IT-632-Software Engineering

Cafeteria Management System (Cashless Canteen)

Low Level Design 1.1

Team-2

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Document Revision History:

Version	Primary Author(s)	Description	Reviewer(s)	Date
1.0	PuravChitaliya, IrfanWadia, Dipen, ,Ashish, Akash,Ankush.	Project Plan	AakashThakkar	15October, 2013
2.0	IrfanWadia	Final Update		19 November, 2013

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1. Introduction

A software design document (SDD) is a written description of the software product, that a software designer writes in order to give a software development team an overall guidance of the architecture of the software project.

1.1 Purpose

The purpose of this document is to outline the technical design of the Cafeteria Management Portal and provide an overview for its usage and management by the users and the site admin respectively. Its main purpose is to –

- Provide low level design of our system
- Provide the link between the Functional Specification and the detailed Technical Design document
- Document the functionality provided by each module or group of modules and show how the various components interact in the design
- This document is intended to help the coding team to build our system.

1.2 Document Overview

This document is organized into the following sections:

- Introduction: Provides information related to this document (e.g. purpose, scope, term definitions etc.)
- Design Overview: Describes the approach and guiding principles
- System Overview: Describes User Characteristics, User Objectives, Hardware and software Requirements, interfaces and Design Constraints.
- System Design: Contains use case diagram, E-R diagram, Relational Scheme, Data-flow Diagram.
- Architecture: Describes architecture design and also describes briefly the functionality of various modules and how group of modules interact to provide common functionality.
- Glossary

1.3 Scope

This document contains the low level design which shows the various modules and how they interact with each other thus enabling our system to work. The Design for various modules outlined in this document builds upon the scope defined in the Requirements phase. This document will serve as a link between design team and coding team and will be frequently referred by coding team to build our system.

1.4 Definitions, Acronyms and Abbreviations

- **Struts2:** Java Web Development Framework.
- **MySQL** – Relational Database Management System (RDBMS)

1.5 Methodology, Tools, Techniques

- Visio
- Microsoft Word
- Struts2

1.6 Key Stakeholders

Students, Faculty, Canteen Owners, CMC Committee.

1.7Intended Audience

This document is meant for the technical team for reference during the implementation phase.

2. Design Overview

We aim to design a Cafeteria Management System that helps its end users to get rid of the cash handling problems like problems of managing change and also would make the system in such a way that it decreases the average time of each canteen transaction effectively. The site will have various features for its users and administrator as well.

The user data, registration details, order information, etc would be stored in the database. ER diagram of the database are depicted below.

2.1Background Information

At system level we need to understand the user requirements very clearly before designing the database, information architecture, the work-flow of the application and the User Interface Design. For the same we have analyzed the various forms filled by the potential website users, to understand their expectations.

2.2 Current Process

The current work done for designing includes:

1. Logic Design: Understanding the requirements and dividing the project into various modules. Each part is independent and will be developed as parts of separate evolutions.

2. Technical Design: Further we have done the flow of processes which is described in section 4 “Use case Diagrams”, understood database by using E-R Diagram. The Activity

and Sequence Diagram also helps in understanding each and every use case. The class diagram depicts the object oriented ness of the system.

2.3 Guiding Principles

1. **Scalability** – It can be used for any canteens of any institutions by doing some modifications. It can become more generalized.
2. **Maintainability** - It is easy to maintain, as only the admin is allowed to update the information.
3. **Portability**–It is a web portal and hence all somebody needs is a web browser that can run on any given operating system and on any mobile device with a web browser.

3. System Overview

3.1 User Characteristics

- Literate: Moderately.
- Computer knowledge: Almost Low.
- Knowledge of money and finance: Yes.
- Age Group: Mostly students so around 18-30, except the faculty and admin staff.

3.2 User Problem Statement

Cafeteria of any institution is very important and has an intimate value attached with it. But what if the users of the cafeteria are face issues of carious kinds in the system itself. The current system of the cafeteria has some serious problems with it. The problems that the users are facing at this point of time is as below:

The problem of change, exchange.

The necessity to keep cash handy all the time while purchasing from the cafeteria.

Loss of wallets/cash in the cafeteria.

The handling of coupons.

The denial of service by the café owners because of no exchange.

- Lengthy and time consuming transactions.
- No records or accounts of the transactions.
- Problems of loans and advances.

3.3 System Objectives

This section outlines the System objectives and requirements for the system.

- Providing a portal facilitating quick, cashless and less erroneous transactions in the cafeteria.
- Providing reports to the users about their transactions in the cafeteria.
- Enabling users to lodge a complaint and give feedback to the Cafeteria Management committee (CMC).
- Less involvement of hard cash in the cafeteria.

3.4 Hardware Requirements

Any computing machine – PC, tablet, smart-phone, etc. with internet access is the only hardware requirement from the user side to access the website. The website will be hosted on DA-IICT's servers. And the desktop applications would be installed into the cafeteria and admin side.

3.5 Software Requirements

The project development would require Adobe Dreamweaver to develop the themes of the website in terms of .css and .jsp source files and other development work. At the server side, we would require XAMPP software to provide the server capability. XAMMP also contains within it a MySQL database server program and apache tomcat web server program. The server running XAMPP will be a database server as well as a web server. The database at the server side will be in MySQL and will be used for maintaining whole of the website's and users' information.

We will use Microsoft Visio for making various Diagrams like sequence diagram, Activity diagram, Data flow Diagram, Database Schema, etc. Microsoft word will be used for writing the documents.

3.6 Interfaces

We would be basically providing 3 interfaces:

1. Users (Students, Faculty and Admin persons)
2. Cafeteria Owners.
3. Administrator.

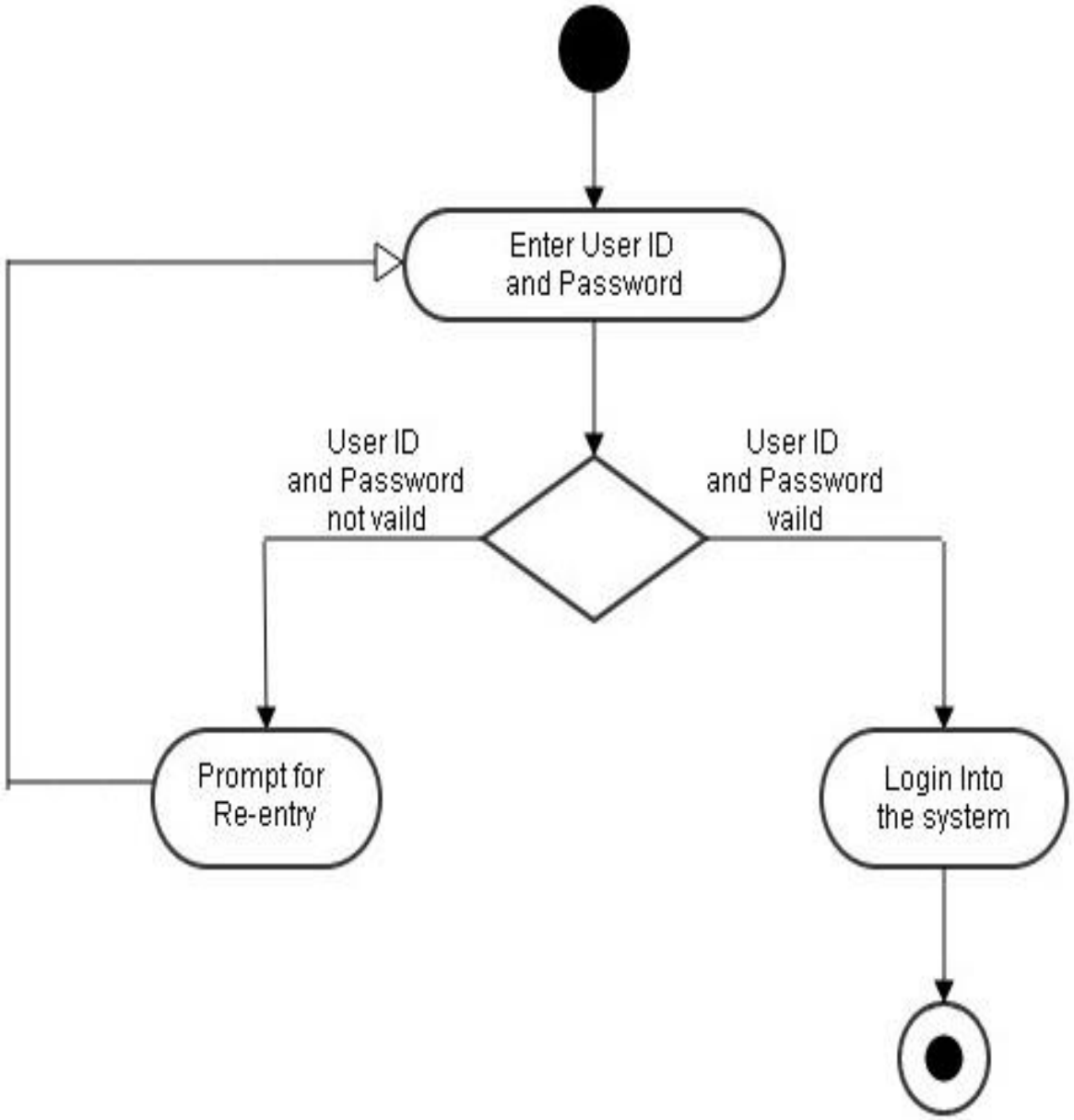
The admin and cafeteria owner would be provided with a desktop application to make transactions faster.

4. Design Overview

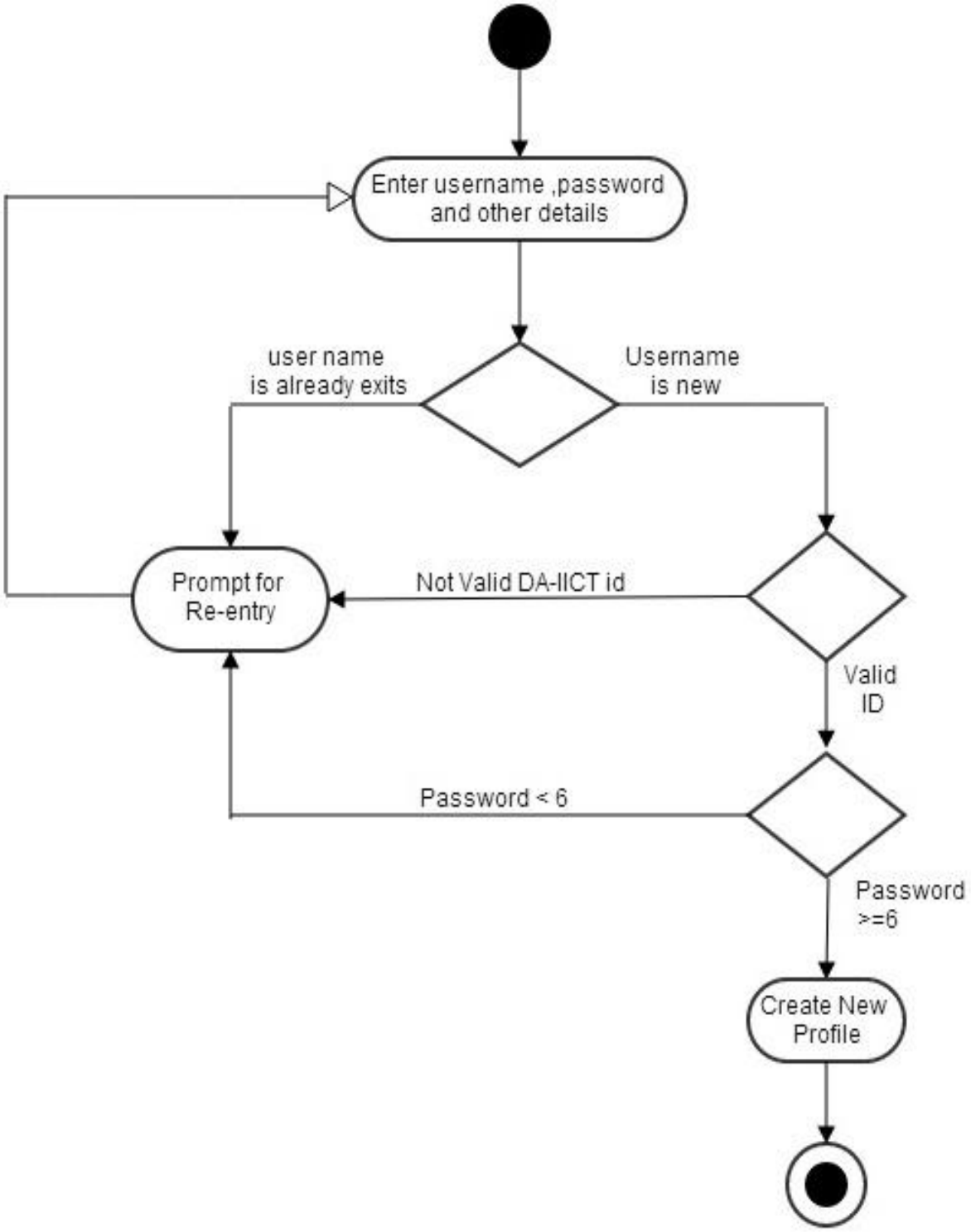
4.1 Activity Diagrams

Users of the system will be the Admin, students, faculty, and cafeteria owners. Each type of user has different needs and hence performs different functions as mentioned in the Software Requirements Specification**.**

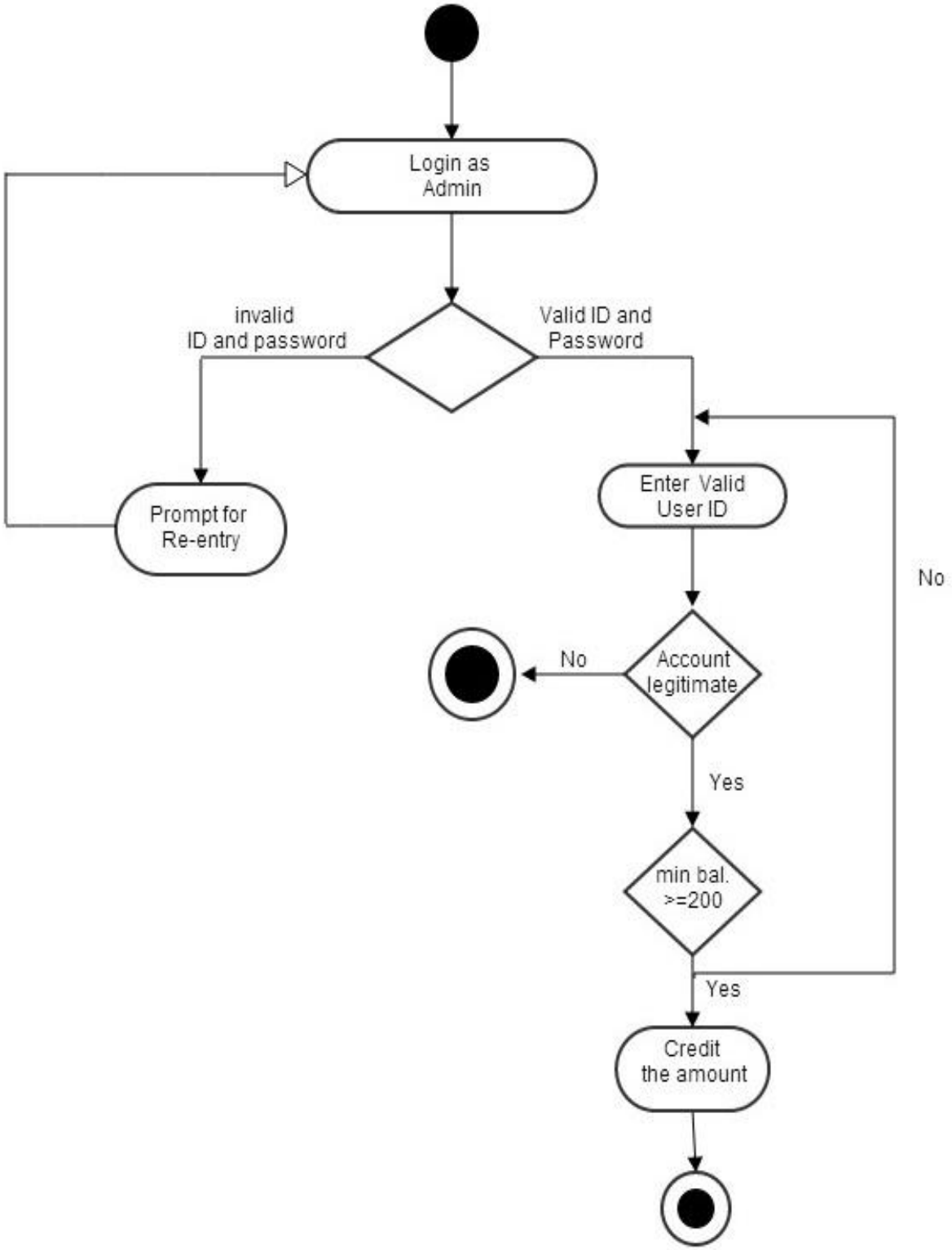
Login:



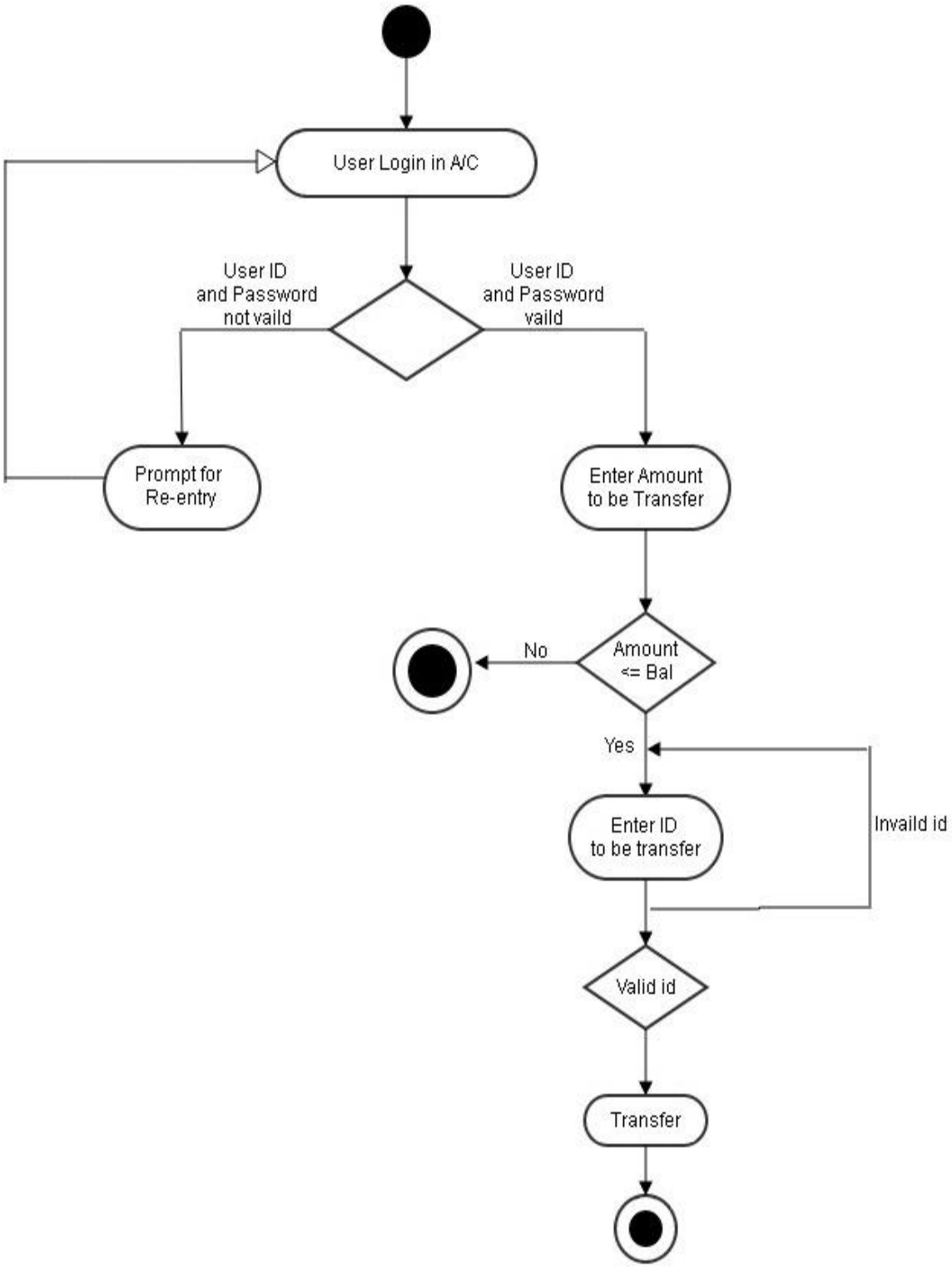
Registration



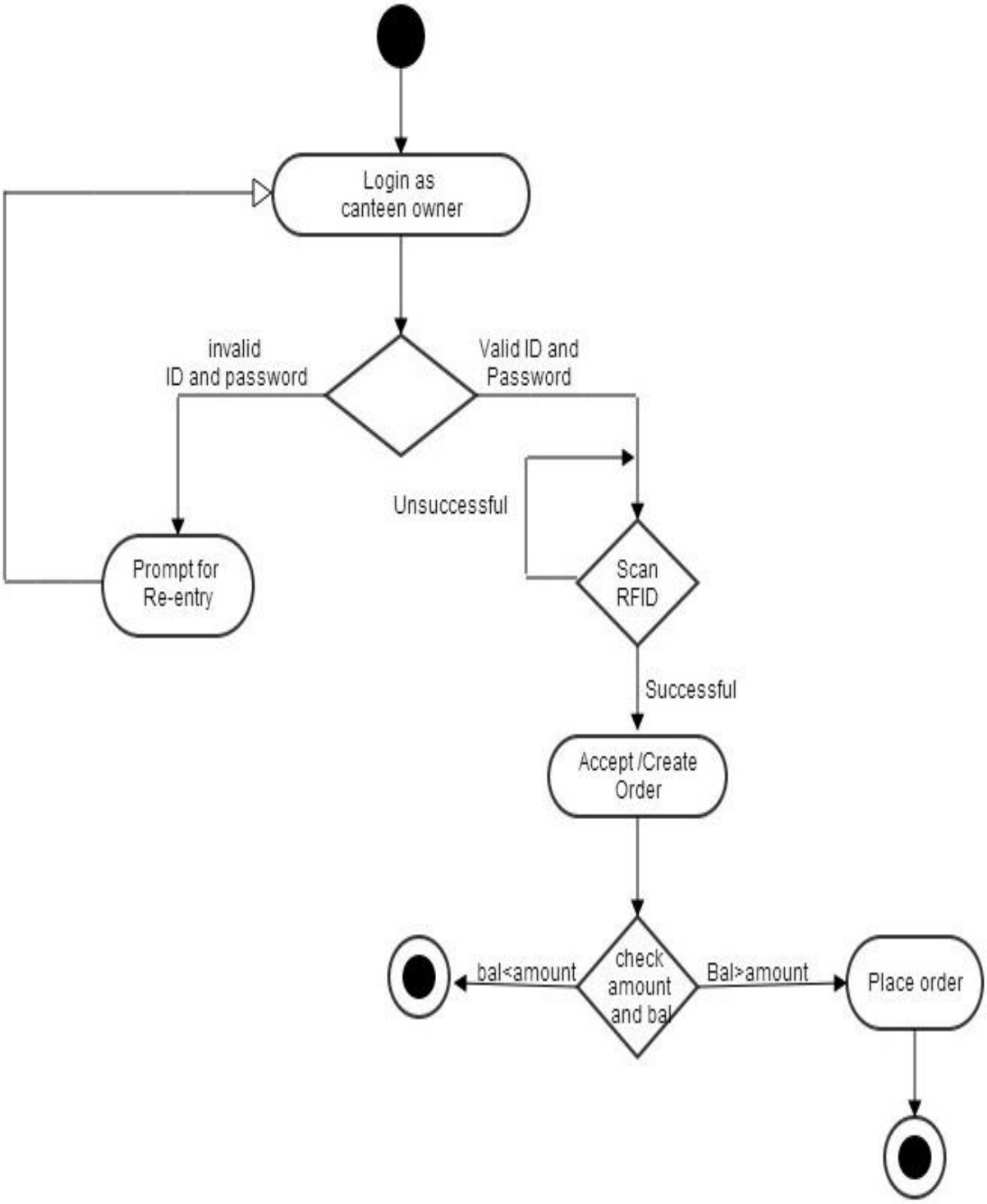
Recharge Account



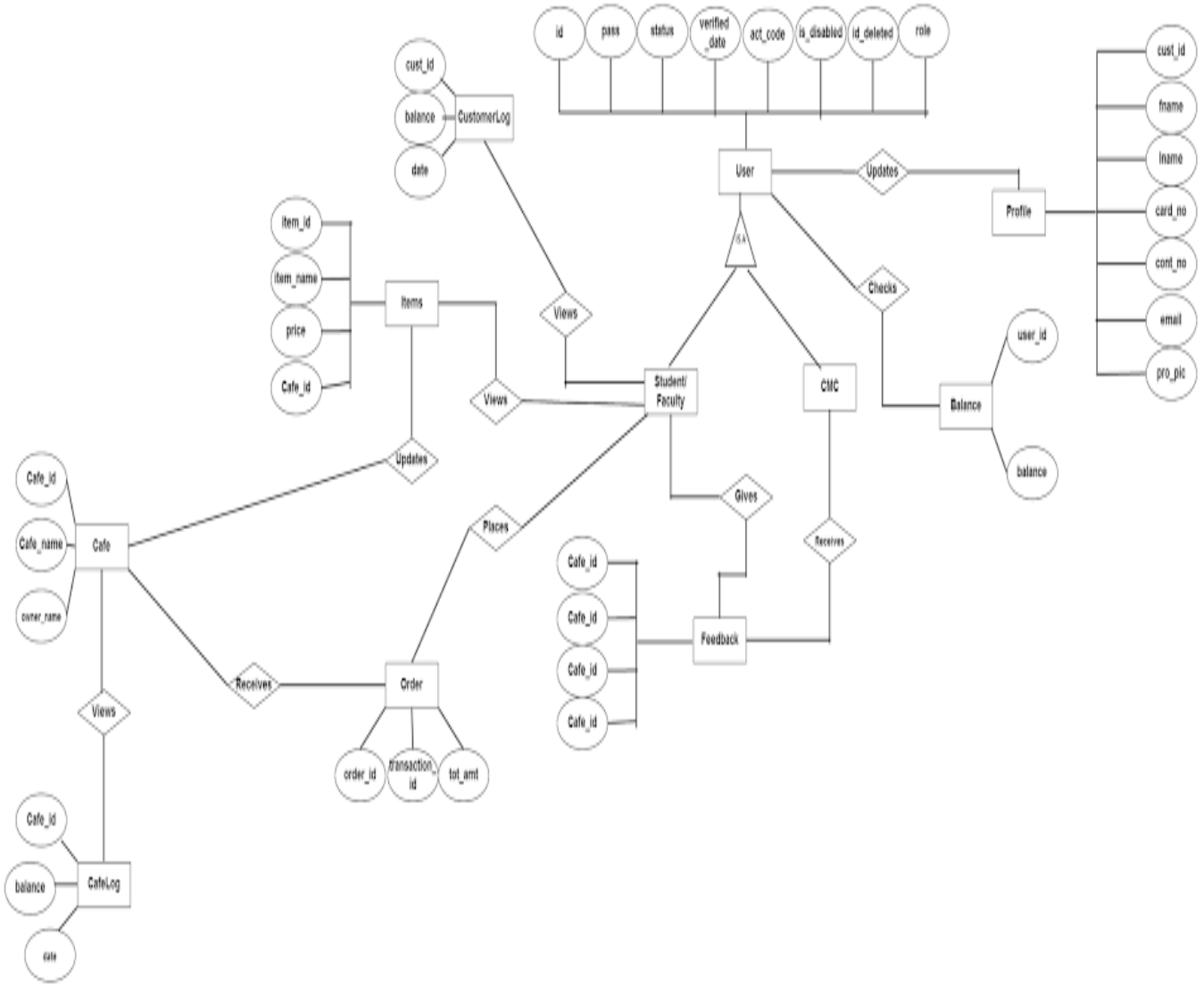
Account to Account Fund Transfer



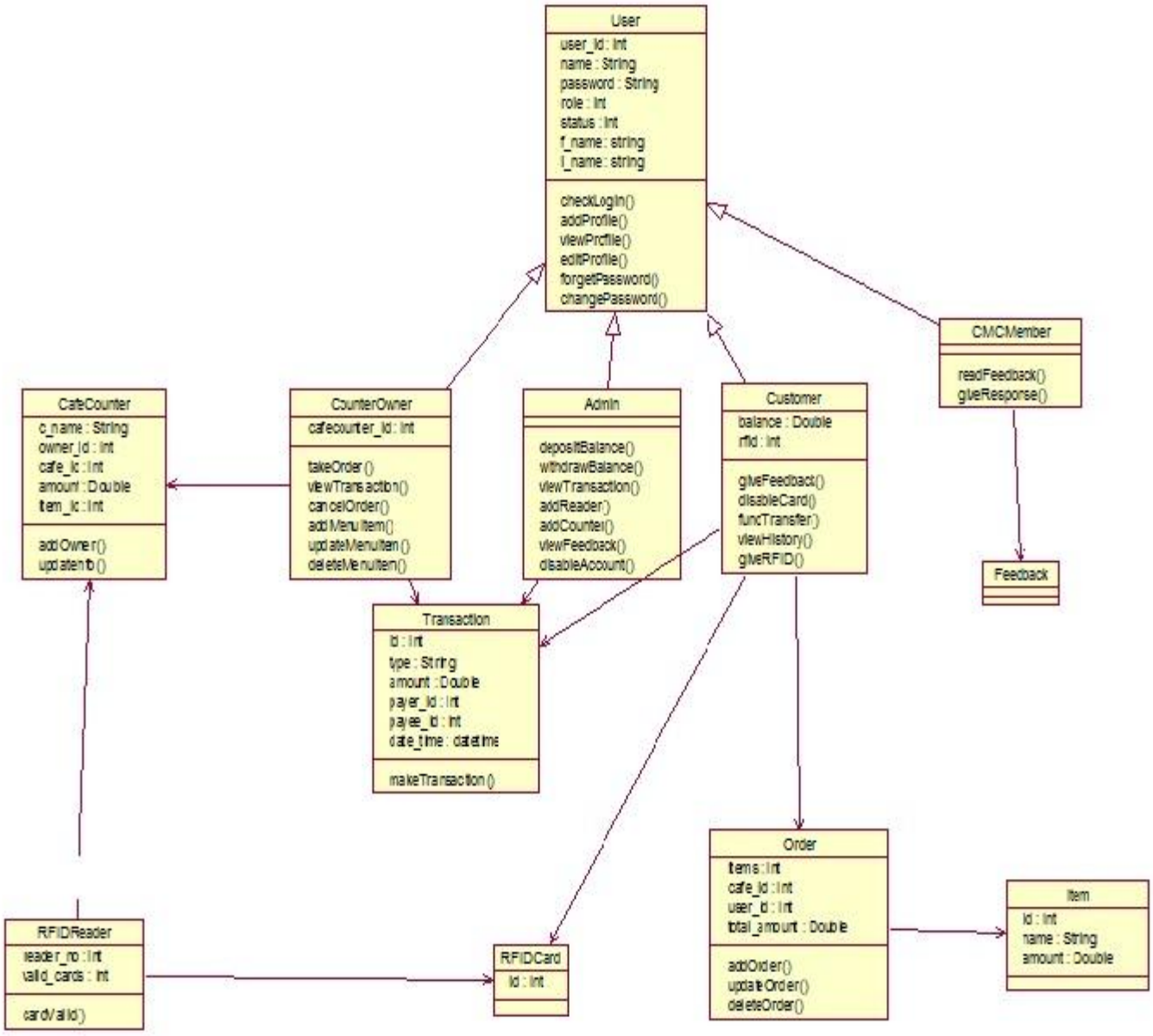
Place/Accept Order



4.2E-R Diagram

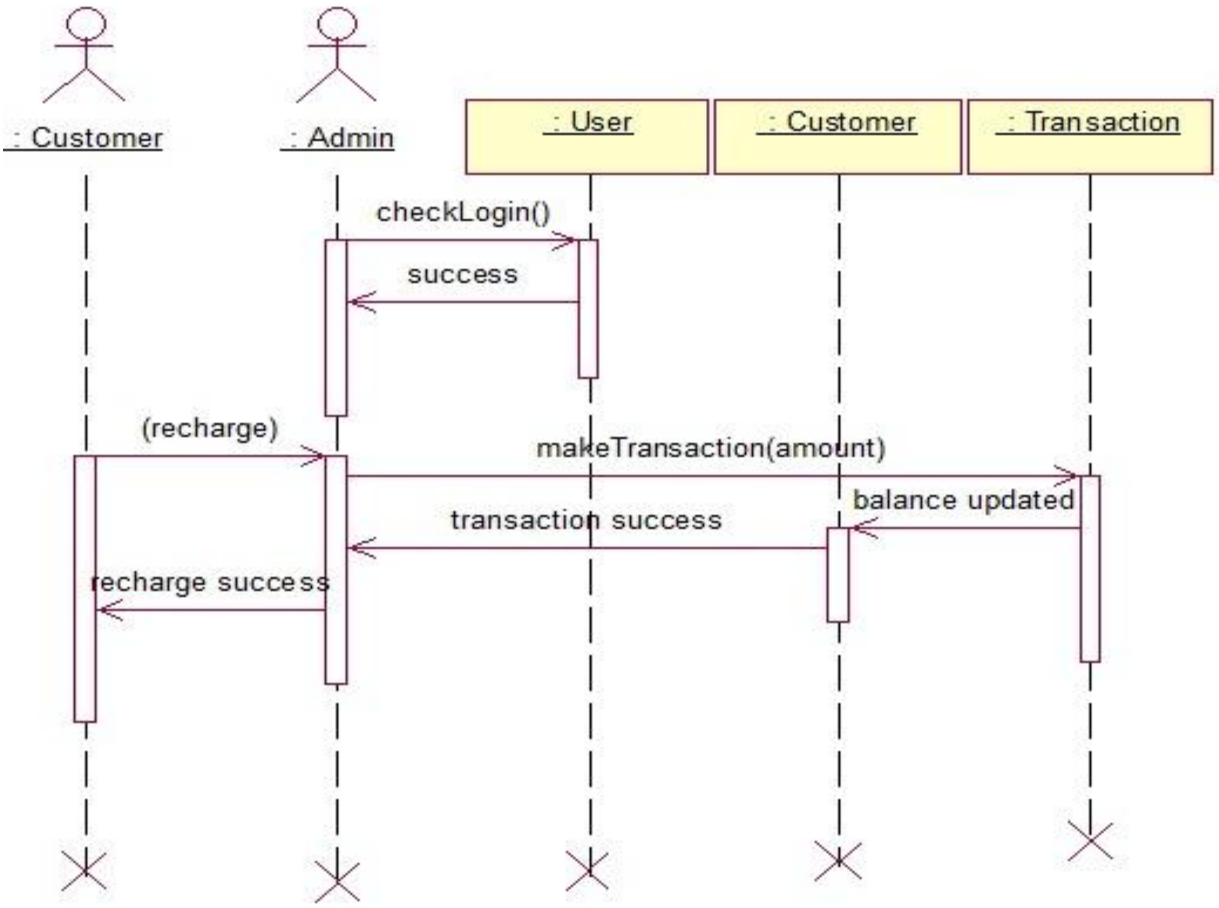


4.3 Class Diagram

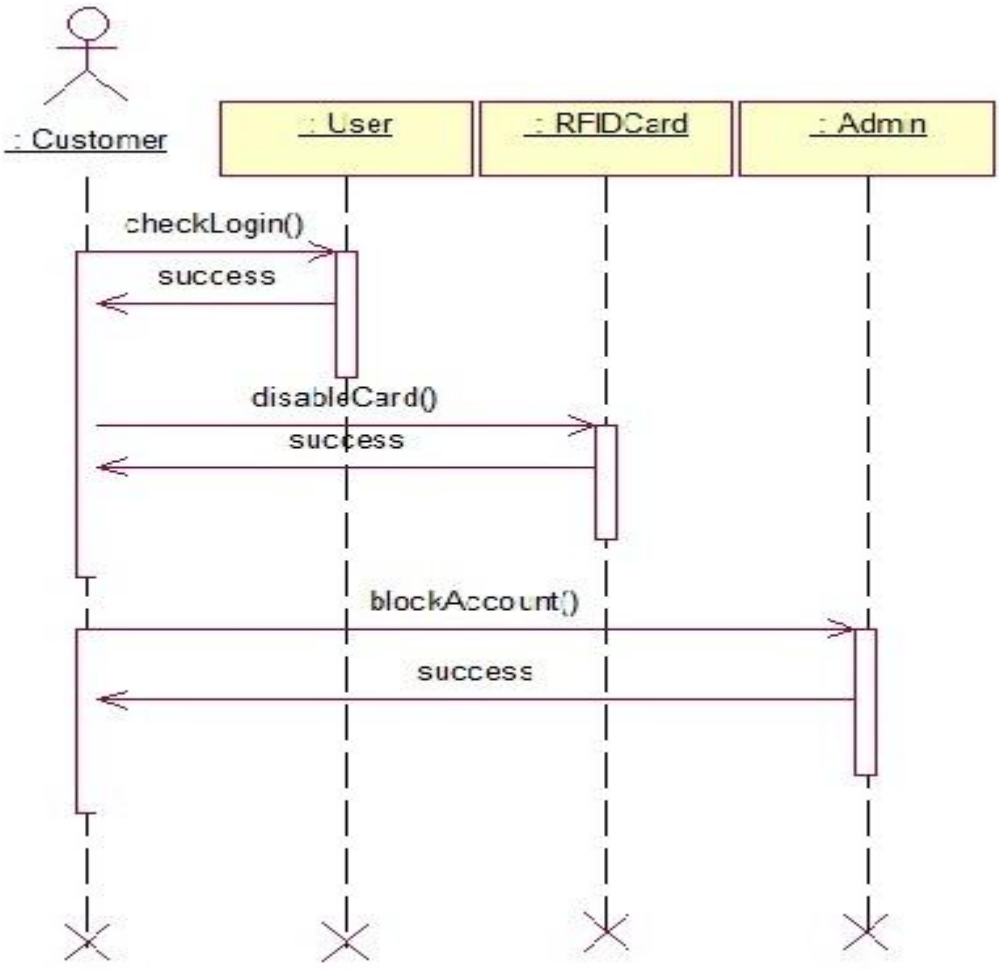


4.4 Sequence Diagrams

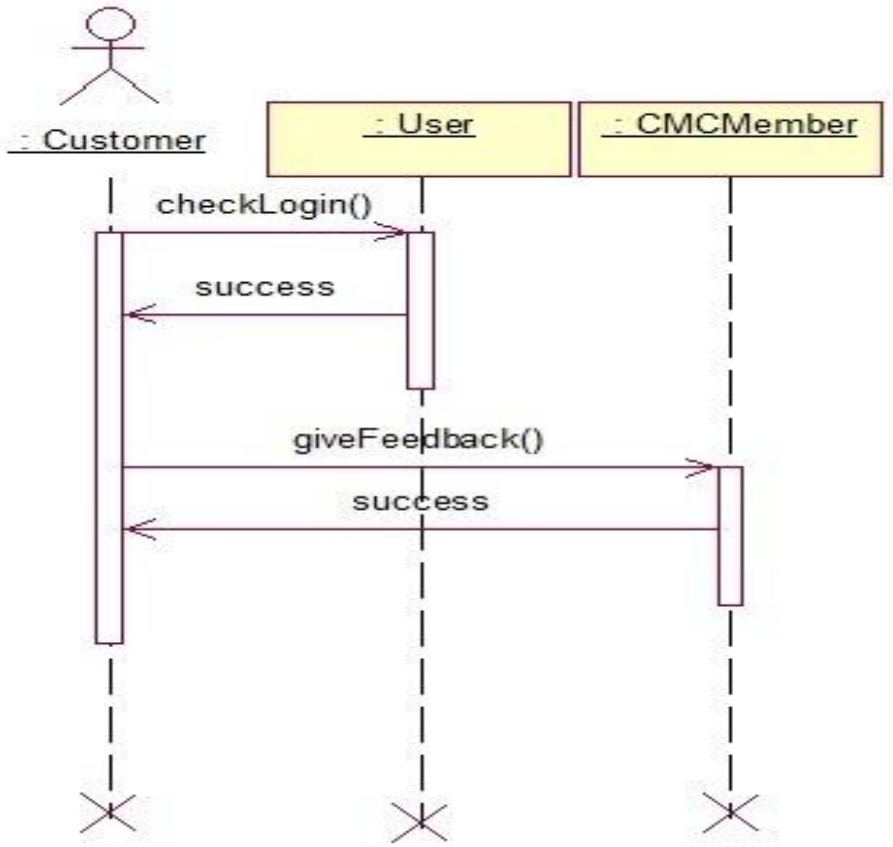
Admin Recharge



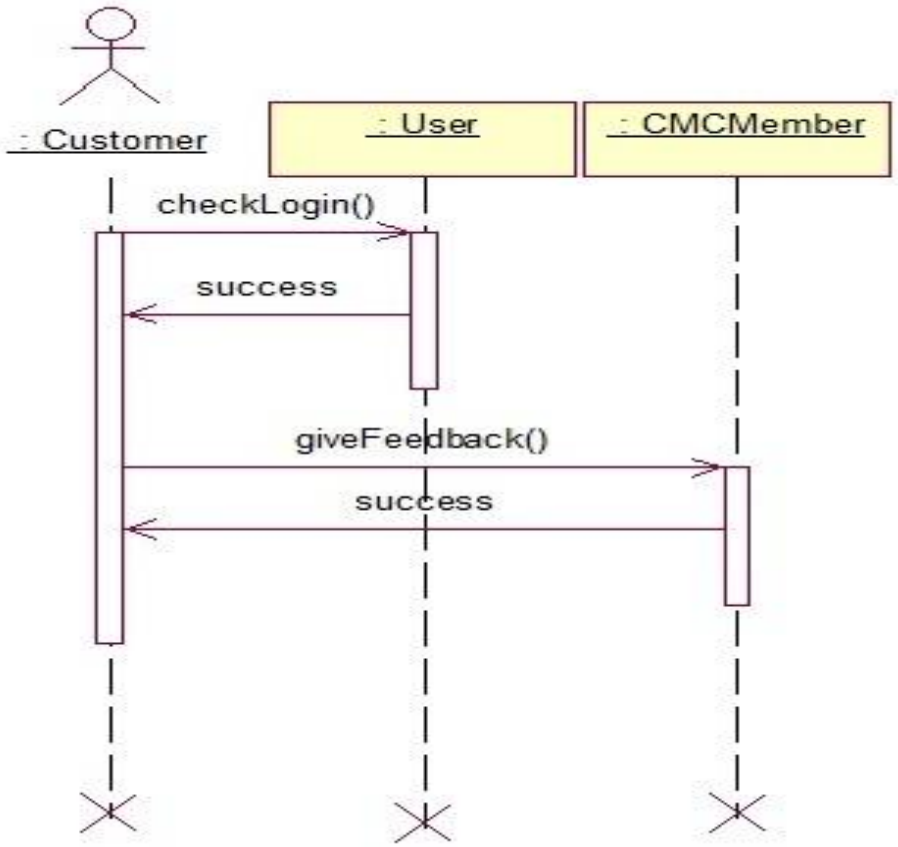
Admin disable Card



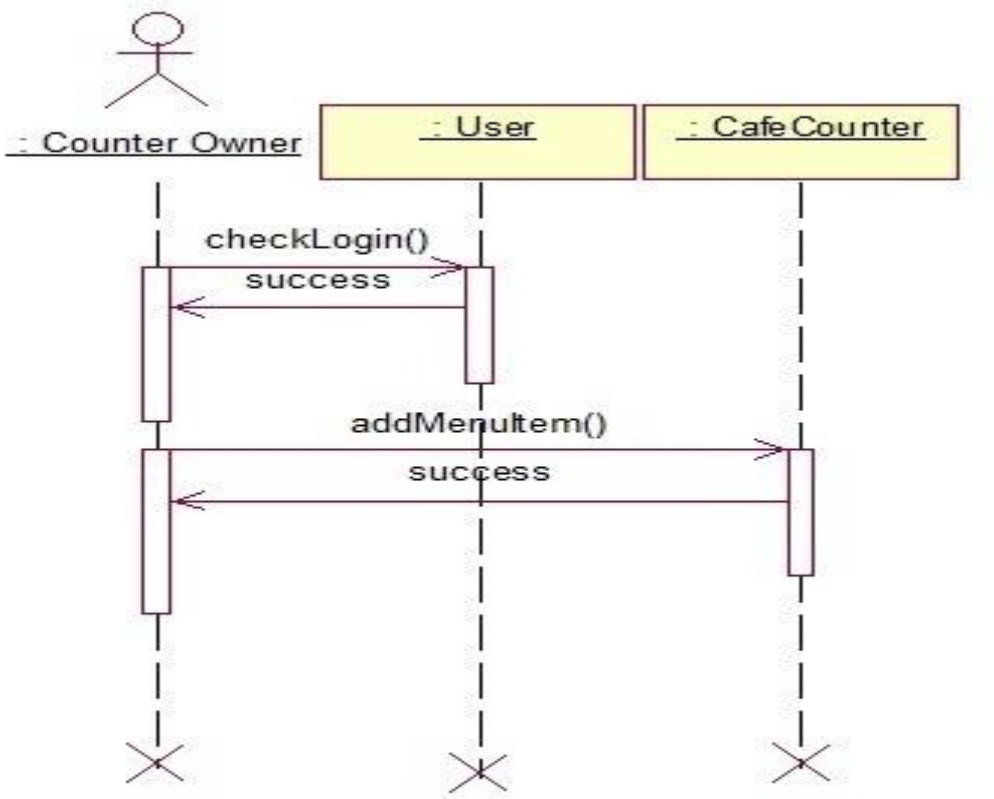
Customer Feedback/Complaints



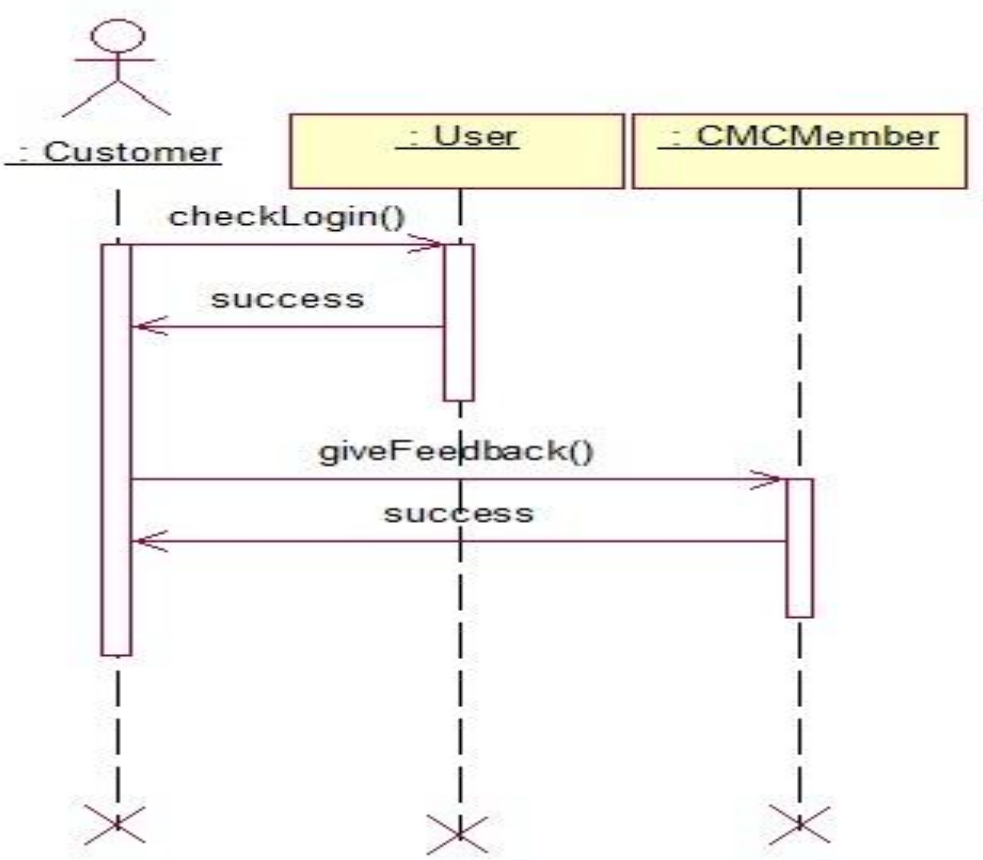
CMC Response



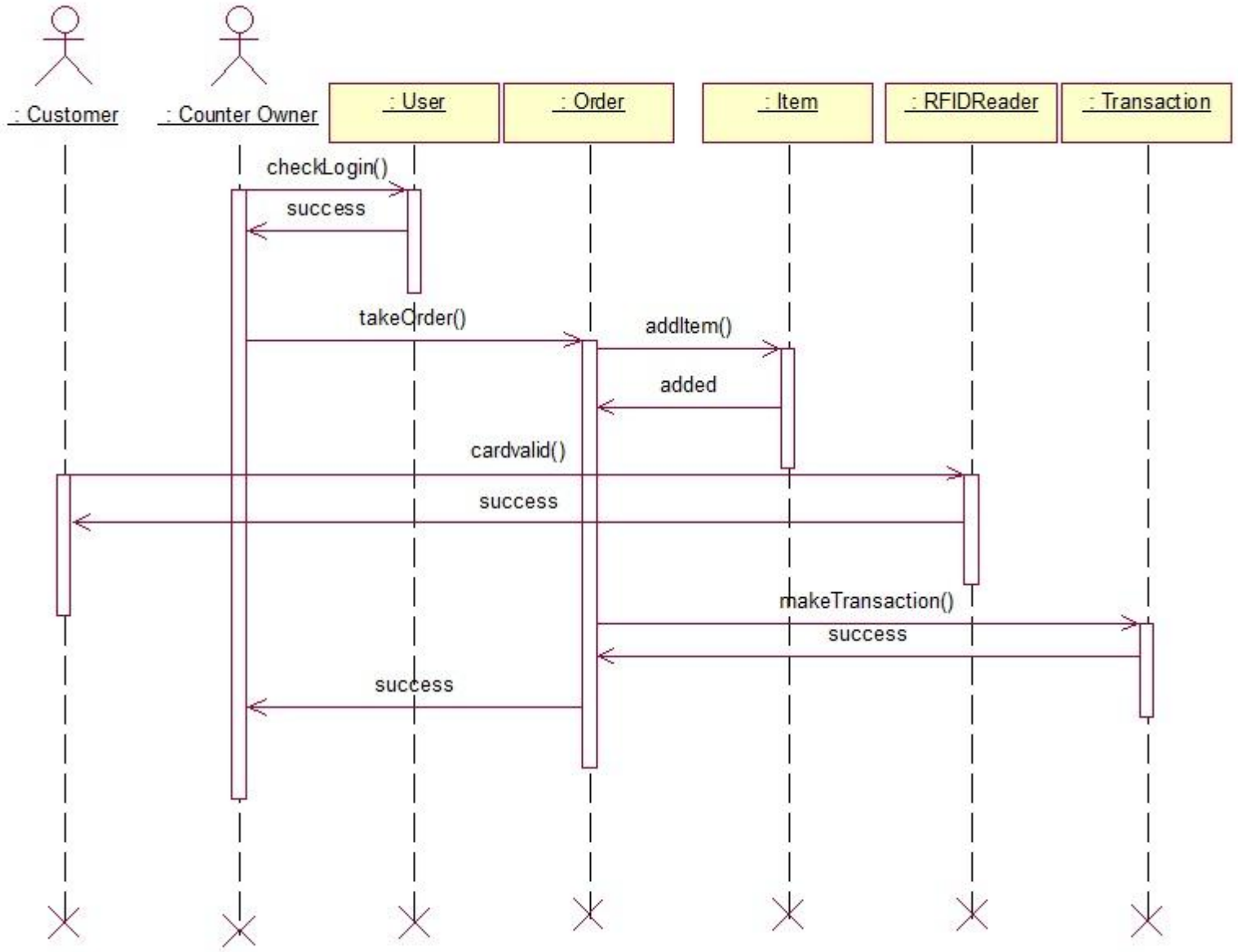
Counter owner add menu item



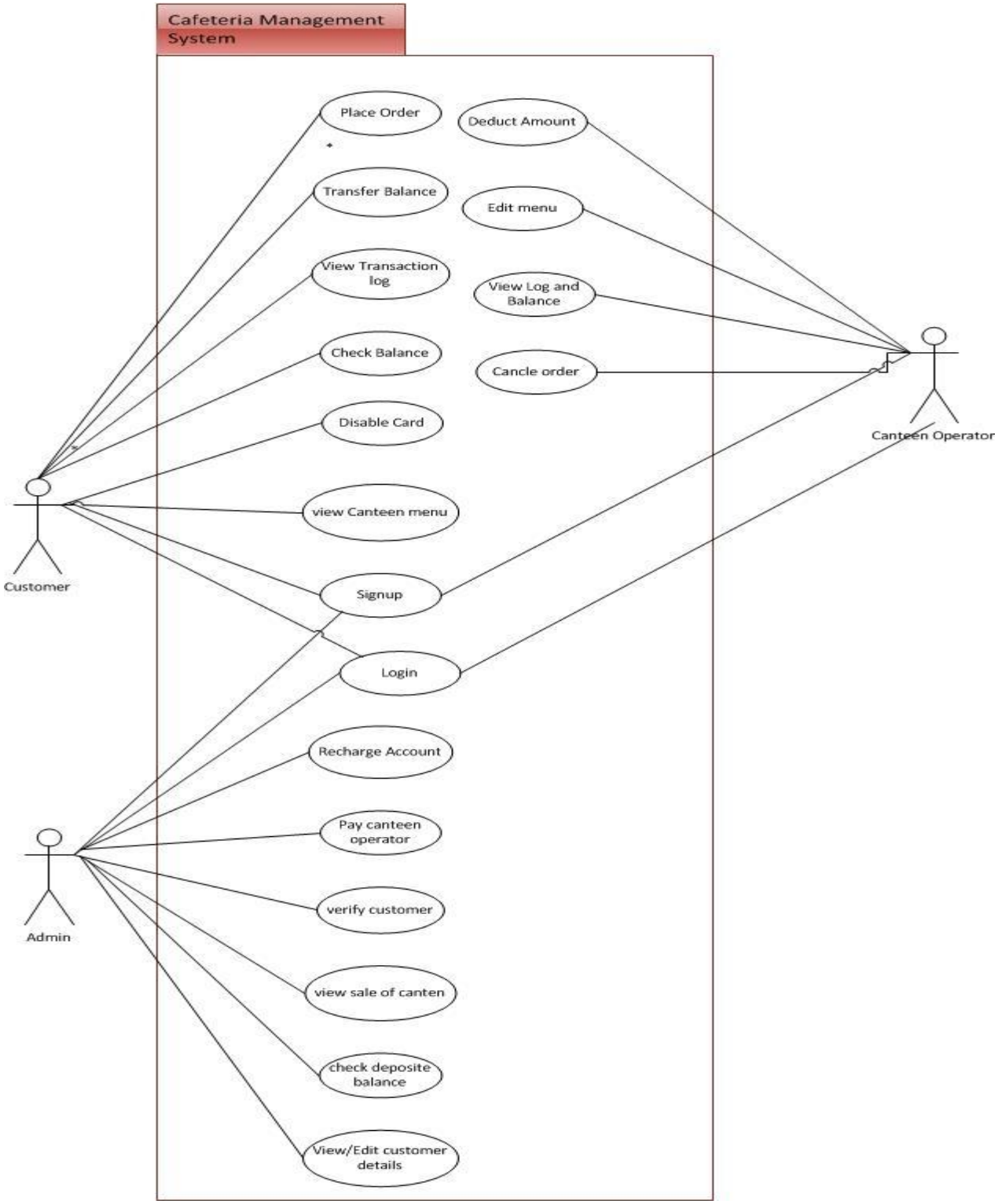
Fund Transfer



Order


: Customer
: Counter Owner
: User
: Order
: Item
: RFIDReader
: Transaction
checkLogin()
success
takeOrder()
addItem()
added
cardvalid()
success
makeTransaction()
success
success

4.5 Use-Case Diagram



5. Low Level Description of Modules

5.1 Registration Module

This module restricts the user to register with her/his DA-IICT webmail ID only.

- Loads the registration form.
- User enters the details (last name, first name, unique username, password and confirm password). She/he is also choose the type of registration.
- When the submission is made, function which will be hooked to the registration action, will be called to check if the entered email-id is DA-IICT webmail id.
- Other validations such as unique username and password character count greater than 6 will be performed.

5.2 Student Portal Module

This module will enable all the registered students to view their daily or monthly expenses.

- Loads up the transaction page.
- The transaction would show the time, date, type and amount of each and every transaction that the user have performed.
- The user can get weekly, monthly, quarterly reports on his expenses at the cafeteria.

5.3User Profile

This module will deliver user profiles feature for all the registered users and will have their basic information.

- It will load the profile page of the user were the user can see his information and can even request to edit them.
- This module would also facilitate the hot listing of the account if the card of a particular student is lost.

5.4 Notification System

- This will notify the users whenever they make order from any one of the cafe.
- The notification would be sent to the user's registered email address.

5.5Order Module

This module will enable user to place an order. After verifying the final amount user will produce RFID card at the cafe counter. Based on reading RFID card final amount will be deducted from the respective user account.

- It will load up the order page.
- The canteen owner types the order into the system and it would automatically sum up the orders and display the total amount to be paid by the customer.
- It will also send notifications.

5.6Fund Transfer Module

This module provides an add-on facility to users. It will enable users to transfer this balance to their friend's account or receive balance from their friend's account.

- It will load up the fund transfer page.
- The user needs to enter the ID and amount to be transferred.
- After that if the balance is greater than the transfer amount than the transfer is completed successfully.

5.6Recharge Module

This module will enable users to recharge their account with admin. So that they can continue to get benefits of cashless transaction with cafe.

- It would open up the recharge page for the admin.
- The admin needs to enter the ID of the user through RFID scanner and enter the amount to be recharged into the account and press submit.
- The recharge amount should be taken from the user in cash form.

6. Glossary

RFID: Radio Frequency Identifier Device.

E-R Diagram (Entity Relationship diagram): An entity-relationship (ER) diagram is a specialized graphic that illustrates the interrelationships between entities in a database.

Use Case Model: Use Case Model describes the proposed functionality of a new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system.

7. References

PuravChitalia, etc. al., Software Requirements Specification v1.0, Group 2, Software Engineering, Autumn 2013-14, DA-IICT

PuravChitalia, etc. al., Project Plan v1.1, Group 2, Software Engineering, autumn 2013-14, DA-IICT