

CREDIT CARD PROCESSING SYSTEM

Problem Statement:

Develop a robust and secure Credit Card Processing System to facilitate electronic transactions for businesses. The system should:

- Process transactions securely: Ensure the confidentiality and integrity of cardholder data using industry-standard encryption and security protocols.
- Support various payment methods: Accept major credit cards (Visa, Mastercard, Amex, etc.), debit cards, and potentially other electronic payment options.
- Integrate seamlessly with merchant systems: Allow easy integration with point-of-sale (POS) systems, e-commerce platforms, and other business software.
- Provide real-time transaction processing: Enable quick and efficient transaction authorization and settlement.
- Generate comprehensive reports: Provide detailed transaction reports for businesses, including sales analysis, fraud detection, and reconciliation.
- Ensure regulatory compliance: Adhere to all relevant payment card industry (PCI DSS) and other regulatory standards.

SOFTWARE REQUIREMENTS SPECIFICATION

30/9/24
CLASSMATE

Date
Page

9

Credit Card Processing System

1. Introduction

1.1 Purpose of this Document

The purpose of this document is to define the software requirements for the development of credit card processing system. This system will facilitate secure, efficient and reliable processing of credit card transactions.

1.2 Scope of the Document

This document covers the software specifications for a system that handles credit card authorization, transaction processing. It will be used by developers, testers and stakeholders to ensure the system meets both business and technical objectives.

1.3 Overview

This processing system will allow users to authorize, process and settle payments using credit cards. This system will be compatible with various payment gateways.

2. General Description

This system will provide users with secure and efficient way to complete transactions. Its key feature includes real-time authorization, encrypted communication, fraud detection mechanisms,

3. Functional Requirements

Authorization - The system will verify the availability of funds and validity of credit card details.

Transaction Processing - It will ensure purchases, ensuring accurate data processing.

Settlement - The system will transfer funds from customer's account to the receiver account.

4. Interface requirements

The system will offer an API for integration with e-commerce platforms.

5. Performance requirement

The system must process transaction within 2 sec under normal condition with failure rate of less than 0.1%.

6. Design constraints

- Must use secure encryption methods.
- Should be compatible with major credit card networks.

7. Non-functional

- Uptime should be at least 99.99%.
- All data must be encrypted during transmission.

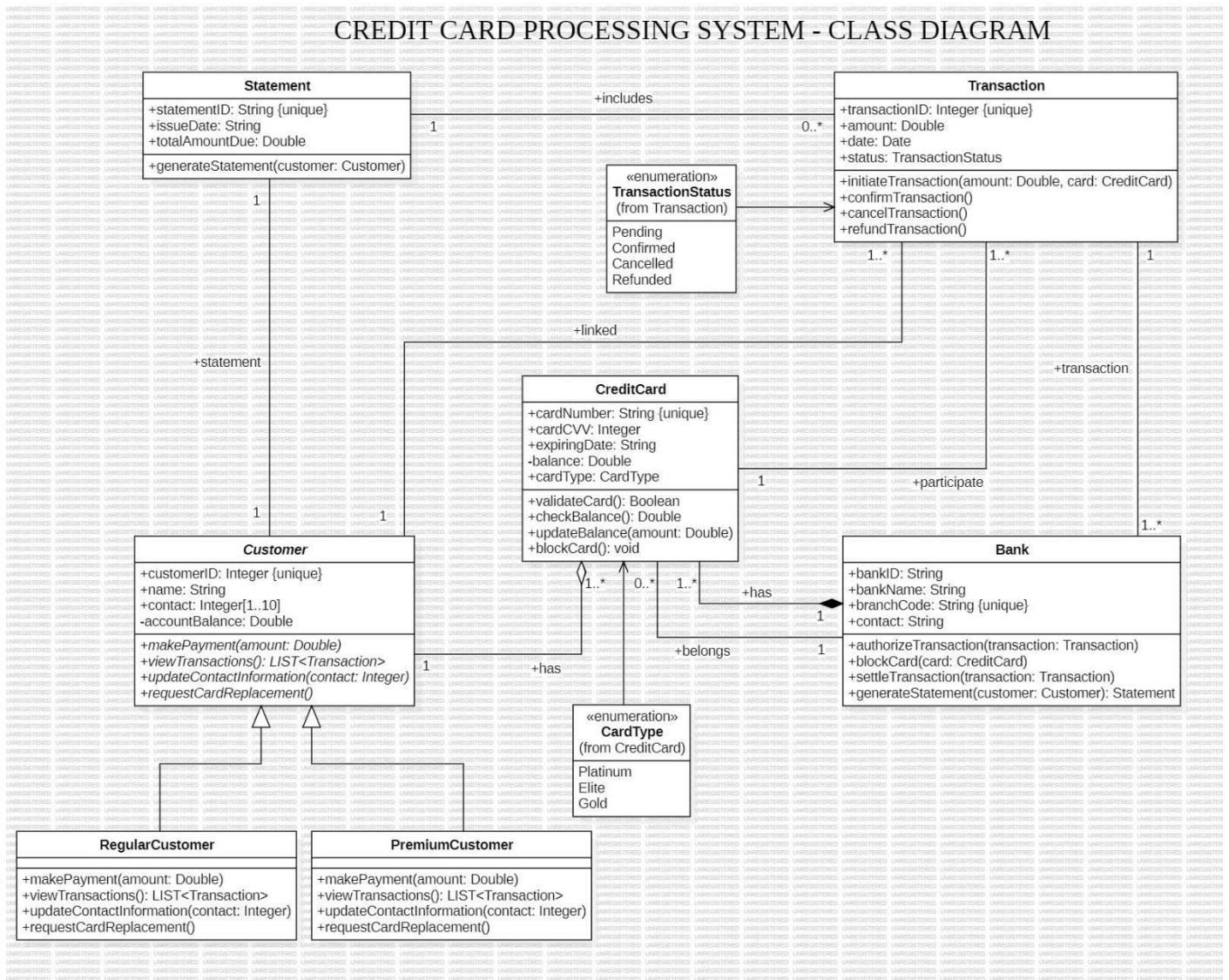
8. Preliminary Schedule & Budget

The project is estimated to be completed within 6 months and total development budget ₹ 1 lac.

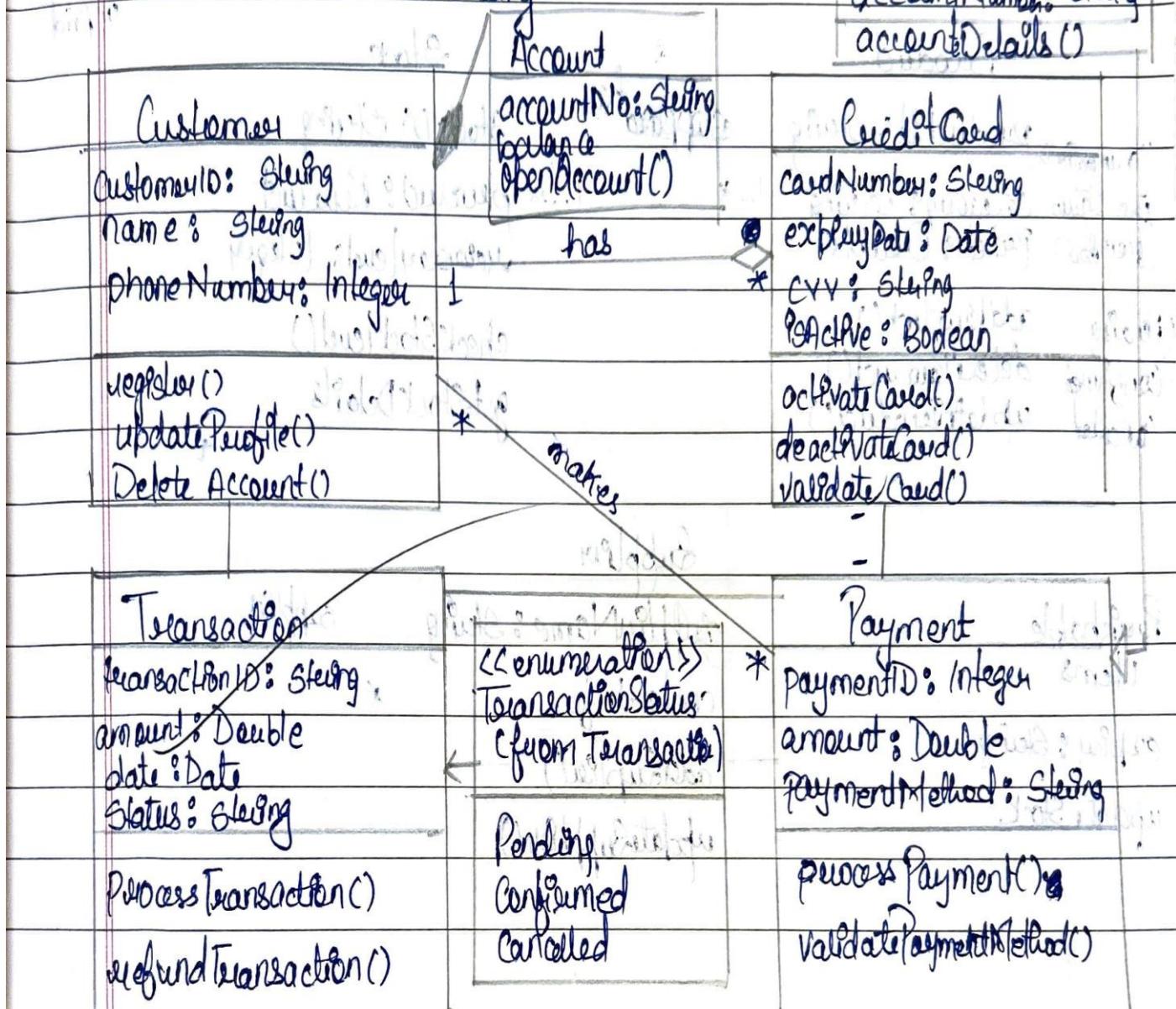
Development - ₹ 85,000, Software License - ₹ 10,000, Hardware - ₹ 25,000, Miscellaneous - ₹ 20,000.

UML DIAGRAMS

CLASS DIAGRAM



Credit Card Processing



Brief Description:

1. Statement

- Represents a billing statement for a customer, containing details of transactions and the total amount due.
- Includes a list of transactions associated with the statement.

2. Transaction

- Represents a single financial transaction, such as a purchase or payment.
- Contains information like transaction ID, amount, date, and status (Pending, Confirmed, Cancelled, Refunded).

3. CreditCard

- Represents a credit card issued to a customer.
- Contains attributes like card number, CVV, expiration date, card type, and current balance.
- Includes methods for validating card details and updating the balance.

4. Customer

- Represents a customer of the credit card processing system.
- Contains attributes like customer ID, name, contact information, and account balance.
- Includes methods for making payments, viewing transactions, updating contact information, and requesting card replacement.

5. Bank

- Represents a financial institution that issues credit cards and processes transactions.
- Contains attributes like bank ID, name, branch code, and contact information.
- Includes methods for authorizing and settling transactions, generating statements, and blocking cards.

6. RegularCustomer

- Represents a customer with standard credit card features and functionalities.

7. PremiumCustomer

- Represents a customer with premium credit card features and benefits, such as higher credit limits or additional rewards.

8. CardType

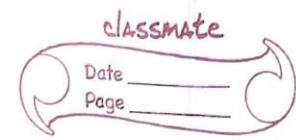
- Represents the different types of credit cards offered by the bank (e.g., Platinum, Elite, Gold).

9. TransactionStatus

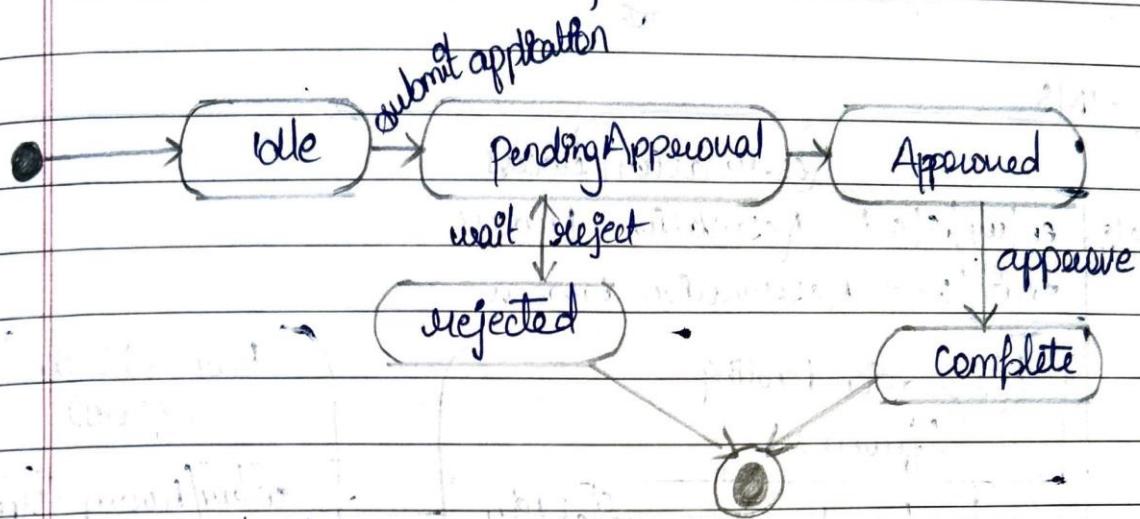
- Represents the possible states of a transaction (Pending, Confirmed, Cancelled, Refunded).

STATE DIAGRAM

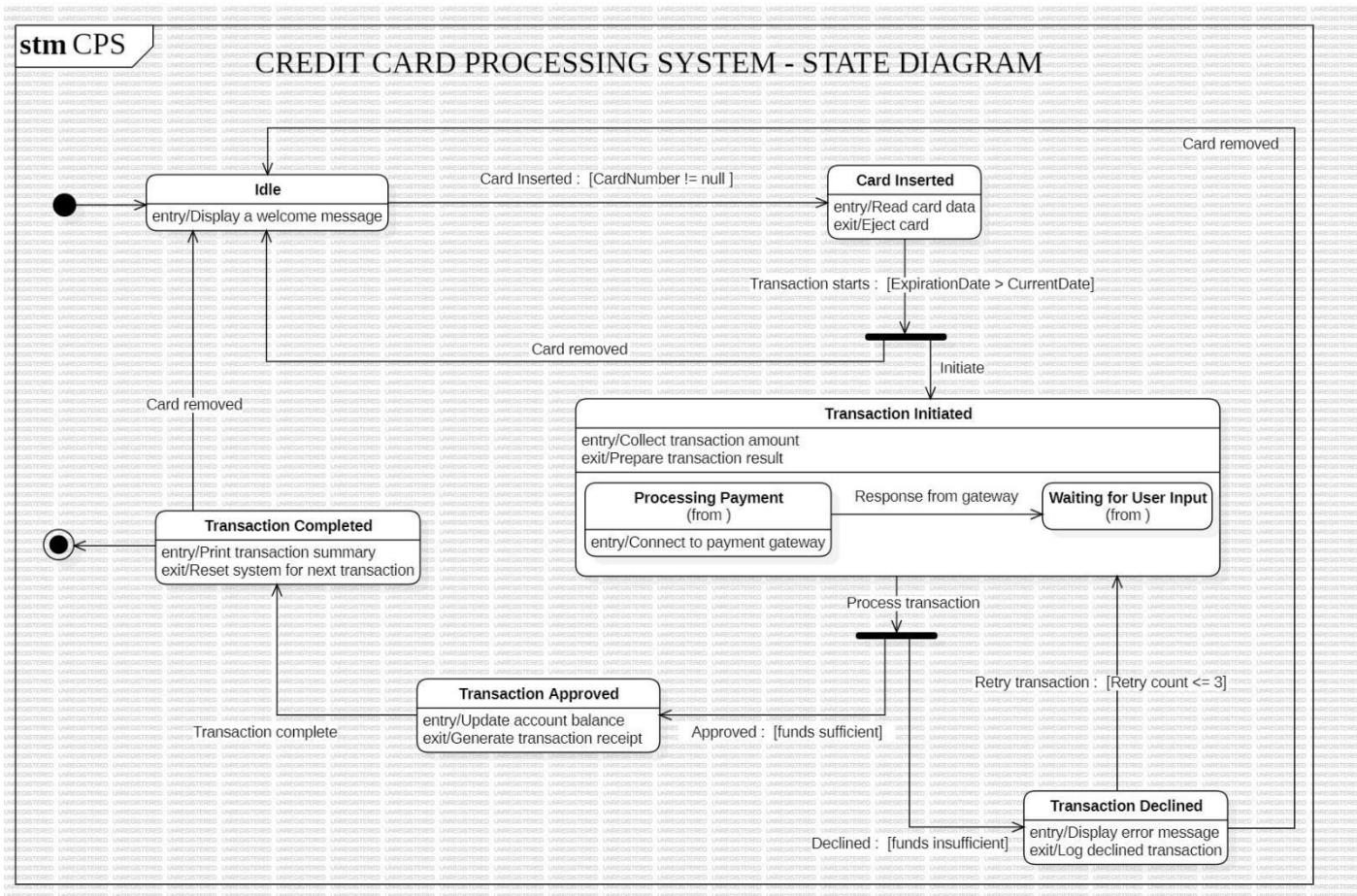
SIMPLE STATE DIAGRAM



8 Credit Card Processing

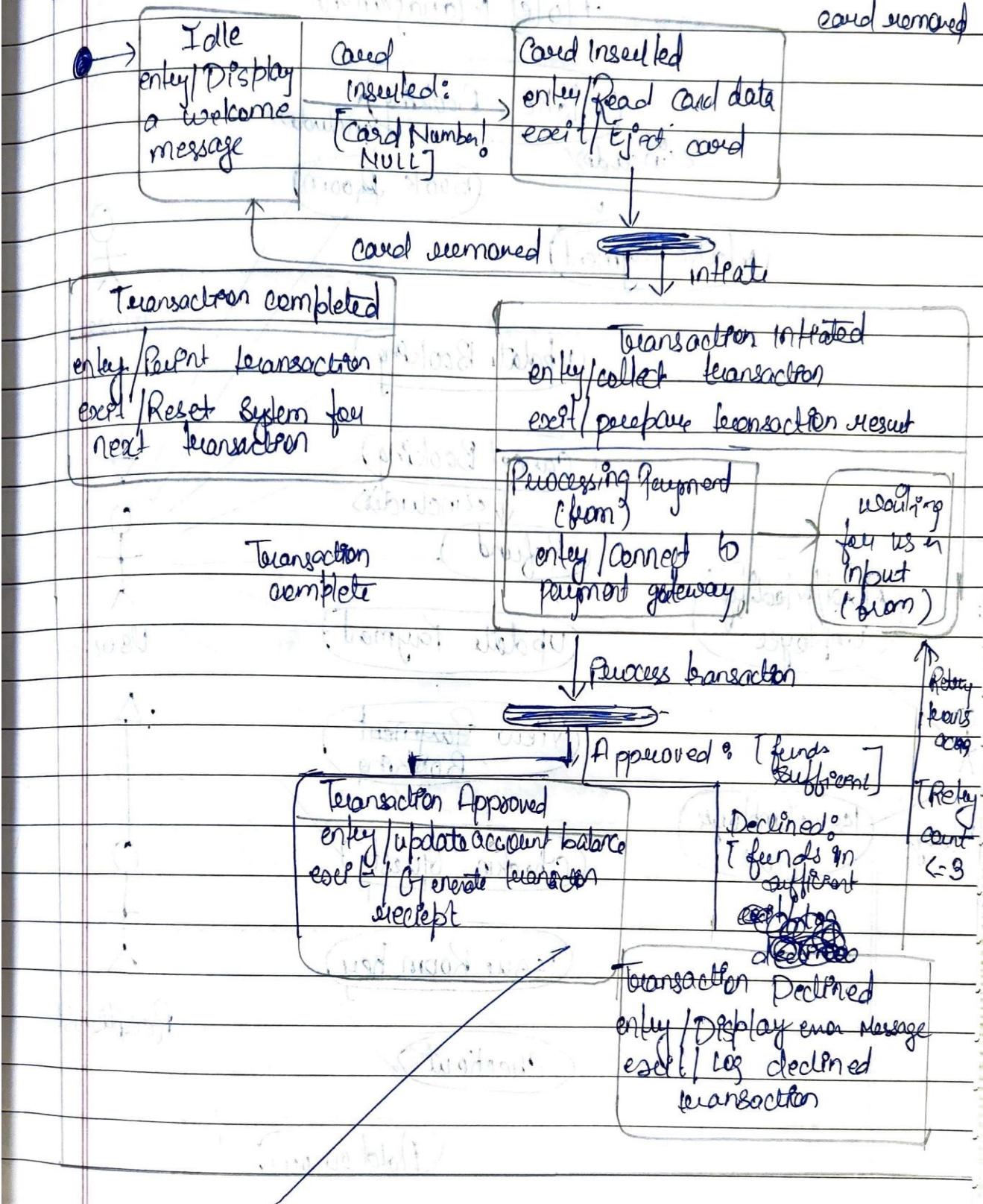


ADVANCED STATE DIAGRAM



Credit Card Processing System

Start CPS



Brief Description:

1. Idle:

- The initial state of the system.
- Displays a welcome message to the user.

2. Card Inserted:

- The state after a card is inserted.
- Reads card data and checks for valid expiration date.

3. Transaction Initiated:

- The state where the transaction process begins.
- Collects transaction amount and initiates communication with the payment gateway.

4. Processing Payment:

- The state where the system is interacting with the payment gateway.
- Connects to the payment gateway and processes the transaction.

5. Waiting for User Input:

- The state where the system awaits further input from the user.
- May be used for additional authorization steps or error resolution.

6. Transaction Approved:

- The state when the transaction is successfully approved.
- Updates the account balance and generates a transaction receipt.

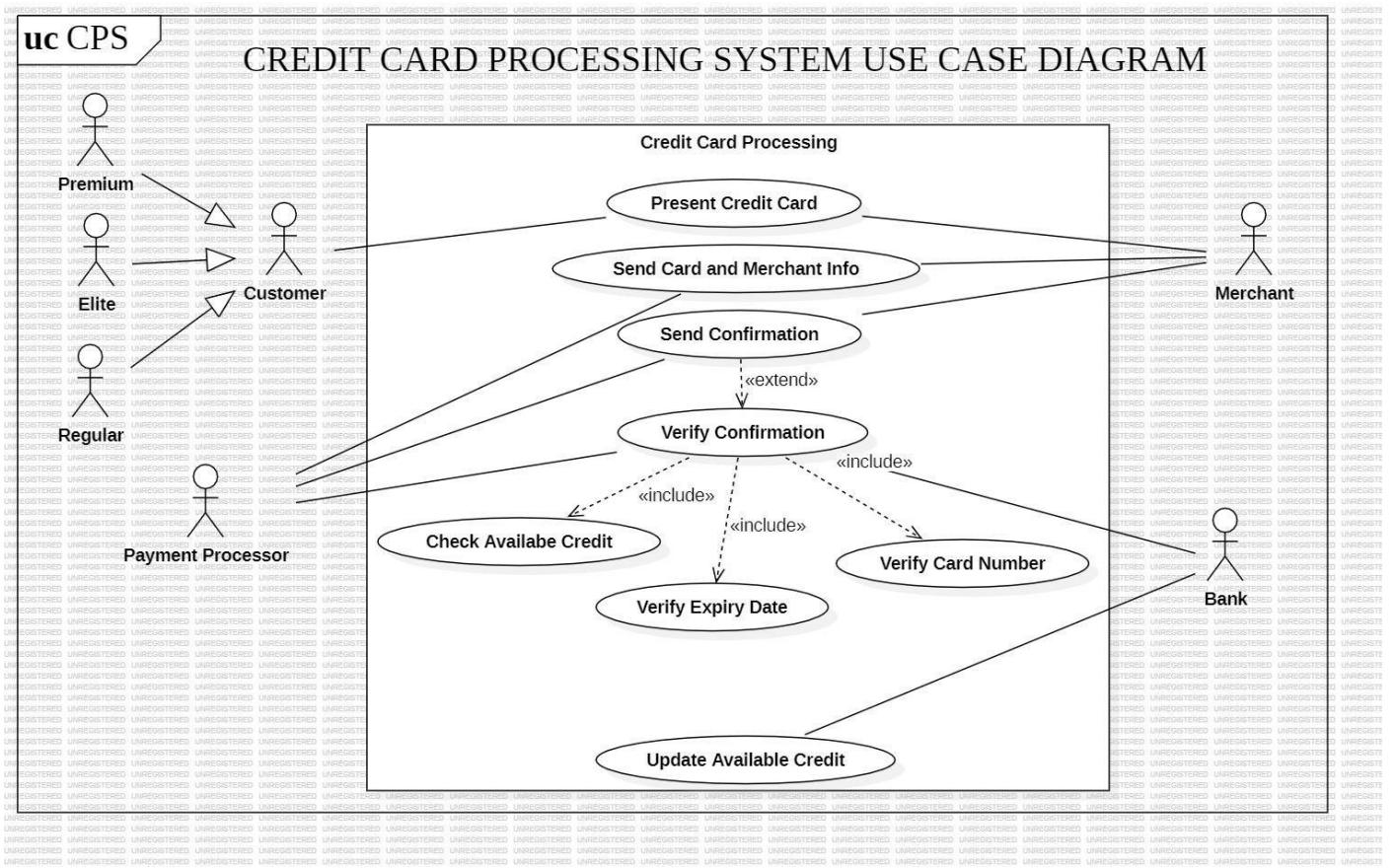
7. Transaction Declined:

- The state when the transaction is declined.
- Displays an error message to the user and logs the declined transaction.

8. Transaction Completed:

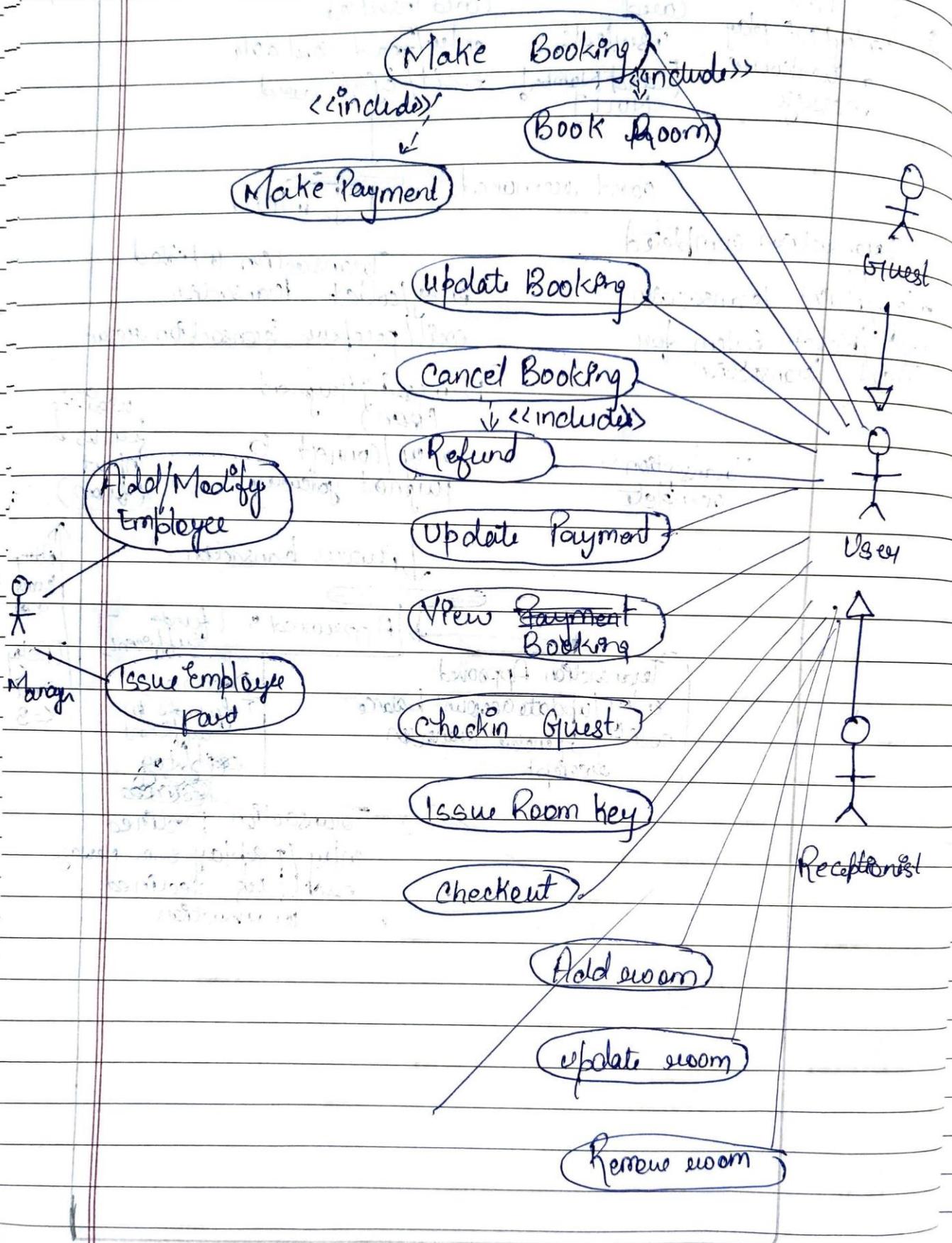
- The final state after a successful or declined transaction.
- Prints a transaction summary and resets the system for the next transaction.

USE CASE DIAGRAM



Use Case Diagram

+ Hotel Management



Brief Description:

Use Cases

- **Present Credit Card:** The customer presents their credit card for a transaction.
- **Send Card and Merchant Info:** Information about the card and the merchant is sent for processing.
- **Send Confirmation:** A confirmation message is sent to the customer and/or merchant.
- **Verify Confirmation:** This use case includes several sub-use cases:
 - **Check Available Credit:** Verifies if the customer has sufficient credit available.
 - **Verify Card Number:** Validates the card number for accuracy.
 - **Verify Expiry Date:** Checks if the card is not expired.
- **Update Available Credit:** Updates the customer's available credit balance after a successful transaction.

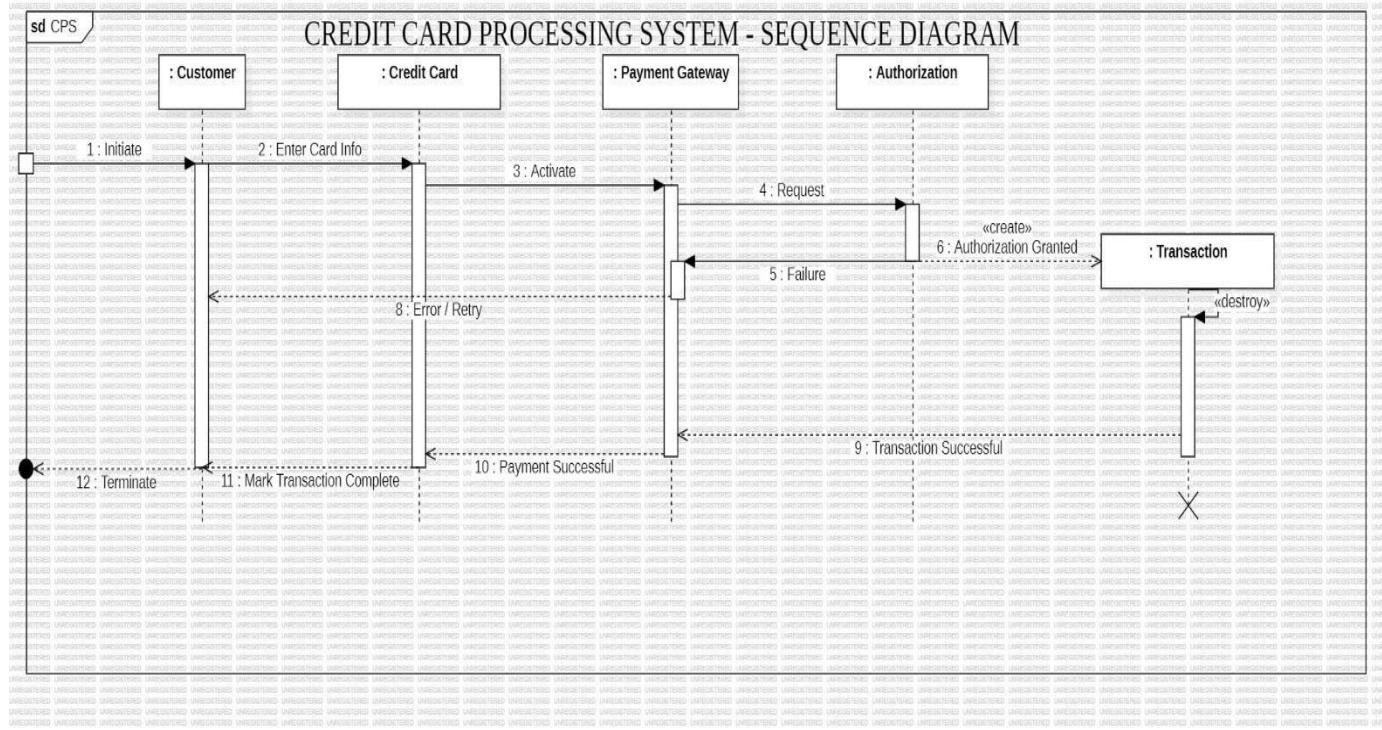
Actor Interactions

- **Customer:** Initiates the transaction by presenting the credit card and receives confirmation.
- **Merchant:** Receives payment information and sends confirmation to the customer.
- **Payment Processor:** Handles the verification and processing of the transaction.
- **Bank:** Provides credit information and updates the customer's account balance.

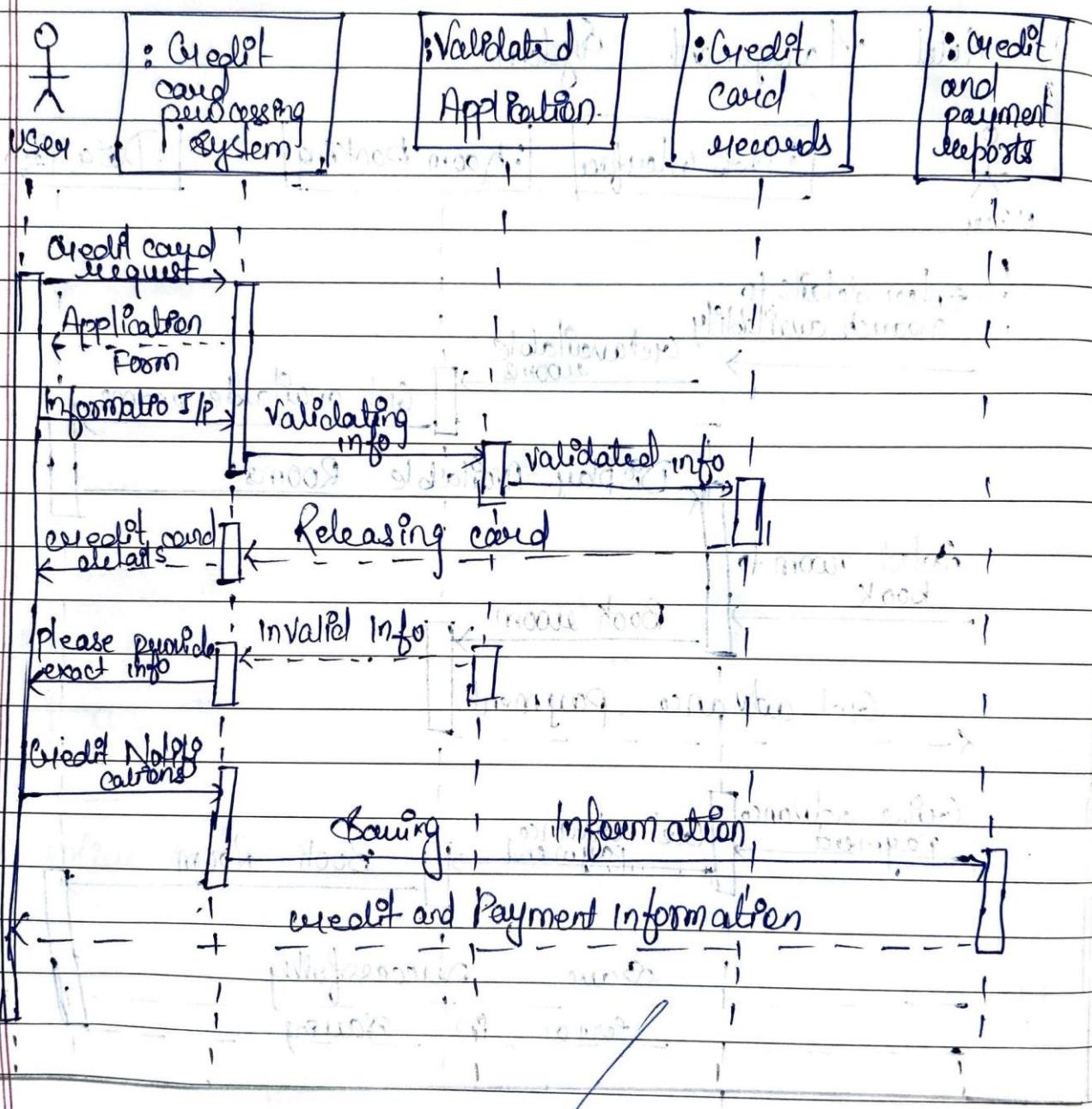
Relationships

- **Include:** Indicates that one use case includes the functionality of another. For example, "Verify Confirmation" includes "Check Available Credit," "Verify Card Number," and "Verify Expiry Date."
- **Extend:** Represents optional behavior that can be added to a use case under specific conditions.

SEQUENCE DIAGRAM



Credit card Processing

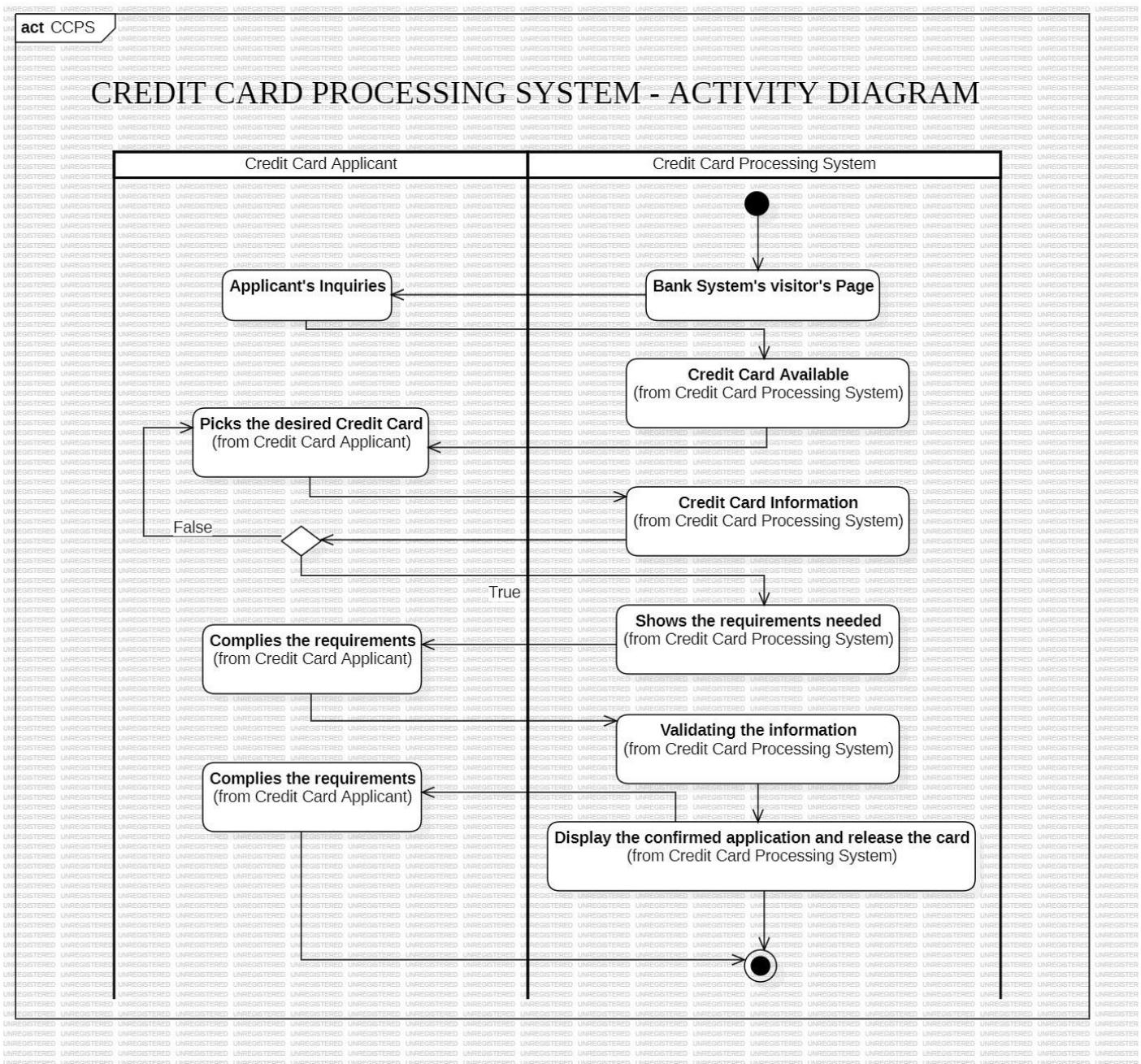


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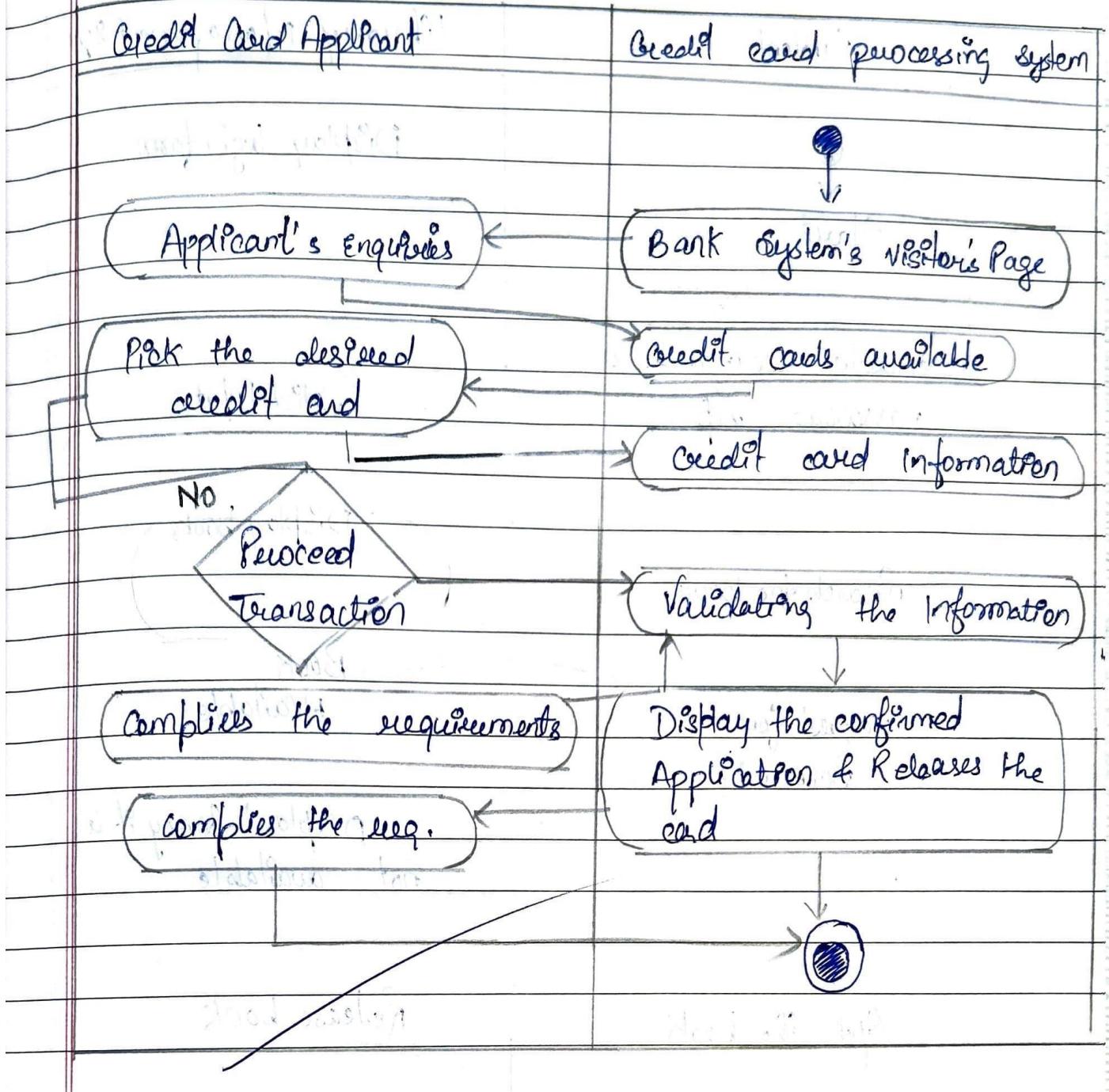
Brief Description:**Interactions**

1. **Initiate:** The customer initiates a transaction.
2. **Enter Card Info:** The customer enters their card information.
3. **Activate:** The credit card is activated for the transaction.
4. **Request:** The system sends a request to the payment gateway for authorization.
5. **Failure:** If authorization fails, an error message is displayed.
6. **Authorization Granted:** If authorization is successful, a transaction object is created.
7. **Payment Successful:** The payment is processed successfully.
8. **Error/Retry:** If an error occurs, the system may attempt to retry the transaction.
9. **Transaction Successful:** The transaction is completed successfully.
10. **Mark Transaction Complete:** The system marks the transaction as complete.
11. **Terminate:** The transaction process is terminated.

ACTIVITY DIAGRAM



Credit Card Processing



Brief description:

Activities:

1. **Applicant's Inquiries:** The process starts with the applicant making inquiries about available credit cards.
2. **Bank System's Visitor's Page:** The applicant is presented with information about available credit card options.
3. **Picks the Desired Credit Card:** The applicant selects a specific credit card based on their needs and preferences.
4. **Credit Card Information:** The system displays detailed information about the selected credit card, including terms and conditions.
5. **Complies with the Requirements:** The applicant reviews and confirms that they meet the eligibility criteria for the selected credit card.
6. **Shows the Requirements Needed:** If the applicant does not meet the requirements, the system displays the necessary requirements to be eligible.
7. **Validating the Information:** Once the applicant meets the requirements, the system validates the information provided in the application.
8. **Display the Confirmed Application and Release the Card:** If the application is approved, the system displays a confirmation message and initiates the process of issuing the credit card to the applicant.