B.M.S. COLLEGE OF ENGINEERING BENGALURU

Autonomous Institute, Affiliated to VTU

Lab Record

Object-Oriented Modelling

Submitted in partial fulfillment for the 5th Semester Laboratory

Bachelor of Engineering
in
Computer Science and Engineering

Submitted by:

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1BM22CS263

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Mar-June 2024

B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the Object-Oriented Modelling(22CS6PCSEO) laboratory has been carried out by SHREE VARNA M (1BM22CS263) during the 5th Semester Oct24-Jan2025.

Signature of the Faculty Incharge:

NAME OF THE FACULTY:

Radhika A D

Assistant Professor

Department of Computer Science and Engineering

B.M.S. College of Engineering, Bangalore

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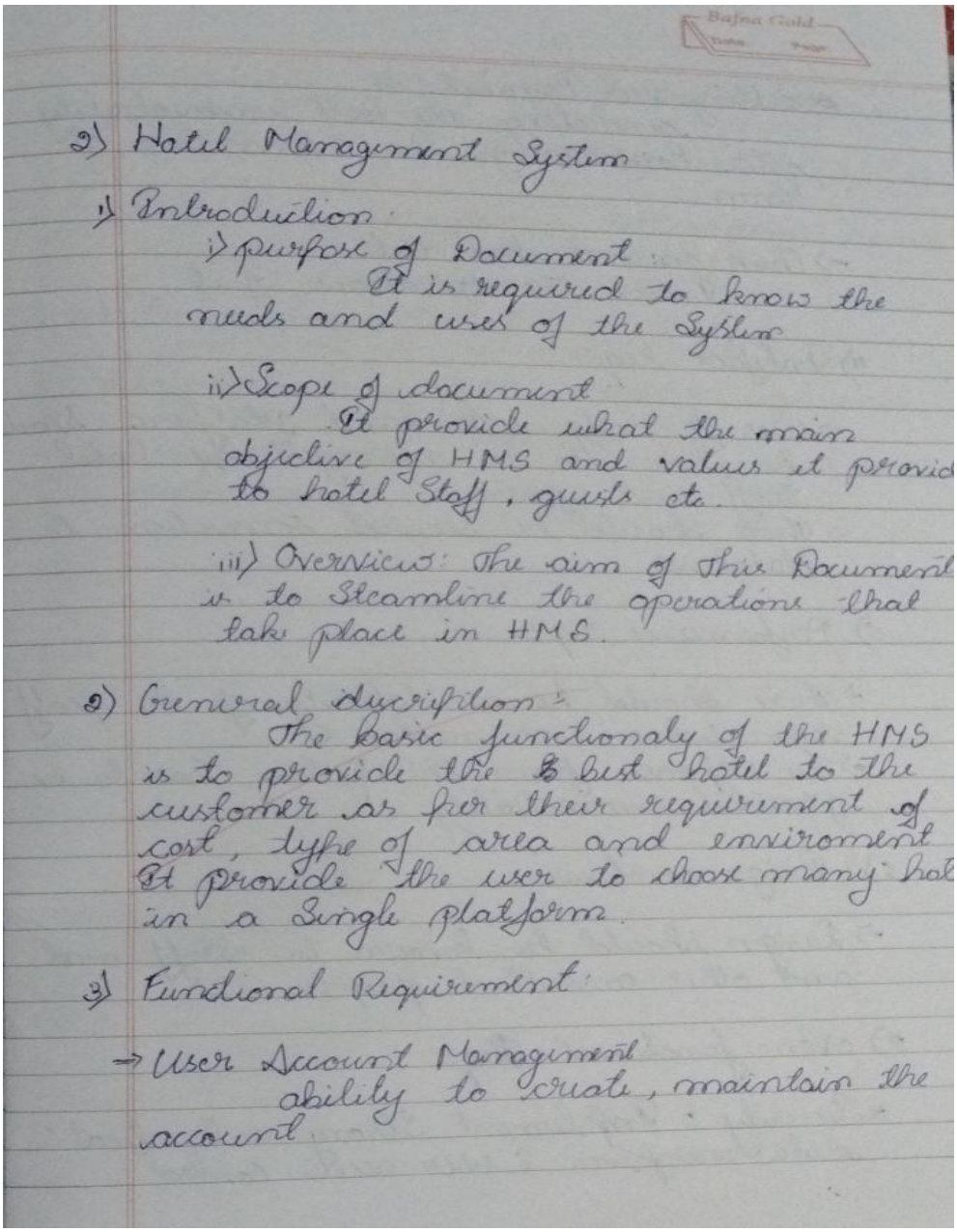
1. Hotel Management System

Problem Statement :

The existing manual processes for managing hotel operations such as reservations, check-ins, check-outs, and billing are prone to human error, inefficiencies, and data mismanagement. There is a need for a centralized, automated system to streamline operations, enhance customer service, manage room availability, and maintain accurate records.

SRS-Software Requirements Specification :



2) Hotel Management System

1) Introduction :

i) purpose of Document :
It is required to know the needs and uses of the System

ii) Scope of document
It provide what the main objective of HMS and value it provid to hotel staff, guests etc.

iii) Overview: The aim of this Document is to Streamline the operations that take place in HMS.

2) General discription :
The basic functionaly of the HMS is to provide the best hotel to the customer as per their requirment of cost, type of area and enviroment It provide the user to choose many hot in a Single platform.

3) Fundional Requirement :

→ User Account Management
ability to create, maintain the account.

- Billing and Payment
  generating the Bill immediately after confirming the reservation of room.

-> Check-In and check-out
  Online the operations of it

4) Inlyface req:

=> user friendly: web-based platform should be able to be managed by hotel staff and guests
=> there should be secured connection to database

5) Performance req:

-> there should be availability of the platform when ever needed.
-> the response from the system has to be provided immediately

6) Design constraine

-> Design should be known to staff and and other consulted people.

7) Non-functional Req:

* Security: Implement strong authentication data encryption & user acces control

* portability: provide compatibility across the devices
* Reliability: provide biller backup system
* Data Integrity: provide better data accuracy and reservation of data.

8) Preliminary Schedule & Budget:

* Budget Estimated is approx high and it req: operational cost
* Initial timeline development of 9 to 12 month month is req.

30/9/24

Class Diagram :

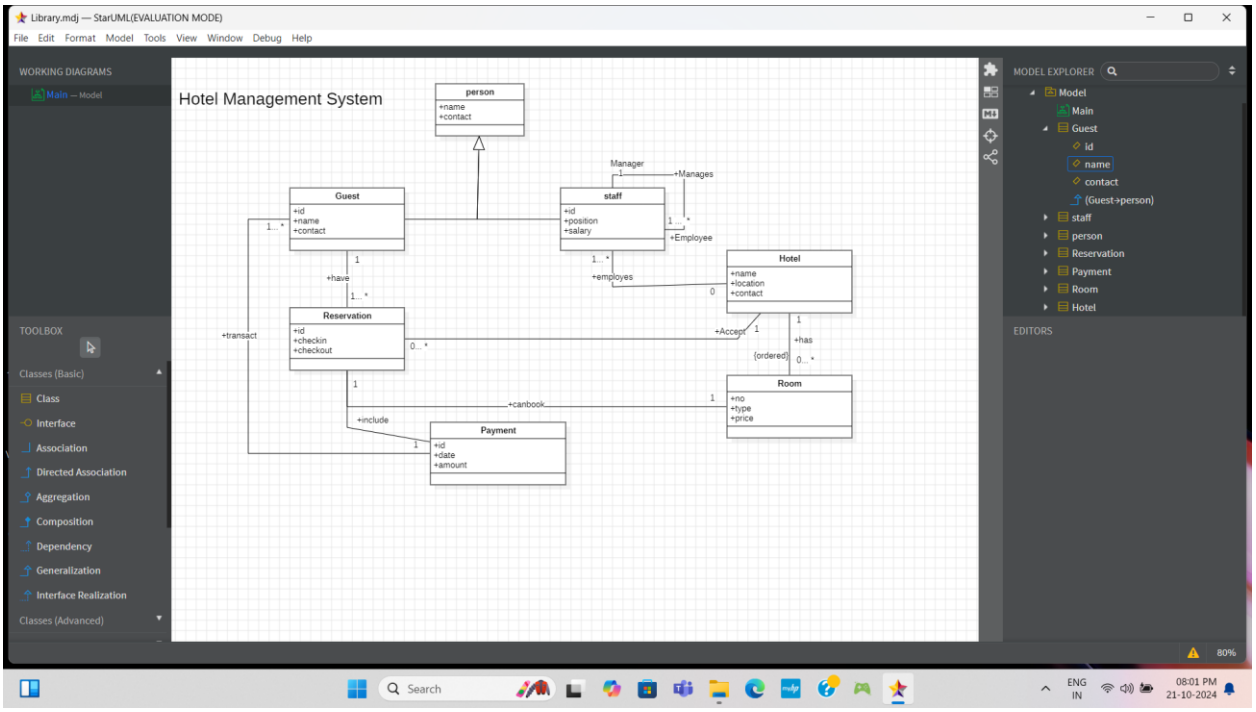


Fig : 1.1

State Diagram :

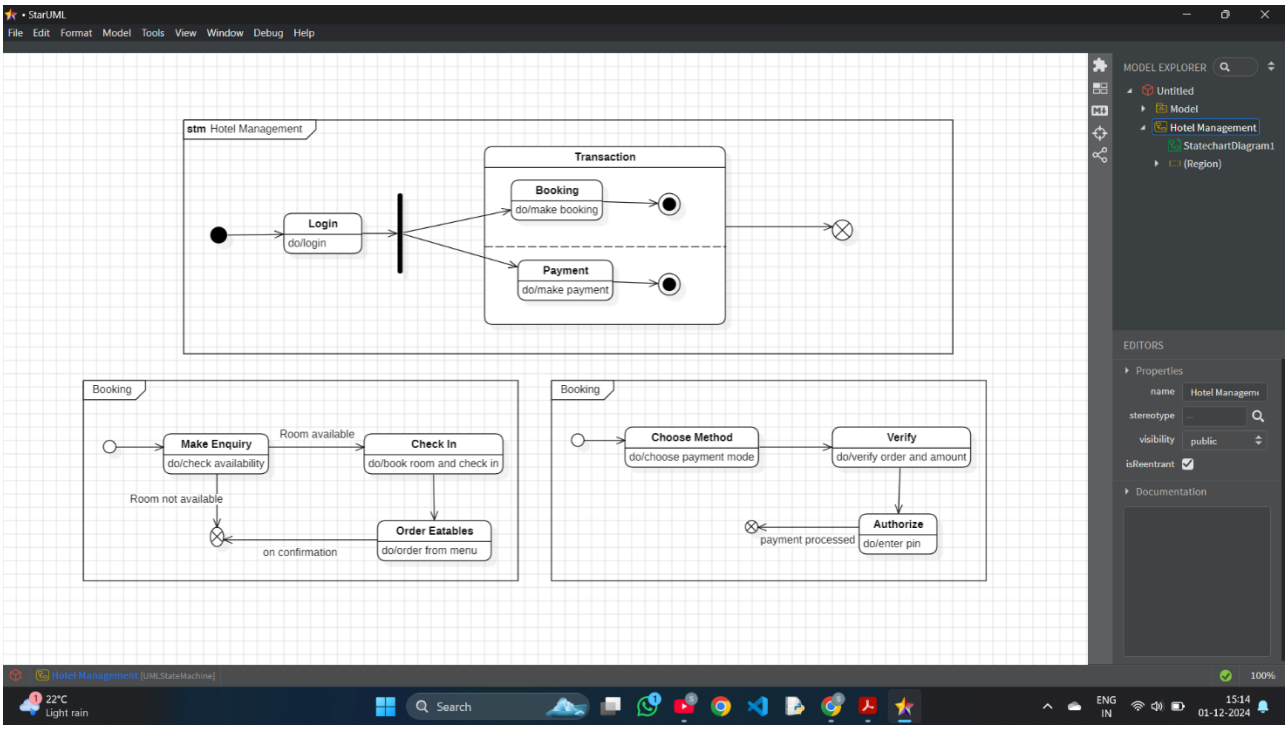


Fig : 1.2

Use Case Diagram :

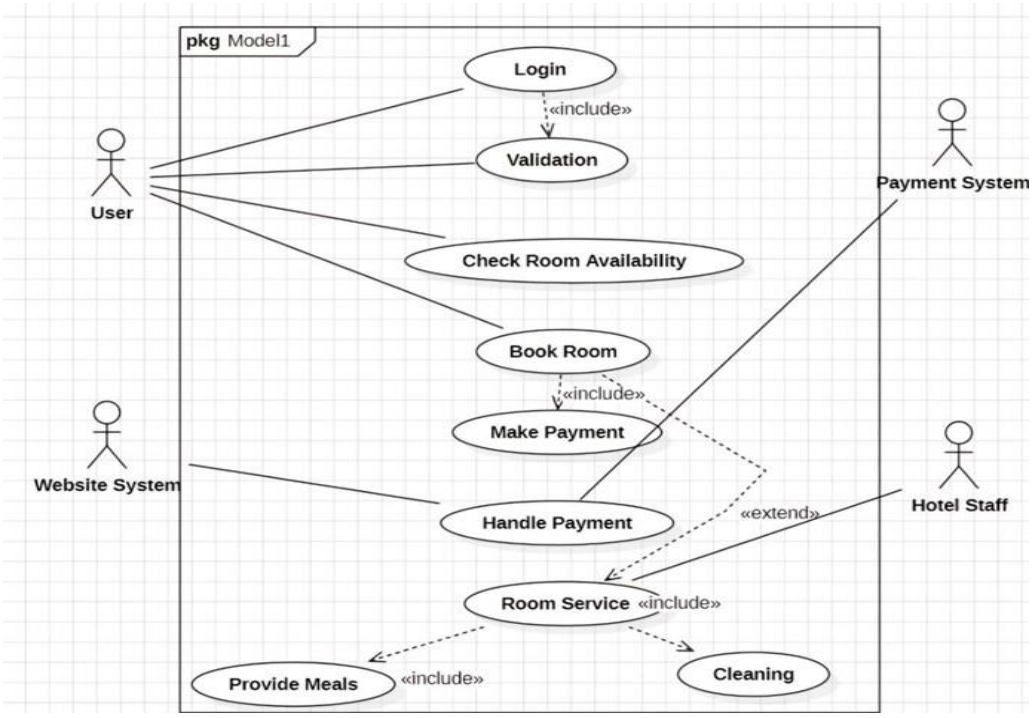


Fig : 1.3

Sequence Diagram :

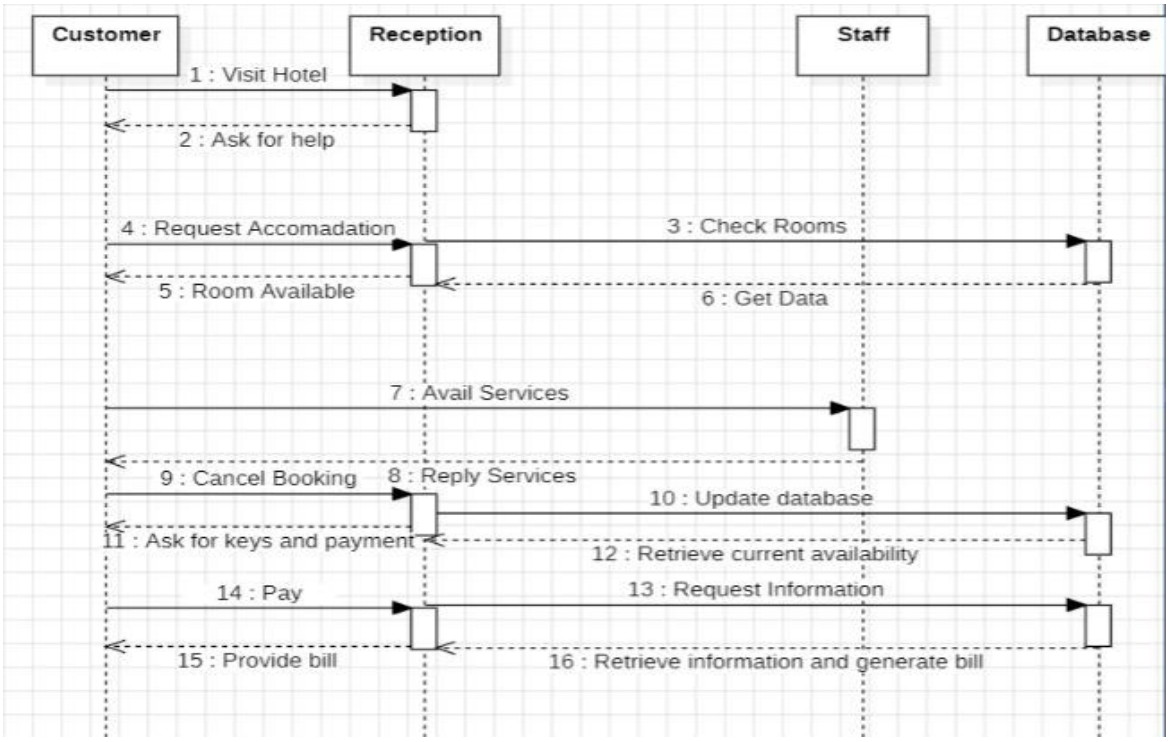


Fig : 1.4

Activity Diagram :

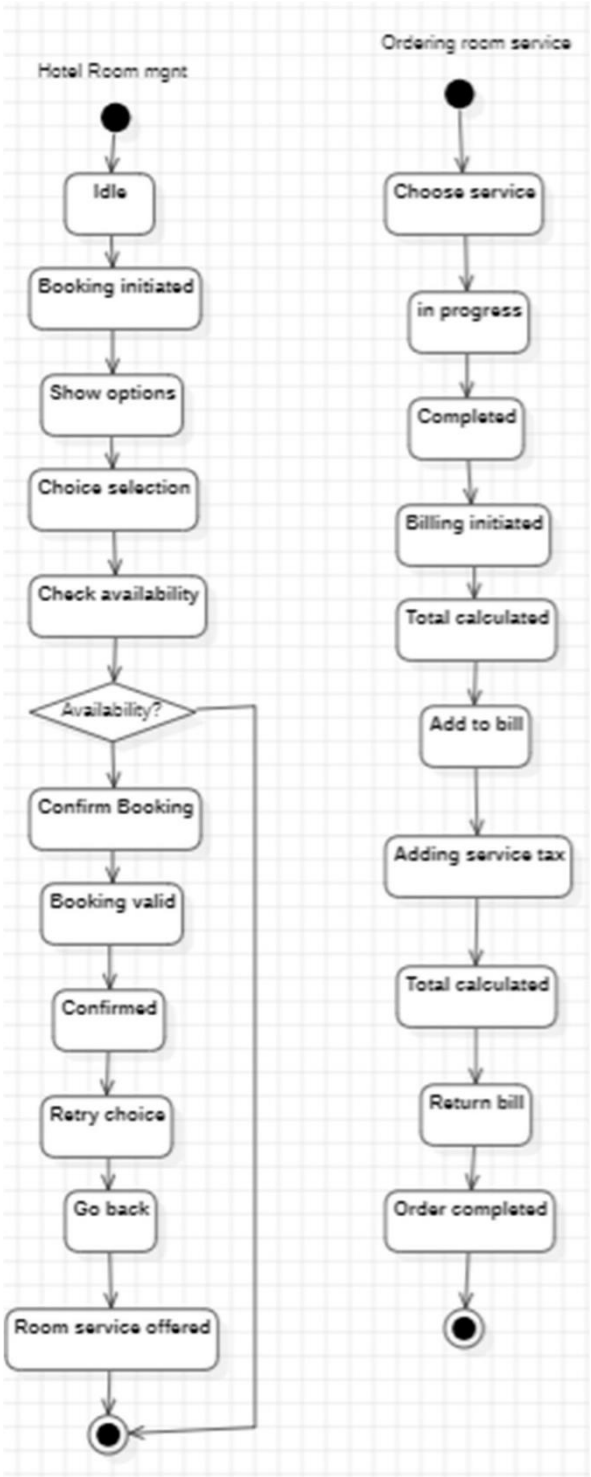


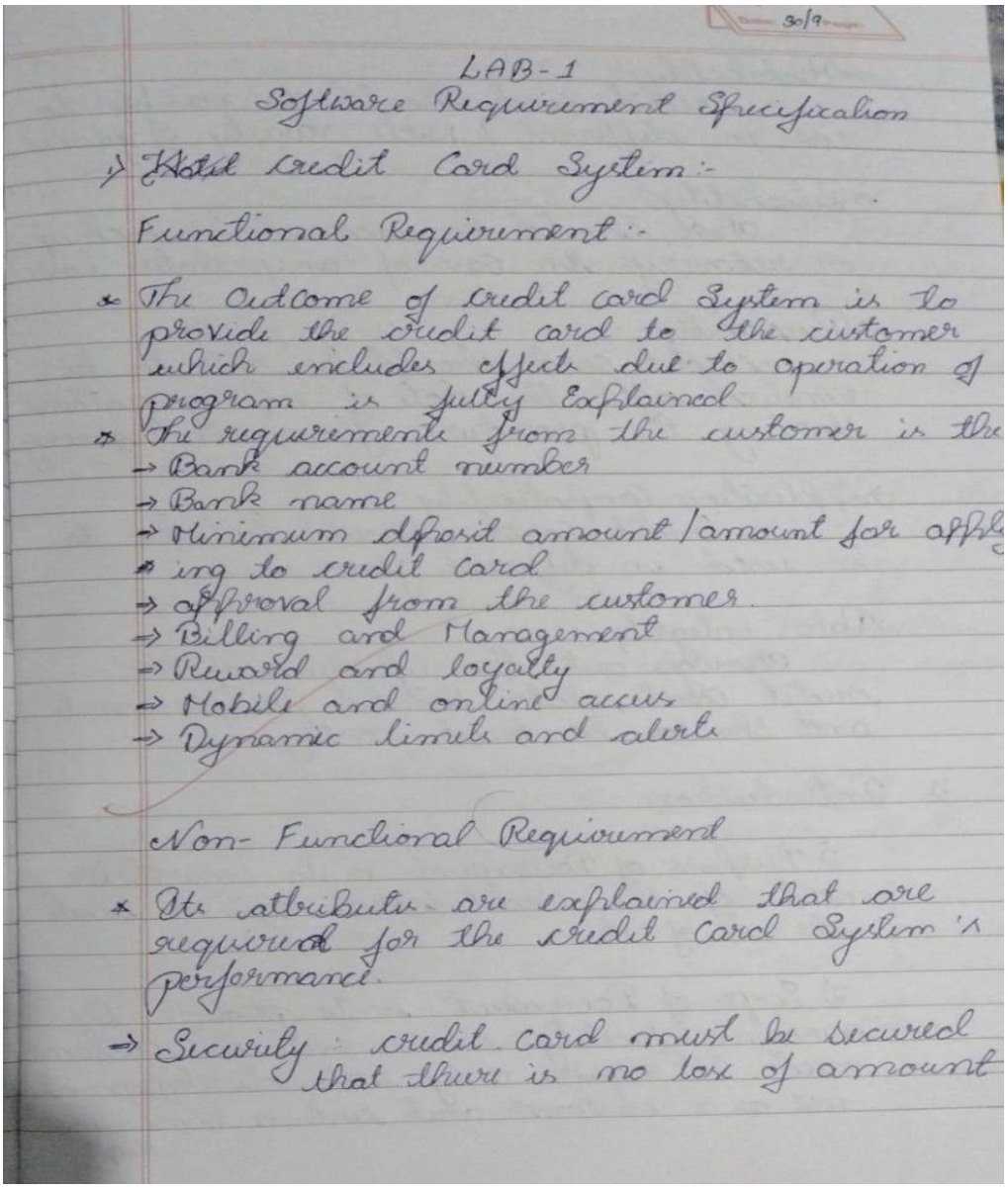
Fig : 1.5

2. Credit Card Processing

Problem Statement :

Manual credit card processing is time-consuming, error-prone, and insecure, leading to potential financial losses and compromised customer data. A secure, efficient, and automated system is required to handle card payments, verify transactions, manage user accounts, and ensure compliance with data protection standards.

SRS-Software Requirements Specification :



LAB-1

Software Requirement Specification

1) Hotel Credit Card System :-

Functional Requirement :-

* The outcome of credit card System is to provide the credit card to the customer which includes effects due to operation of program is fully explained.
* The requirements from the customer is the
  - → Bank account number
  - → Bank name
  - → Minimum deposit amount / amount for applying to credit card
  - → approval from the customer
  - → Billing and Management
  - → Reward and loyalty
  - → Mobile and online acces
  - → Dynamic limits and alerts

Non- Functional Requirement

* Its attributes are explained that are required for the credit card System's performance.

→ Security : credit card must be secured that there is no loss of amount

⇒ Portability:
Credit card should to possible to use in different / wide variety of places

⇒ Reliability:
There should be immediate back up or recovery in case of any data loss

⇒ Reusability:
Credit card should be able to be renewed after the date of expiry without starting the procedure from the bigining

⇒ Application Compatibility:
Credit card should be able to be used in different places

⇒ Data integrity:
Throughout the life Span of the credit card, data should be preserved and should be trust worthy.

1) Introduction

i) Purpose of Document: is to ensure the need of the credit card System and the use of it

ii) Scope of Document: is to provide the amount facility where ever the customer need. It require only little development cost as a customer and certain time is req

iii) Overview: of credit card is to provide real-time processing & user friendly.

2) General description:

The basic functionality of credit card System is to provide the amount facility where ever the customer go without carry the amount instead carry a credit card with a limit

. It can be used in place of cash until the limit is reached.

3) Enterface Requirement

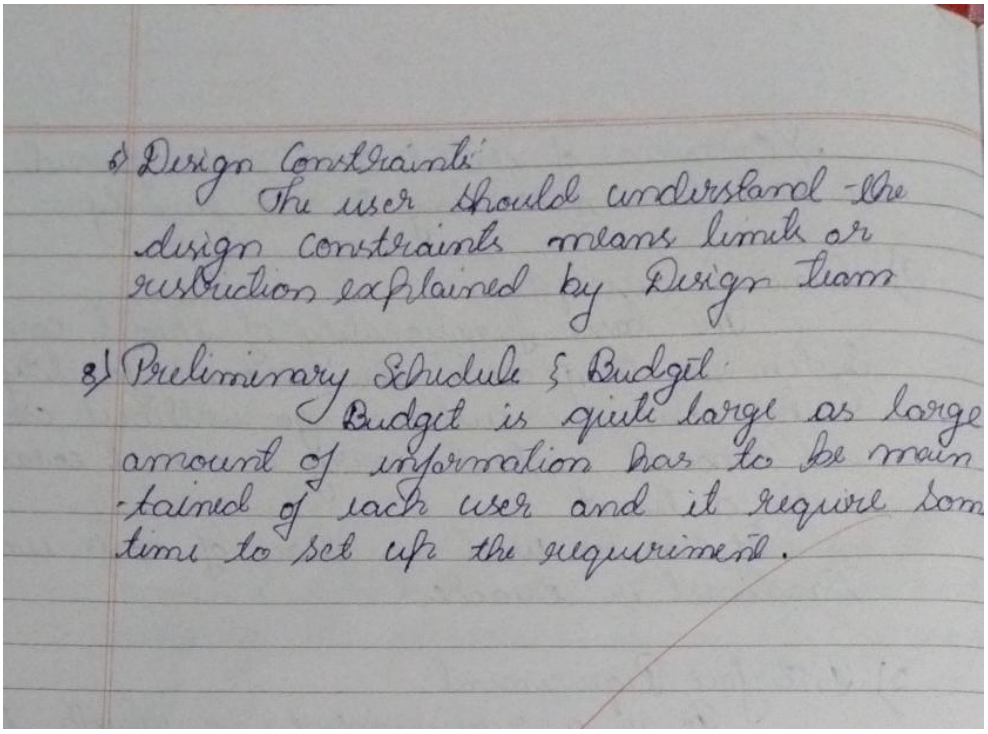
It is a requirement in which the Software come into picture. All the transactions are stored in the memory i.e shared memory in the form of code

The System will ensure the authenticated user only get the req' information

4) Performance Requirement

this is how the credit Card System work in case of any constrain that come in the System

The Specific condition like amount is debited from the account but the amount is not credited to the ~~cust~~ one who is to be paid. In such a case with in a day it should be resolved for better performance



7) Design Constraints
The user should understand the design constraints means limit or restriction explained by Design team

8) Preliminary Schedule & Budget
Budget is quite large as large amount of information has to be maintained of each user and it require some time to set up the requirement.

Class Diagram :

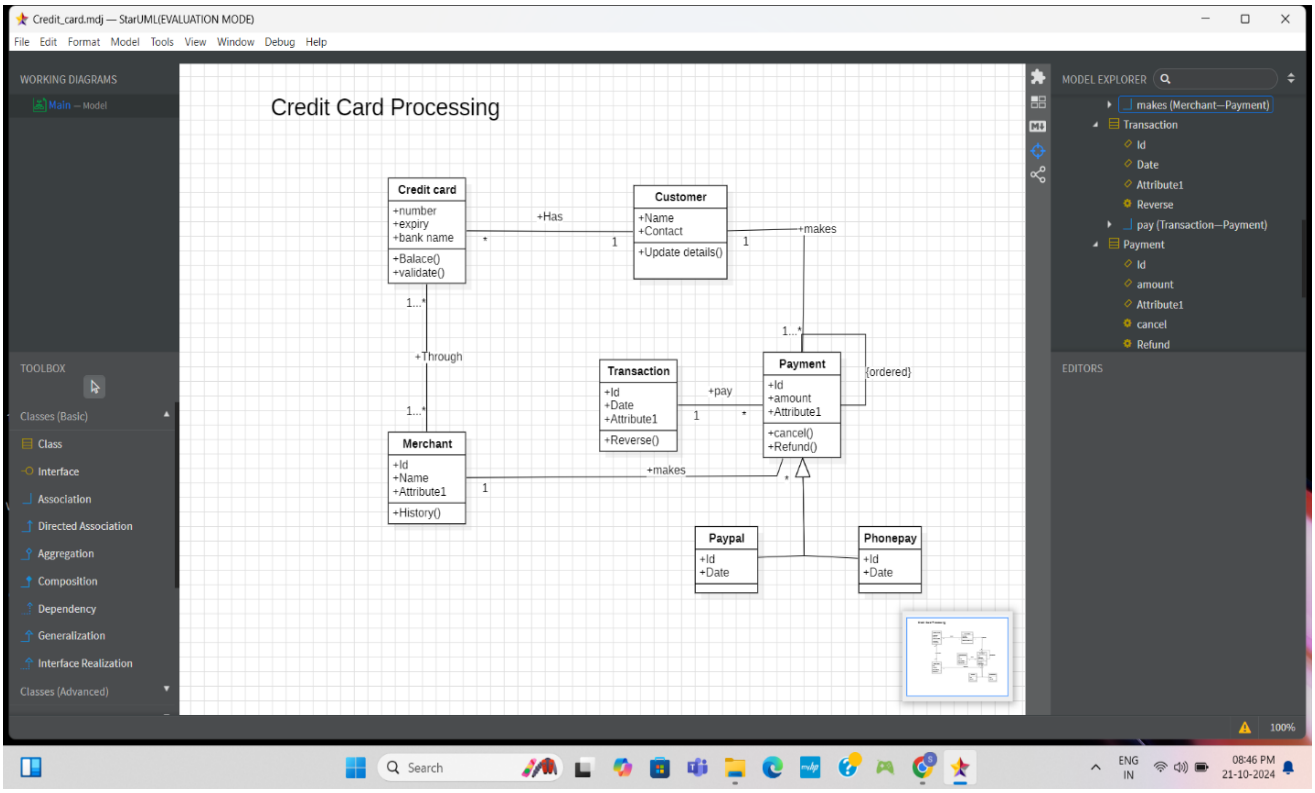


Fig : 2.1

State Diagram :

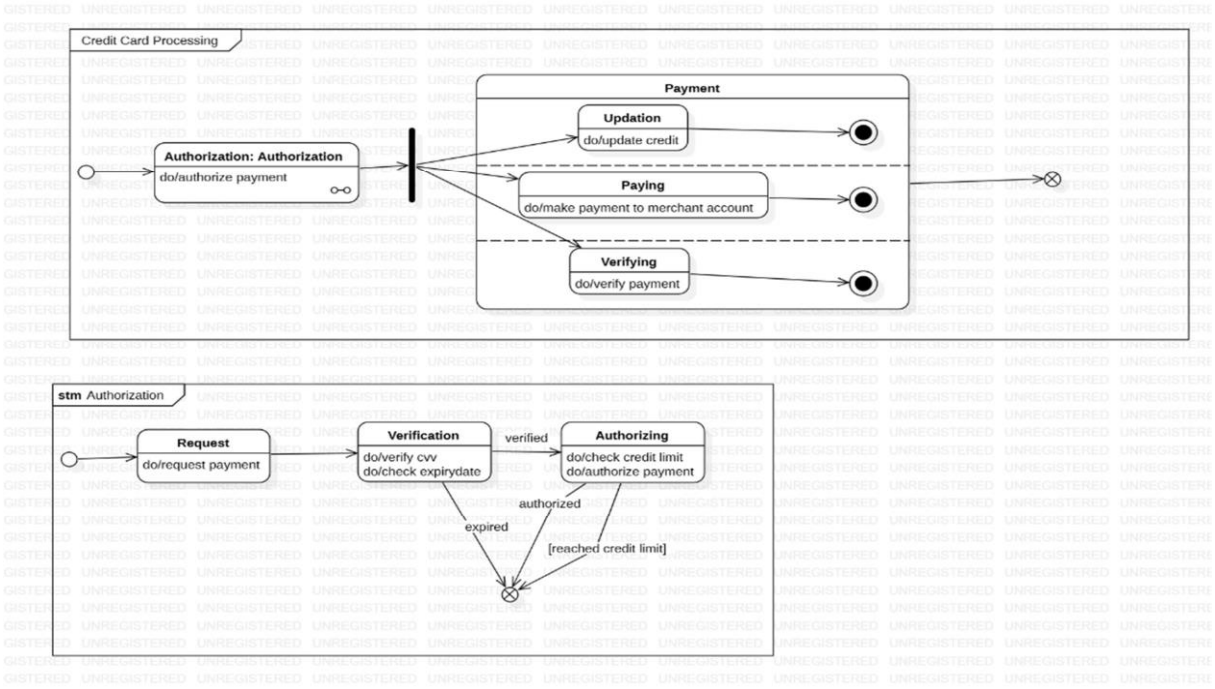


Fig : 2.2

UseCase Diagram :

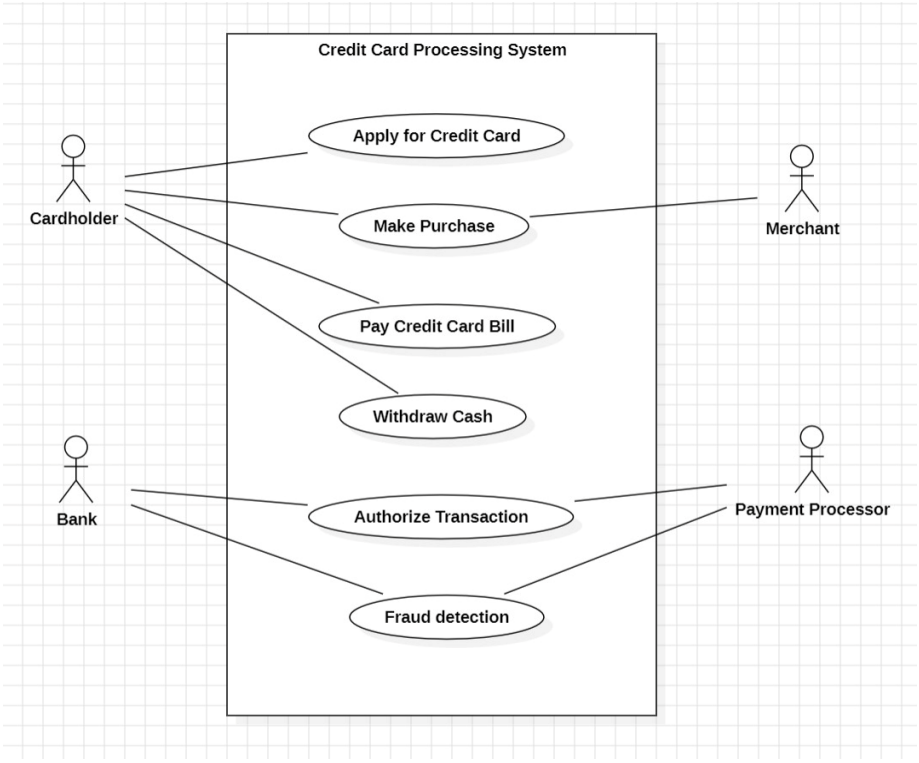


Fig : 2.3

Sequence Diagram :

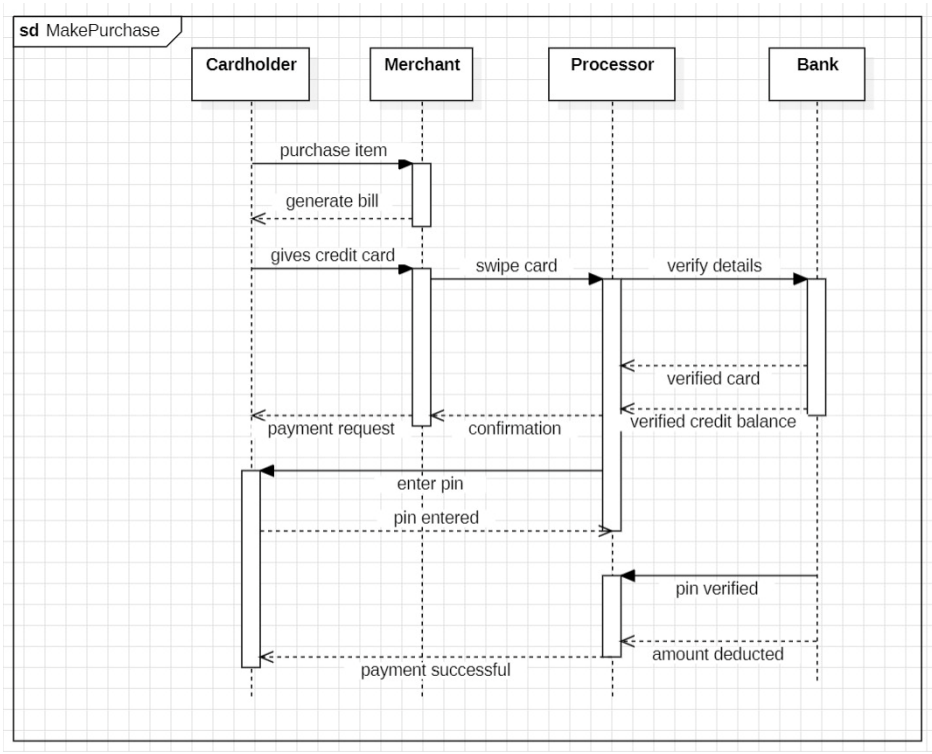


Fig : 2.4

Activity Diagram :

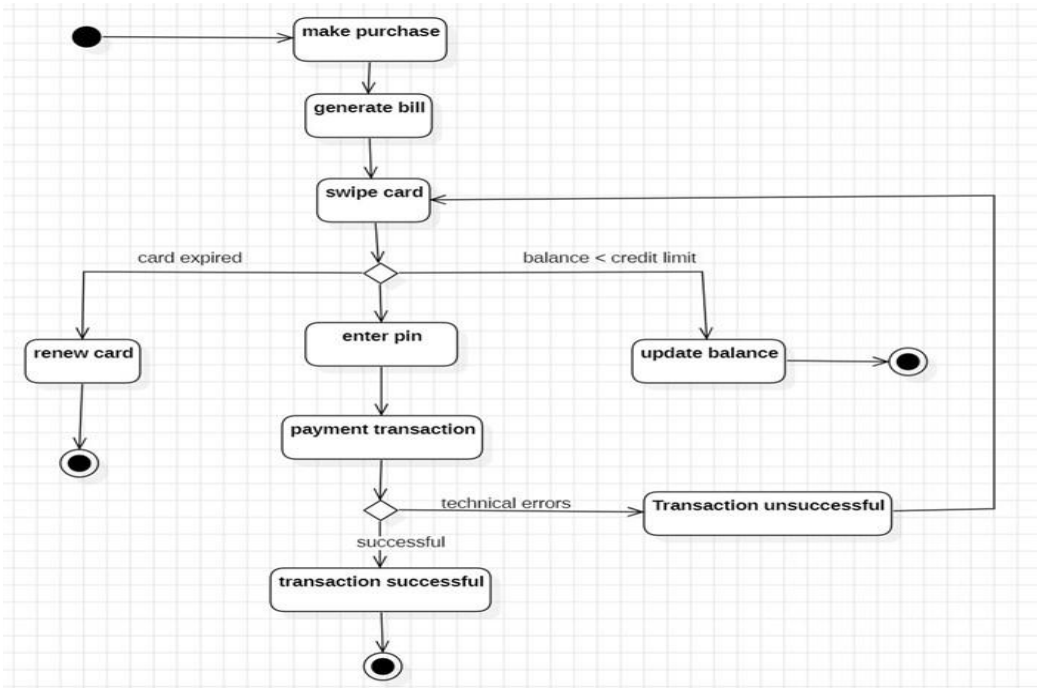


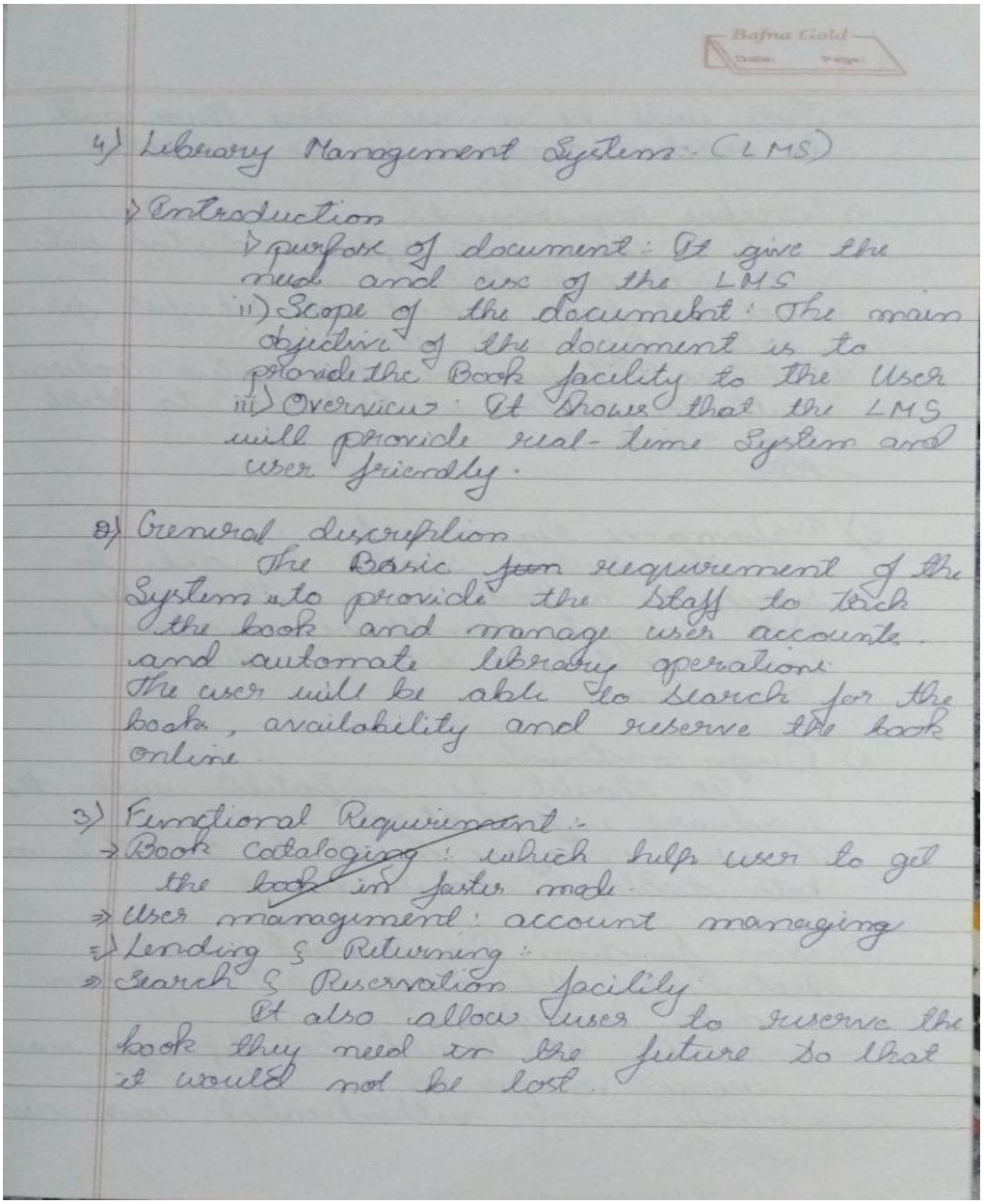
Fig : 2.5

3. Library Management System

Problem Statement :

Managing a library with traditional methods involves tracking books, members, and transactions manually, which is inefficient and error-prone. A digital library management system is needed to automate book cataloging, borrowing, returning, and membership management while providing seamless search capabilities and analytics.

SRS-Software Requirements Specification :



4) Library Management System (LMS)

1) Introduction
   i) purpose of document: It give the need and use of the LMS
   ii) Scope of the document: The main objective of the document is to provide the Book facility to the User
   iii) Overview: It shows that the LMS will provide real-time System and user friendly.

2) General discription
   The Basic ~~fun~~ requirement of the System is to provide the staff to track the book and manage user accounts and automate library operations. The user will be able to search for the books, availability and reserve the book online.

3) Functional Requirement:
   → Book cataloging: which help user to get the book in faster mode.
   → User management: account managing
   → Lending & Returning:
   → Search & Reservation facility
   It also allow users to reserve the book they need in the future so that it would not be lost.

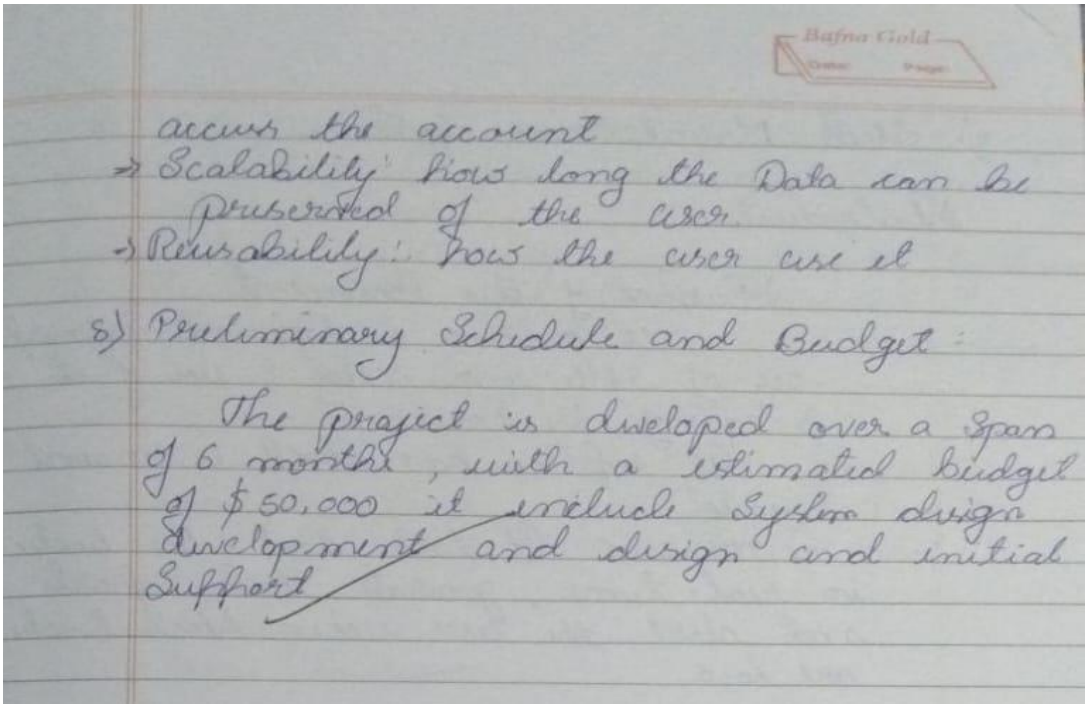
⇒ There will be a case where there will be overdue amount to be reported

4) Interface requirement:
It shows how Software System interact with each other
⇒ User Interface: web-based interface for both staff and user
⇒ Database Interface: how the System interact with the centralized Database to store book recods
→ ~~API~~

5) Performance requirement:
The System should be able to search for a book in less than 5 Sec
Data integrity should be maintained.
Ensure that no data loss during transactions

6) Design constraints:
It should be compatible with the hardware infrastructure
The user interface must be accessible on both desktop & mobile devices

7) Non-function Requirement
⇒ Reliability uptime of 99.9% and provide data backups.
⇒ portability: It should be deployed easily across various OS.
⇒ Security: only authenticated user can



accus the account
⇒ Scalability: How long the Data can be presented of the user.
⇒ Reusability: How the user use it

8) Preliminary Schedule and Budget:

The project is dveloped over a span of 6 months, with a estimated budget of $50,000 it include System dvign dvelopment and dvign and initial Support

Class Diagram :

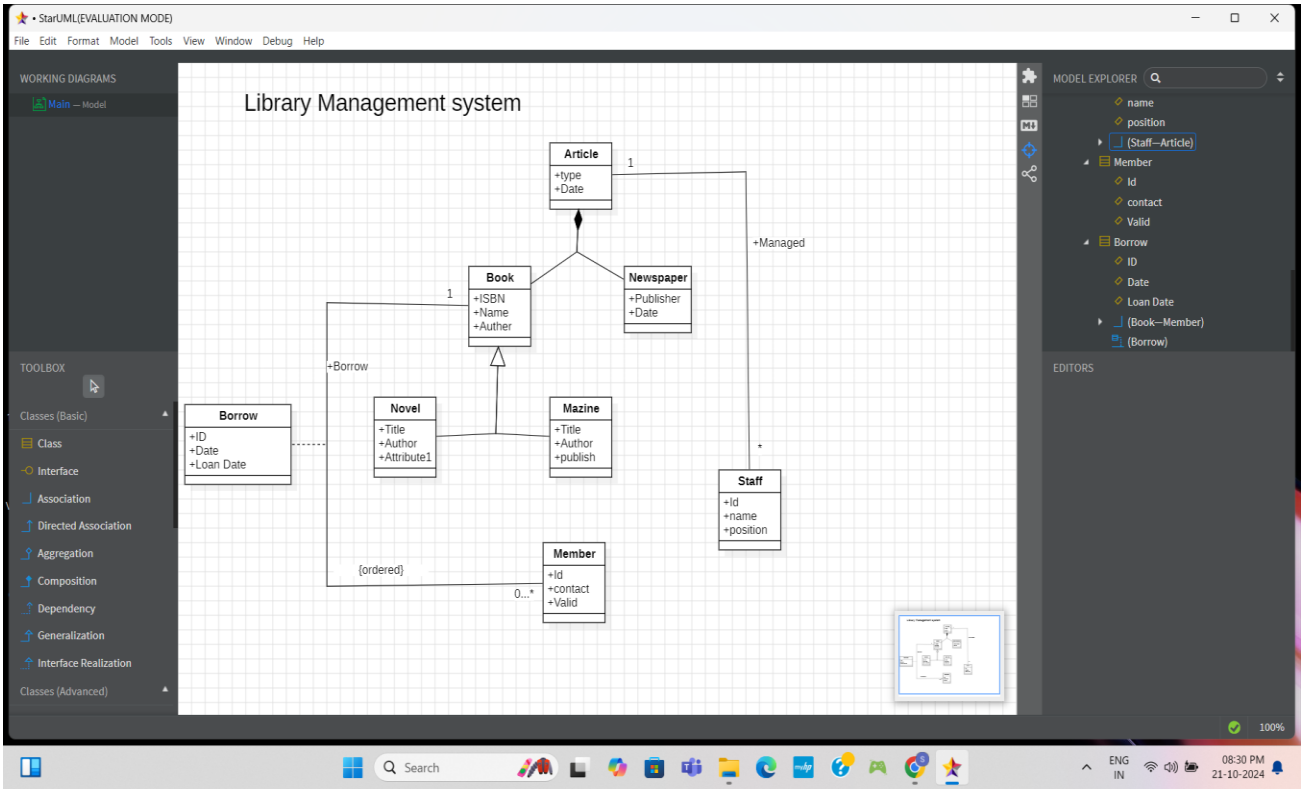


Fig : 3.1

State Diagram :

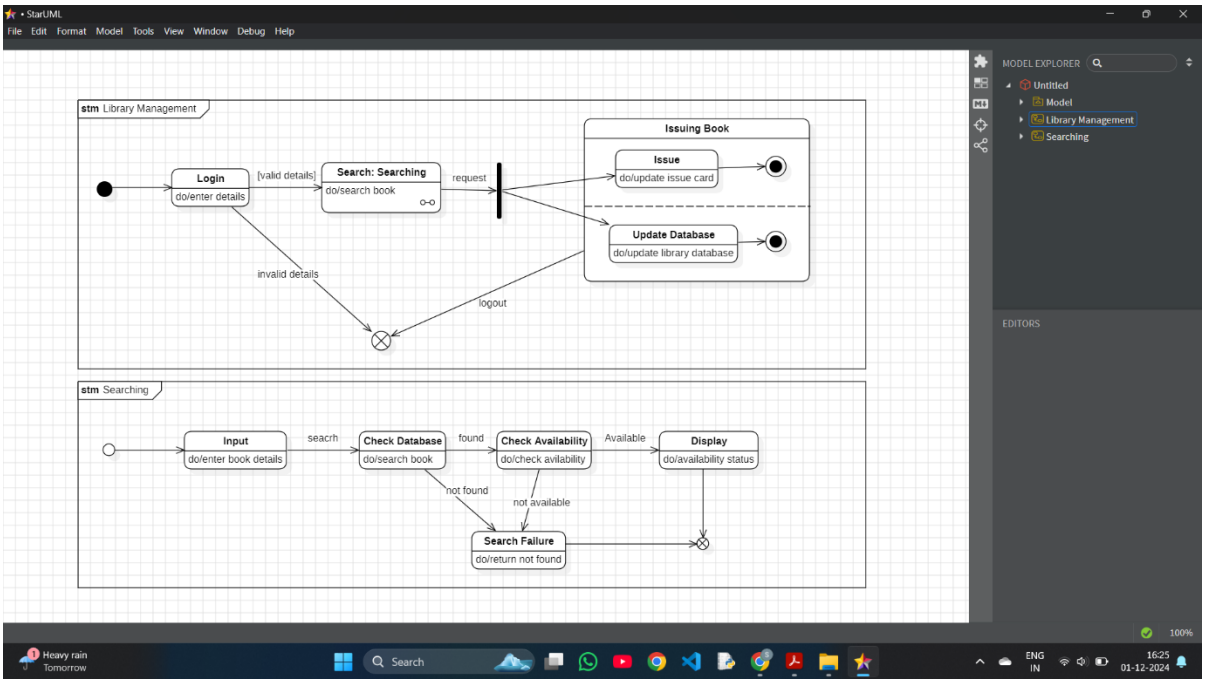


Fig : 3.2

UseCase Diagram :

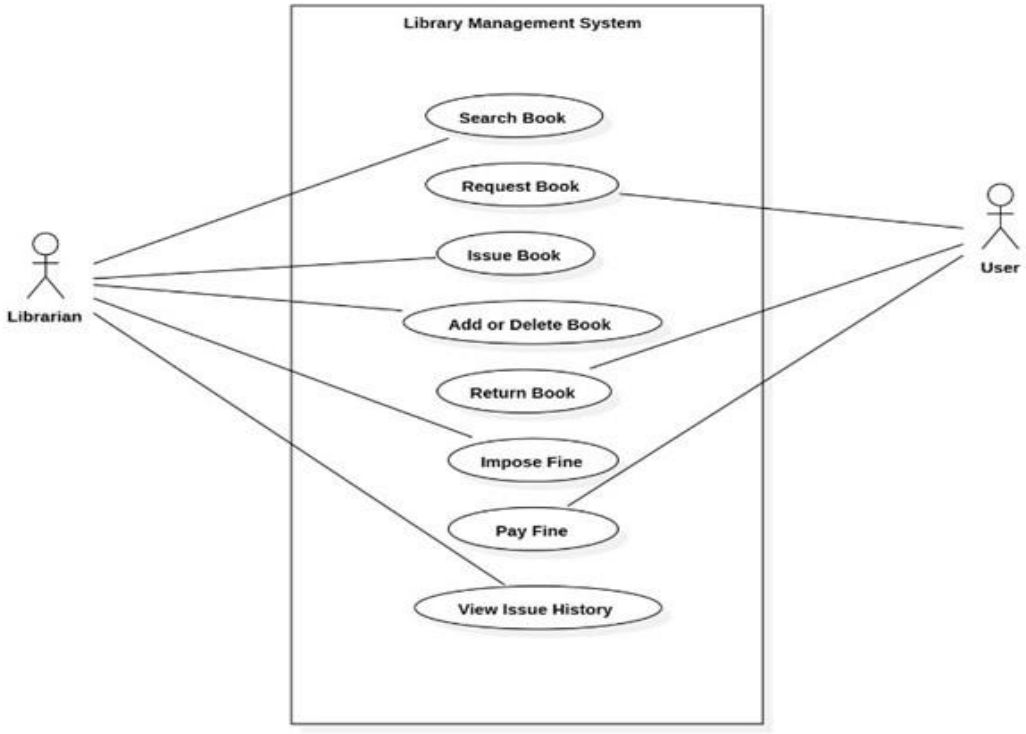


Fig : 3.3

Sequence Diagram :

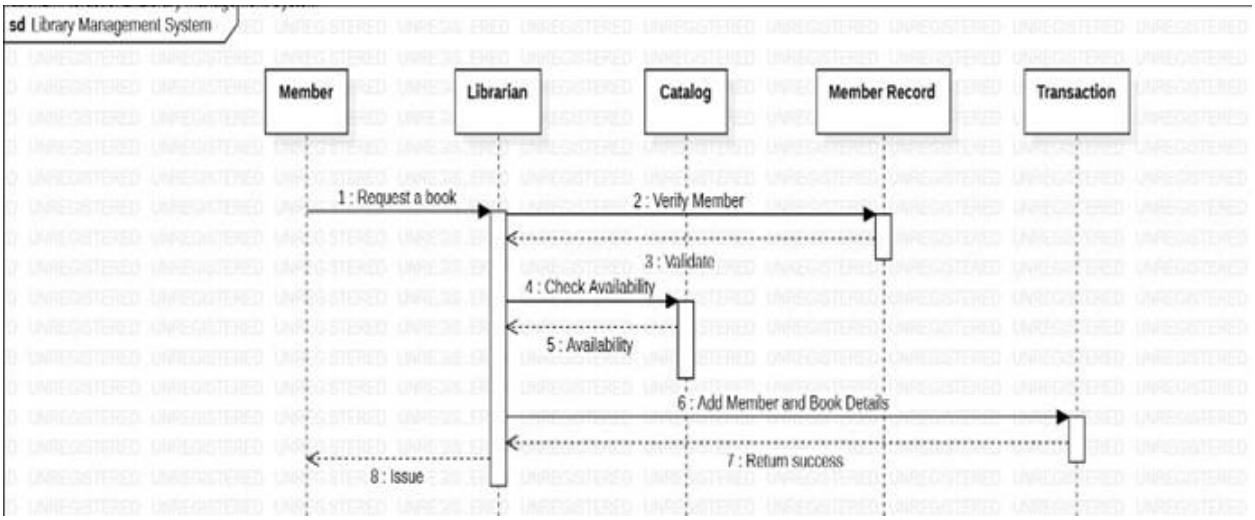


Fig : 3.4

Activity Diagram :

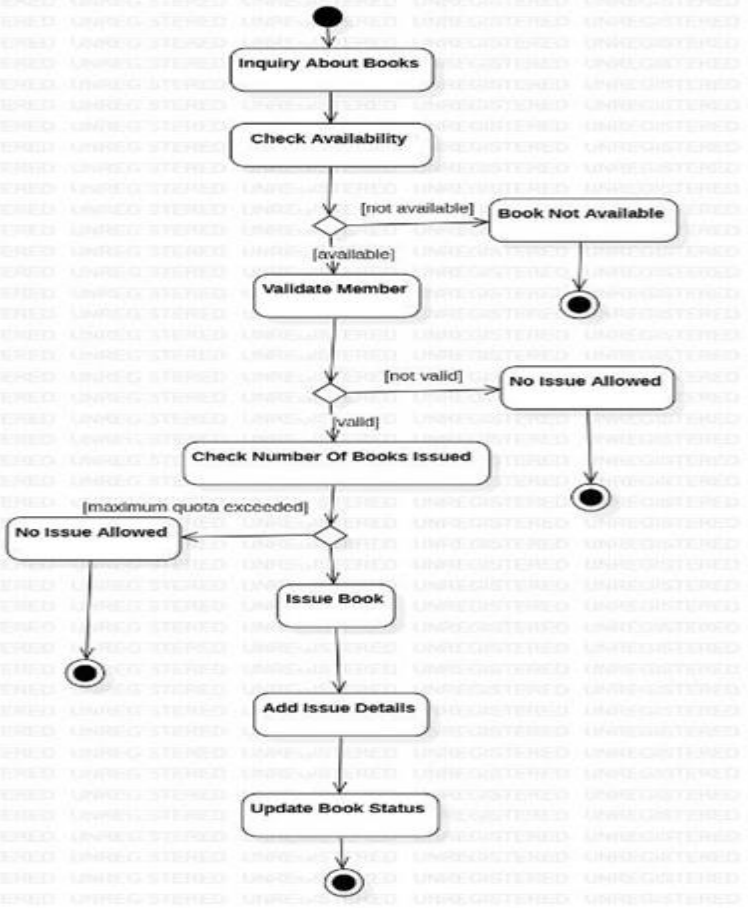


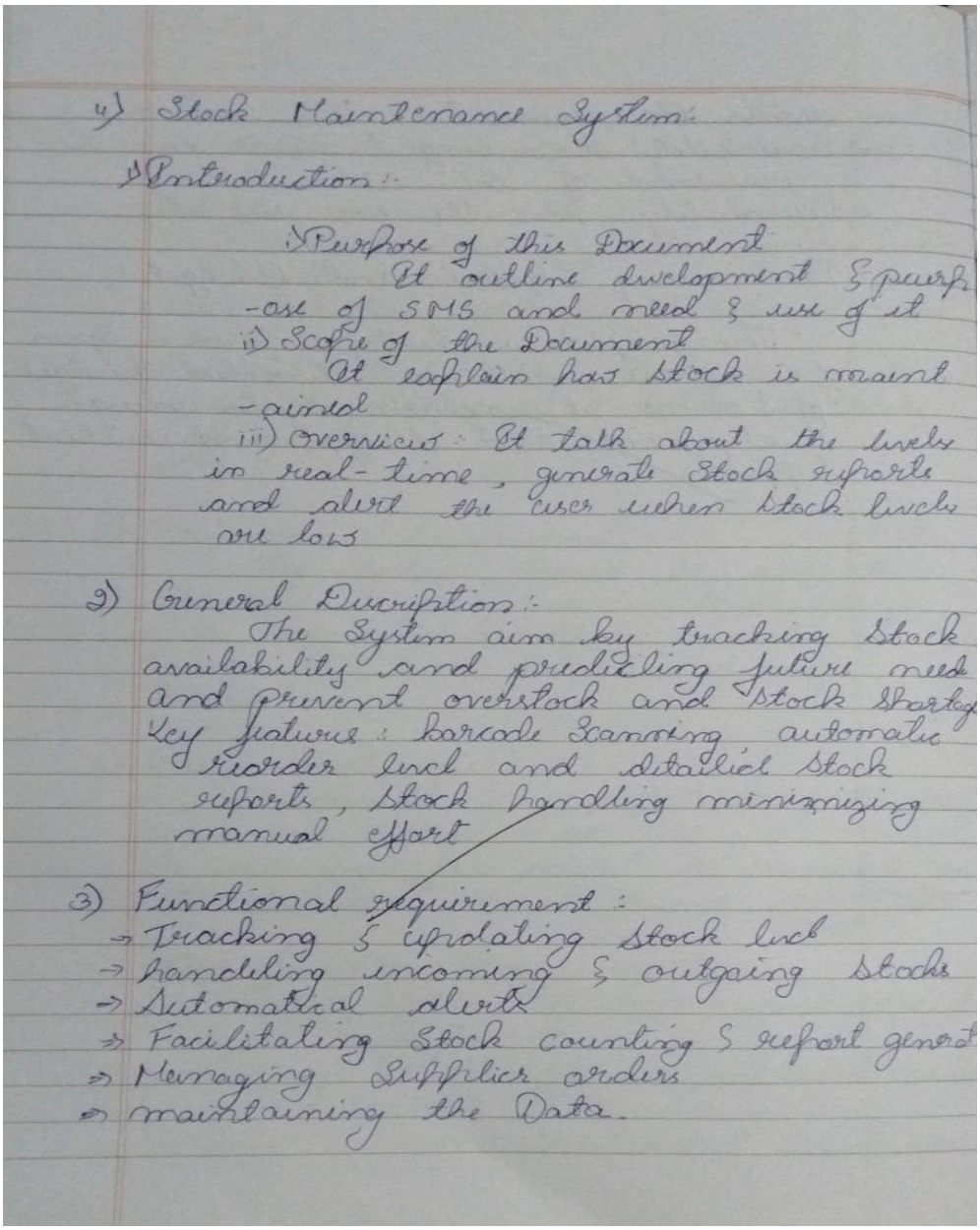
Fig : 3.5

4. Stock Maintenance System

Problem Statement :

Manual stock maintenance in businesses often leads to inaccuracies, overstocking, or understocking, impacting operational efficiency and customer satisfaction. An automated stock maintenance system is needed to track inventory levels, manage reorders, reduce wastage, and optimize supply chain processes.

SRS-Software Requirements Specification :



4) Stock Maintenance System:

1) Introduction:

i) Purpose of this Document
It outline dvelopment & purp
-ose of SMS and need & use of it
ii) Scope of the Document
It explain how stock is maint
-ained
iii) Overview: It talk about the levels in real-time, generate stock reports and alert the user when stock levels are low

2) General Discription:
The System aim by tracking stock availability and predicting future need and prevent overstock and stock shortag
Key features: barcode Scanning automatic reorder level and detailed stock reports, stock handling minimizing manual effort

3) Functional requirement:
→ Tracking & updating stock level
→ handling incoming & outgoing stocks
→ Automated alerts
→ Facilitating stock counting & report generat
→ Managing Supplier orders
→ maintaining the Data.

4) Enterface requirement:
→ User Enterface for data input (barcode) and reporting
⇒ Database interface and external Systems
⇒ Secure API's and data streams
⇒ The interface should be user friendly.

5) Performance requirement
System must perform efficiently, handling large volume of stock data and processing transaction in real-time
→ Response time
⇒ Memory
⇒ Error tolerance.

6) Design Constrains:
* use of Specific Database Managment S/Y to store data
* It should match with the hardware infrastructure
* Integrat with barcode Scanners and external Supply.

7) Non-functional Attributes:

→ Security: must protect sensitive data
→ Reliability: System must operate continuosly with minimal
→ Portability: easily transferable across different platform
→ Scalability: handle increased loads

8) preliminary Schedule and Budget
Estimated timeline is six month for full development with first two month. The total projected cost of $ 50,000 with potential adjustment based on business needs

Class Diagram :

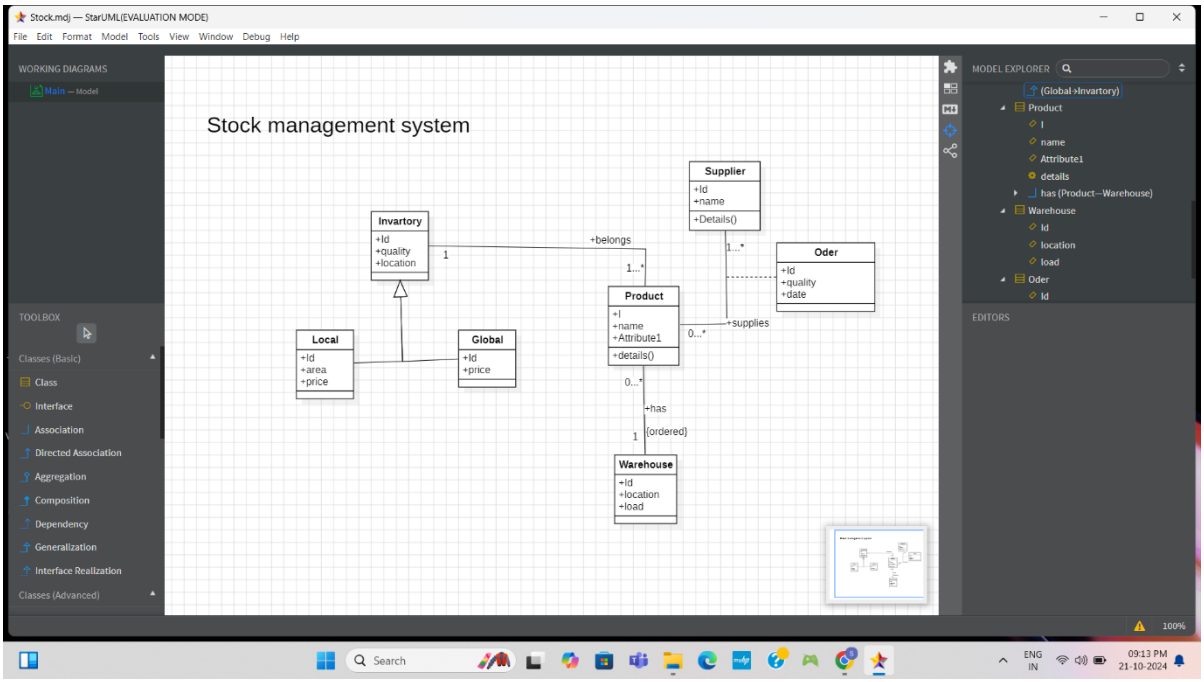


Fig : 4.1

State Diagram :

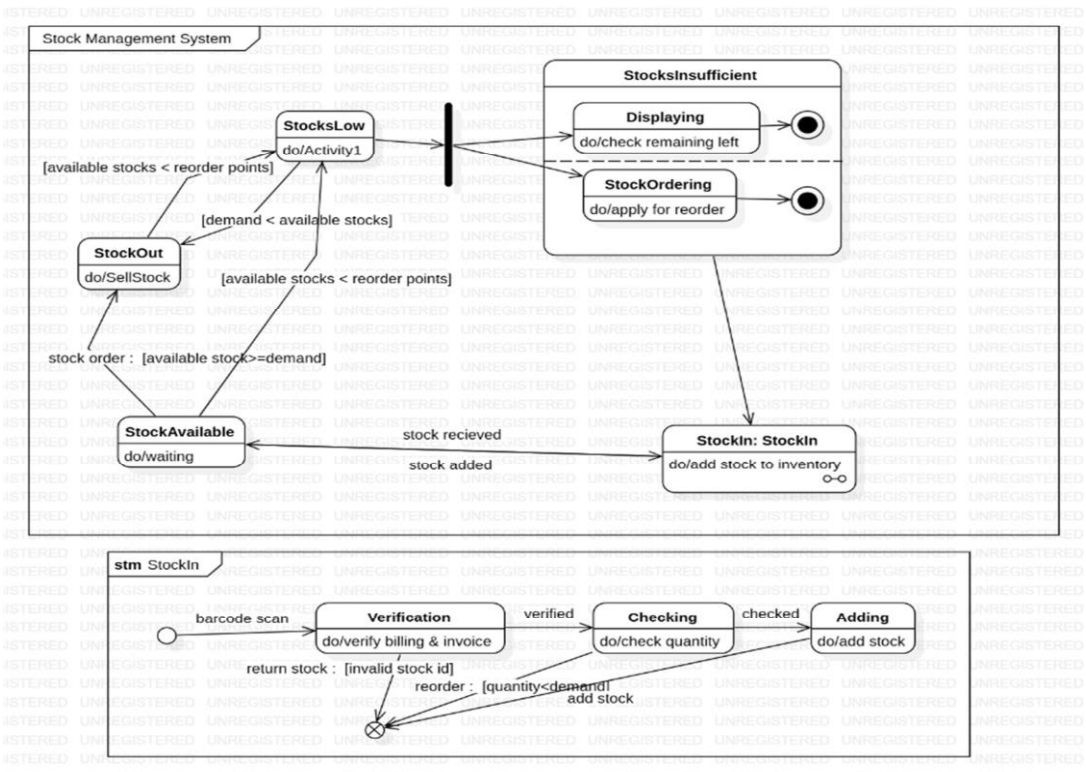


Fig : 4.2

UseCase Diagram :

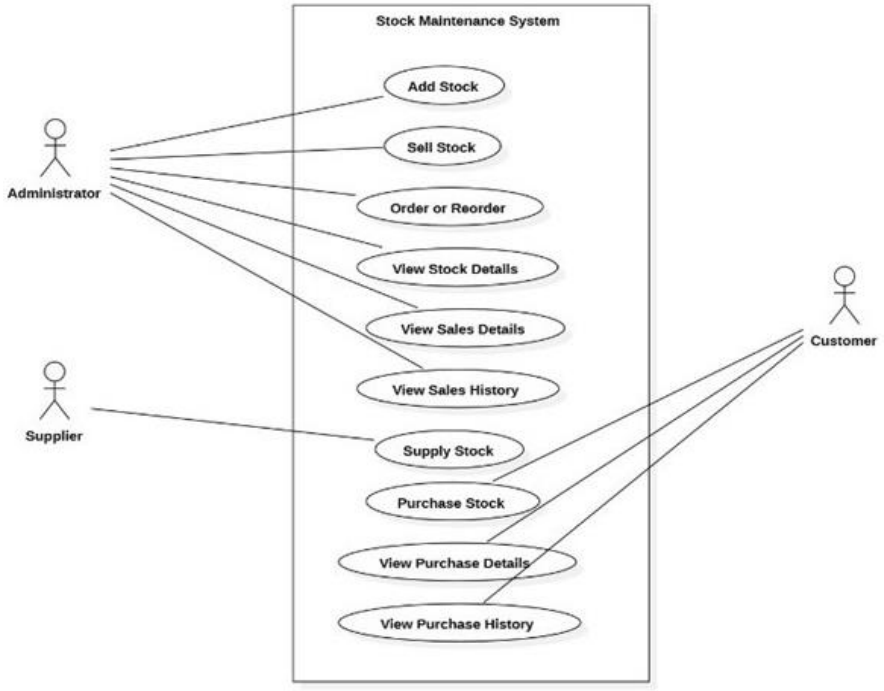


Fig : 4.3

Sequence Diagram :

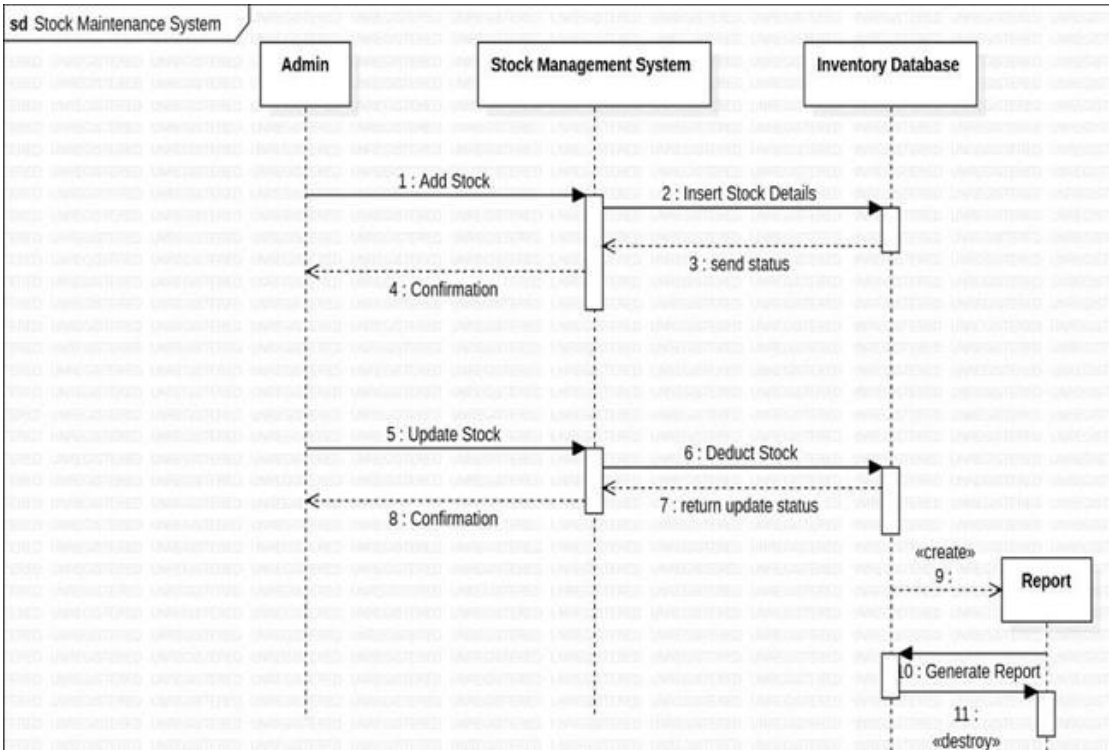


Fig : 4.4

Activity Diagram :

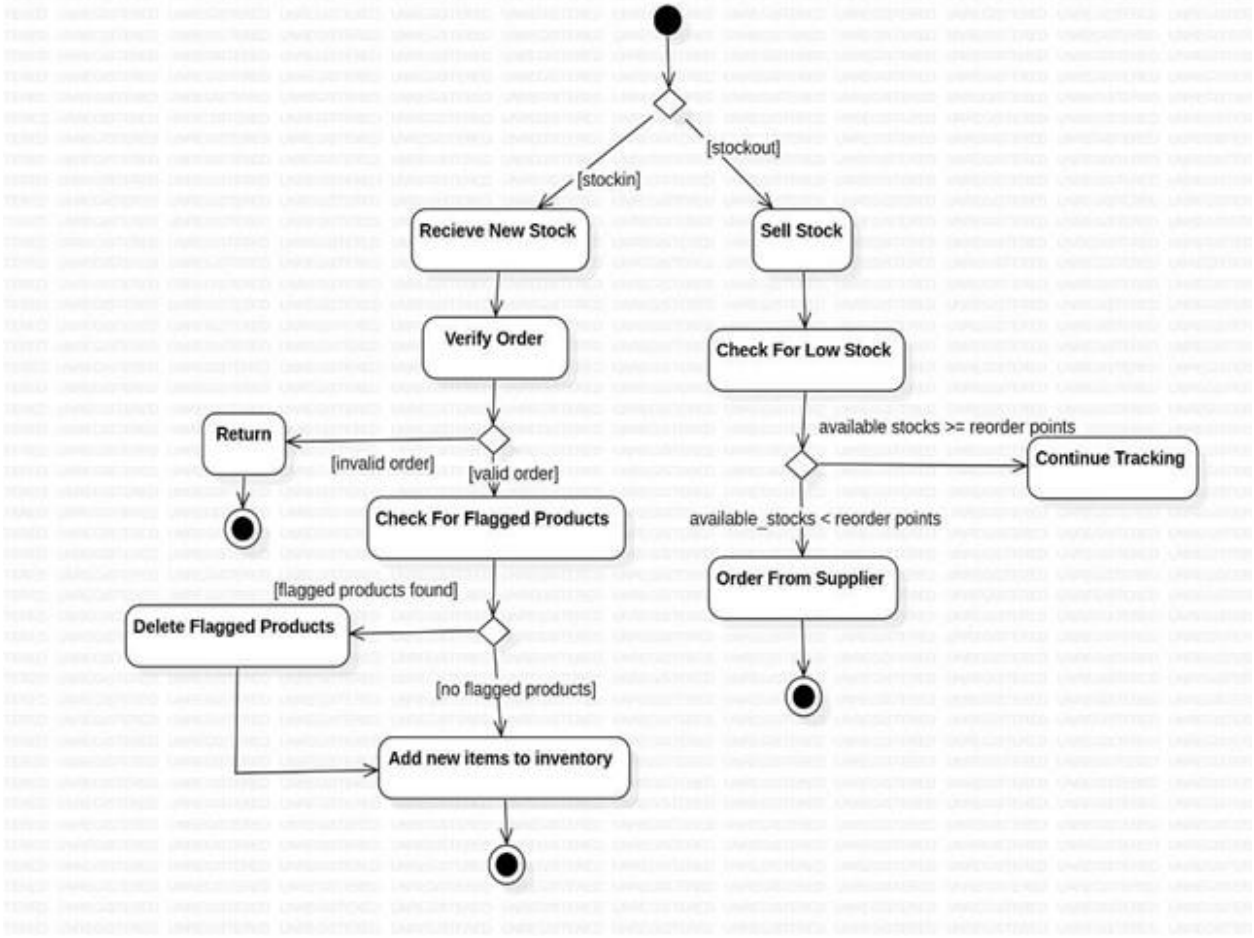


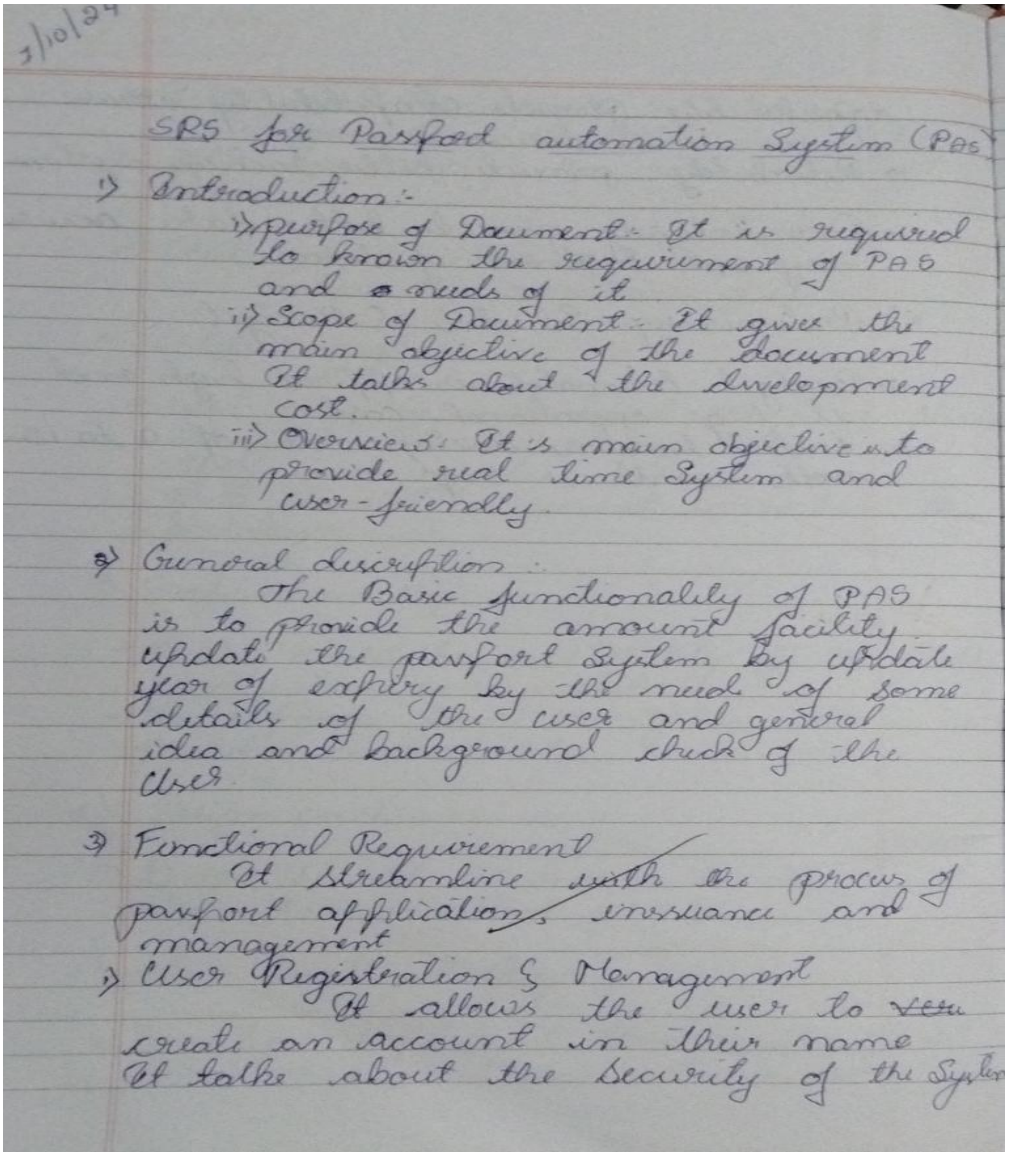
Fig : 4.5

5. Passport Automation System

Problem Statement :

The manual process of issuing and renewing passports is slow, cumbersome, and prone to errors, causing delays for applicants and inefficiencies in data management. A passport automation system is required to digitize and streamline the process, ensure data accuracy, enhance security, and provide real-time status tracking for users.

SRS-Software Requirements Specification :



7/10/24

SRS for Passport automation System (PAS)

1) Introduction :-
   i) Purpose of Daument :- It is required to knoiw the requirment of PAS and needs of it
   ii) Scope of Daument :- It gives the main objective of the Document It talks about the development cost.
   iii) Overview :- It is main objective is to provide real time System and user-friendly.

2) General discription :-
   The Basic functionality of PAS is to provide the amount facility update the passport System by update year of expiry by the need of some details of the user and general idea and background check of the User

3) Functional Requirement
   It Streamline with the procss of passport application, inssuance and management
   1) User Registeration & Management
      It allows the user to ~~you~~ create an account in their name It talks about the Security of the Syste

ii) Application : User need to fill the form and submit it and provide required document

iii) Payment processing :
It allow user to make online payment and generate and send payment receipt

iv) Data validat' & verificat'

v) workflow management : Send alerts and notificat' to user

4) Interface Requirement :
It shows how the Software System interact with each other

i) User Interface : It is the one how the user interact with the software

ii) Application / Admin interface :
how the Management interact with the user for some facility

iii) Security Interface : the management will take care of the security i.e, authen-tication of the user

iv) Backend interface

5) Performance Requirement :
The shows how the PAS work in case of any constrains that comes in the System
Eg la condition where the User provided details does not match with the user's document in such a case

how the system recognise the fault and notify the management about it and take the correct one.

6) Design Constraints :
These are the constraints that arise during the designing of PAS application. The system should be user-friendly as they have to use the application without any assistive technology

7) Non-Functional requirement :-
It talk about the
=> Performance
=> Security
=> Availability
=> Usability, Reliability
=> Efficiency

8) Preliminary Schedule and Budget
The initial version and budget of project plan is the requirement that should be known is approx high
=> It include approximation cost for the operation

Class Diagram :

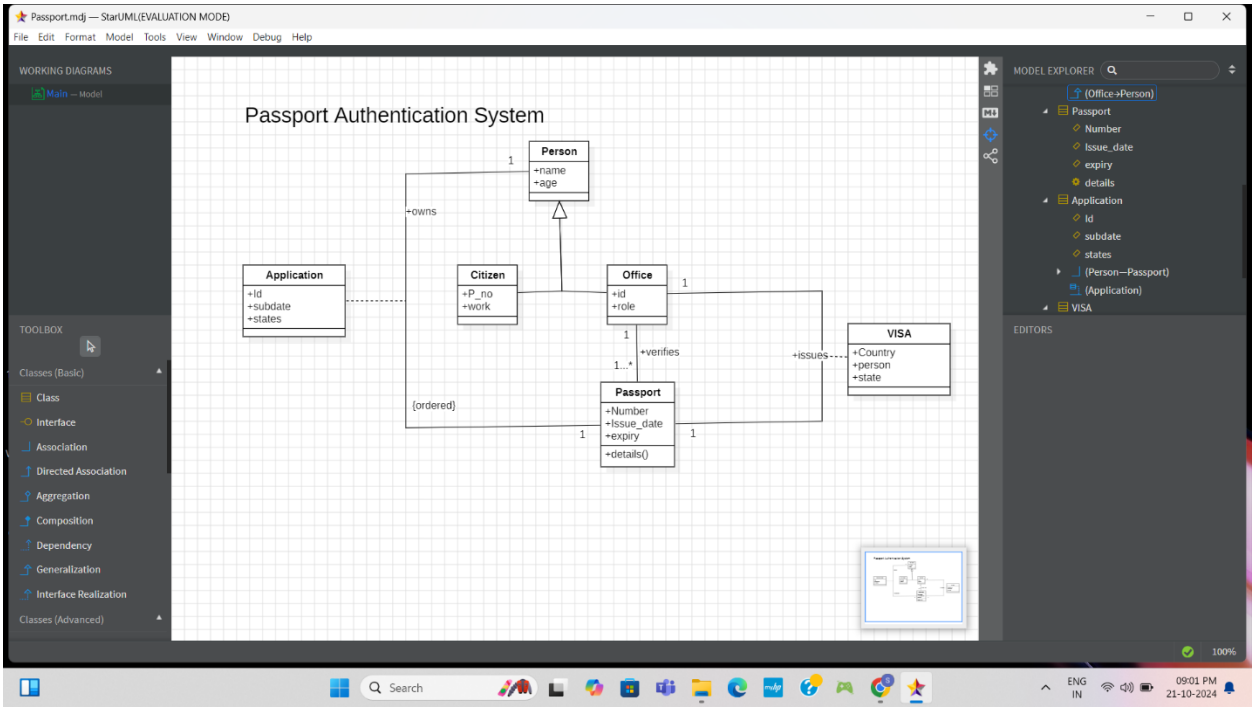


Fig : 5.1

State Diagram :

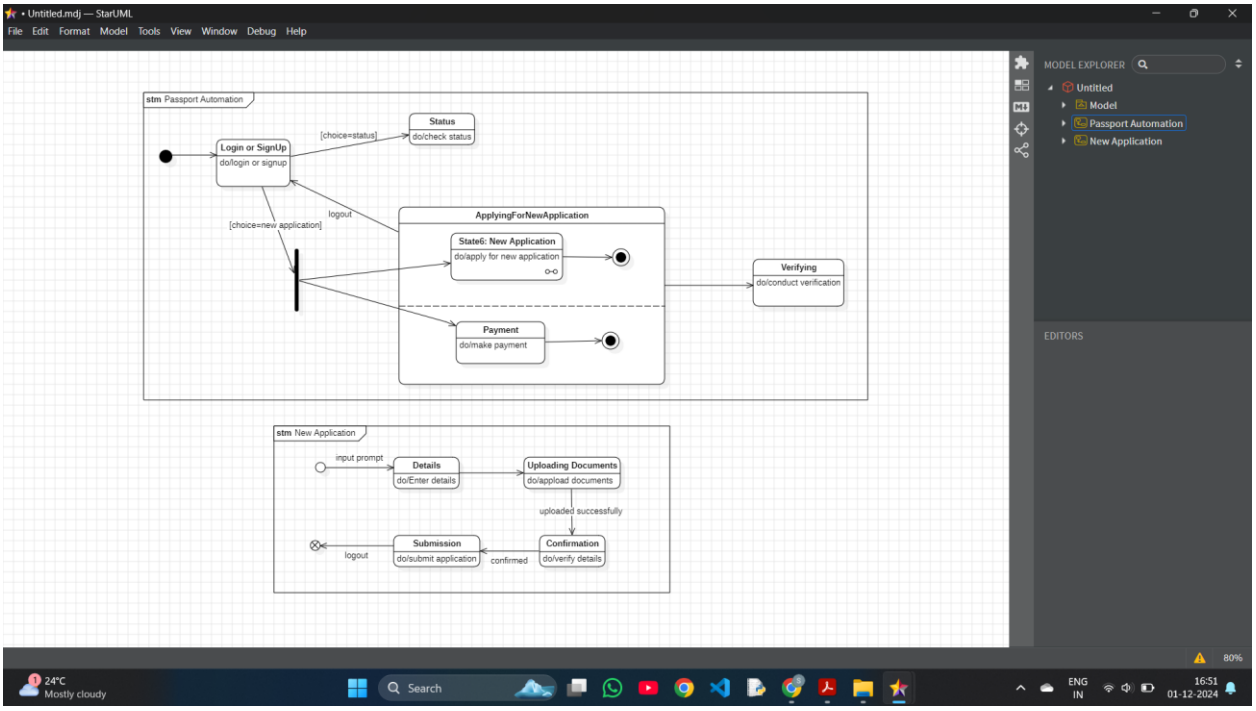


Fig : 5.2

UseCase Diagram :

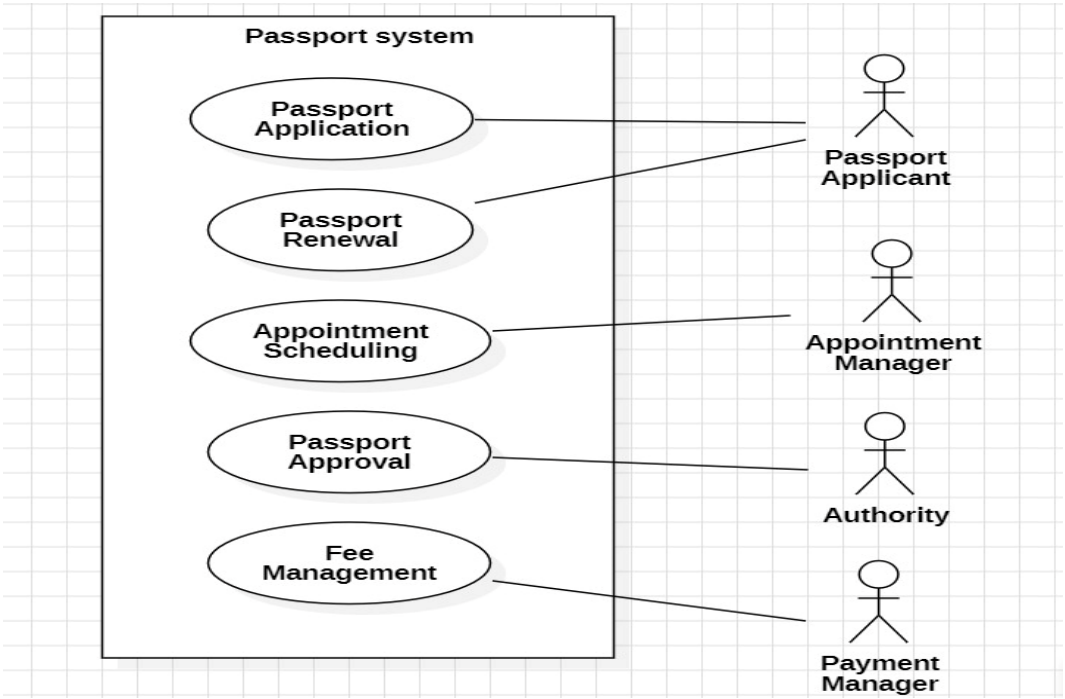


Fig : 5.3

Sequence Diagram :

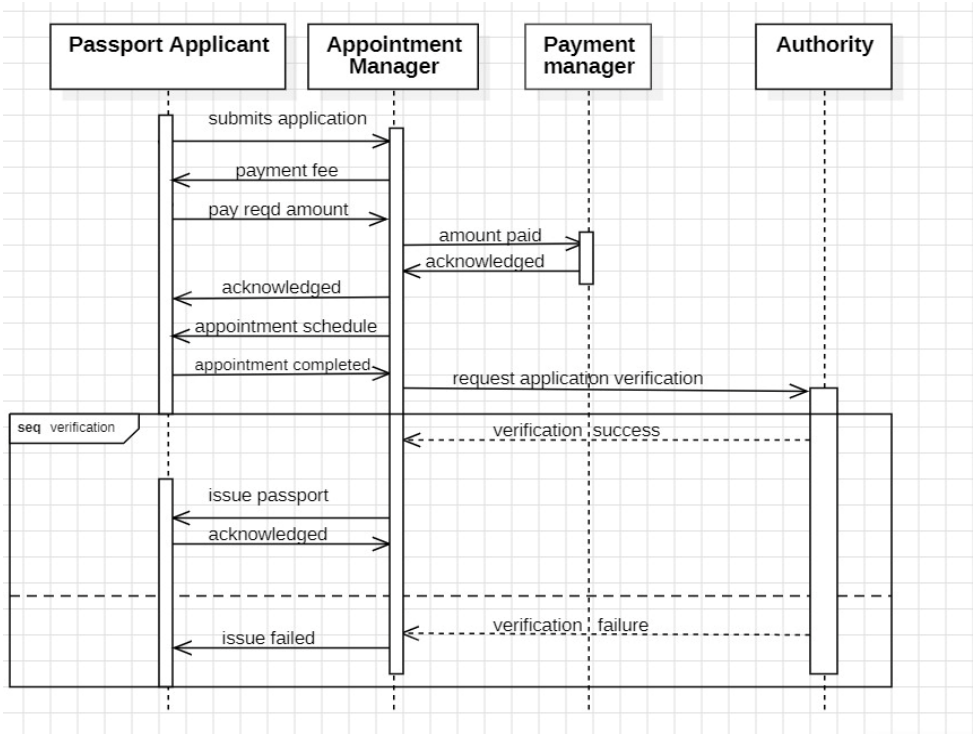


Fig : 5.4

Activity Diagram :

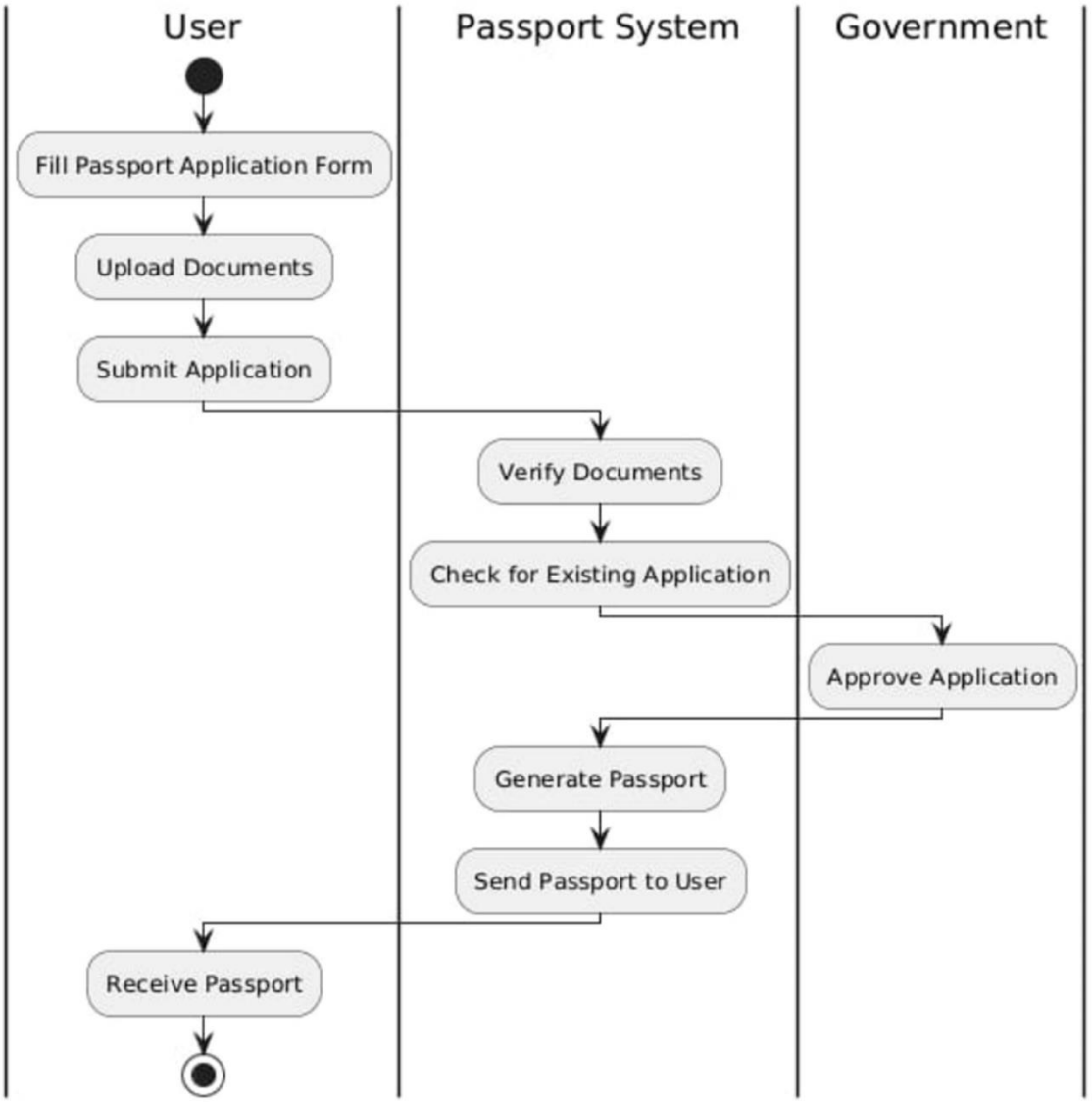


Fig : 5.5