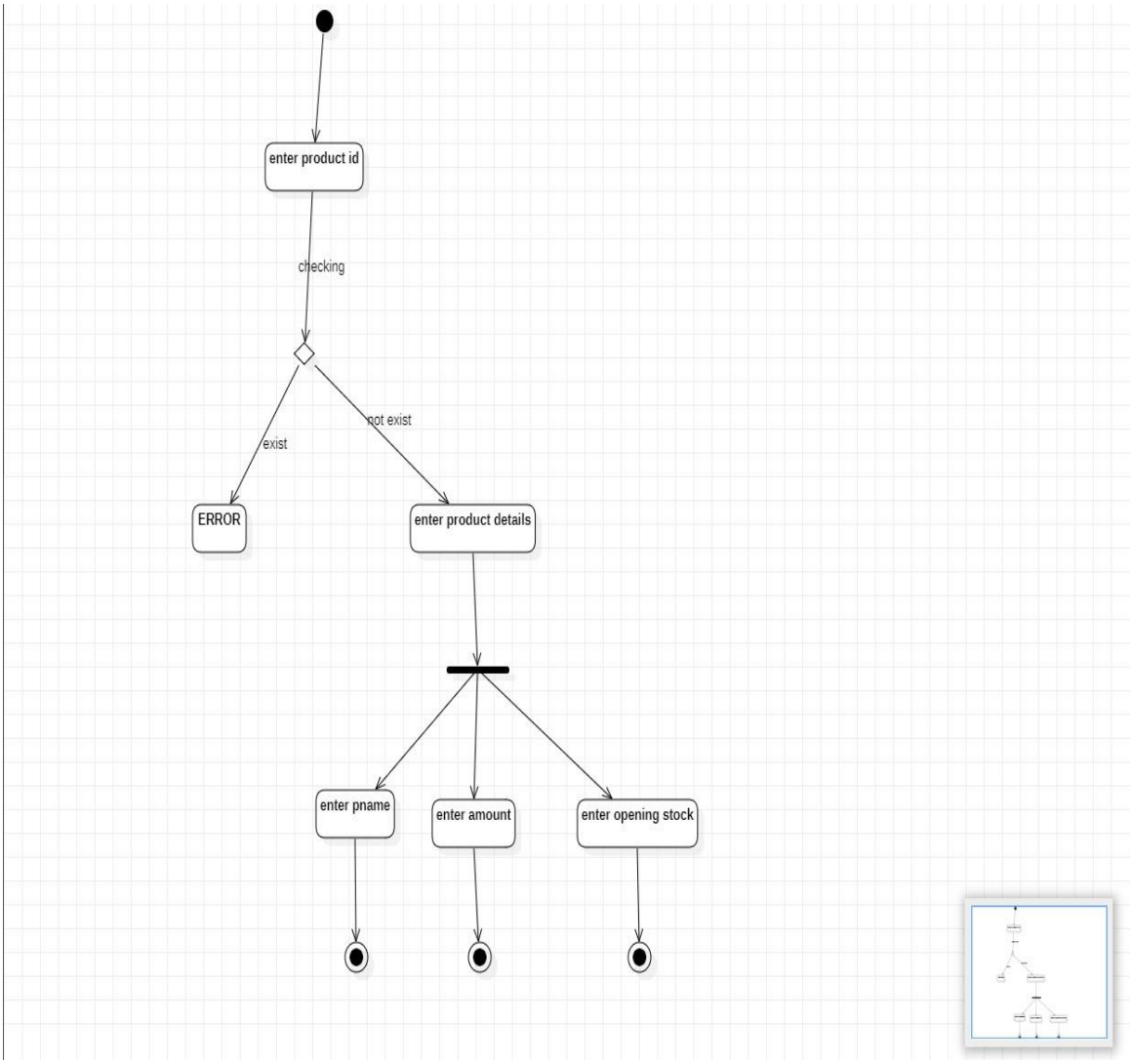



Fig 4.8

The activity diagram above receives the order and forks into two activities i.e order stock and transaction status . on choosing an option if the user wants a reciept it gets printed otherwise no and order ends.

# 5. PASSPORT AUTOMATION SYSTEM

## 5.1 Problem statement

To design an efficient system for an Automation management

## 5.2 Software Requirement Specification

Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an Automation system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the passport management system, different sectors available in the passport office and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: Gives latest information on the passport making process , documents required to make the passport etc…

Provides stock fecilities like process updates, ups and downs etc…

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of slots available , the costs updated time to time, passport seva information, payment information of the customers and all the required data processing is done through the same system accurately .

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

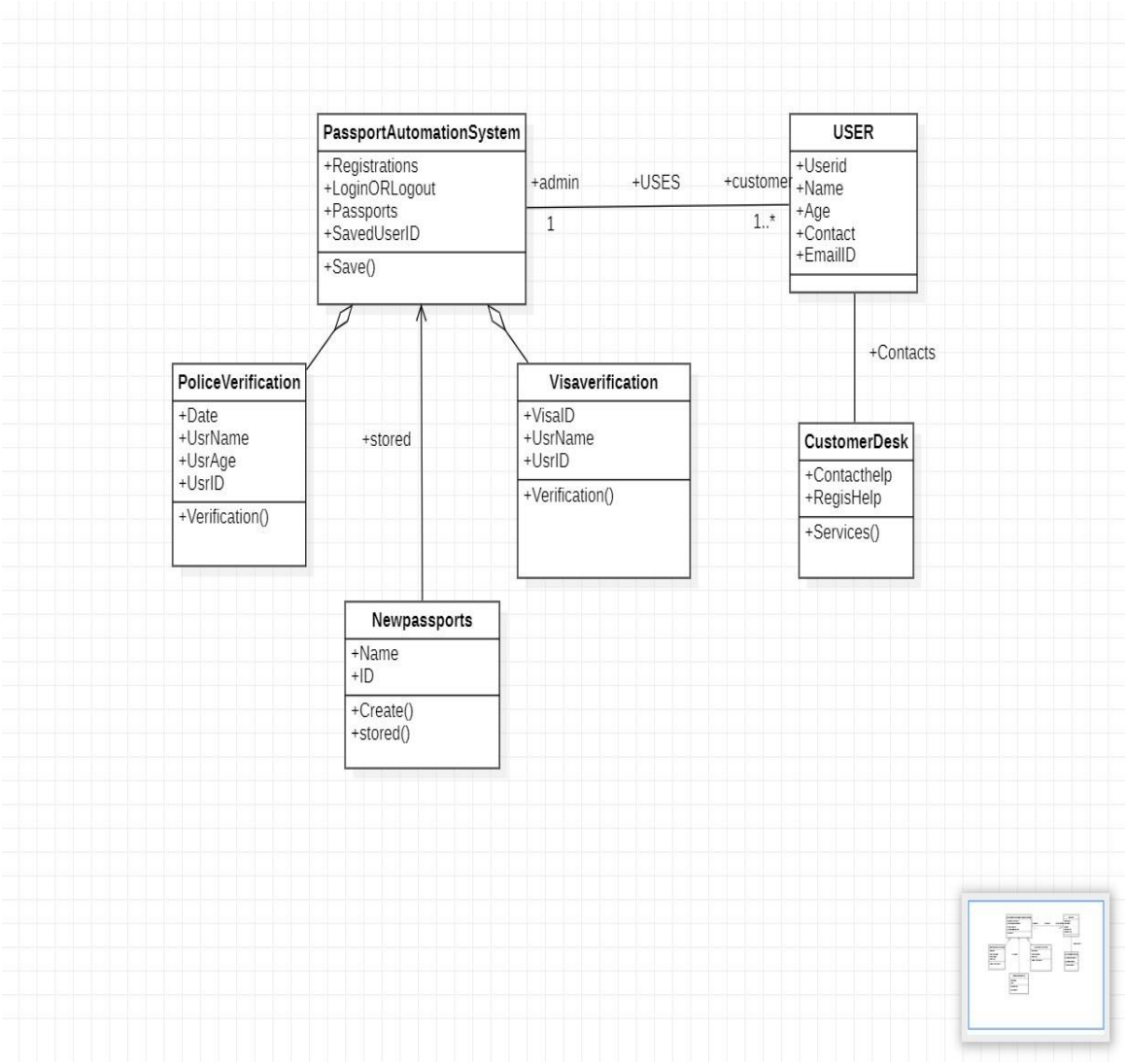
(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

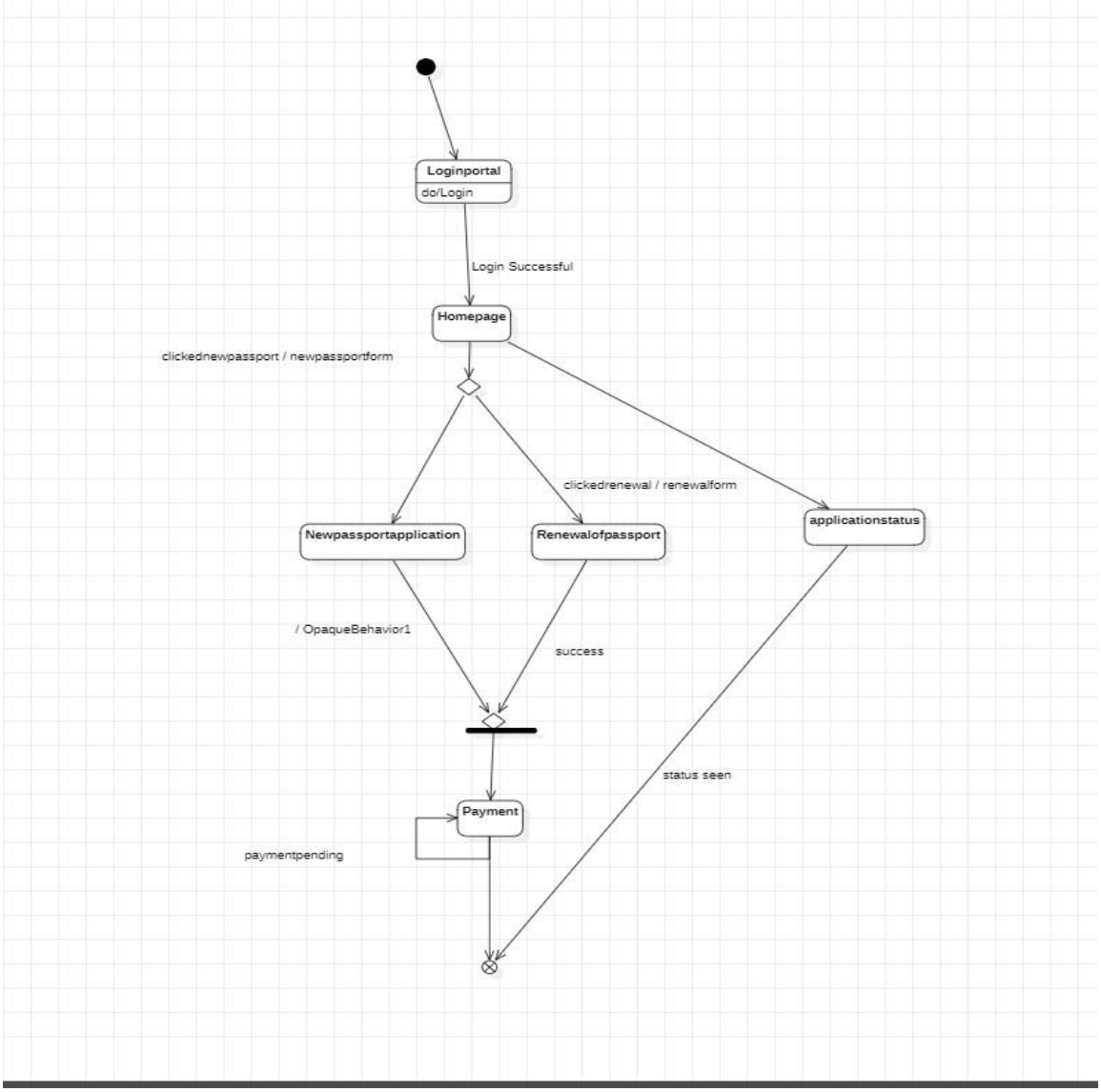
(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## 5.3 Class Diagram



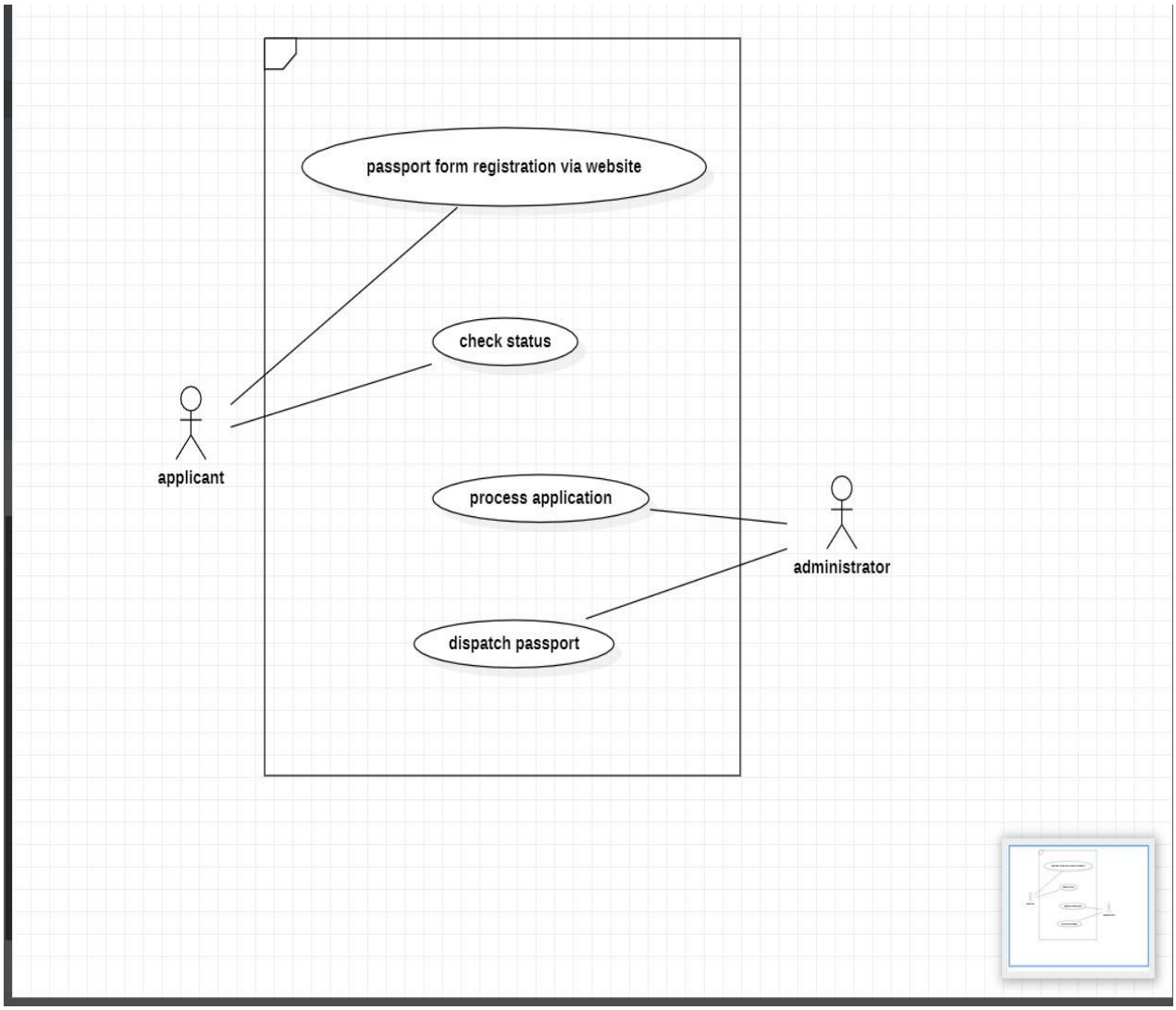

The online passport automation system has customers who must have an account in the online website wherehe/she can purchase can book a slot to either reneiw the passport or to opt for a new passport.

## 5.4 State Diagrams




The above state diagram shows different states the passport system goes through when the user is trying to book a slot and what error conditions can also occur during the course of booking a slot.

## 5.5 Use Case Diagram




**Actors:**

Customer: a person who uses the online shopping system

Admin:Manages slots booked by users

Payment:500rs payment for slot booking

**Use Case:**

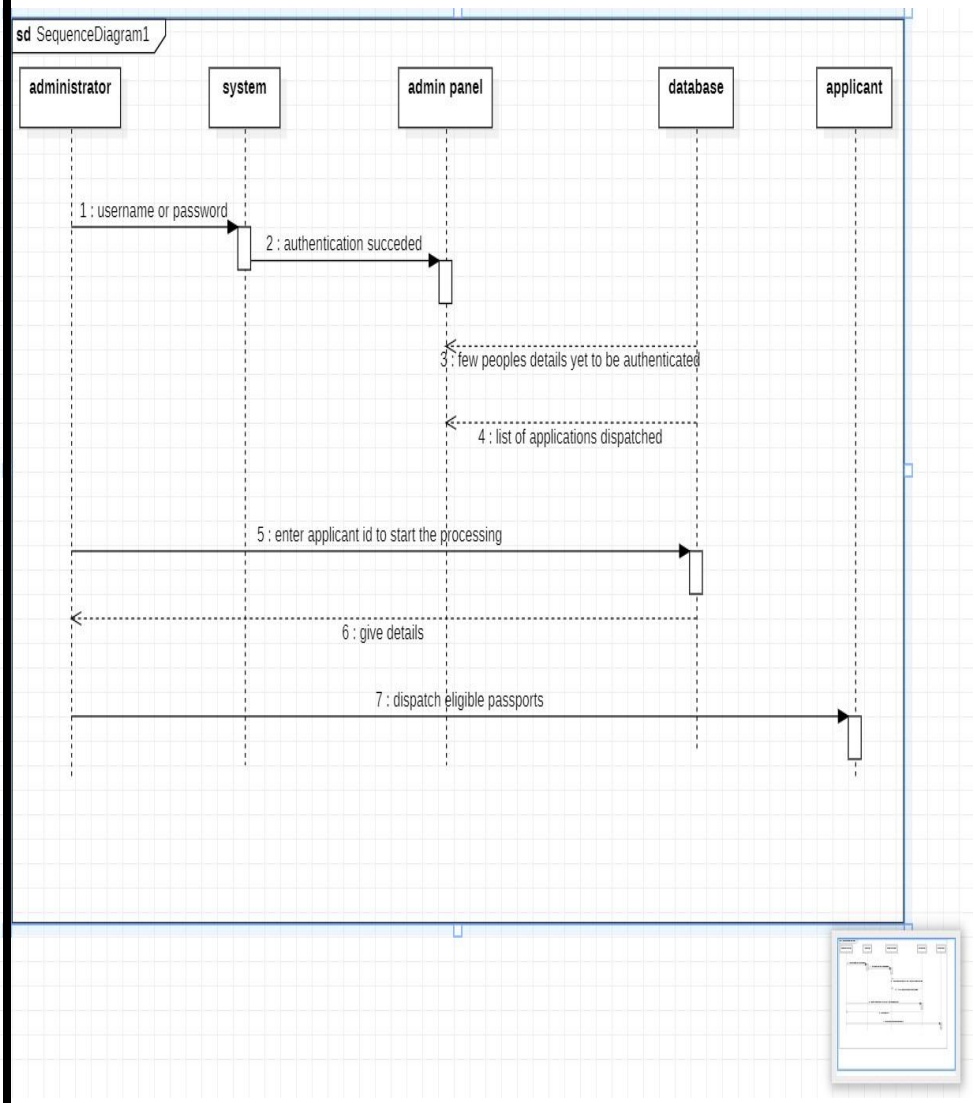
view passport status : Processing application

Make payment : accepts payment for the products purchased

Deliver passport to address : delivery of the product is

handled

## 5.6 Sequence Diagram




the customer logins into the online interface

The slots are displayed

The customer chooses the date and time

The customer books slot

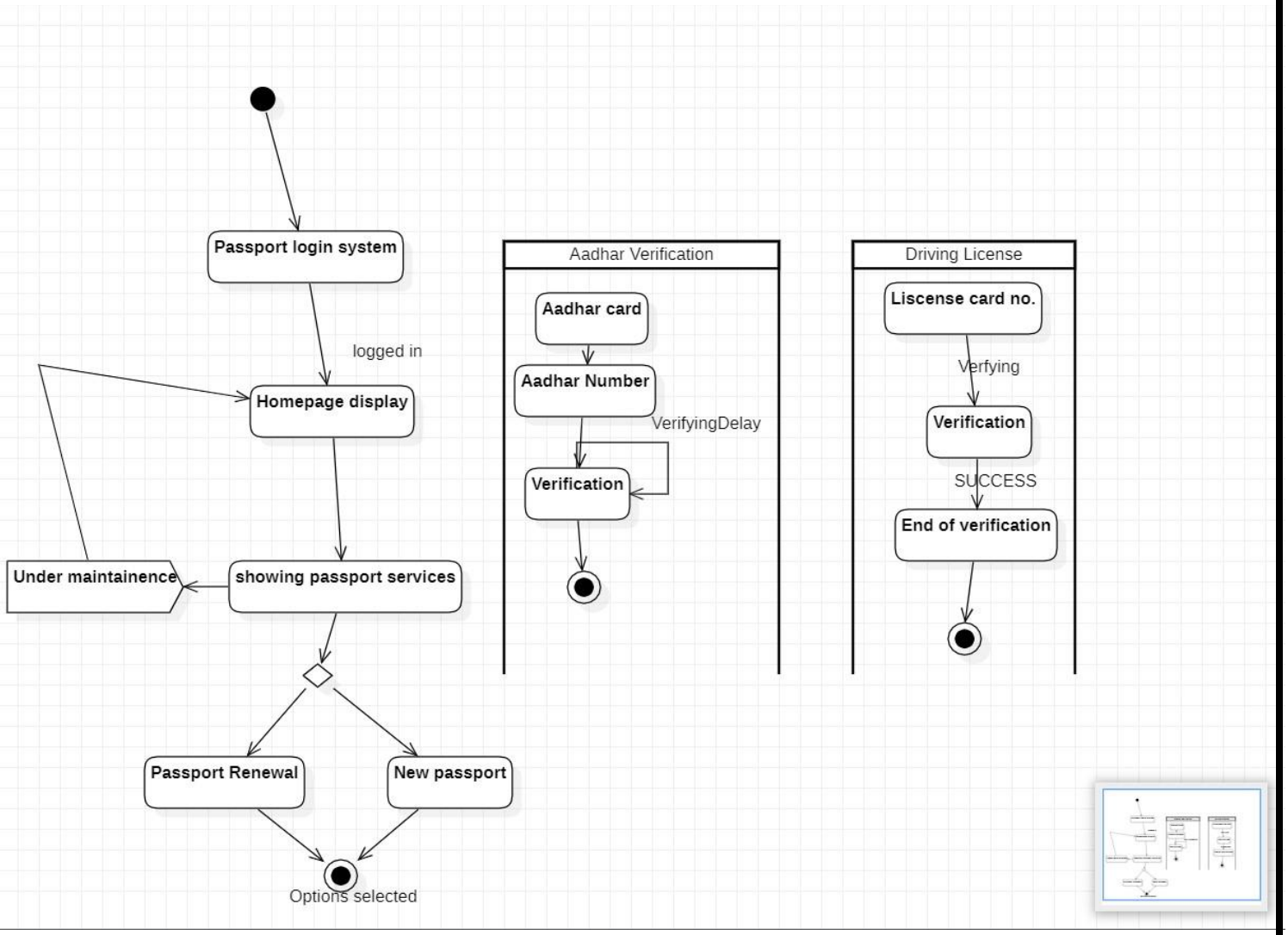
The online interface requests for payment

The customer provides details and confirmation is sent

The customer logs out

The logout confirmation is sent to the customer

## Activity Diagram




The simple activity diagram gives us activities in booking a slot and paying for the order and also showing error conditions. The customer is first made to register and then login into their account. Then the slots are displayed,where they can select their choice and pay for them.

# 6. RAILWAY RESERVATION SYSTEM

## 6.1 Problem statement

Railway Reservation System is a system used for booking tickets over internet.Any Customer Can book tickets for different trains.Software has to be developed for automating the manual reservation system of railway.The system should be standalone in nature.It should be designed to provide functionalists like booking of tickets in which a user should be able to applied for tickets of any train and of any class.The software takes the current system date and time as the date of issue and calculates the amount to be paid by the user. It also provide the functionality of cancellation of tickets.

## 6.2 Software Requirement Specification

(5) Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an Railway reservation system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the passport management system, different sectors available in the railway office and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: Helps in efficient booking of tickets for the trains and easy cancellation of the tickets and even the cancellation fees might be applied accordingly.

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of slots available for train bookings at different times , the costs updated time to time, the payment information of the customers and to know special quota seats and all the required data processing is done through the same system accurately .

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

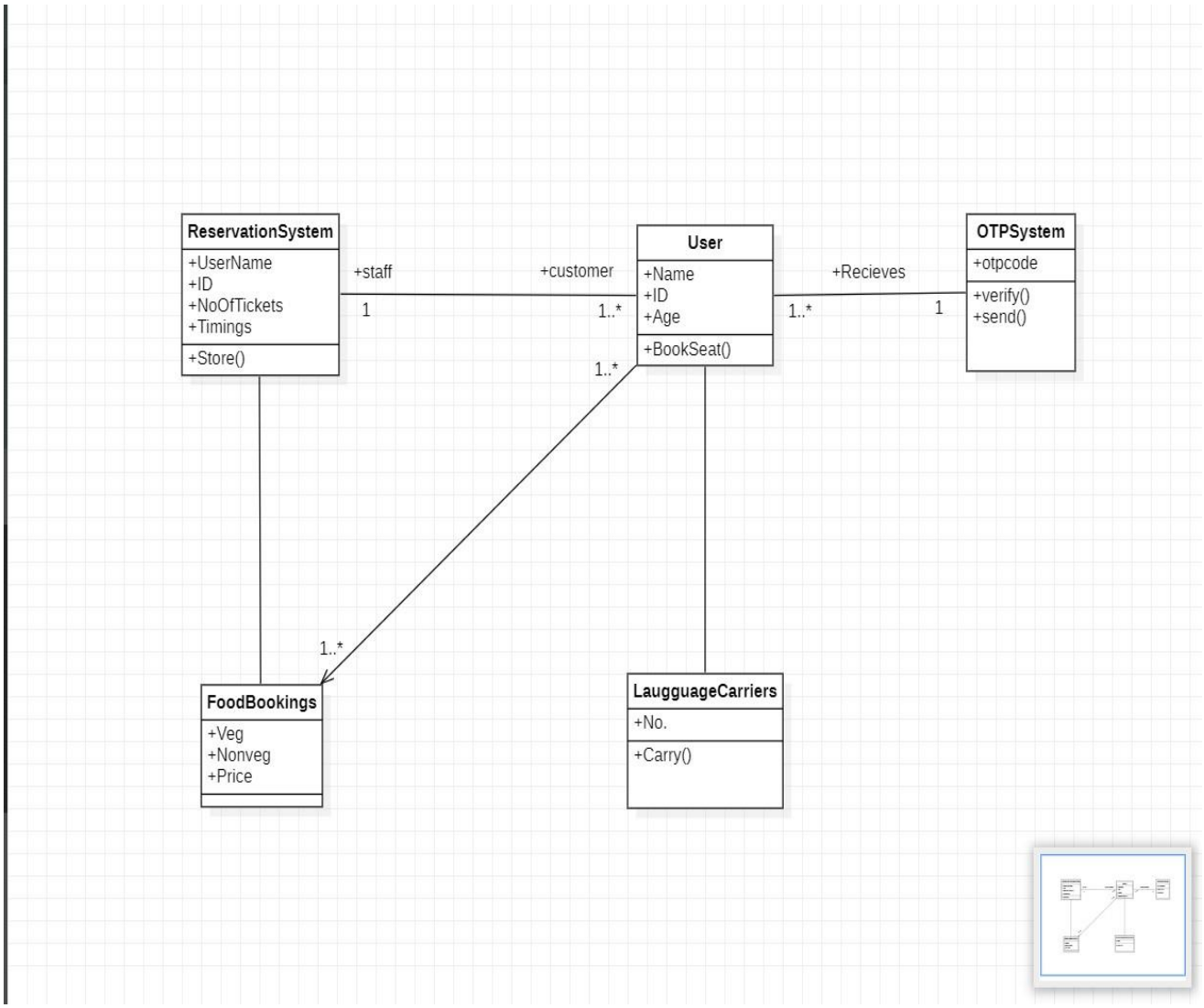
(6) Design Constraints: The design team can apply their on methodologies for implementing

the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

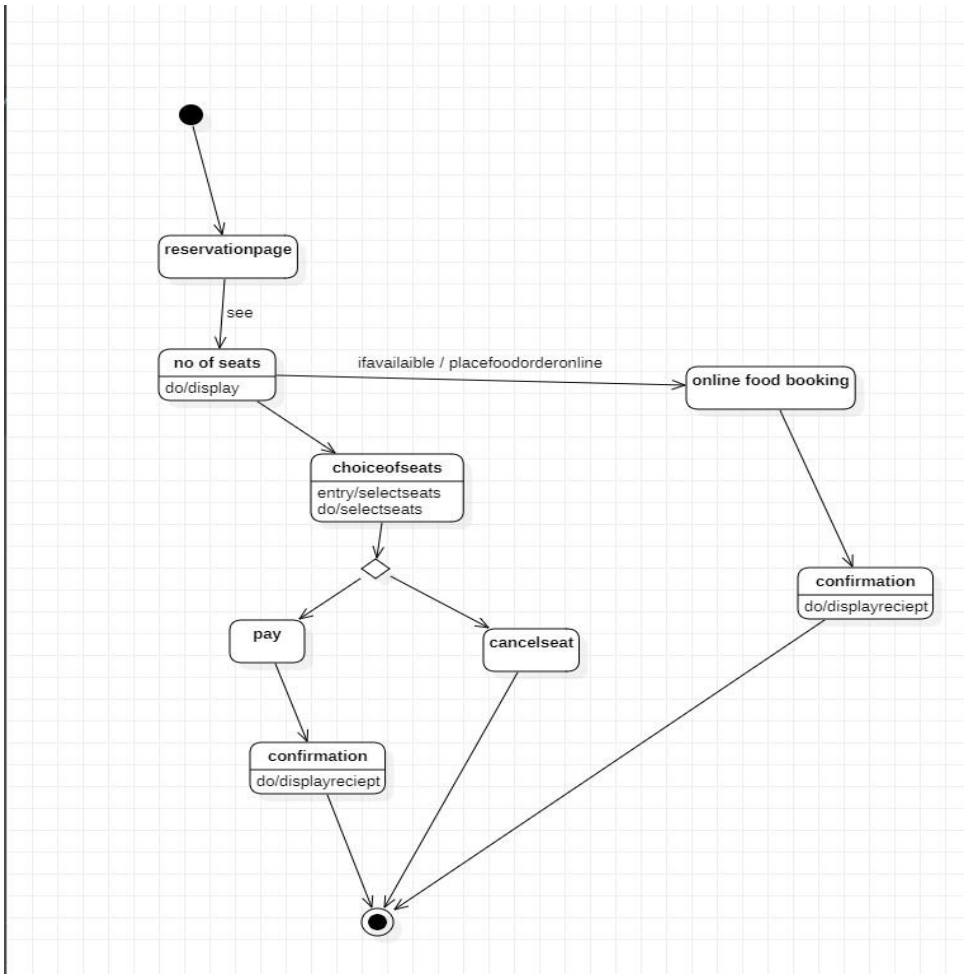
(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## 6.3 Class Diagram




The admin manages the trains and reservation related to railway reservation system. There are three types of reservation, I.e RAC,waiting and confirmed.The passengers with a reservation goes to one or the other reservation.A train consists of coaches and engine.A passenger pays for the ticket booked .Tickets can be booked in two ways by i-ticket or by e-ticket booking.

## 6.4 State Diagrams




The simple state diagram gives the states involved in booking a train ticket and paying for the same. The user can see the train details and book a train for a particular source and destination . on timeout an error message is displayed and redirected to the main page. The user can then select a train and make payment for it

The advanced state diagram has states for paying the ticket.from the ready state the user goes to payment initiation after which the card details are accepted and an OTP is sent to the registered mobile number. On verification the money is deducted and ticket is sent to the customer.

## 6.5 Use Case Diagram

### 6.5.1 Simple Use Case Diagram

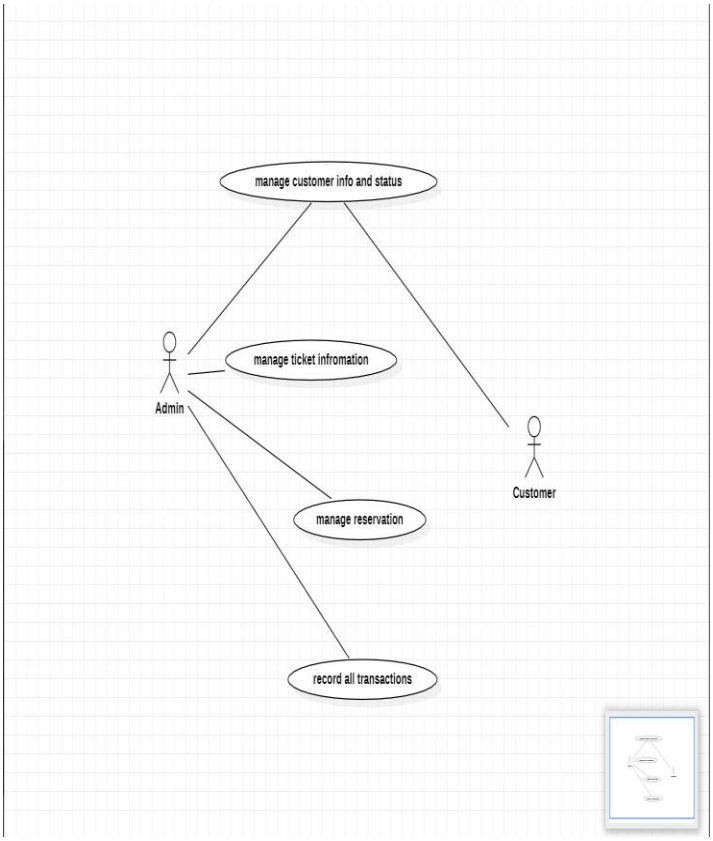



Fig 6.4

**Actors:**

User: uses the railway reservation system.

Admin: manages all information

Railway System: System that is used for train ticket reservation.

**Use Case:**

Register: The first time user has to create a account in railway system.

Book Ticket: User can select the type of coach and no of seats and book the ticket.

Make payment: System displays the payment details. User can make his payment.

## 6.6 Sequence Diagram

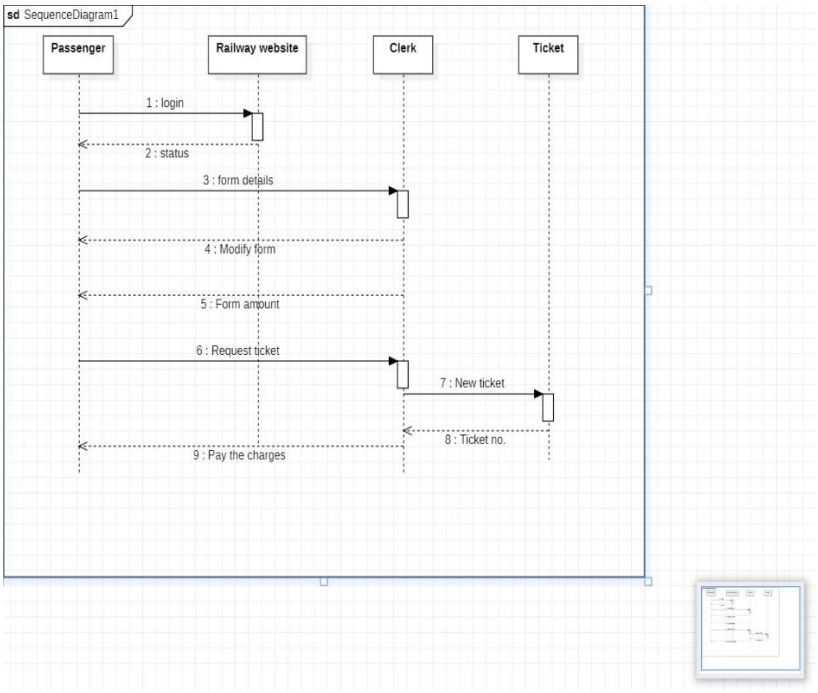



Fig 6.6

User logs into the railway reservation system.

Admin verifies the login details.

System establishes secure communication.

User checks for availability of trains .

Admin updates the train details.

System displays the train details.

User books tickets.

System displays payment details.

User makes the payment.

System issues the e-ticket.

User logs out .

## 6.7 Activity Diagram

### 6.7.1 Simple Activity Diagram

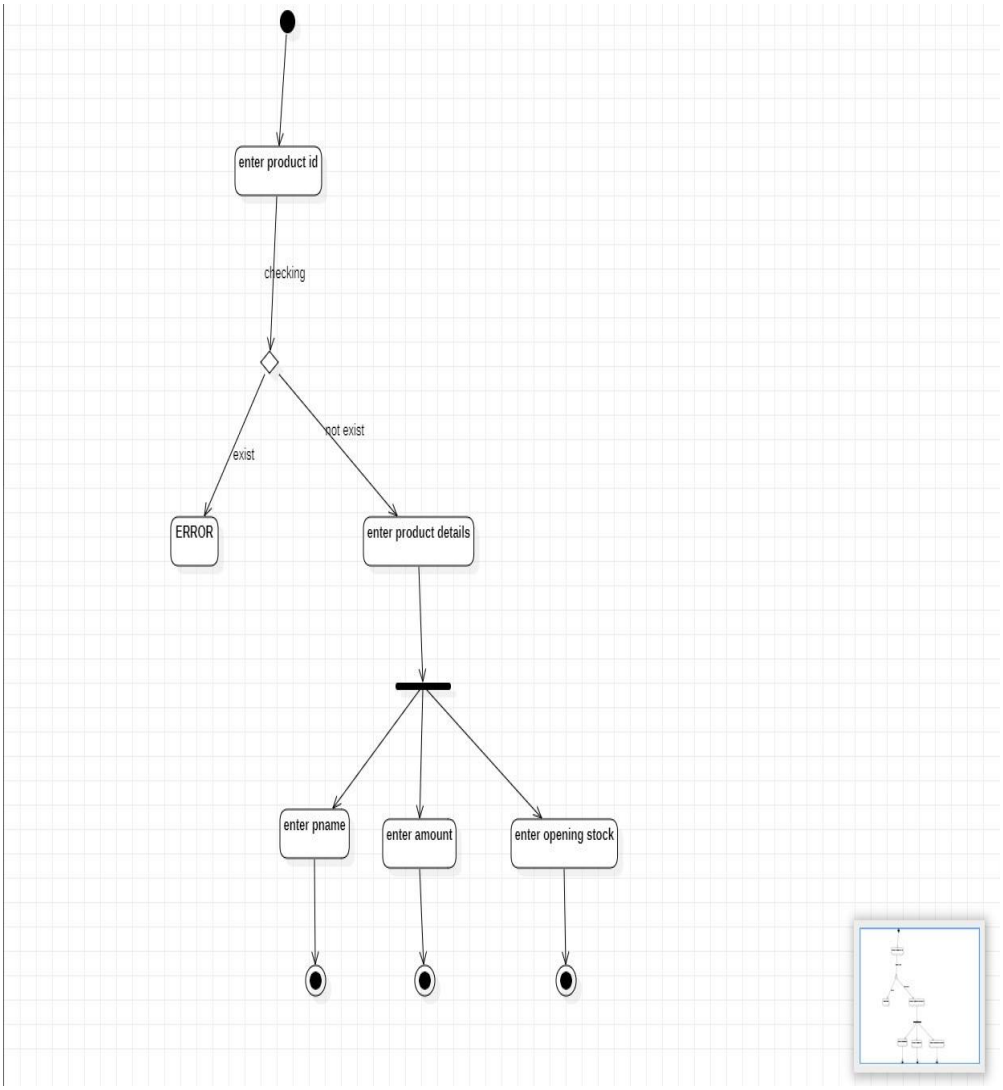



Fig 6.8

The activity diagram tells about the steps happening while canceling a ticket which is booked.the user first need ts login and select his ticket,confirm cancellation, request refund and print the canceled ticket and logout.

# 7. ONLINE SHOPPING SYSTEM

## 7.1 Problem statement

To design an efficient system for an Online shopping system

## 7.2 Software Requirement Specification

(1)Introduction:

(1.1)Purpose of documentation: It is necessary to build such a documentation for such kind of a system for easy understanding of how an Railway reservation system works.

(1.2)Scope of the document: The main aim behind making this document is for easy understanding of the passport management system, different sectors available in the railway office and for what purpose they are for.

(1.3)Overview: The system will give the information regarding the basic fecilities provides by the system in detail.

(2)General Description: Helps the user to know various clothings present in the website application.

Various brands provides

Different payment options.

(3)Functional Requirements: The software is designed in such a way that

It satisfies all the needs of the customer it gives the latest info on the number of books available for bookings at different times , the costs updated time to time, the payment information of the customers and to know special quota seats and all the required data processing is done through the same system accurately .

Along with membership info.

(4)Interface Requirements: The system has a well define accurate and a well responding interface for the customers. Th interface is developed using programming languages such as python and java. The system has memory space of 2 TB as of now.

(5) Performance Requirements: The system has a memory space of 2TB to store all the customer booking details. This website can be operated on any operating system without system lags and backend is developed using mongo DB.

(6) Design Constraints: The design team can apply their on methodologies for implementing the tools and technologies specified but within the company boundaries.

(7)Non-Functional Requirements: The system is provides with security using Mcaffee security they system is reliable and can also recover from immediate shutdowns and power failure Enough capacity of the system to store all the important details of the customers.

(8)Prilemenary Schedule and Budget: The project will require a time period of 1 month and budget of 60000rs.

## 7.3 Class Diagram

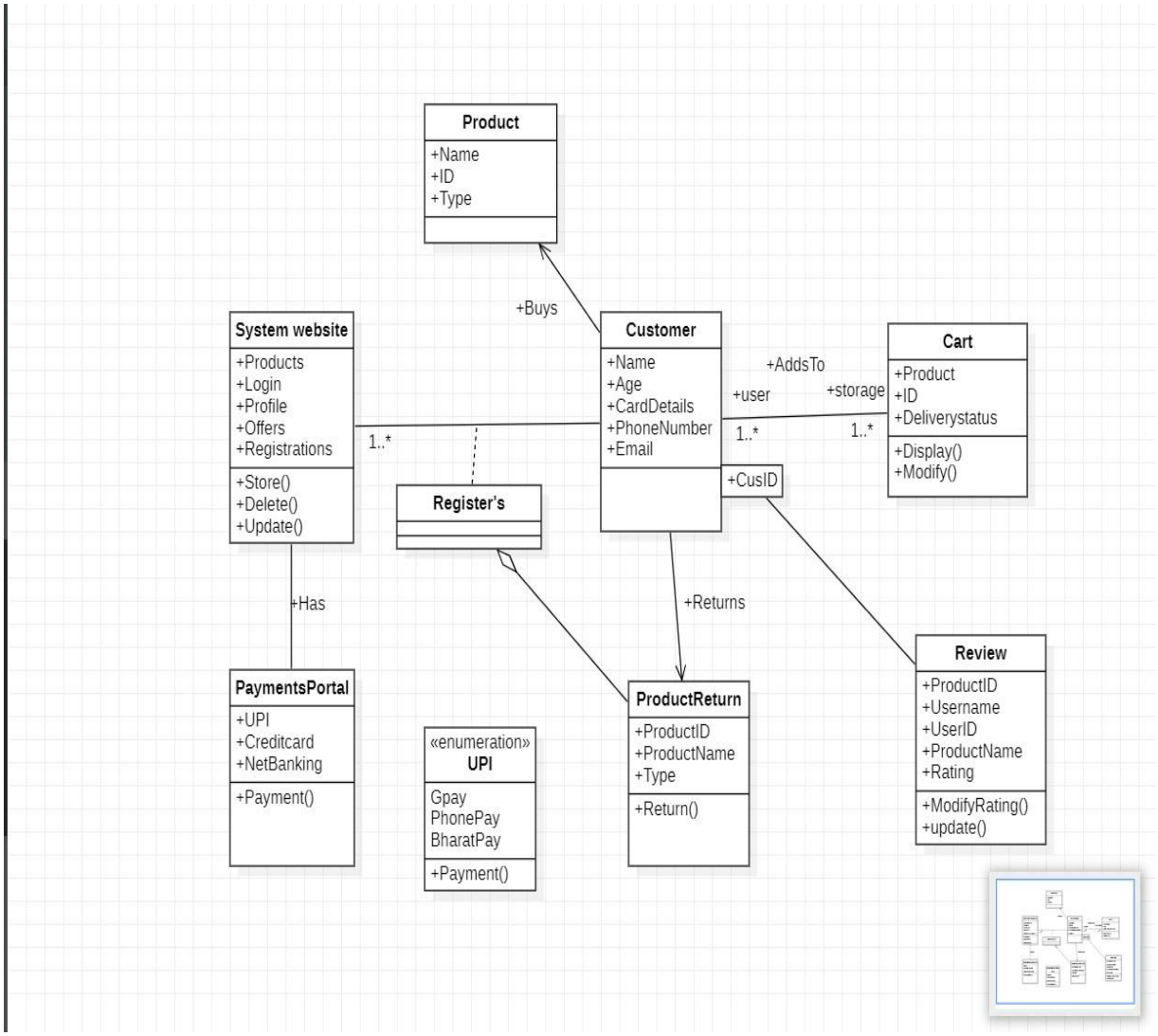
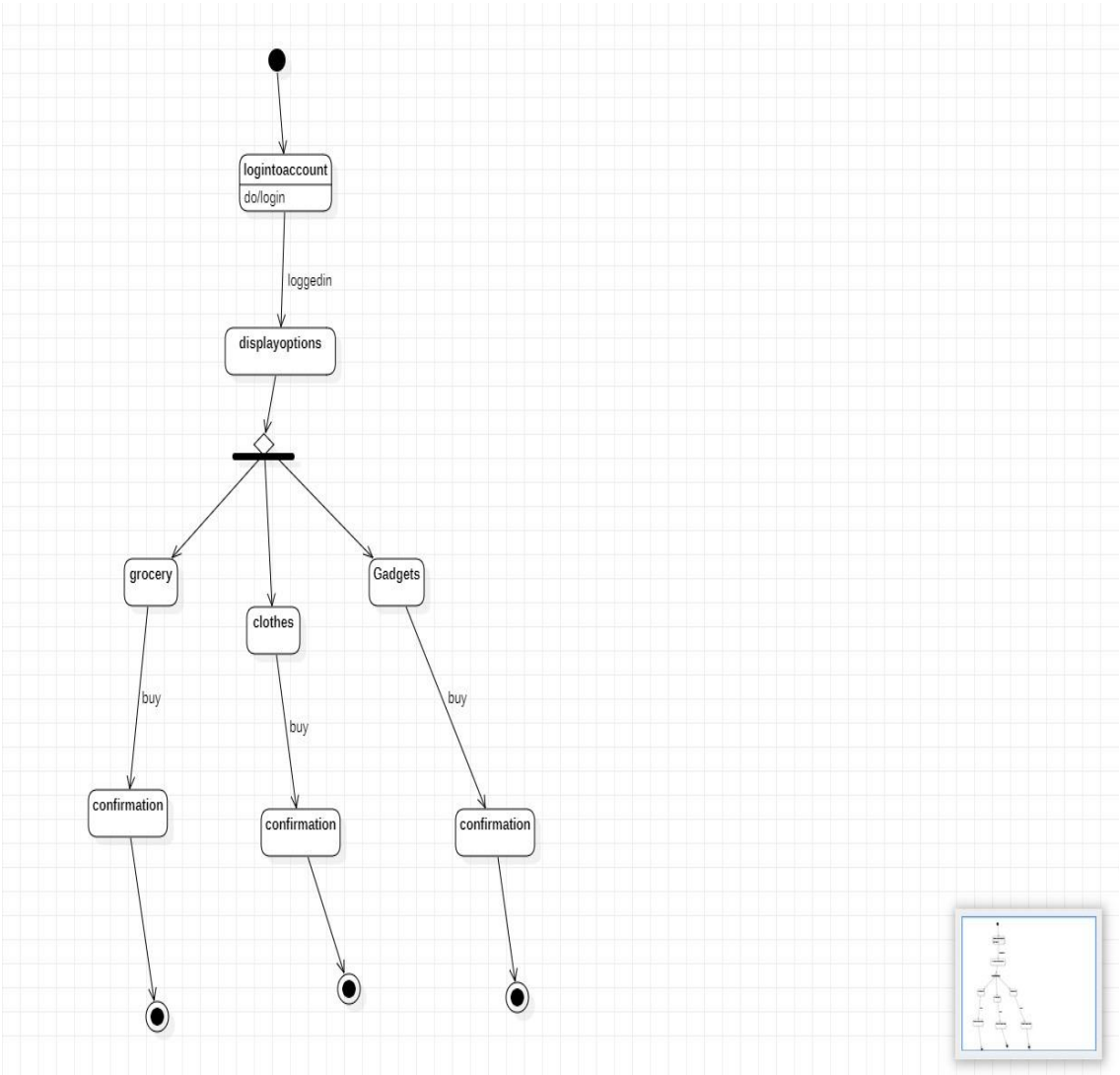



Fig 7.1

The above class diagram gives a brief description of how the online shopping system works and what all services are provides by the system in terms type of payment and the type and quality of products.

## 7.4 State Diagram




The simple state diagram shows different states a system goes through when it has to execute a customer's order

## 7.5 Use Case Diagram

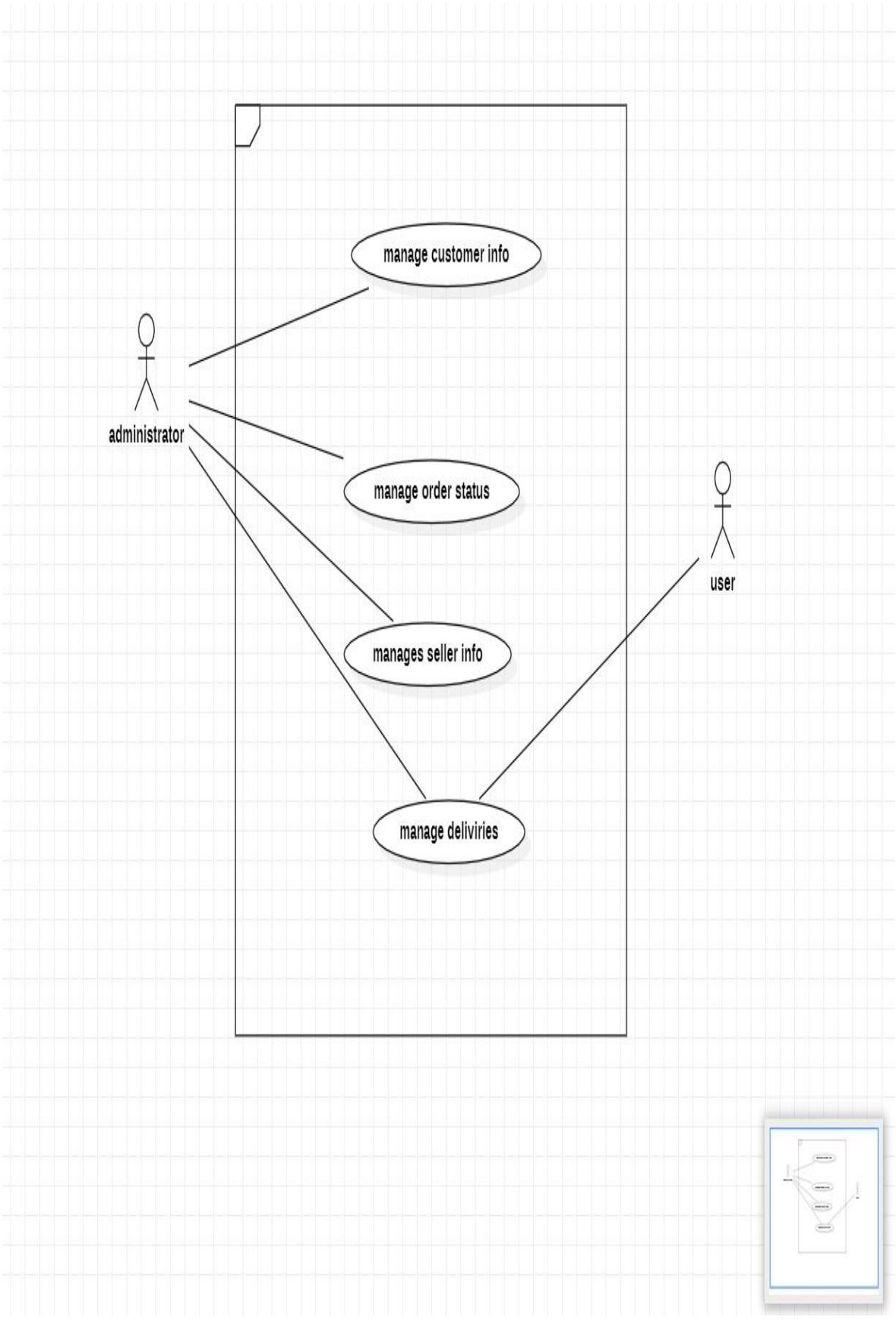



Fig 7.4

**Actors :**

User: the person who uses the shopping system

Admin system: manages thesystem

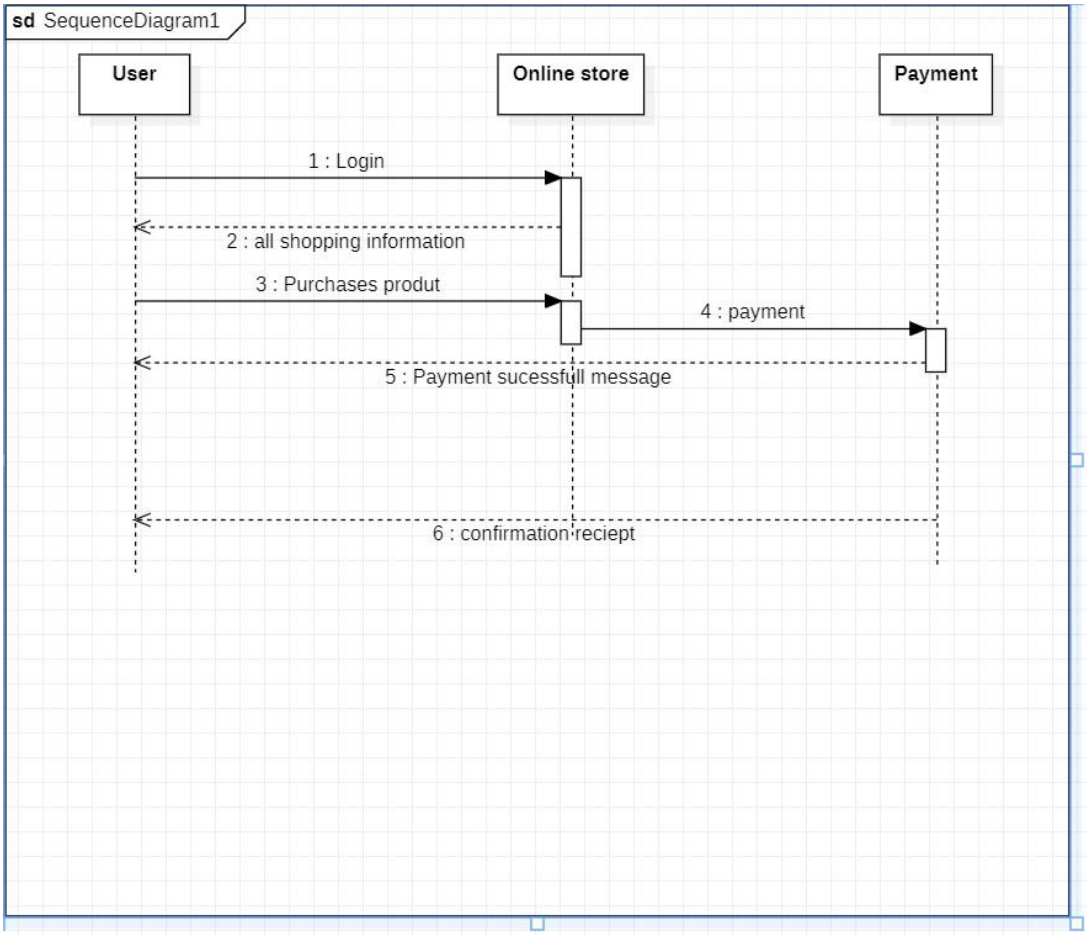
**Use case:**

Create order : performs creation of new bill

Manage customer information.

Manages Deliveries

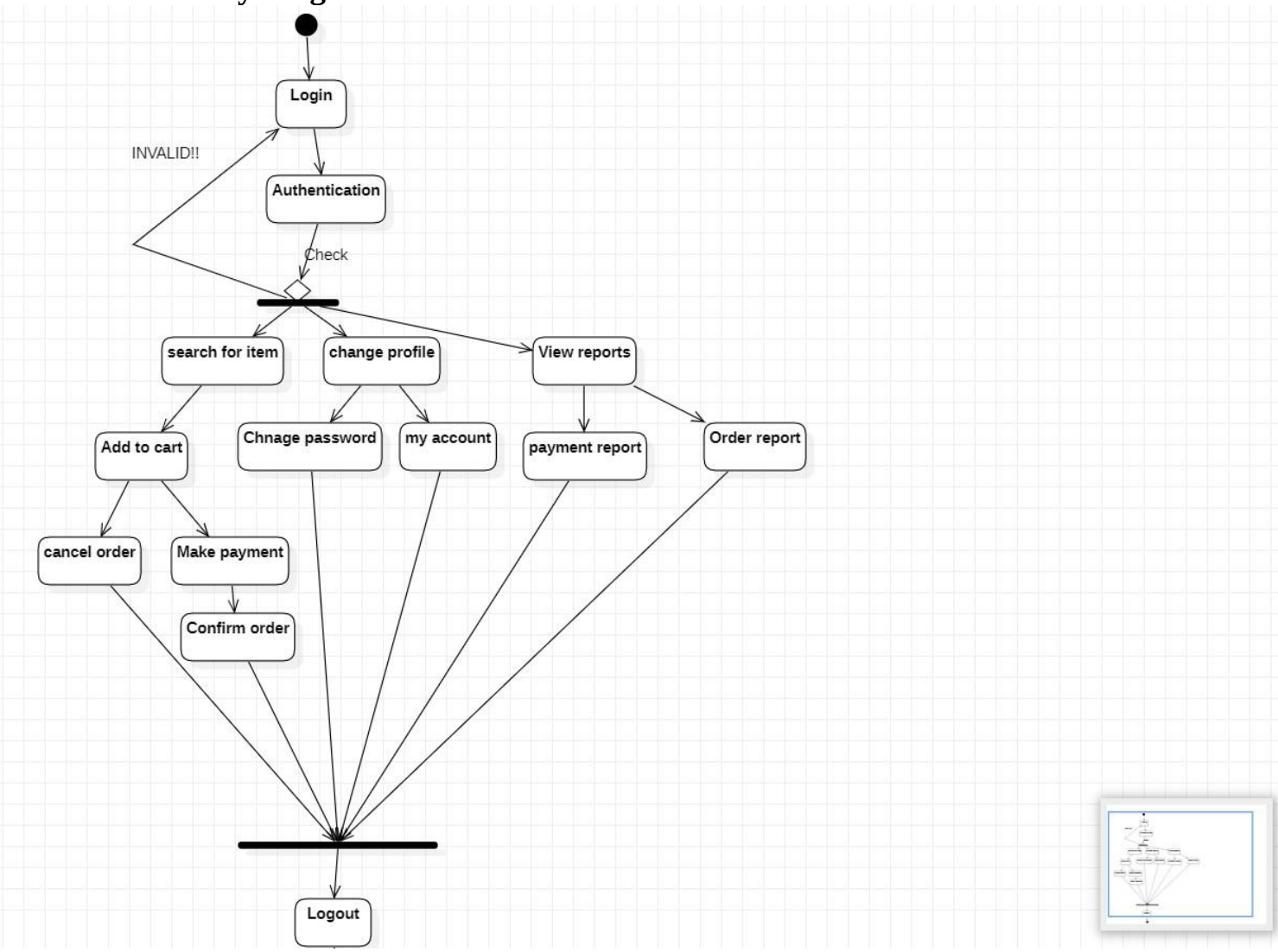
## Sequence Diagram




**Scenario:The user first login's into the system and the sytem provides all necessary information to the user according to his/her's need**

**Then the user purchases the product money gets dedected and receipt goes to the user.**

## 7.6 Activity Diagram




The simple activity diagram gives the states involved in creating and order and successfully delivering it .