**B.M.S. COLLEGE OF ENGINEERING BENGALURU**
Autonomous Institute, Affiliated to VTU

Lab Record

# Software Engineering and Object-Oriented Modeling

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

Bachelor of Engineering
in
Computer Science and Engineering

*Submitted by:*

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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 Analysis and Design(22CS6PCSEO) laboratory has been carried out by KEERTHI P REDDY (1BM21C090) during the 6th Semester Mar-June-2024.

Signature of the Faculty Incharge:

NAME OF THE FACULTY:

Department of Computer Science and Engineering
B.M.S. College of Engineering, Bangalore

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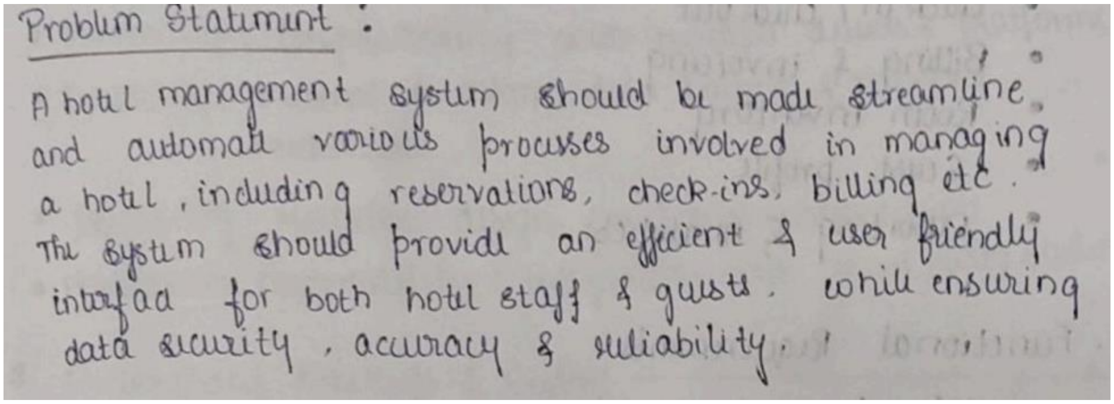
# 1. Hotel Management System

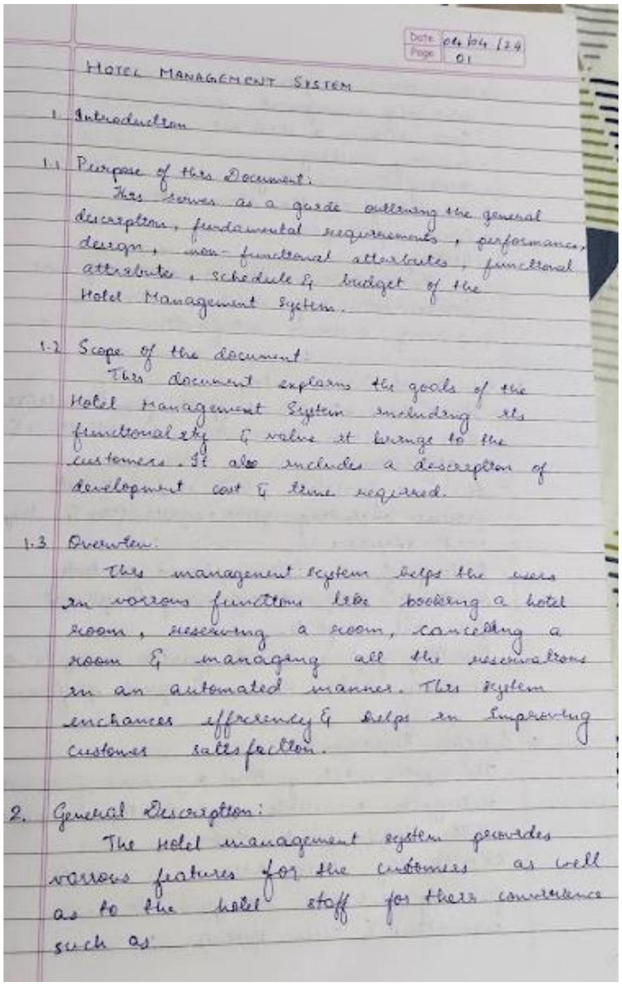
## 1.1 Problem Statement



Problem Statement :

A hotel management system should be made streamline and automate various processes involved in managing a hotel, including reservations, check-ins, billing etc. The system should provide an efficient & user friendly interface for both hotel staff & guests. while ensuring data security, accuracy & reliability.

## 1.2 SRS-Software Requirements Specification



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HOTEL MANAGEMENT SYSTEM

1. Introduction

1.1 Purpose of this Document:

This serves as a guide outlining the general description, fundamental requirements, performance, design, non-functional attributes, functional attribute, schedule & budget of the Hotel Management System.

1.2 Scope of the document

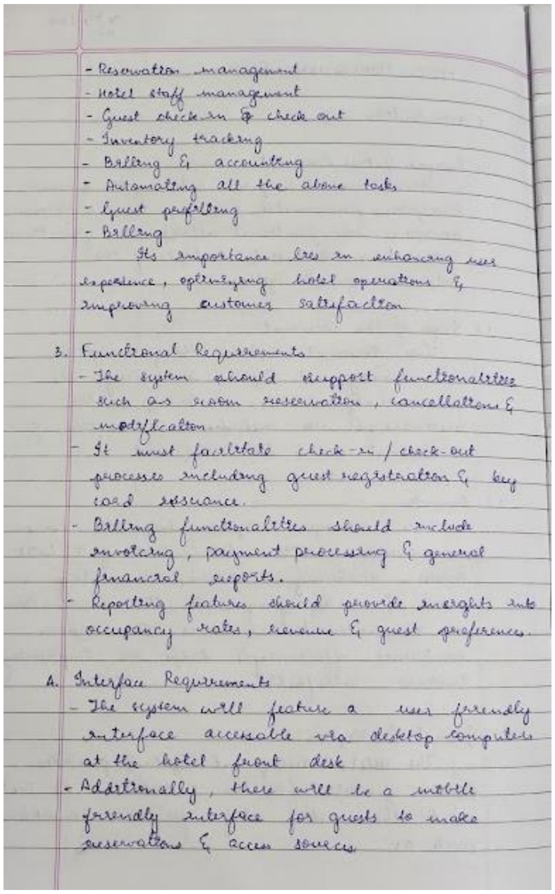
This document explains the goals of the Hotel Management System including its functionality & value it brings to the customers. It also includes a description of development cost & time required.

1.3 Overview.

This management system helps the users in various functions like booking a hotel room, reserving a room, cancelling a room & managing all the reservations in an automated manner. This system enchances efficiency & helps in Improving customer satisfaction.

2. General Description:

The Hotel management system provides various features for the customers as well as to the hotel staff for their convenience such as

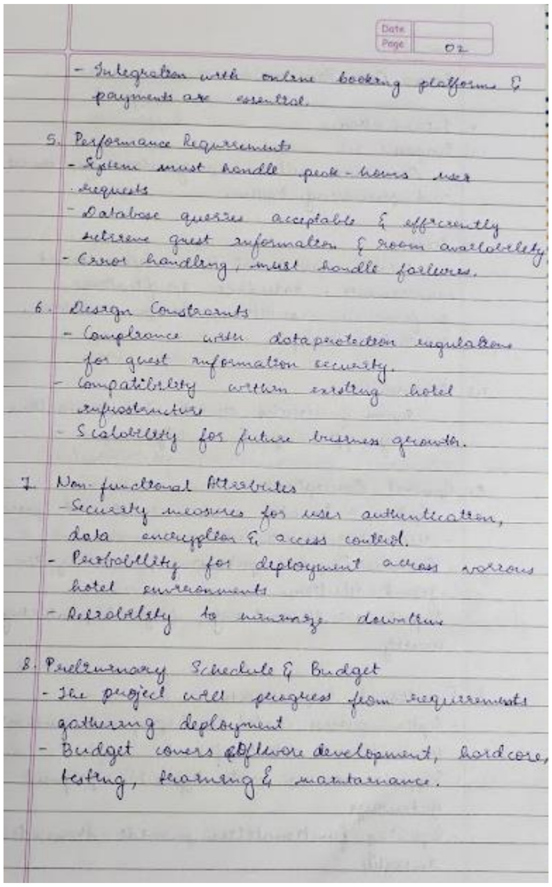


- Reservation management
- Hotel staff management
- Guest check in & check out
- Inventory tracking
- Billing & accounting
- Automating all the above tasks
- Guest profiling
- Billing

Its importance lies in enhancing user experience, optimizing hotel operations & improving customer satisfaction

3. Functional Requirements
   - The system should support functionalities such as room reservation, cancellation & modification
   - It must facilitate check-in / check-out processes including guest registration & key card issuance.
   - Billing functionalities should include invoicing, payment processing & general financial reports.
   - Reporting features should provide insights into occupancy rates, revenue & guest preferences.

4. Interface Requirements
   - The system will feature a user friendly interface accessible via desktop computers at the hotel front desk
   - Additionally, there will be a mobile friendly interface for guests to make reservations & access services



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- Integration with online booking platforms & payments are essential.

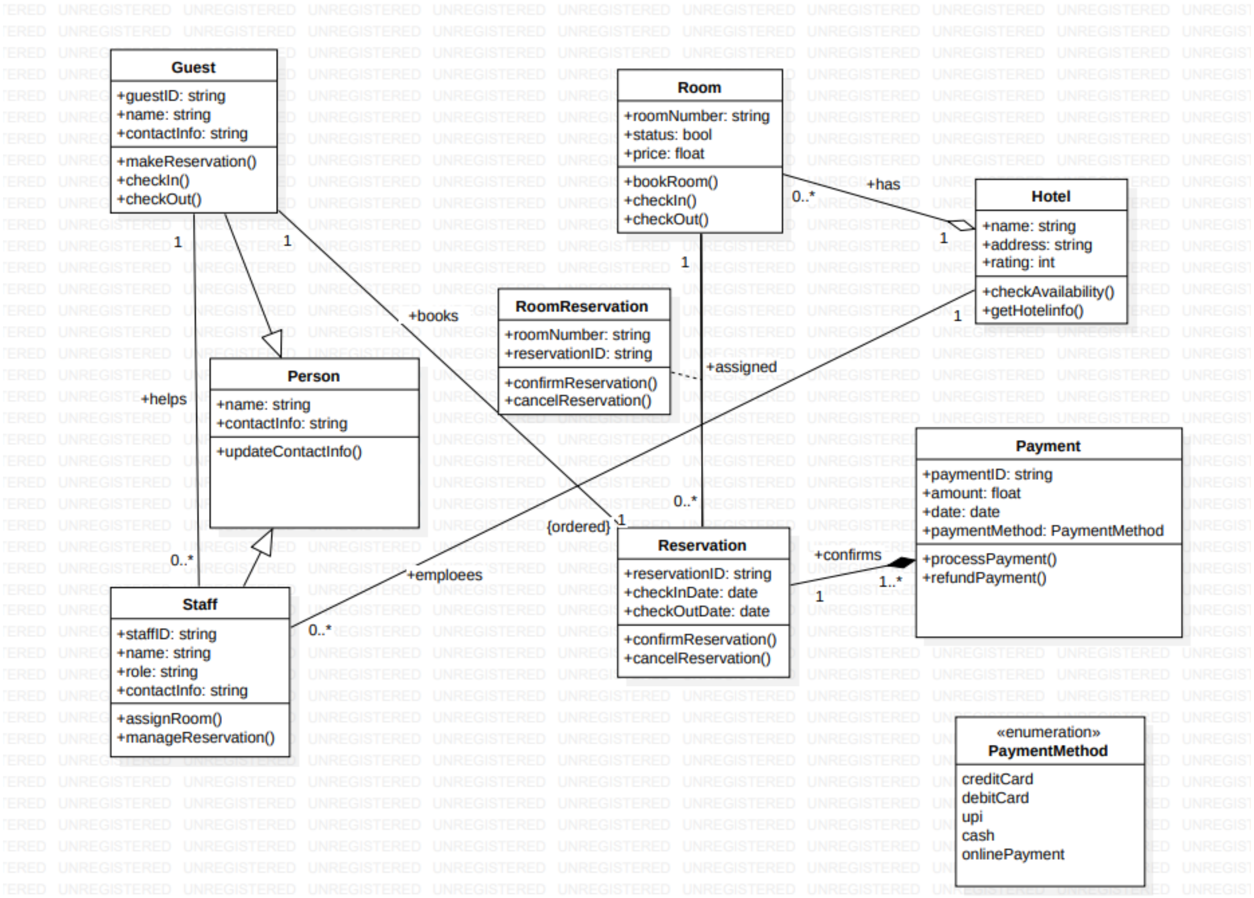
5. Performance Requirements
   - System must handle peak-hours user requests
   - Database queries acceptable & efficiently retrieve guest information & room availability
   - Error handling, must handle failures.

6. Design Constraints
   - Compliance with dataprotection regulations for guest information security.
   - Compatibility within existing hotel infrastructure
   - Scalability for future business growth.

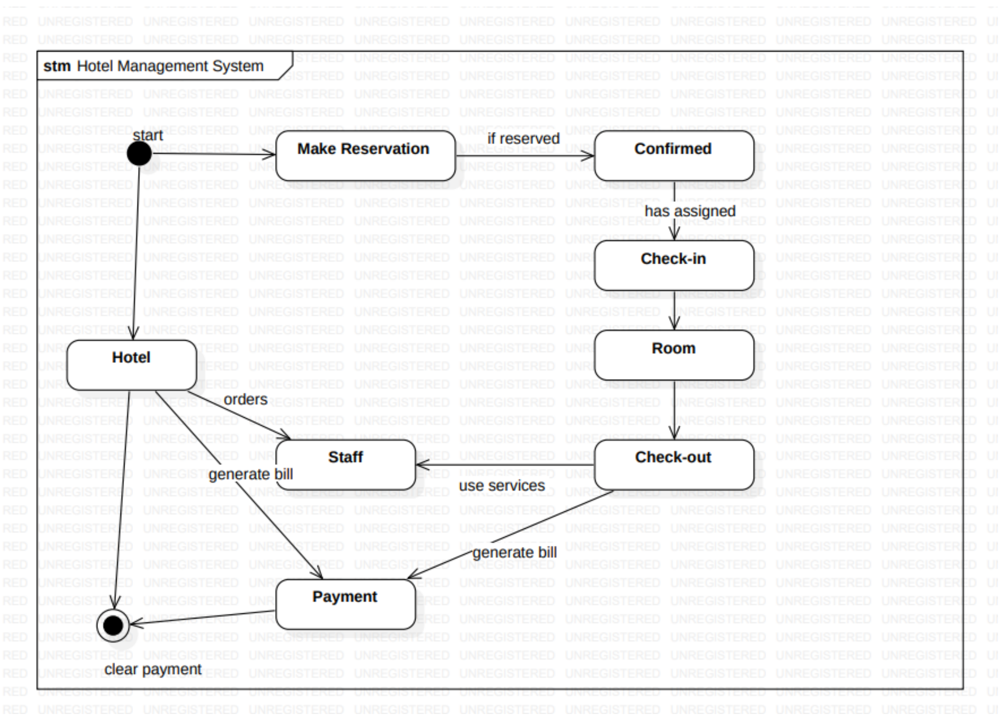
7. Non-functional Attributes
   - Security measures for user authentication, data encryption & access control.
   - Portability for deployment across various hotel environments
   - Reliability to minimize downtime

8. Preliminary Schedule & Budget
   - The project will progress from requirements gathering deployment
   - Budget covers software development, hardcore, testing, training & maintenance.

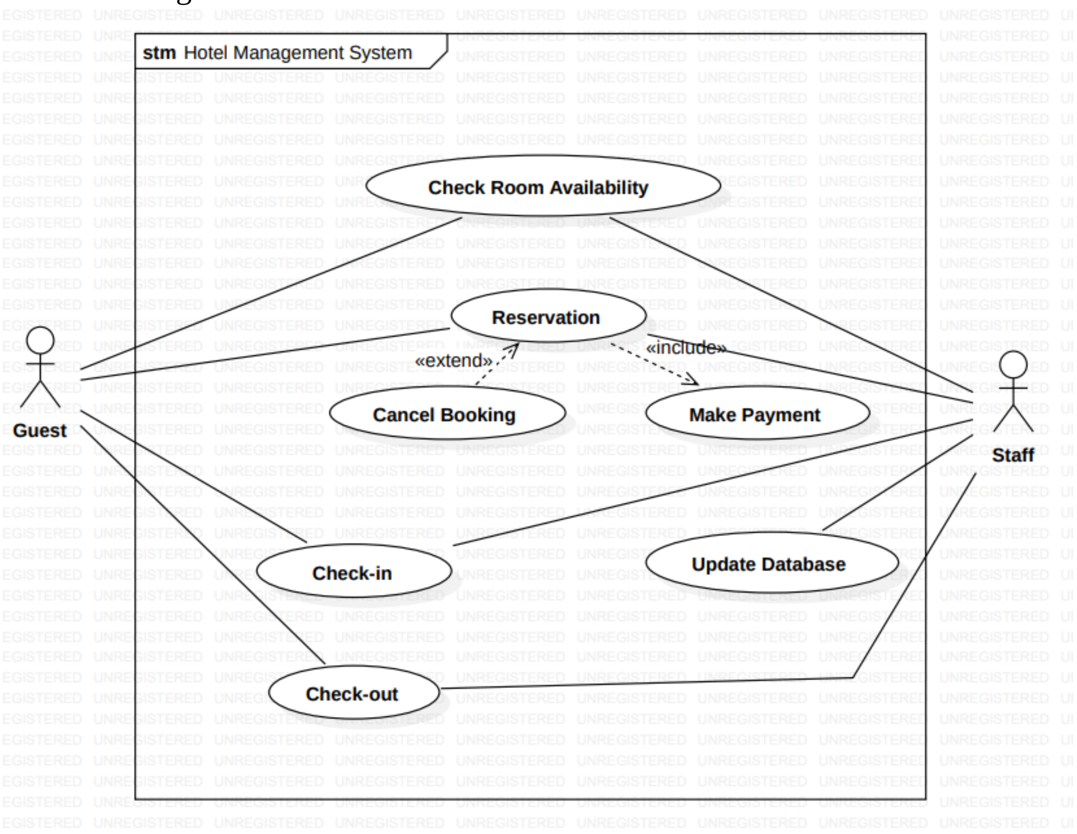
## 1.3 Class Diagram



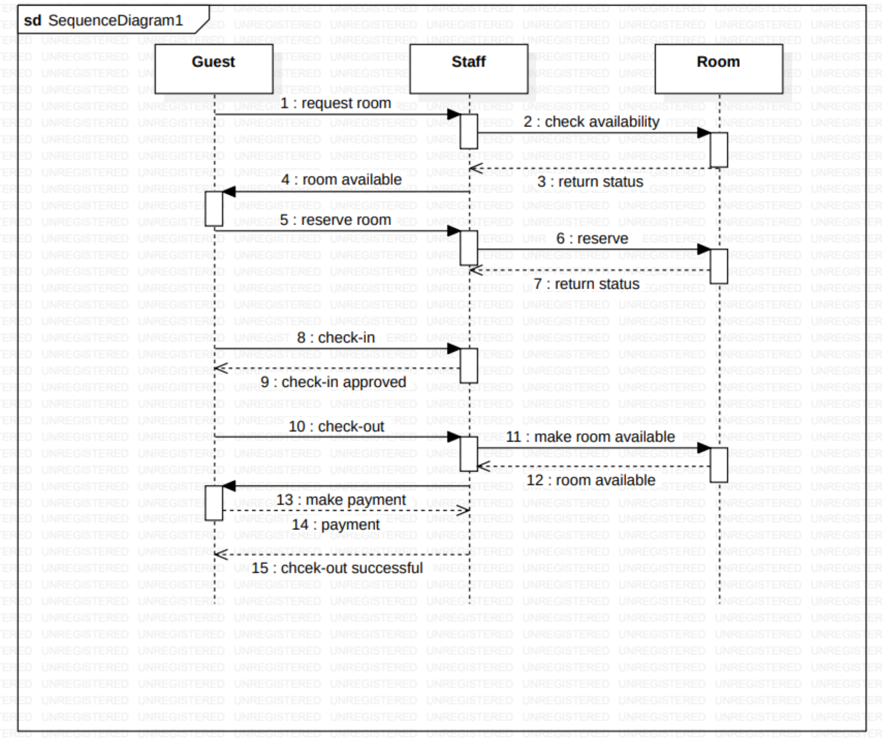
## 1.4 State Diagram



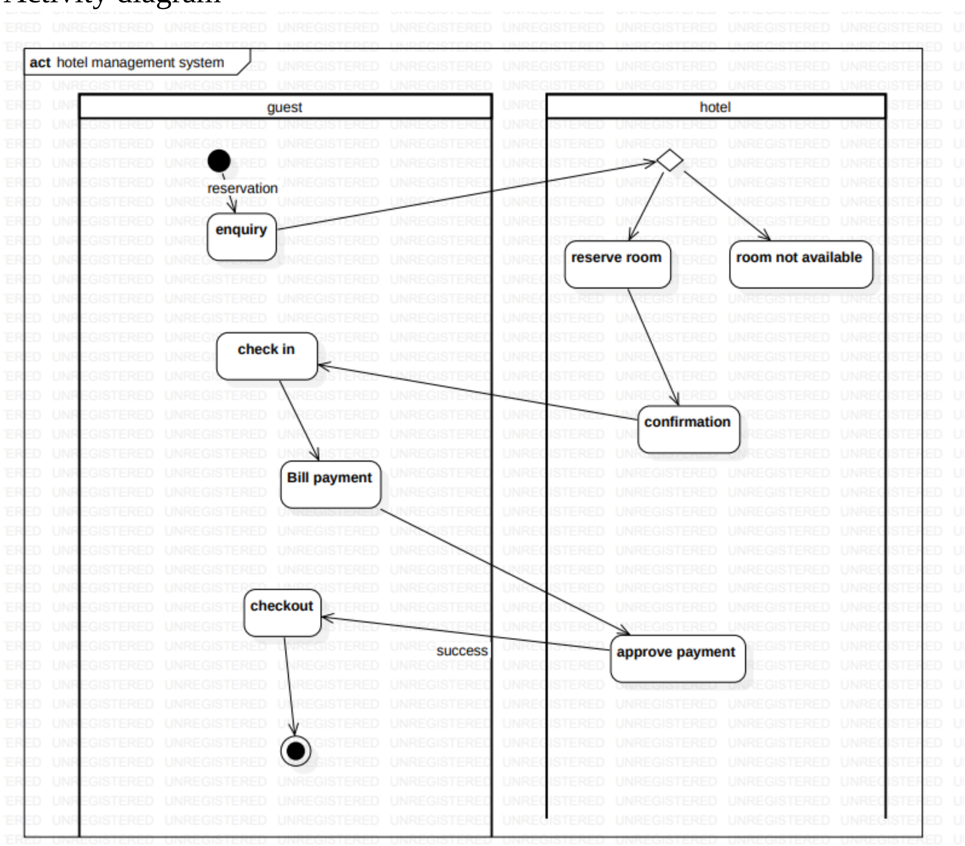
## 1.5 Use Case Diagram



## 1.6 Sequence Diagram

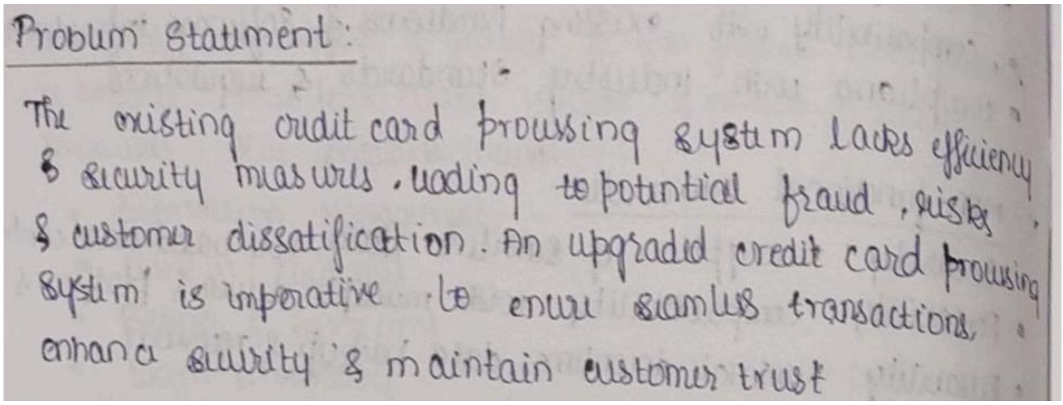


## 1.7 Activity diagram



# 2. Credit Card Processing System

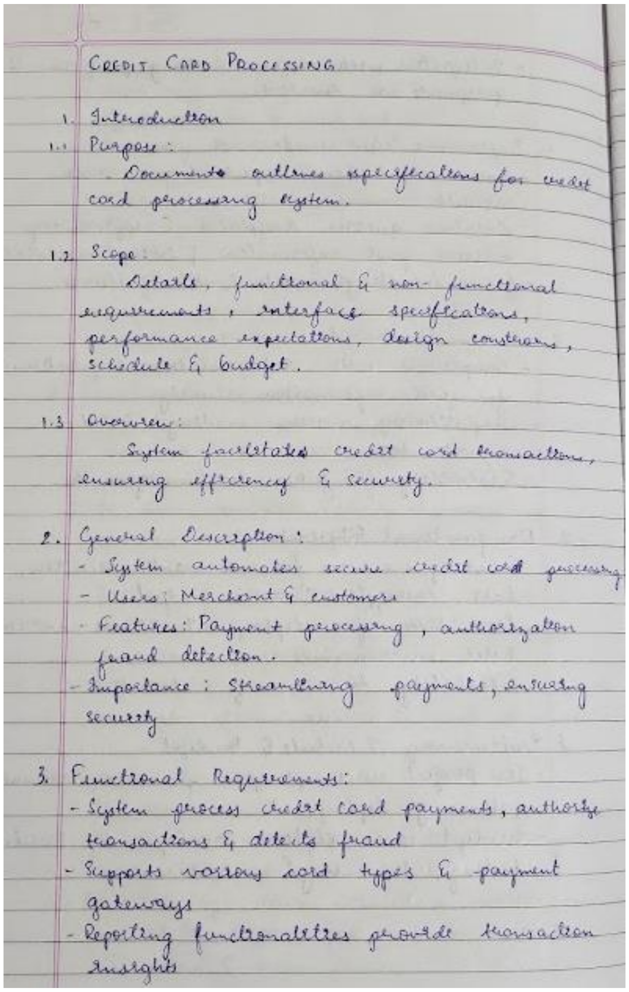
## 2.1 Problem Statement



Problem Statement:

The existing credit card processing system lacks efficiency & security measures, leading to potential fraud, risks & customer dissatification. An upgraded credit card processing system is imperative to ensure seamless transactions, enhance security & maintain customer trust

## 2.2 SRS-Software Requirements Specification



CREDIT CARD PROCESSING

1. Introduction

1.1 Purpose:

Documents outlines specifications for credit card processing system.

1.2 Scope:

Details, functional & non-functional requirements, interface specifications, performance expectations, design constrains, schedule & budget.

1.3 Overview:

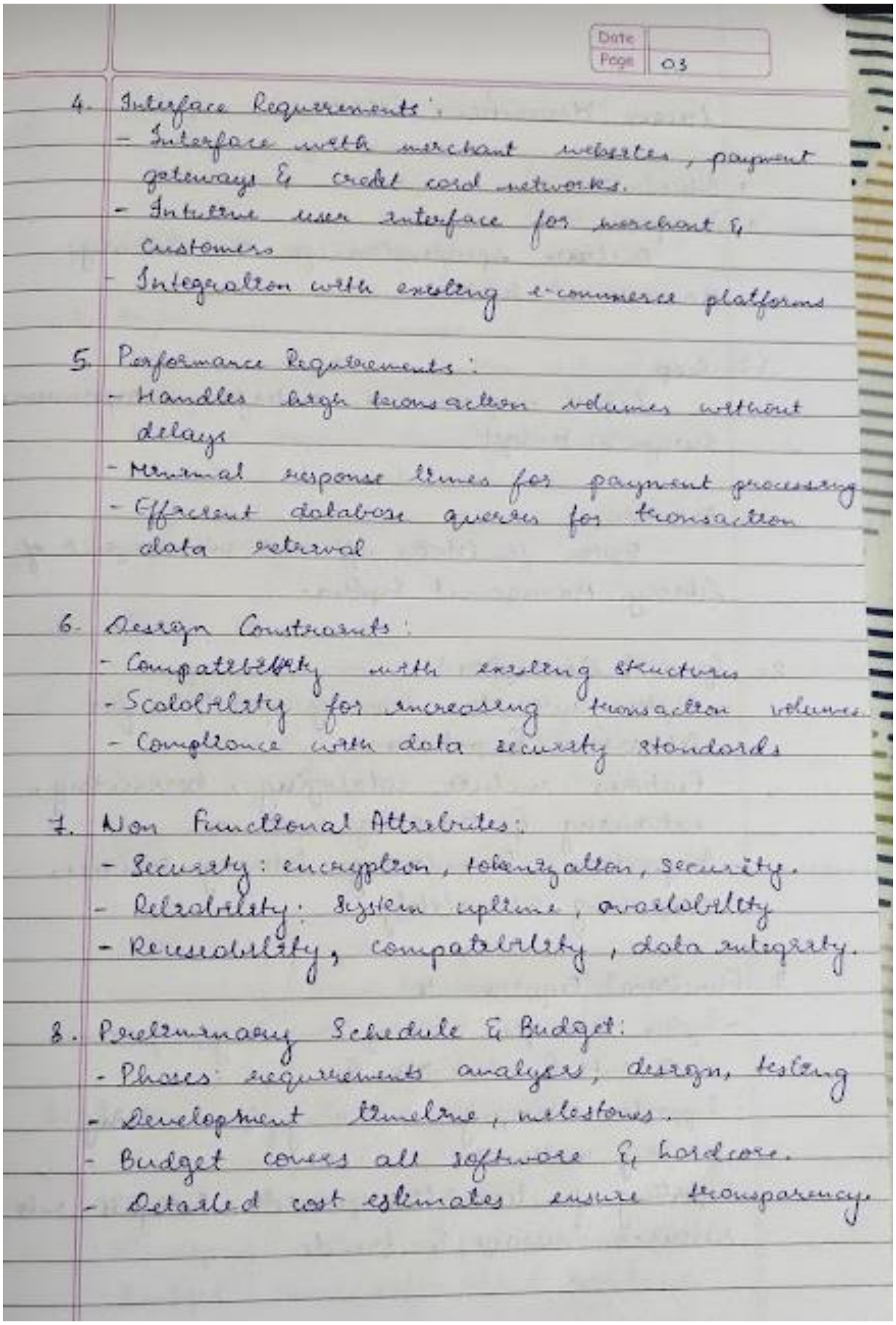
System facilitates credit card transactions, ensuring efficiency & security.

2. General Description:

- System automates secure credit card processing
- Users: Merchant & customers
- Features: Payment processing, authorization fraud detection.
- Importance: Streamlining payments, ensuring security

3. Functional Requirements:

- System process credit card payments, authorize transactions & detects fraud
- Supports various card types & payment gateways
- Reporting functionalities provide transaction insights



4. Interface Requirements:
- Interface with merchant websites, payment gateways & credit card networks.
- Intuitive user interface for merchant & customers
- Integration with existing e-commerce platforms

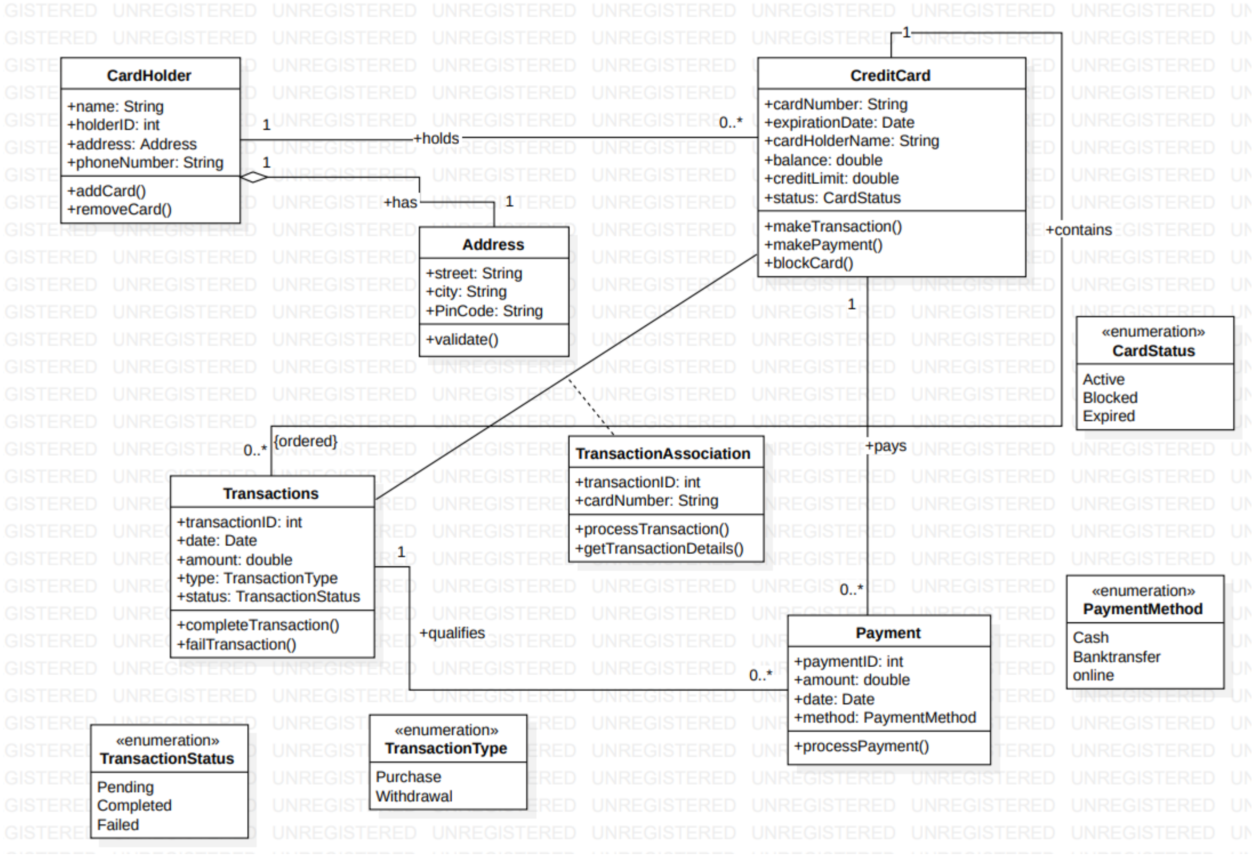
5. Performance Requirements:
- Handles high transaction volumes without delays
- Minimal response times for payment processing
- Efficient database queries for transaction data retrieval

6. Design Constraints:
- Compatibility with existing structures
- Scalability for increasing transaction volumes
- Compliance with data security standards

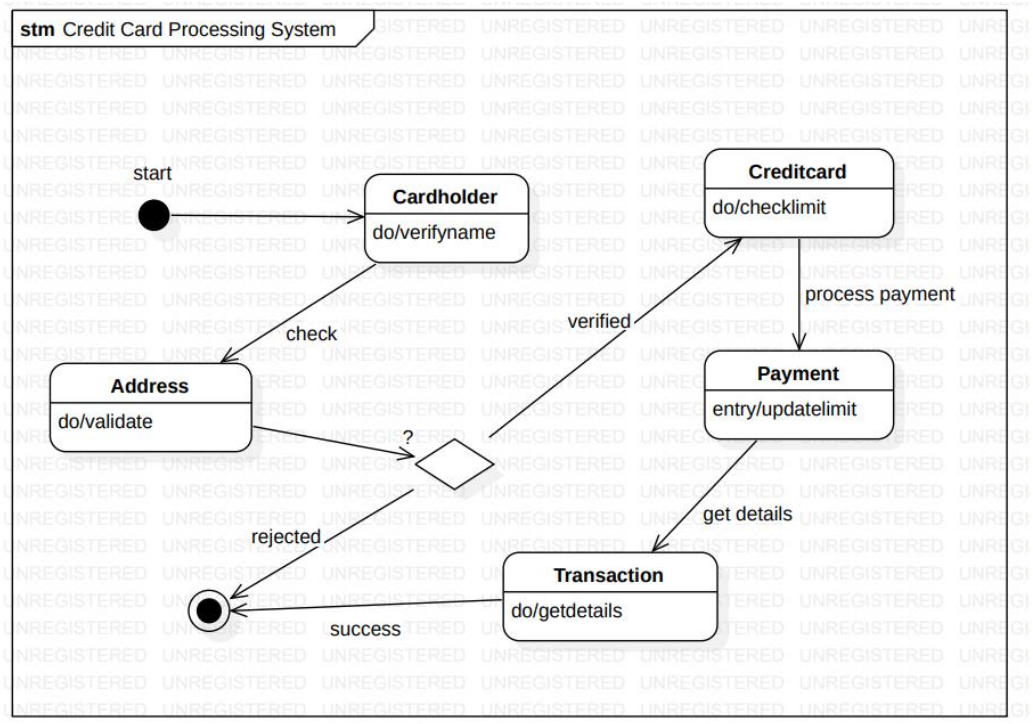
7. Non Functional Attributes:
- Security: encryption, tokenization, security.
- Reliability: System uptime, availability
- Reusability, compatibility, data integrity.

8. Preliminary Schedule & Budget:
- Phases: requirements analysis, design, testing
- Development timeline, milestones.
- Budget covers all software & hardware.
- Detailed cost estimates ensure transparency.

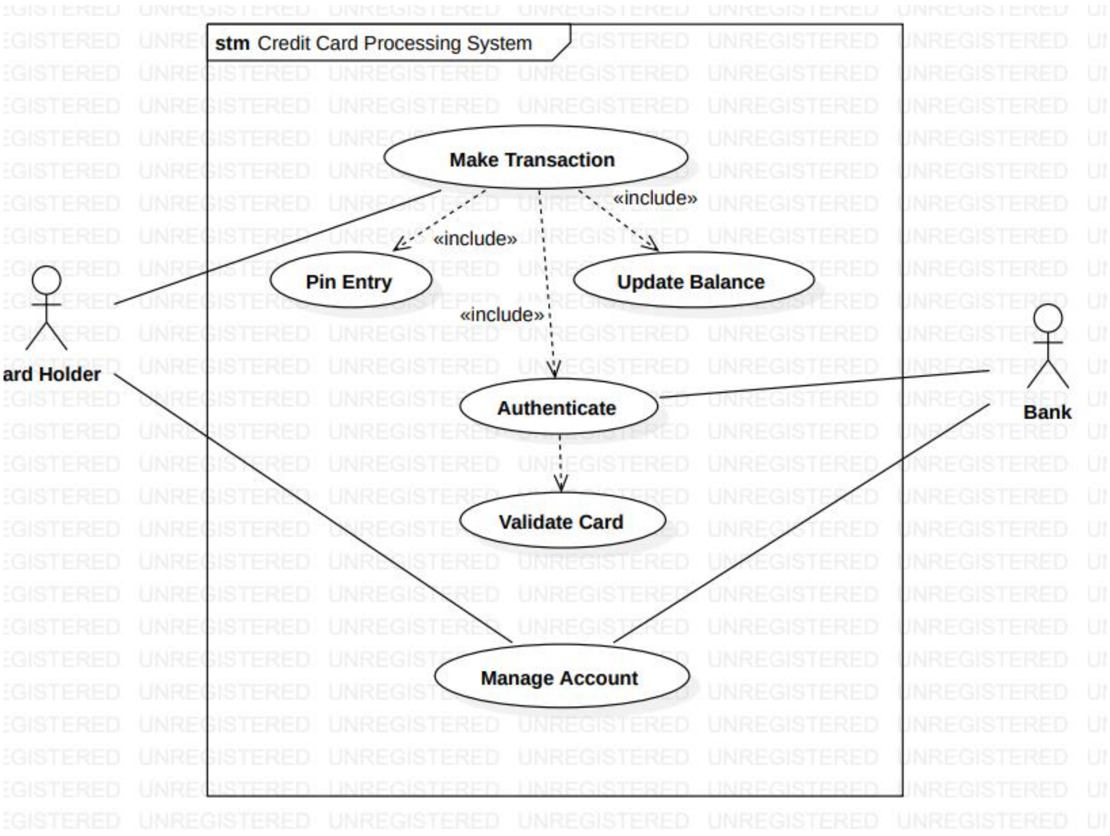
## 2.3 Class Diagram



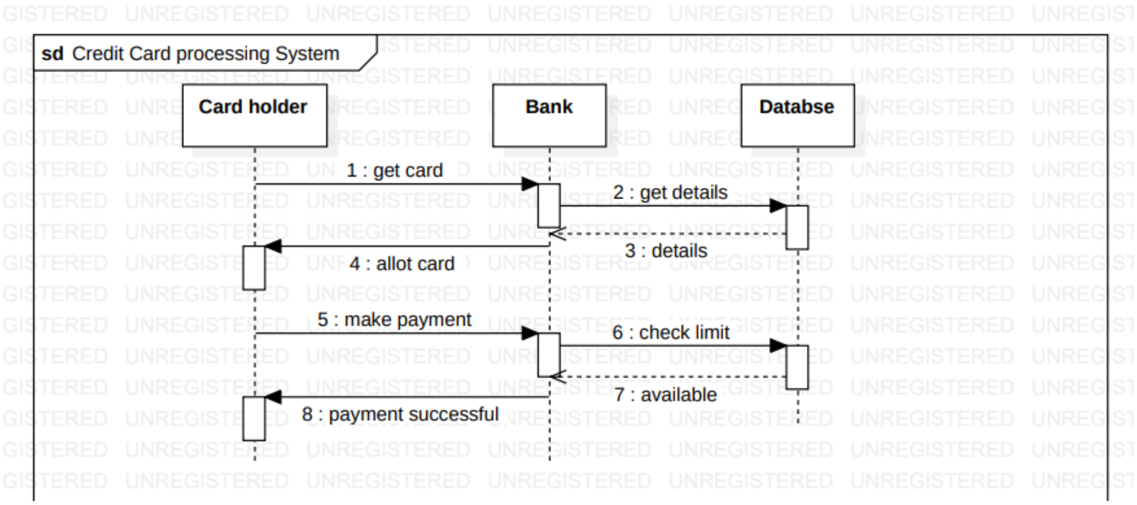
## 2.4 State Diagram



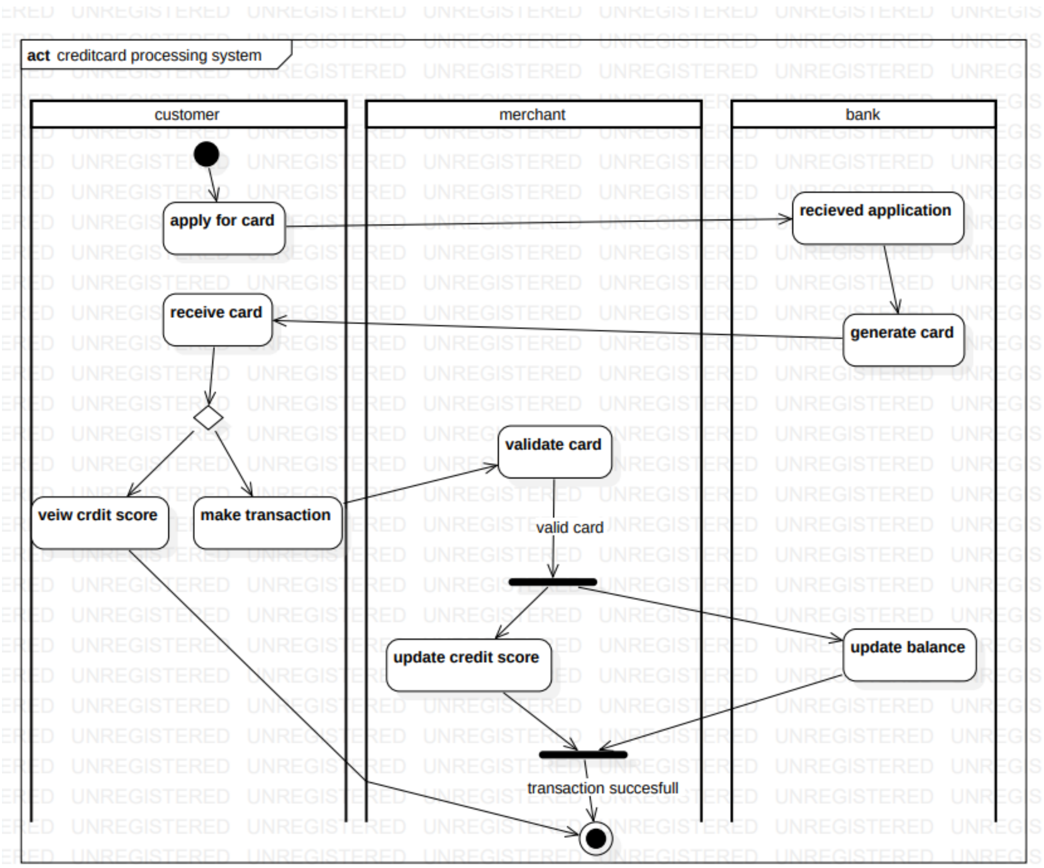
## 2.5 Use Case Diagram



## 2.6 Sequence Diagram

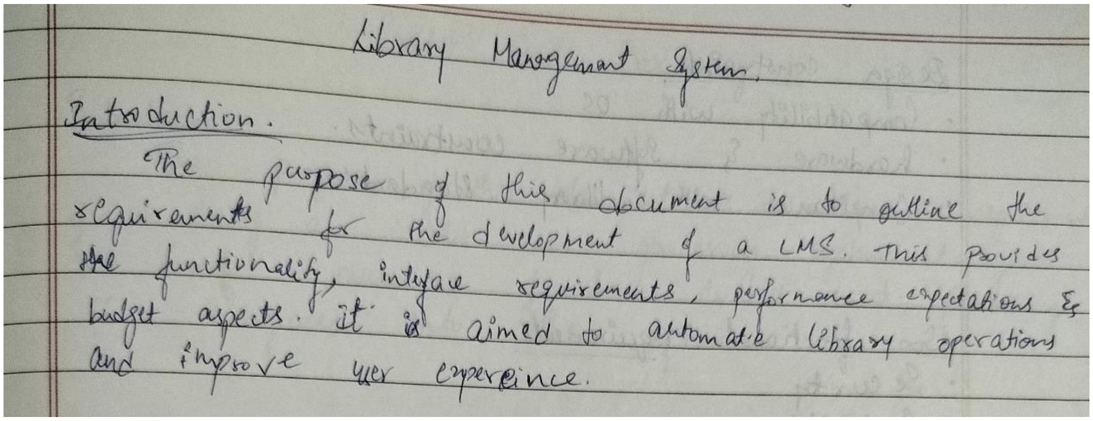


## 2.7 Activity diagram



# 3. Library Management System

## 3.1 Problem Statement

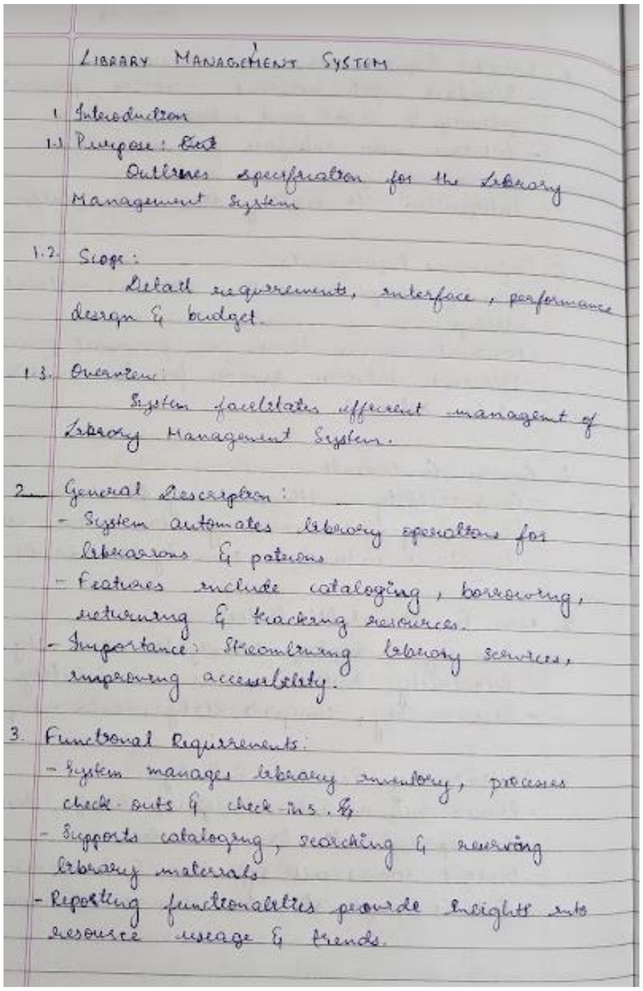


Library Management System.

Introduction.

The purpose of this document is to outline the requirements for the development of a LMS. This provides ~~the~~ functionality, intyface requirements, performance expectations & budget aspects. it is aimed to automate library operations and improve user experience.

## 3.2 SRS-Software Requirements Specification



LIBRARY MANAGEMENT SYSTEM

1. Introduction

1.1 Purpose: ~~Ext~~

Outlines specification for the Library Management System

1.2. Scope:

Detail requirements, interface, performance design & budget.

1.3. Overview:

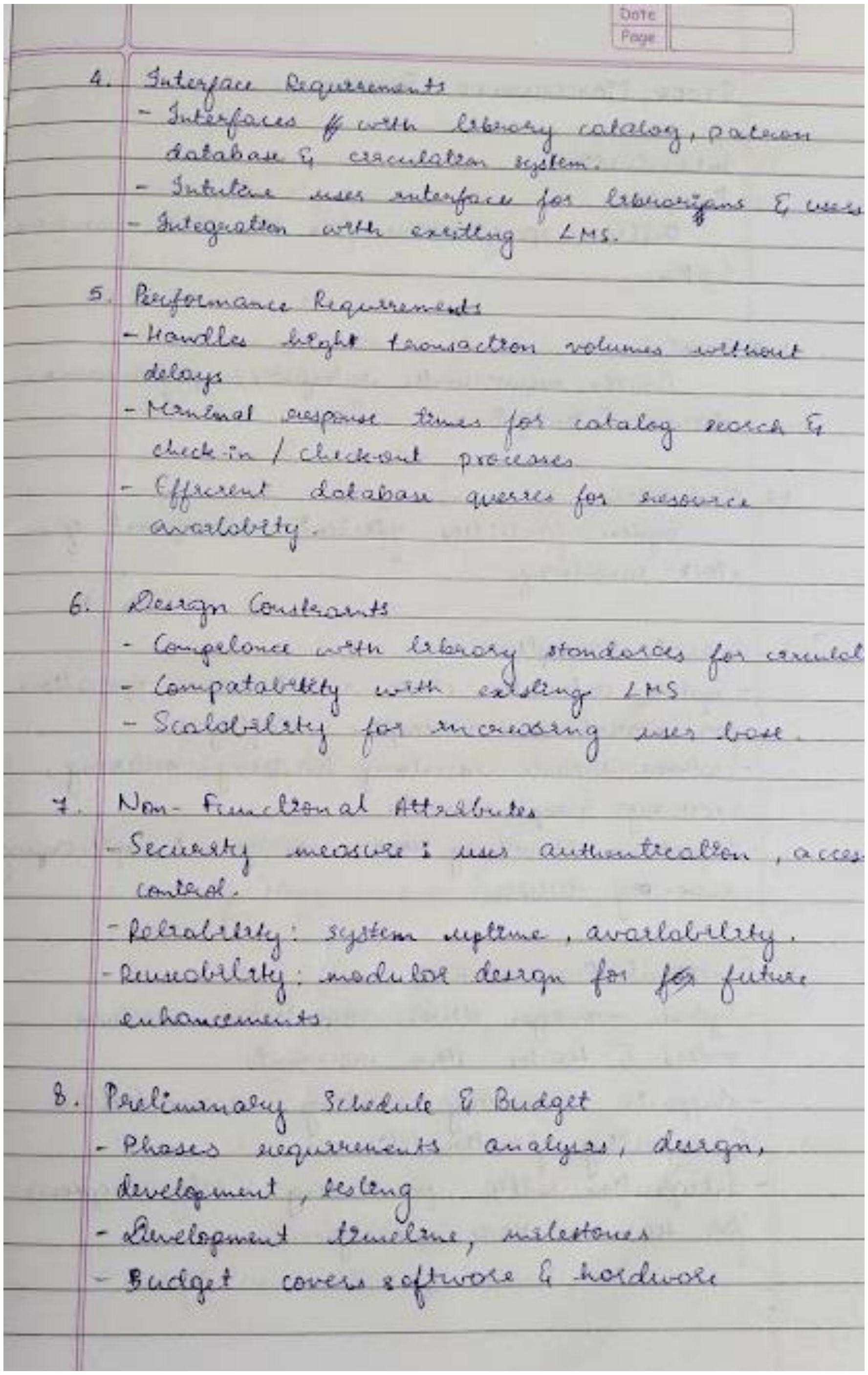
System facilitates efficient managent of Library Management System.

2. General Description:

- System automates library operations for librarians & patrons
- Features include cataloging, borrowing, returning & tracking resources.
- Importance: Streamlining library services, improving accessibility.

3. Functional Requirements:

- System manages library inventory, processes check-outs & check-ins. ~~&~~
- Supports cataloging, searching & reserving library materials
- Reporting functionalities provide insights into resource usage & trends.



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4. Interface Requirements
   - Interfaces ~~f~~ with library catalog, patron database & circulation system.
   - Intuitive user interface for librarians & users
   - Integration with existing LMS.

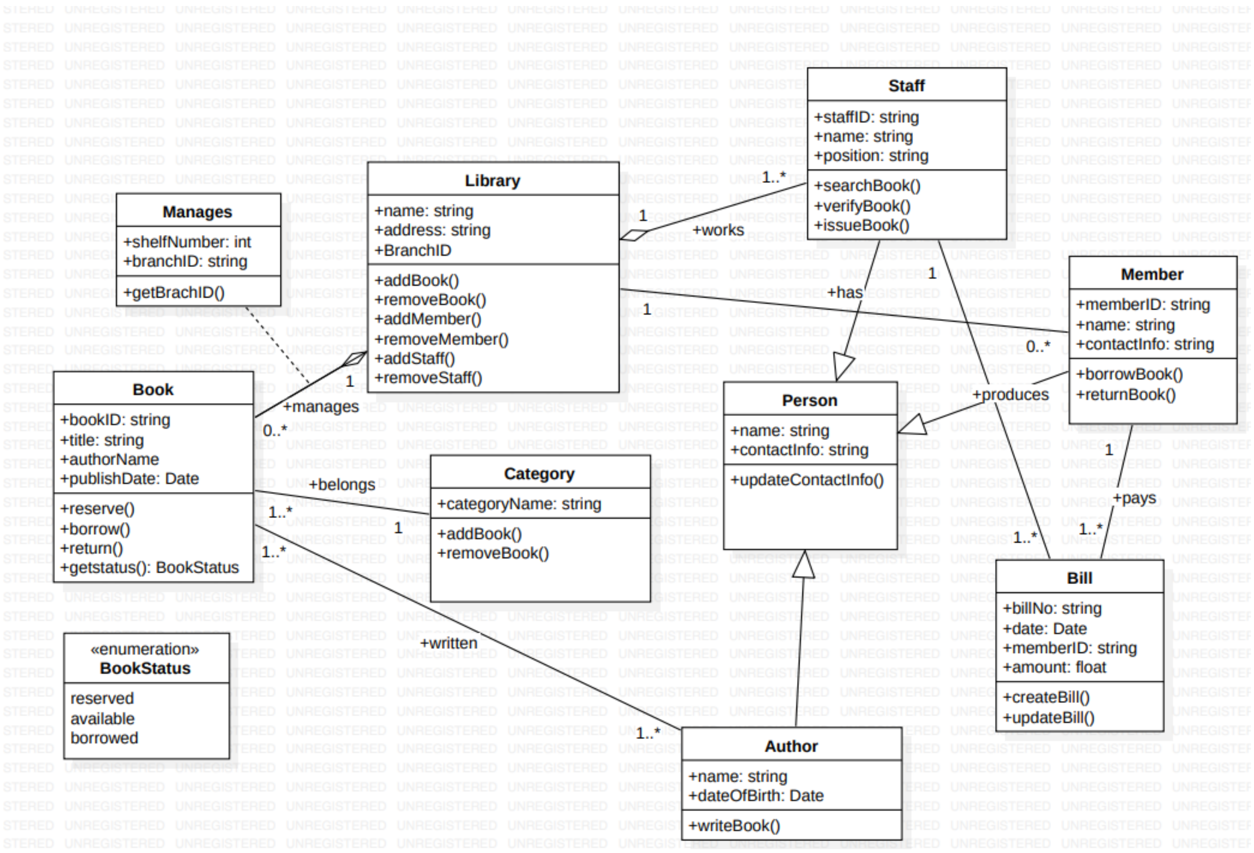
5. Performance Requirements
   - Handles high transaction volumes without delays
   - Minimal response times for catalog search & check-in / checkout processes
   - Efficient database queries for resource availability.

6. Design Constraints
   - Compliance with library standards for circulat
   - Compatability with existing LMS
   - Scalability for increasing user base.

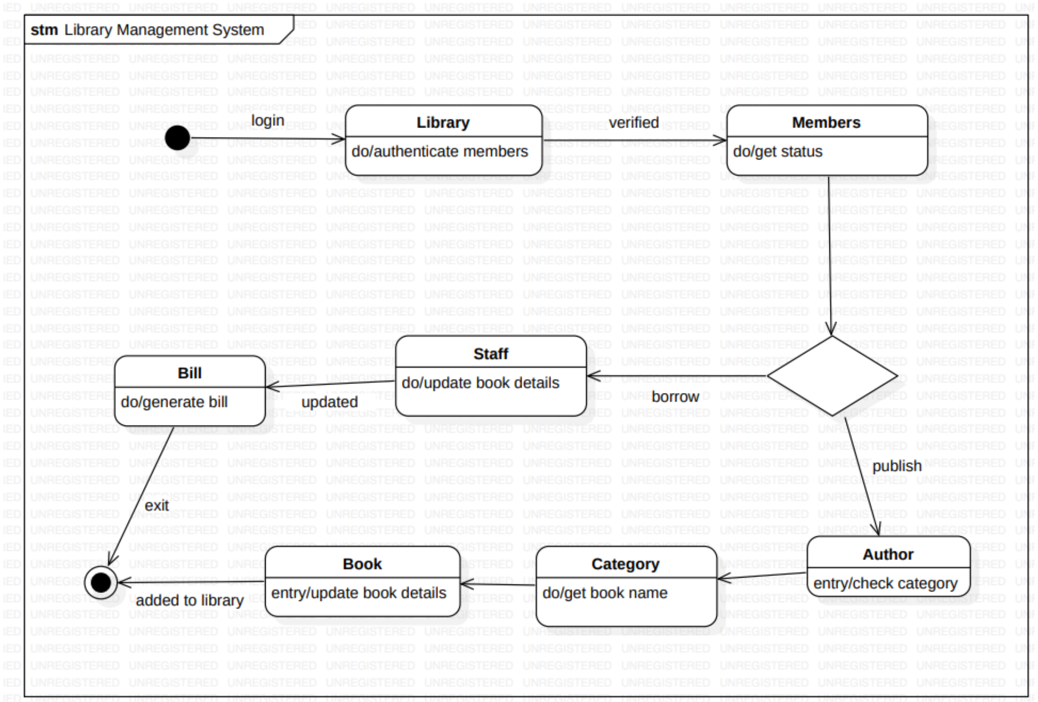
7. Non-Functional Attributes
   - Security measure: user authentication, acces control.
   - Reliability: system uptime, availability.
   - Reusability: modular design for ~~for~~ future enhancements.

8. Preliminary Schedule & Budget
   - Phases requirements analysis, design, development, testing
   - Development timeline, milestones
   - Budget covers software & hardware

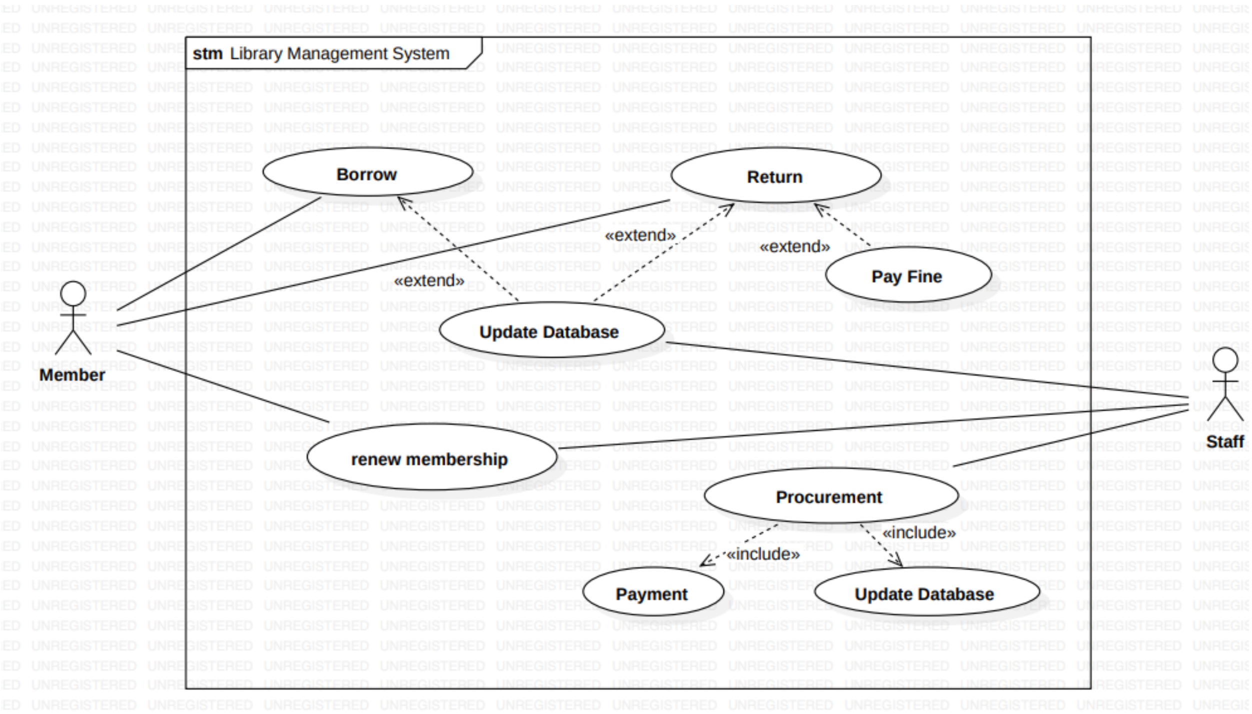
## 3.3 Class Diagram



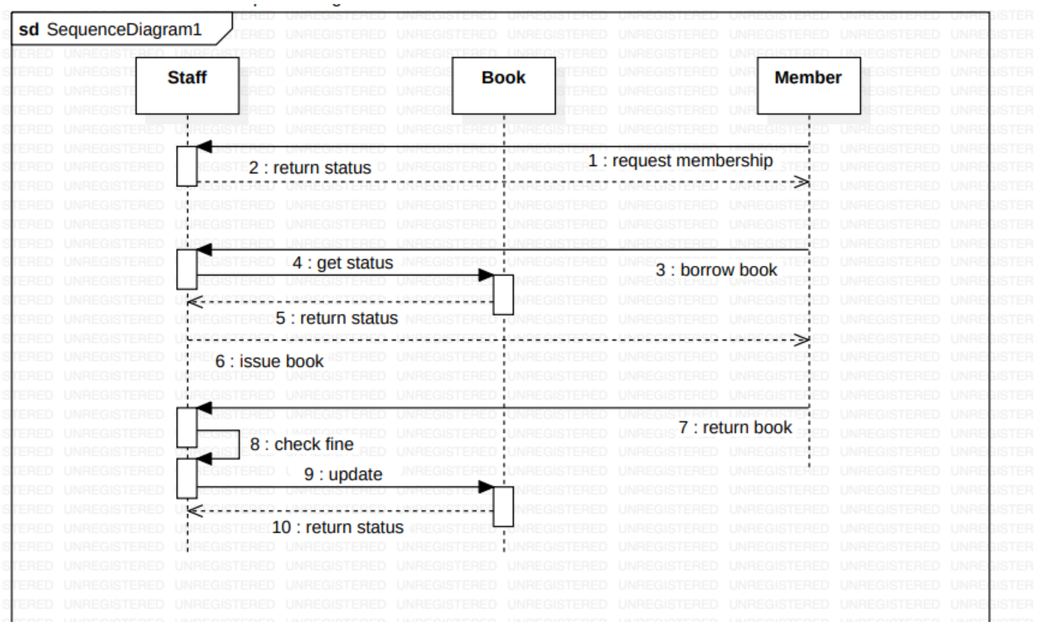
## 3.4 State Diagram



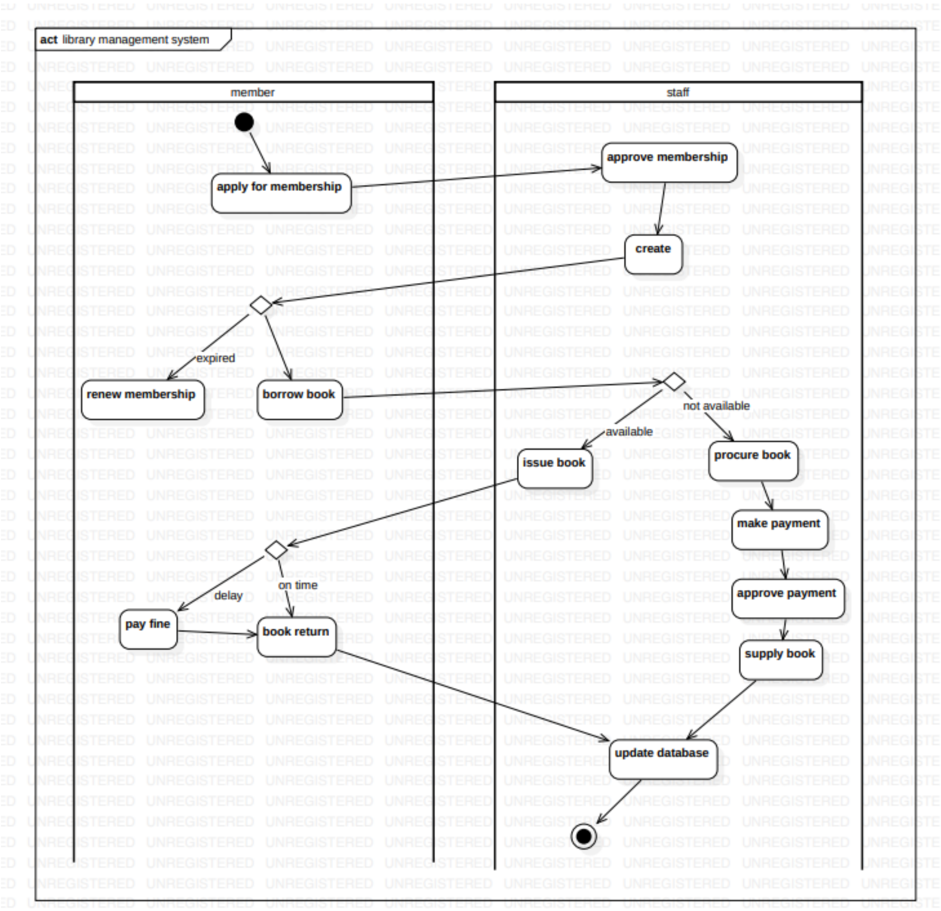
## 3.5 Use Case Diagram



## 3.6 Sequence Diagram

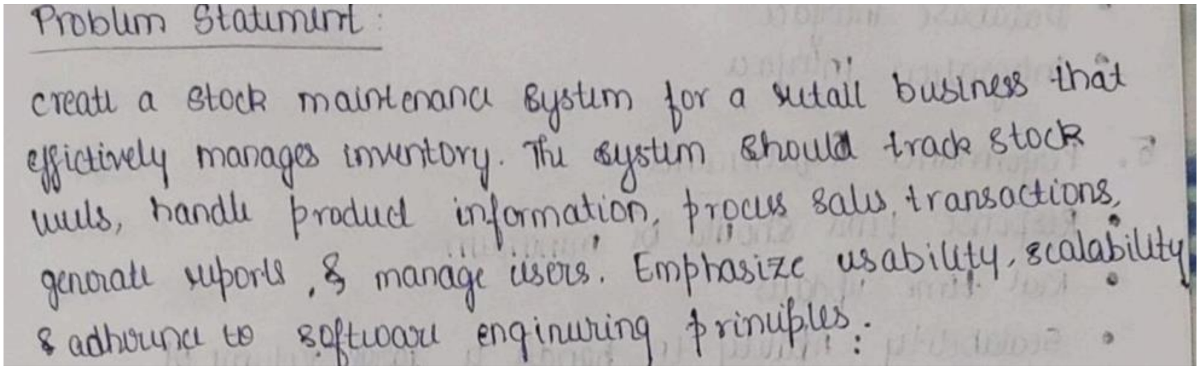


## 3.7 Activity diagram



# 4. Stock Maintenance System

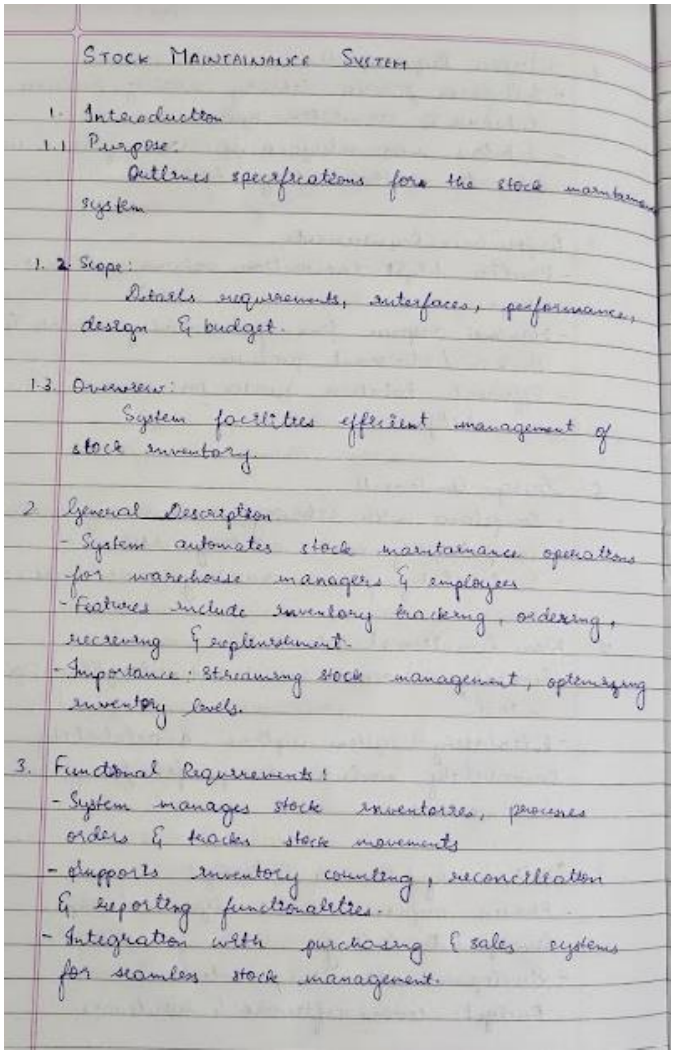
## 4.1 Problem Statement



Problem Statement:

Create a stock maintenance system for a retail business that effectively manages inventory. The system should track stock levels, handle product information, process sales transactions, generate reports, & manage users. Emphasize usability, scalability & adherence to software engineering principles.

## 4.2 SRS-Software Requirements Specification



STOCK MAINTAINANCE SYSTEM

1. Introduction

1.1 Purpose:

Outlines specifications for the stock maintenance system

1.2 Scope:

Details requirements, interfaces, performance, design & budget.

1.3. Overview:

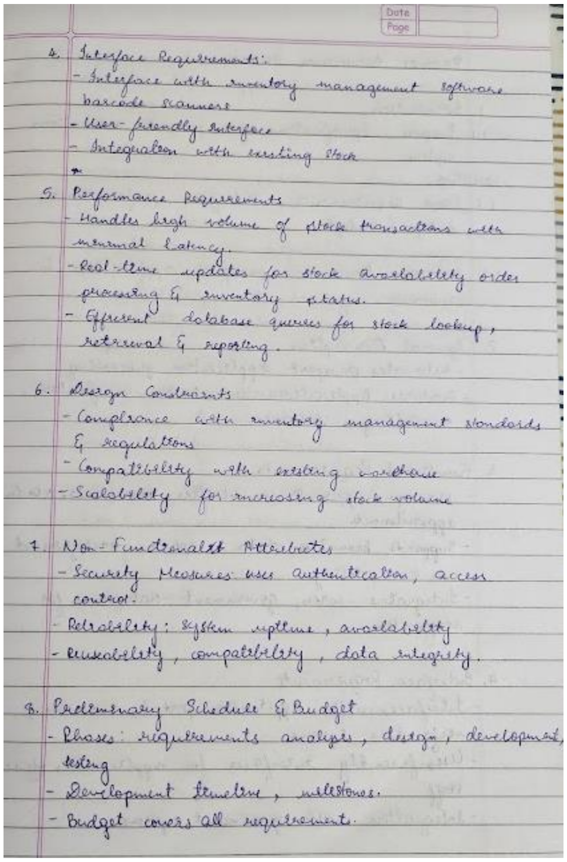
System facilitates efficient management of stock inventory.

2 General Description

- System automates stock maintainance operations for warehouse managers & employees
- Features include inventory tracking, ordering, receiving & replenishment.
- Importance: Streaming stock management, optimizing inventory levels.

3. Functional Requirements:

- System manages stock inventories, processes orders & tracks stock movements
- Supports inventory counting, reconciliation & reporting functionalities.
- Integration with purchasing & sales systems for seamless stock management.



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4. Interface Requirements:
- Interface with inventory management software barcode scanners
- User-friendly interface
- Integration with existing stock

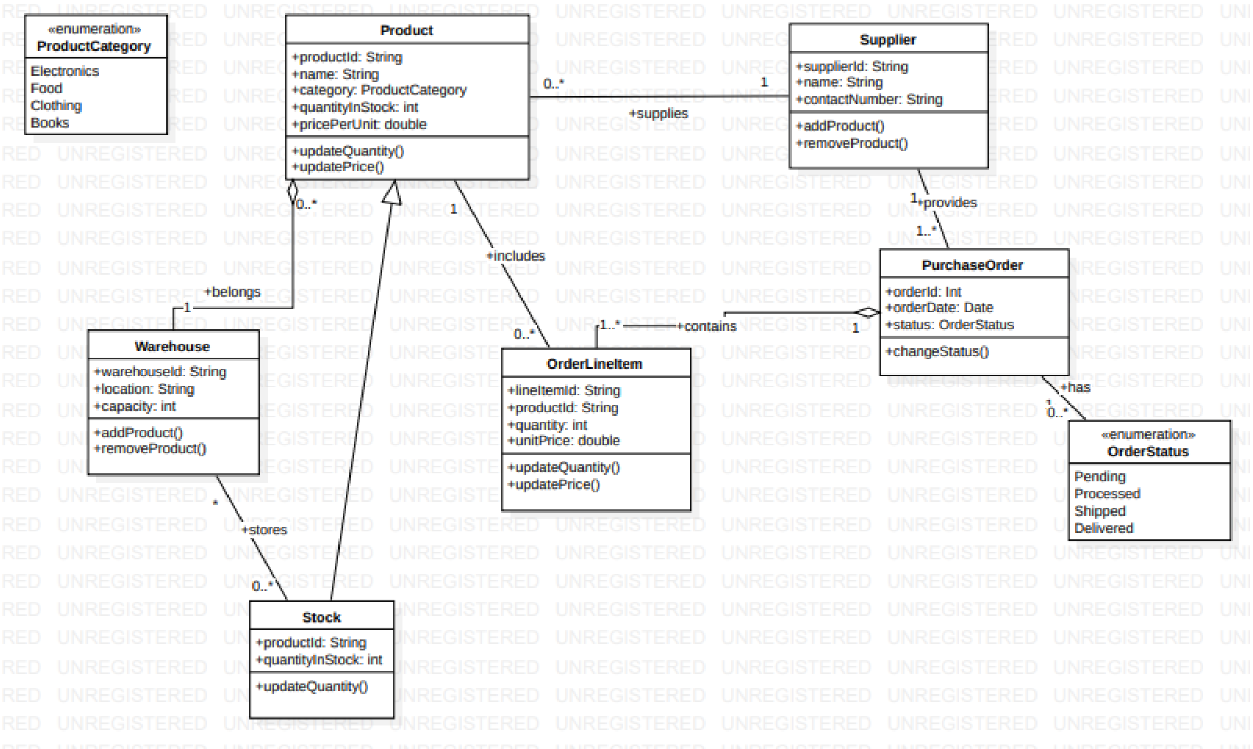
5. Performance Requirements
- Handles high volume of stock transactions with minimal latency.
- Real-time updates for stock availability order processing & inventory status.
- Efficient database queries for stock lookup, retrieval & reporting.

6. Design Constraints
- Compliance with inventory management standards & regulations
- Compatibility with existing warehouse
- Scalability for increasing stock volume

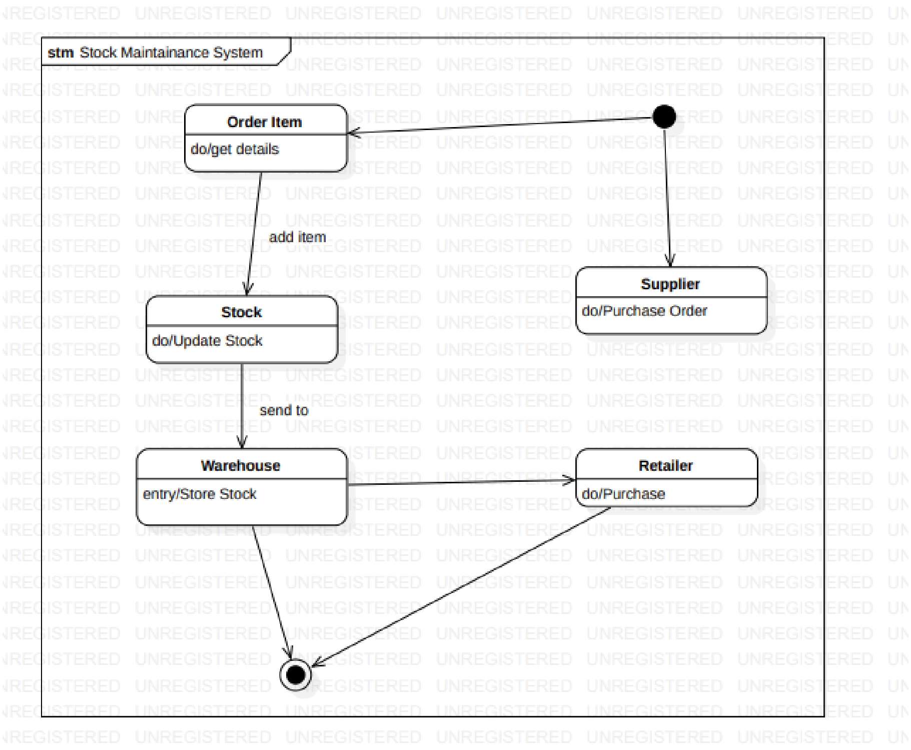
7. Non-Fundamental Attributes
- Security Measures uses authentication, access control.
- Reliability: system uptime, availability
- Reusability, compatibility, data integrity.

8. Preliminary Schedule & Budget
- Phases: requirements analysis, design, development, testing
- Development timeline, milestones.
- Budget covers all requirements.

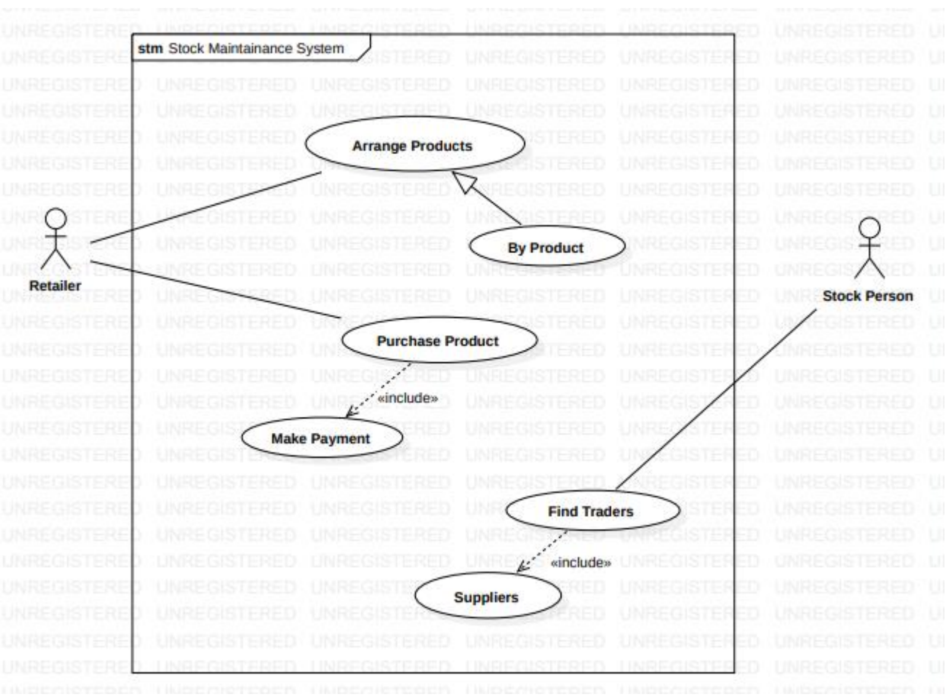
## 4.3 Class Diagram



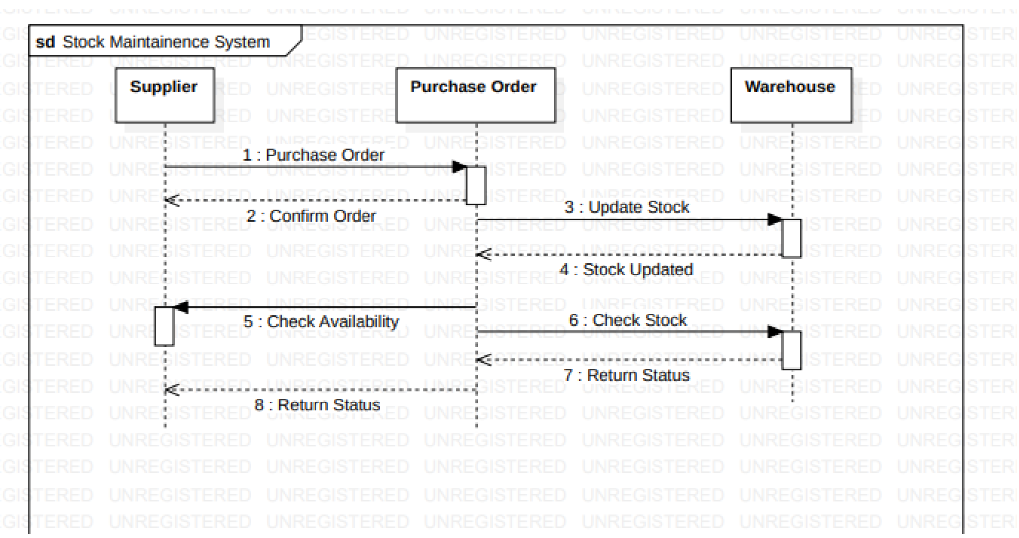
## 4.4 State Diagram



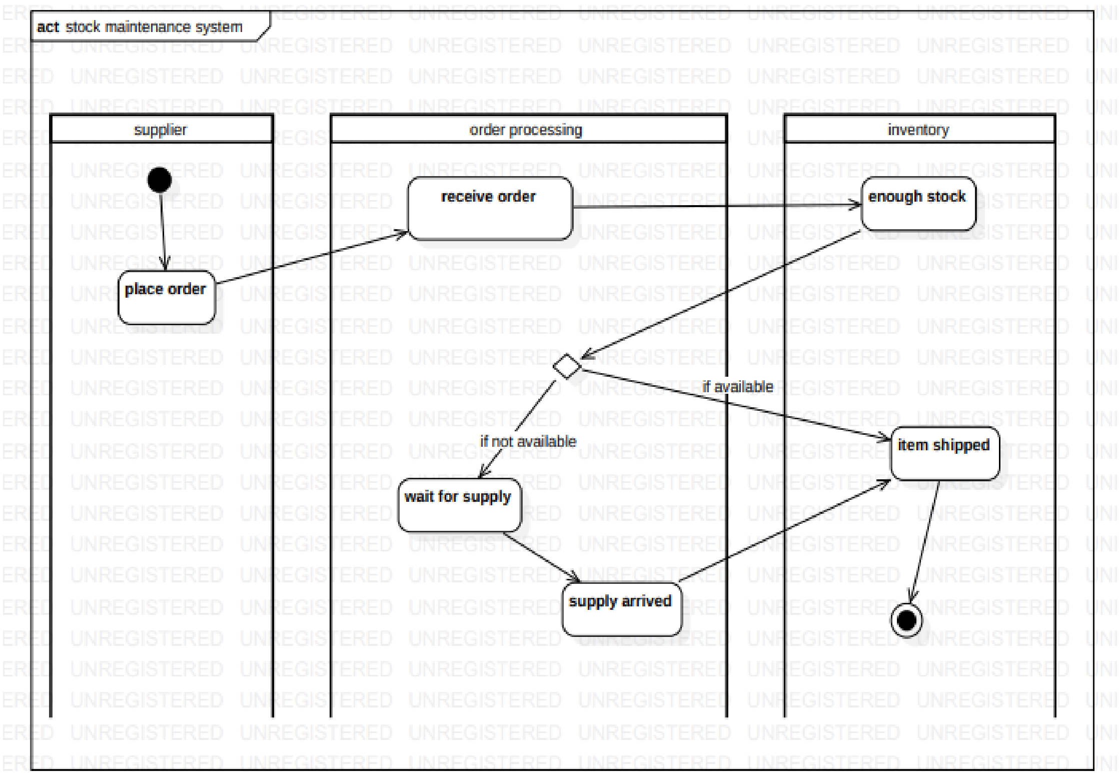
## 4.5 Use Case Diagram



## 4.6 Sequence Diagram

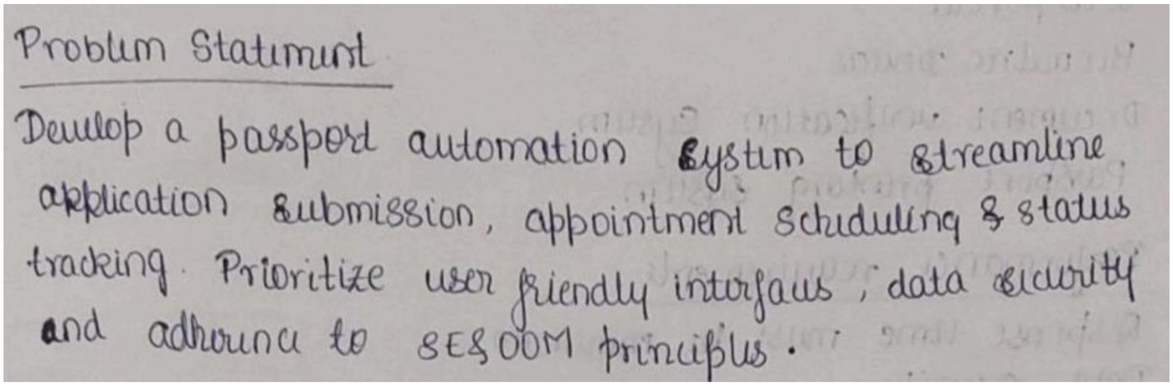


## 4.7 Activity diagram



# 5. Passport Automation System

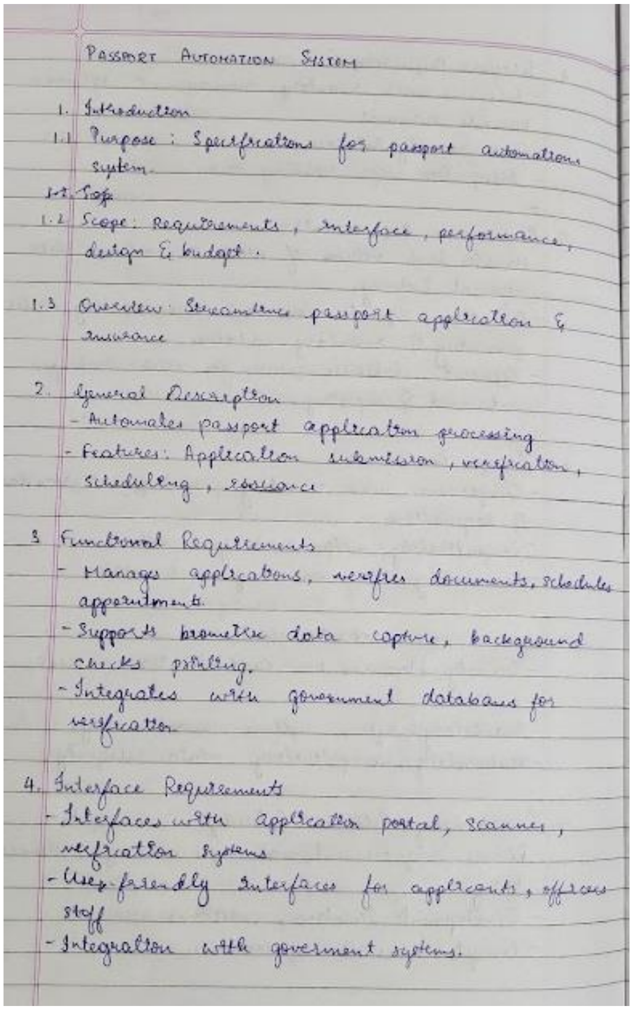
## 5.1 Problem Statement



Problem Statement

Develop a passport automation system to streamline application submission, appointment scheduling & status tracking. Prioritize user friendly interfaces, data security and adherence to SE&OOM principles.

## 5.2 SRS-Software Requirements Specification



PASSPORT AUTOMATION SYSTEM

1. Introduction

1.1 Purpose : Specifications for passport automations system.

~~1.2. Top~~

1.2 Scope: Requirements, interface, performance, design & budget.

1.3 Overview: Streamlines passport application & issuance

2. General Description

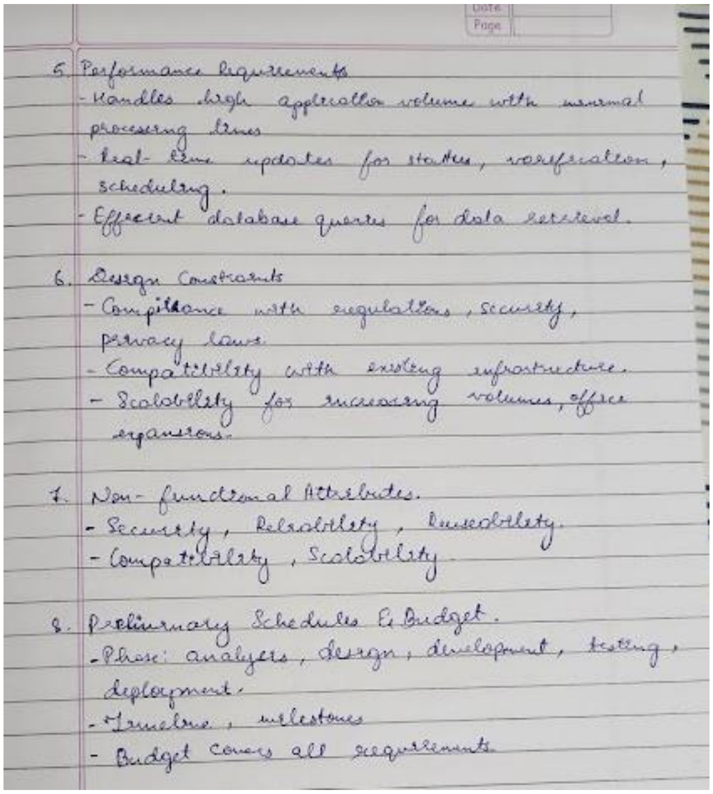
- Automates passport application processing
- Features: Application submission, verification, scheduling, issuance

3 Functional Requirements

- Manages applications, verifies documents, schedules appointments.
- Supports biometric data capture, background checks printing.
- Integrates with government databases for verification

4. Interface Requirements

- Interfaces with application portal, scanner, verification systems
- User-friendly interfaces for applicants, offices staff
- Integration with government systems.



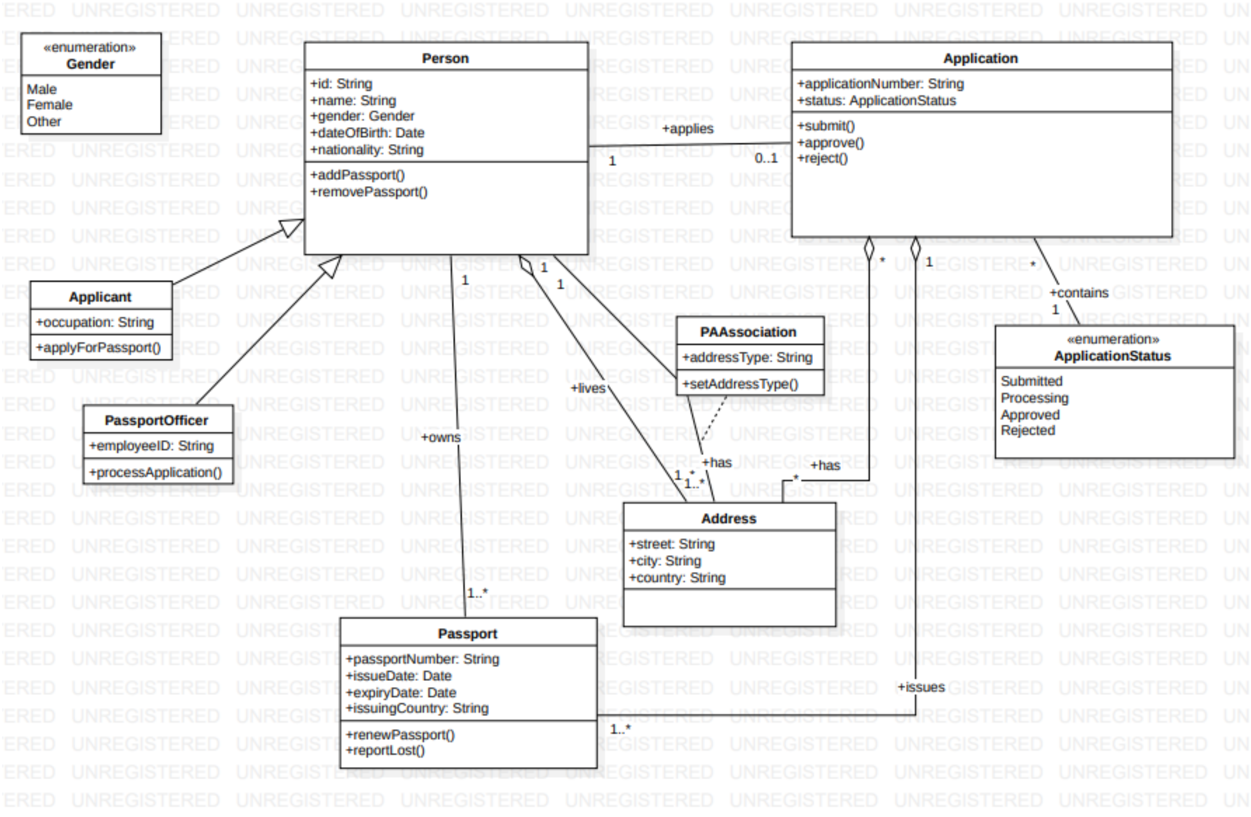
5. Performance Requirements
- Handles high application volume with minimal processing times
- Real-time updates for status, verification, scheduling.
- Efficient database queries for data retrieval.

6. Design Constraints
- Compliance with regulations, security, privacy laws
- Compatibility with existing infrastructure.
- Scalability for increasing volumes, office expansions.

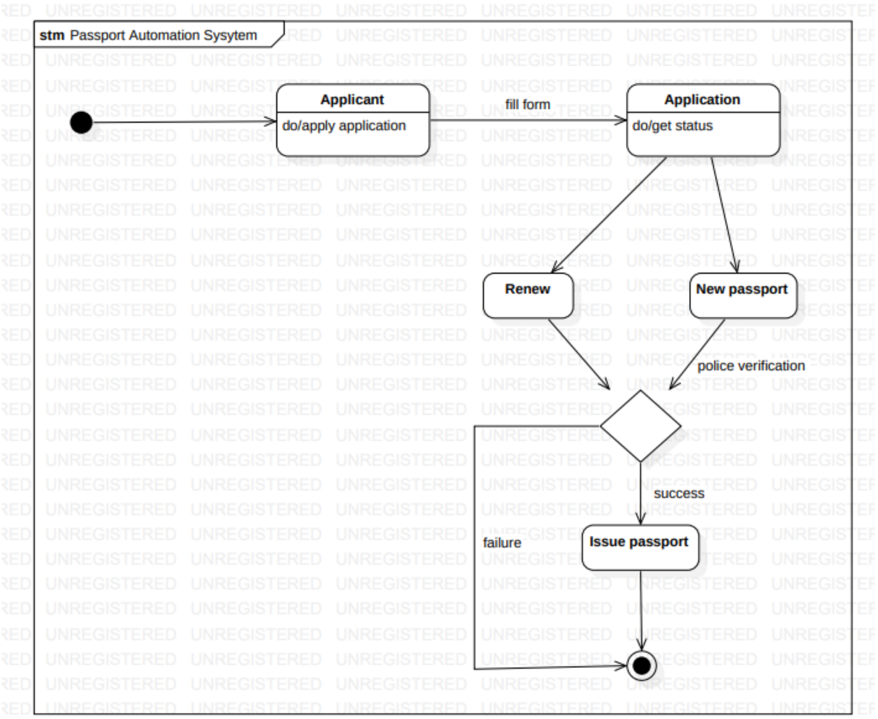
7. Non-functional Attributes.
- Security, Reliability, Usability.
- Compatibility, Scalability.

8. Preliminary Schedules & Budget.
- Phase: analysis, design, development, testing, deployment.
- Timeline, milestones
- Budget covers all requirements

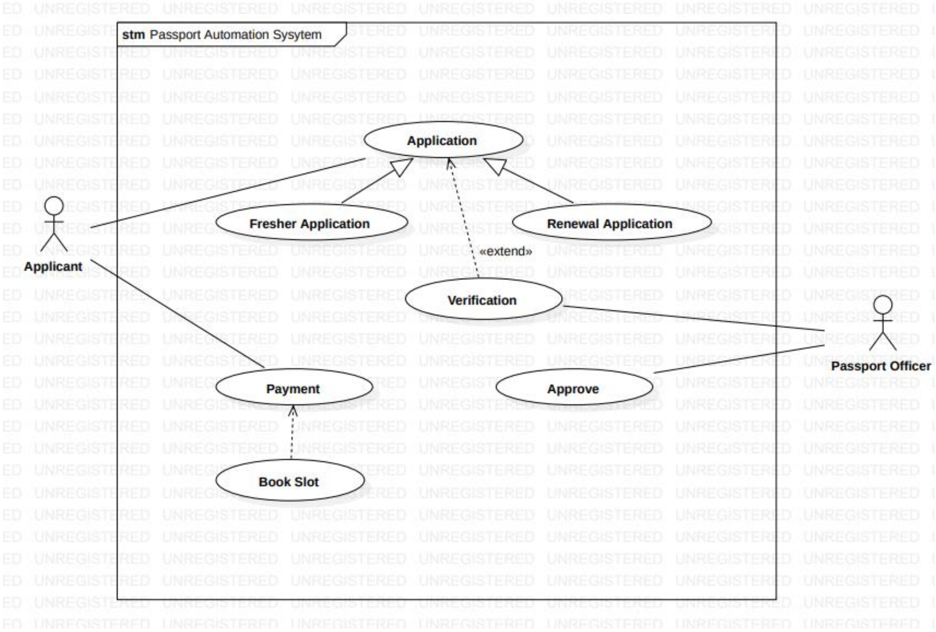
## 5.3 Class Diagram



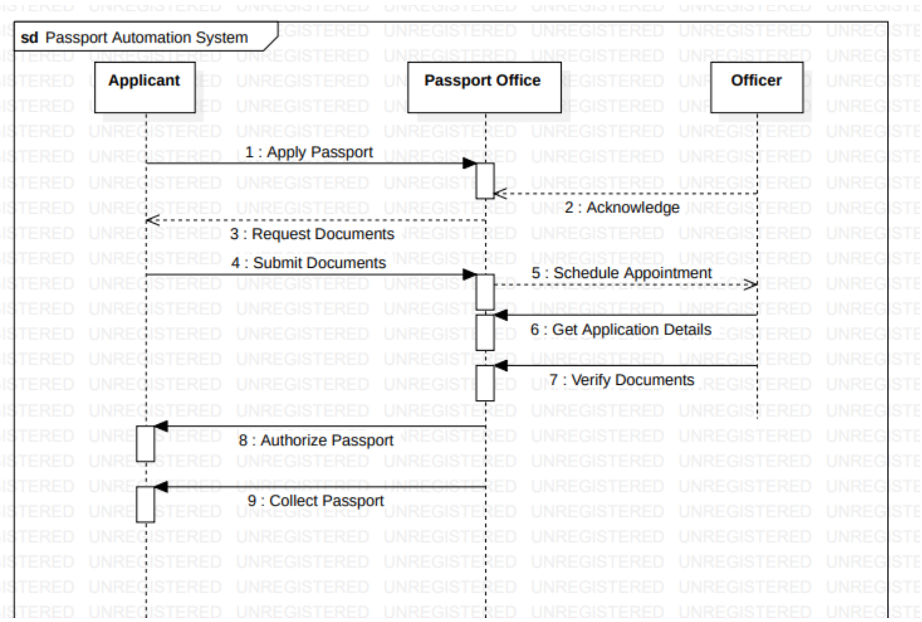
## 5.4 State Diagram



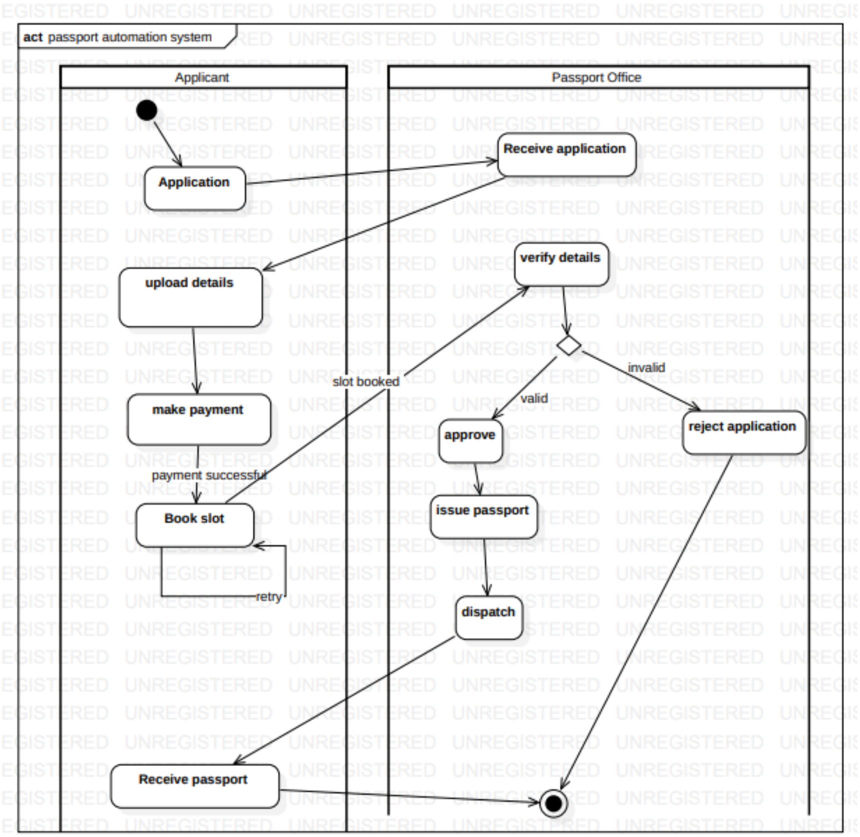
## 5.5 Use Case Diagram



## 5.6 Sequence Diagram



## 5.7 Activity diagram


act passport automation system
Applicant
Passport Office
Application
Receive application
upload details
verify details
make payment
payment successful
slot booked
Book slot
retry
valid
invalid
approve
reject application
issue passport
dispatch
Receive passport