Software Requirement and Specifications

Automated Cyber Cafe System

Software Project Lab II

AUTOMATED CYBER CAFE SYSTEM

SOFTWARE PROJECT LAB-II

COURSE CODE: SE 505

Submitted to

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Letter of Transmittal

Emon Kumar Dey
Lecturer**,**
Institute of Information Technology,
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05 April 2015

Honorable Sir,

We have prepared the enclosed report on Software Requirements Specification of Automated Cyber Cafe System for your approval. This report details the requirements we gathered for the project.

The primary purpose of this document is creating SRS report for the project we are doing for our software project lab-II. This report includes the details of each steps we followed to collect the requirements.

Sincerely Yours,

Md Rakib Hossain

Mobashir Sadat

A.H.M Azimul Haque

Acknowledgement

As it is a complete project for us, we have completed our SRS part properly by the grace of ALMIGHTY ALLAH.

Our grateful thanks to our supervisor Alim Ul Gias Sir who in spite of being busy with his duties took time out to hear, guide and help us with his valuable information and knowledge to complete this SRS report. Our honorable course coordinator Emon Kumar Dey Sir also has a great contribution to complete this SRS report.

Executive Summary

The purpose of the SRS (Software Requirements Specification) document is to provide the whole process and overall description of the Automated Cyber Cafe system of Center Library of University of Dhaka. In this document the requirements of this software are specified. In addition, the purpose of this software is to ease and automate the tasks carried out by the people related with Cyber Cafe system automated operations. Specific design and software requirements specifications are provided here for the system development.

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Chapter1

Introduction to Automated Cyber Cafe System

An automated cyber cafe system is proposed for the Cyber Center, University of Dhaka located beside the Central Library, University of Dhaka. The Cyber Center serves the students of University of Dhaka by providing internet and computing facilities. To provide and avail these facilities both the authority of DU Cyber Center and the students have to follow some predefined processes. These processes are maintained by the administrators of DU Cyber Center .The purpose of this automated cyber cafe system is to make all the manual functionality fully automated .The sections below give overview of everything included in this SRS document, also, the purpose of this document is described here.

1.1 Purpose

The document is about the Software Requirements Specification (SRS) for the Automated Cyber Cafe System (ACCS). The purpose of this document is to give a detailed description of the requirements for the Automated Cyber Cafe System (ACCS). This software requirements specification document enlists all necessary requirements that are required for the project development. To derive the requirements we need to have clear and thorough understanding of the system to be developed. This has been prepared after detailed communications with the project team and stakeholders.
It includes a set of use cases that describe interactions the users will have with the software. It will also explain the system constraints, interface and interactions between the software and the users.

1.2 Overview

- The remainder of this document includes nine chapters and appendices.
- The second and third chapters introduce different types of stakeholders and their interaction to the system. The chapters also provide the requirements specification in detail and provide a description of the different system interfaces.
- The fourth one provides an overview of the system functionality and system interaction with other systems based on the scenario of the Automated Cyber Cafe System (ACCS).

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- The fifth and sixth chapters show the interaction of data within the system using various functionalities. Different specification techniques are used in order to specify the requirements more precisely for different audiences.
- The seventh chapter shows the continuous flow of data within the system.
- The eighth chapter describes the behavior of the software.
- Conclusion is in the ninth chapter.
- The Appendices at the end of the document include the necessary tools we have needed to develop the SRS of the Automated Cyber Cafe System (ACCS).

1.3 Conclusion

In this document we have discussed our project overview including project purpose. In next chapter, we discuss about inception of the project.

Chapter 2

Inception of Automated Cyber Cafe System

2.1 Introduction

Inception is the beginning phase of requirements engineering. This phase helps to get orientation and to make a first draft about the project planning.

The inception phase is not responsible to describe the requirements completely in detail. It defines how the Automated Cyber Cafe System (ACCS) gets started and what the scope is and nature of the problem to be solved. The goal of the inception phase is to identify concurrence needs and conflict requirements among the stakeholders of this project. To establish the groundwork we have worked with the following related to the inception phases:

- Planning meeting

- Identifying Stakeholders

- Our questions to the stakeholders

- Recognizing multiple viewpoints

- Working towards collaboration factors

2.2 Planning meeting

At an early stage in the project, several stakeholders and subject matter experts are convened to discuss the project and make the product plan. We have chosen stakeholders based on the nature and complexity of the project and its product deliverable. Depending on the size of the project and its complexity, the meeting may take several days or weeks.

2.3 Identifying Stakeholders

Stakeholder refers to any person or group who can influence or can be influenced by the system directly or indirectly. Stakeholders include end-users who interact with the system and everyone else in an organization that may be influenced by its installation. Stakeholder identification is the process used to identify all stakeholders for a project. It is important to understand that not all

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stakeholders have the same influence or effect on a project, nor will they be influenced in the same manner. It should be done in a methodical and logical way to ensure that stakeholders are not easily omitted. The following questions help us to identify stakeholders:

- Who uses the system?
- Who is affected by the outputs of the project?
- Who evaluates/approves system?
- Who maintains the system?
- Who has knowledge (specialist) about the system?
- Whose work will influence my project? (During the project and also once the project is completed).

2.4 Our questions to the stakeholders

We set our questions for the stakeholders in a way so that they could give their opinion and requirements for the system. The questions are mentioned in the last part of the SRS. Our questions also focus on the measurable benefits and successful implementation of the project.

2.5 Recognizing multiple viewpoints

We have collected the following view points by discussing with Md Muniruzzaman (Deputy Director Library Cyber Center Dhaka University) who has enough experiences working in DU Cyber Center. He is also the system administrator of DU Cyber Center. We have also discussed with other regular staffs at DU Cyber Center to gather information and requirements. In absence of system administrator they are considered as regular administrator at DU Cyber Center. Moreover we have discussed with some students of University of Dhaka since they are also the user of this Cyber Center and our stakeholder.

2.5.1 System Administrator Viewpoints
a) Prepaid card generating within desired range.
b) Monthly balance sheet generating
c) Maintain a database for viewing student information and card usage.
d) Database must be secured.

2.5.2 Regular Administrator Viewpoints
a) Easily access to the system.
b) Easy maintenance such as inserting, updating student information.
c) Easy to operate.

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2.5.3. Student/User Viewpoints
a) Easy to access in user pc.
b) Easy to view usage.
c) Easy to be registered and paid.

2.6 Working towards collaboration

We have asked our stakeholders for their requirements and found out that each of them has their own requirements. Some of the requirements are common as well as conflicting. So we need to follow the steps given below to merge the requirements:

➢ Find out the common and conflicting requirements.
➢ Divide the requirements into different categories.
➢ Identify the special requirements that the stakeholders have.
➢ Identify the all the requirements according to the stakeholder's priority points and prioritize them through voting.
➢ Take final decision about the requirements.

2.7 Conclusion

The inception phase of this project helped us to identify the stakeholders as well as their different requirements. We have recognized multiple viewpoints of stakeholders by communicating with them. In the next chapter, we have discussed about finding requirements and scenario.

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To make the project successful, we have made several group discussions

1. Date: 30/12/2014
   Place: IIT DU
   Meeting agenda: **Identifying stakeholders with our supervisor**

   Group Members:

   - Mobashir Sadat (BSSE-0507)

   - Md Rakib Hossain (BSSE-0516)

   - A.H.M. Azimul Haque (BSSE-0519)

Group supervisor

   - Alim Ul Gias (Lecturer at IIT DU)

2. Date: 8/01/2015

Place: DU Cyber Center

Meeting agenda: **Collecting requirements from stakeholders**

Group Members:

   - Mobashir Sadat (BSSE-0507)

   - Md Rakib Hossain (BSSE-0516)

   - A.H.M. Azimul Haque (BSSE-0519)

3. Date: 18/01/15

Place: DU Cyber Center
Meeting agenda: **Discussion on requirements with supervisor**
Group Members:

   - Mobashir Sadat (BSSE-0507)

   - Md Rakib Hossain (BSSE-0516)

   - A.H.M. Azimul Haque (BSSE-0519)

Group supervisor

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➢ Alim Ul Gias (Lecturer at IIT DU)

4. Date: 29/01/2015

Place: IIT DU
Meeting agenda: **Discussion on report writing about "Inception" phase**
Group Members:
Group Members:

➢ Mobashir Sadat (BSSE-0507)

➢ Md Rakib Hossain (BSSE-0516)

➢ A.H.M Azimul Haque (BSSE-0519)

Group supervisor

➢ Alim Ul Gias (Lecturer at IIT DU)

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Chapter3

Elicitation of Automated Cyber Cafe System

3.1 Introduction

Elicitation is the task that helps the developer to define what is required. To complete the elicitation step of Automated Cyber Cafe System (ACCS) we face many problems like problems of the scope, problems of the volatility and problems of understanding. However, this is not an easy task. To help overcome this problem, we have worked with the elicitation requirement activity in an organized and systematic manner.

3.2 Eliciting Requirements of Automated Cyber Cafe System

Requirements elicitation of ACCS combines elements of requirements gathering, problem solving, elaboration, negotiation and specification. It requires the cooperation between the stakeholders and us to elicit requirements. To elicit requirements of ACCS we completed following tasks:

- ➢ Collaborative Requirements Gathering
- ➢ Quality Function Development
- ➢ Usage scenario

3.2.1 Collaborative Requirements Gathering

The main goal of our project is to automate all the manual functionality and rebuild other automated functionality of DU Cyber Center. So, at first we have tried to identify the scope of the problem, problems of understanding, propose elements of the solution, negotiate different approaches, and specify a preliminary set of solution requirements in an atmosphere that is conducive to the accomplishment of the goal.

To better understand the flow of events of ACCS as they occur, we present a brief usage scenario that outlines the sequence of events that led up to the requirements gathering. To gather the requirement, we have used a technique called use "5Ws and an H". It refers to:

1) Who 2) What 3) Why 4) When 5) Where 6) How

There are three problems that are encountered as elicitation of ACCS occurs:

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(a) Problems of the scope: The boundary of the ACCS is well defined. We know what we are going to do and our limitations related to this project. To develop the software we will perform the following tasks:

➢ We will provide the access to the permitted users.

➢ There will be the options for inserting and updating the existing administrator account and student information.

➢ The system will be developed using ASP .Net and C# programing language

➢ Data of this system will be stored in database using MySQL/Sql Server

After developing this software we will not provide any kind of tools or environment needed for this software. We will try to provide a user manual to maintain the software.

(b) Problems of the understanding: To have a clear understanding about the reason of doing this as a project, we put ourselves in front of some questions such as:

➢ What is needed from the software?

   - DU Cyber Center's user activities, administrator activities and their financial activities will be maintained by this software.

➢ The capabilities and limitation of the computing environment:

   - Now the financial part of DU Cyber Center is maintained manually, it lacks the necessity of security and time safety. It will make the whole work automated, smooth and authenticated.

   -Bedsides all the machines of DU Cyber Center are backdated. They are not compatible with the new technology. This causes us to develop this system as a platform independent using minimal hardware resource.

➢ The domain of the problem:

   - We will develop the software only for DU Cyber Center's Administrator and their users.

(c) Problems of the volatility: Requirements change overtime. This is due to dynamic environment. We have considered the problem of volatility as an important aspect because the requirements can change.

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(d)Requirement elicitation through interview:

- Interviews are often the best means to elicit qualitative & quantitative information of ACCS such as opinion, policies and narrative description of activities of the problem. We discussed with our stakeholders Md Muniruzzaman (Deputy Director Library Cyber Center Dhaka University) and regular staffs of DU Cyber Center to come up with the deserved results. We also discussed with some students at DU Cyber Center.

(e)Requirement elicitation through questioning:
- While interviewing our stakeholders, we asked several questions on different fields. The questions are attached below:

(f)Questionnaire for the project

The aim of the questionnaire is to collect information on the methods and practices for this project. Stakeholder's input is extremely important to identify gaps and desire data that will help in driving future tools and methods that may better support their activity. The sample questionnaire used for the project is given below. The fill-up document is later attached with the SRS in the appendix section.

Questionnaires:

➢ What are the functionalities of your old automated cyber cafe system?

➢ Who directly interacts with the system?

➢ Who has the administrator power over the software?

➢ Is there any multiple admins or only one admin?

➢ How you want to serve your client as the old system or in a new way?

➢ Do you expect the same features as you are provided by the old software?

➢ Are there any major problems you face from the old software? What are the problems?

➢ How do you want to solve these problems?

➢ How do you serve your clients?

➢ Mainly who is the user of your Cyber Cafe? This system serves only DU Students or any other People?

➢ What is the information of the user you store in the ledger book when students are registered as a client?

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- ➢ What is the information that card contains?
- ➢ After registration how they use this card to get the services?
- ➢ How do you want to generate these cards? Generate one card when one user is registered or many cards for many users as well as for future uses?
- ➢ If you generate many cards at one time then what is the maximum and minimum numbers of cards you want to generate at one time?
- ➢ Who is responsible for generating the cards and distributing those cards?
- ➢ What types of information the card number and the pin number would be?
- ➢ Is the account number and the pin randomly generated or having any preferable choice or any sequence related to the user's provided information?
- ➢ In which environment (Operating system) you want to run the new software?
- ➢ Is there any problem if we propose a new environment for the new software?
- ➢ Do you need a user manual book for maintaining the software?
- ➢ Do you provide a user manual book for your clients?
- ➢ Are you in a need of some extra features that help your work?
- ➢ Who is responsible for generating this monthly balance sheet?
- ➢ What is the information the balance sheet contains?
- ➢ If you are able to see the active user list then what is the information you want to see in the active user list?
- ➢ Can you see a particular card usage?
- ➢ What is the information particular card usage contains.
- ➢ In case of electricity failure what are the steps taken by you?
- ➢ Do you want to add any other features with this automation?

The outcomes of the questions are given in appendix (10.1)

(g)Existing Resource:

- • A good volume of resource and reports of cyber cafe maintenance software are available, which provide useful information about the existing system.

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(h)Observation:
- Observation provides first-hand information of ACCS about how activities are carried out. We have gone to the DU Cyber Center several times and noticed their regular activities

3.2.2 Quality Function Development

Quality function deployment (QFD) is a quality management technique that translates the needs of the customer into technical requirements for software. QFD "concentrates on maximizing customer satisfaction from the software engineering process". With respect to our project the following requirements are identified by a QFD. We will cover the following requirements:

(a)Normal Requirements:
- ➢ The system will preserve all the activities of DU Cyber Center including student and administrator activities
- ➢ It makes all the manual functionality automated and adds new features.
- ➢ Keep track of all the financial activities at DU Cyber Center.
- ➢ The system will allow only permitted admin to access through individual login account. They can insert update and student information.
- ➢ Administrator can generate prepaid card numbers for student.
- ➢ At the end of a month administrator can generate monthly balance sheet.

(b)Expected Requirements:

- ➢ The administrators view any fields of students.
- ➢ The system shall automatically send notification to the user when their using time is close to be finished.
- ➢ Student can purchase multiple cards.
- ➢ One card cannot be used at the same time more than one computers.
- ➢ The system must ensure database backups, which are as recent and complete as possible
- ➢ Backup files should be in readable file format in form of spread sheet and standard compression formats.

(c)Exciting Requirements:
- ➢ Platform independent.
- ➢ Student can also view their card usage

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3.2.3 Usage Scenario:

Automated Cyber Cafe System, University of Dhaka

An automated cyber cafe system is proposed for the Cyber Center, University of Dhaka located beside the Central Library, University of Dhaka. The Cyber Center serves the students of University of Dhaka by providing internet and other computing facilities. To provide and avail these facilities both the authority of DU Cyber Center and the students have to follow some predefined processes. These processes are maintained by the administrators of DU Cyber Center. There are two administrators, one is the system administrator and another is the regular administrator. How this Cyber Center manually functions is described below.

How Does The DU Cyber Center Provide Internet Services to The Students?

With a view to giving the internet facilities the authority of DU Cyber Center maintains a prepaid card distribution system. The students who want to get the service have to purchase a prepaid card through a registration process at DU Cyber Center. The unit price of these prepaid cards is 60 taka .With these prepaid cards students are allowed to use internet facilities for 300 minutes and the validity of these prepaid cards is 180 days. Within these 180 days the cardholder can use the prepaid card any number of times for getting internet facilities until that prepaid card's usage of 300 minutes is being finished.

How Do They Generate these Prepaid Cards?

The authority of DU Cyber Center has to generate these prepaid cards before providing the services to the students. Every prepaid card contains two types of information .The first one is a card number and the second one is a pin number, corresponding to that card number. The card number would be a 10 digits numeric value where the first six digits contain the current day/month/year and the last four digits contain a serial number. Suppose a card number is: 2002140001.Here the first six digits (200214) indicates current date: 20/02/14 and the last four digits (0001) indicates the card serial number. Besides the pin number is auto generated corresponding to the card number. The pin number would be an eight character long alpha numeric value with the constraint of having only uppercase characters, for example, (AFE4F6C7).However first of all; they only generate the prepaid card number and corresponding pin number respectively in a spread sheet. They can generate any number of

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prepaid card numbers and corresponding pin numbers within a desired rang. The minimum number is 500 and the maximum number is 2000.After generating that information they print every card number and correspondent pin number individually in a well-designed card paper. Moreover the card paper contains some instructions on how to use this card and the official logo of University of Dhaka. After printing the card number, pin number, instructions and official logo on this card paper, the card paper is considered to be the desired prepaid card.

How Do the Students Purchase these Cards and Register at DU Cyber Center?

After generating these prepaid cards the authority of DU Cyber Center preserves these cards for future uses. When a student is going to purchase a card s/he has to deposit 60 taka to the data entry operator. The data entry operator makes the students registered by keeping track the student's information in a ledger book**.** The students have to show their student's identity card for providing that information. The data entry operator writes down the student's name, department name, current academic year, department roll, attached hall name from the student's identity card in the ledger book. Then the operator takes a generated prepaid card and writes down that prepaid card number and pin number in the ledger book beside that student information. Now the student is the owner of that card. Thus a student is fully registered to the DU Cyber Center for getting the internet facilities by using his/her purchased card.

How Do The Students Use these Prepaid Cards to Get The Internet Services?

Becoming the owner of a prepaid card, now the students are able to use internet and other computing facilities at DU Cyber Center. Inside the DU Cyber Center when the students sit before a computer and turn on the computer, a window will appear in the computer screen .Here they will be asked for entering the card number and the pin number of the prepaid card that belongs to them by the system. The students will enter the card number and the pin number of their own card. The card number and the pin number are case sensitive .It means that students have to enter the card number and the pin number as same as they are mentioned in their card. If they do anything wrong the system will let them know. However if they do it correctly, the system will let them access to the computer home screen to use internet and other computing facilities. In the home screen they will be able to see a small timer window where their 300 minutes countdown will appear. Gradually when the countdown becomes 15.00 minutes the system will notify the students for the first time to save and pack up their work. Again the system will notify the student when the countdown becomes 5.00 minutes. After finishing the 300 minutes countdown the system will automatically close and the card is considered as an expired card. A card is also considered as an expired card after passing 180 days from the day, the card is purchased. As a result the students are not allowed to access to the computer by using this expired card.

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Moreover students are not allowed to use more than one computer using a valid card at the same time. It is strictly prohibited as it makes their valid card invalid. Students must be aware of these issues. If students face any problems using their card they are requested to contact with the regular administrator to solve their problems

Apart from these Students are also allowed to see their card usage from the timer window. The card usage contains card number, pin numbers, card owner's name, date, PC No (which computer they used), Starting Time (when they started using), Ending Time (when they finished using), Using Time (how long they used),Remaining Time(how much time is remaining to finish 300 minutes) and Card validity (how long the card is valid).

How Do The Administrators Maintain the Cyber Center Functions Properly?

As it is mentioned above there are two types of administrators who are responsible for maintaining all the processes of DU Cyber Center. One is system administrator and another is regular administrator. Both the administrators have some particular tasks and responsibilities to do for maintaining these processes. Their tasks and responsibilities are mentioned below respectively.

✓ Card Generating:

It is the responsibility of system administrator to generate cards before providing services. Only system administrator can perform this operation. Normally he has to decide how many cards would be generated.

✓ Register student and distribute Cards:

It is the responsibility of regular administrator to register the students and distribute the cards among them. Here in this particular case regular administrator accomplishes this task as a data entry operator.

✓ Update Student information:

If any correction is needed after registration of the students then it is the responsibility of regular administrator to make the correction and update the students' information.

✓ Generating Monthly Balance Sheet:

Generating monthly balance sheet is the responsibility of system administrator. The balance sheet contains date (from beginning to end of the month), Cards (how many cards are distributed in each date), Unit price (prices of each card), Amount (total amount of card unit price on each day), Bank Deposited & date (bank deposit amount and deposit's date).

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To generate this report system administrator has to fill up bank deposit amount and the deposit's date in the balance Sheet. (On which date the system administrator deposited at bank and the deposited amount)

✓ View Active User:

Both the system administrator and the regular administrator can see a list of active users who are using internet inside the DU Cyber Center. This contains PC No (In which computer they are using), active user's Card number, Cardholder Name, Starting Time (when they started using), Running Time (how long they are using), Remaining Time.

✓ View A Particular Card Usage.

If required both the system administrator and the regular administrator can see any particular card usage. The card usage contains card numbers, pin numbers, card owner's name, department name, department roll, attached hall name, date, PC No (which computer they used), Starting Time (when they started using), Ending Time (when they finished using), Using Time (how long they used), Remaining Time (how much time remain to finish 300 minutes) and Card validity (For how many days the card is validate).

✓ View All Users History from a specific date to another specific date:

Occasionally both the system admin and regular admin are in a need of observing the users history from a specific date to another specific date. So they are able to see all users' history which contains two specific dates, Card Number, Cardholder Name, PC No, Starting Time, Ending Time, Using Time, and Card Validity.

✓ Electricity Failure:

In case of electricity failure the students are requested to turn on the computer and enter their card number and pin number again for further usage.

3.3 Conclusion:

We have identified all the necessary requirements to fulfill our project scope. We have generated our scenario of the project. Based on this scenario, we have developed scenario based model in the next chapter.

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Chapter 4

Scenario-based modeling of Automated Cyber Cafe System

This chapter describes the scenario-based modeling of Automated Cyber Cafe system (ACCS)

4.1 Introduction

Scenario based modeling comprises of three parts:
- Use case diagram
- Activity diagram
- Swimlane diagram

Based on the scenario discussed on previous chapter, we have designed use case diagram, activity diagram and swimlane diagram of the project.

A use case diagram is a graphic depiction of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify, and organize system requirements and it contains some components.
- The actors, usually individuals involved with the system defined according to their roles.
- The use cases, which the specific roles are played by the actors within and around the system.
- The relationships between and among the actors and the use cases.

In Automated Cyber Cafe System (ACCS) the use case diagram represents the whole process and activities of managing user and administrator operations of the Cyber Center of DU.
The actors are to be identified from the scenario.
These actors are of two types.
- Primary actor
- Secondary actor

Primary actor: The actors those both produce and consume information of a system.
Secondary actor: The actors those either produce or consume information of a system.

The identified actors of automated cyber cafe system are:
- System admin (SA)
- Regular admin (RA)
- Student/User
- System

4.2 Use case diagrams and scenario

In this section use case diagram and scenario are described elaborately. Each use case diagram contains its name, level number, primary and secondary actors.
The scenario of the first use-case diagram is provided in previous chapter as it represents the whole scenario of the automated cyber cafe system.

Use Case Scenario			
Level 0	**Level 1**	**Level 2**	**Actors**
Automated Cyber Cafe System	Authentication	Log in	System admin, Regular admin
		Log out	System admin, Regular admin
	Update Admin Account	Edit account	System admin, Regular admin
		Recover Password	System admin, Regular admin
	Generate Card	Generate Card	System admin
	Register User	Register User	System admin, Regular admin
	User Activities	Enter Card Info	Student
		View Card Usage	Student
		Exit From System	Student
	System activity in user PC	System activity in user PC	System
	Update User information	Search User	System admin, Regular admin
		Update info	System admin, Regular admin
	Generate monthly Balance sheet	Generate monthly Balance sheet	System admin,
	View History	View active user	System admin, Regular admin
		View particular card usage	System admin, Regular admin
		View history	System admin, Regular admin

Table 4(a) Use Case Scenario

Automated Cyber Cafe System
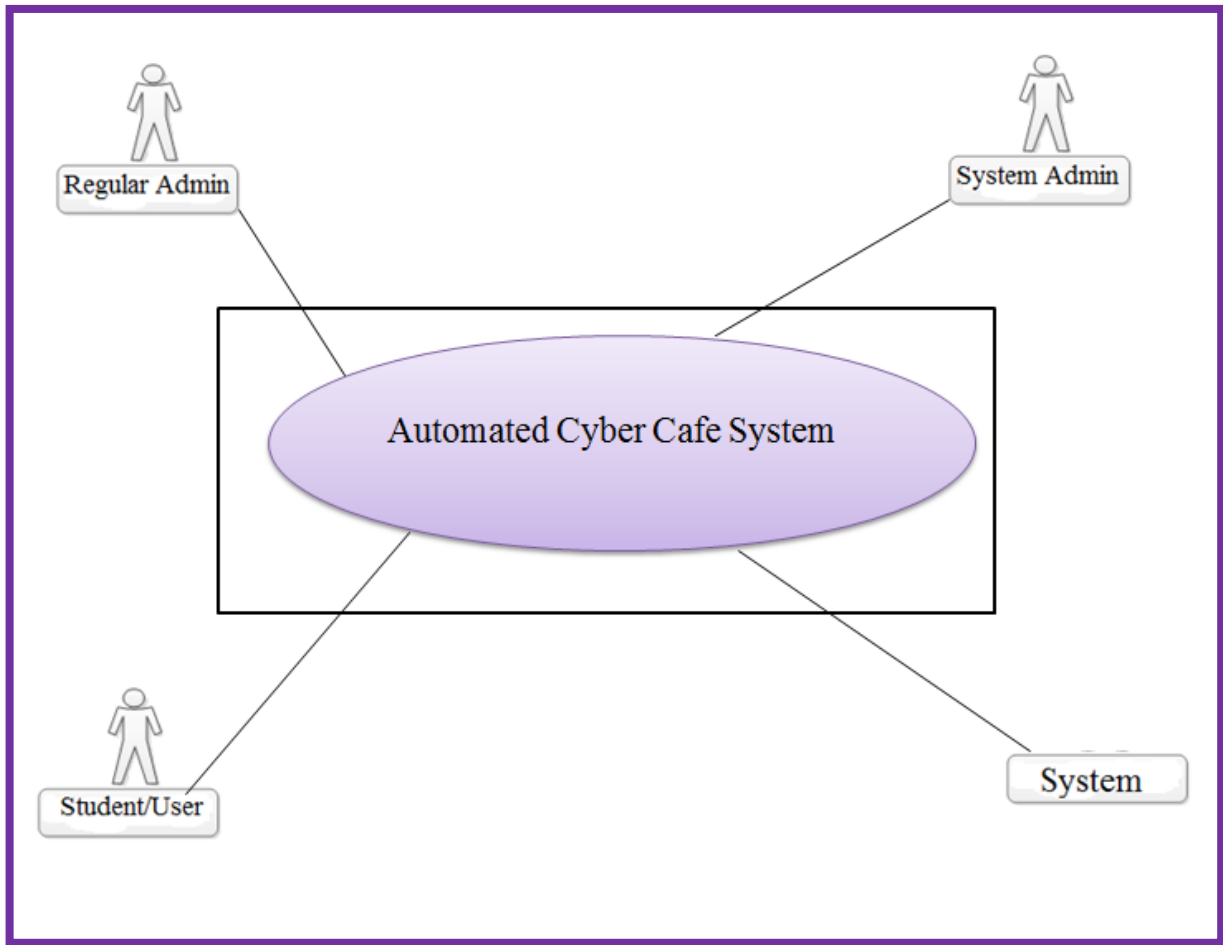
Fig: Use case (a): Automated Cyber Cafe System (level 0)

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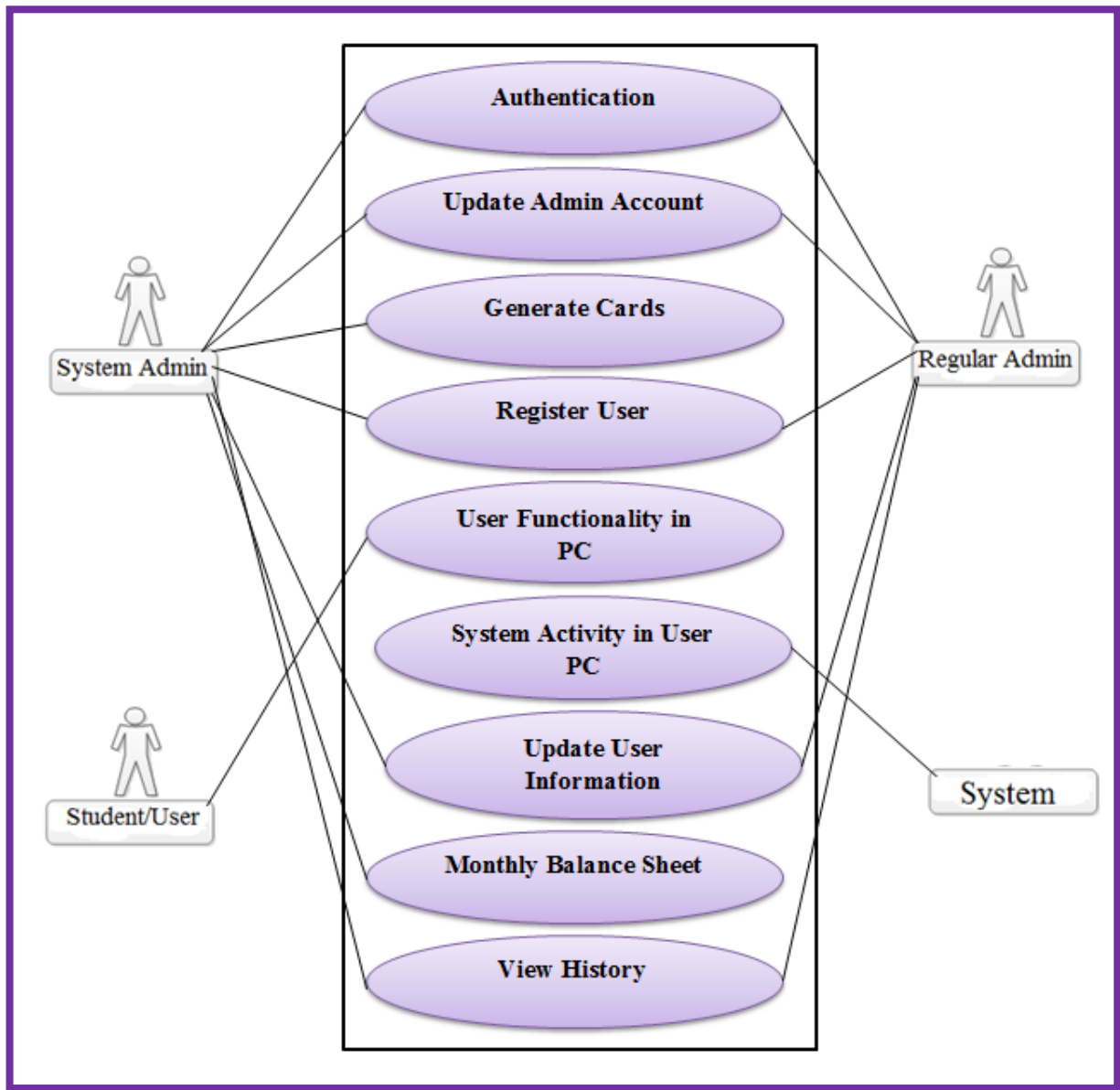
Fig: Use case (b): Automated Cyber Cafe System (level 1)

Automated Cyber Cafe System
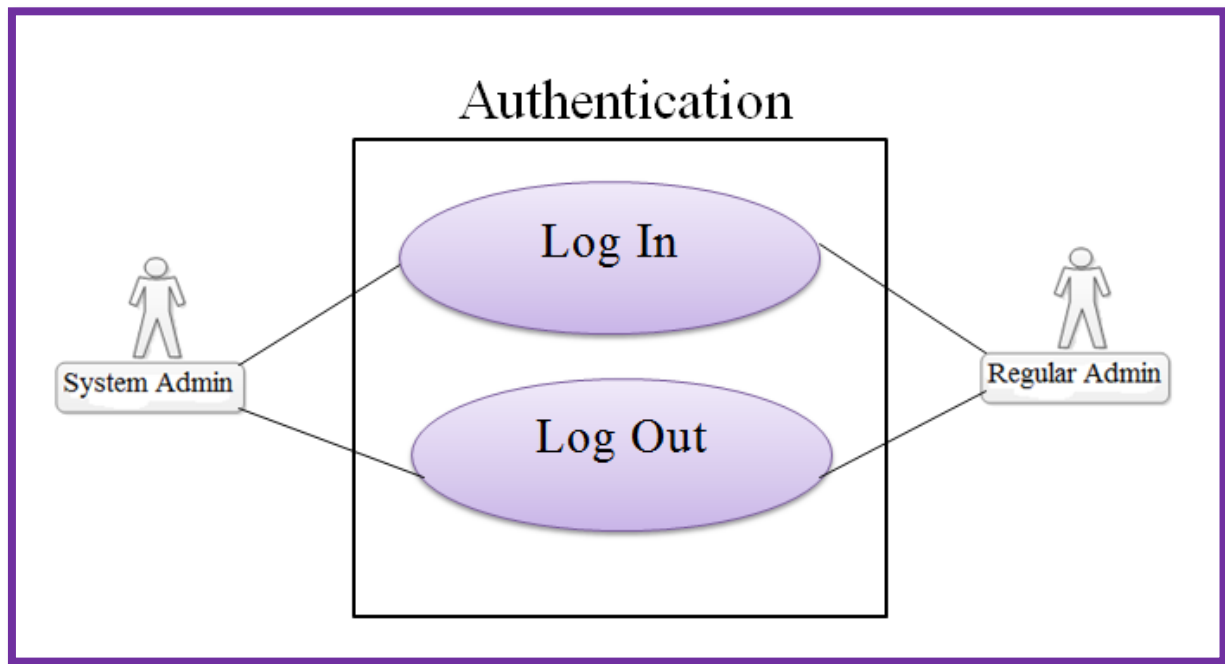
Fig: Use case (c): Authentication (level 1.1)

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(a) Use Case Description: **Log In**

Use Case Id	Level 1.1.1
Use Case Name	**Log In**
Primary Actor	System Admin, Regular Admin
Secondary Actor	none
Goal in Context	To enter the system.
Precondition	Must have an account on this system.
Scenario	1. View log in window. 2. Click on 'Log In' button. 3. Input User name or User ID & Password. 4. Proceed to the next activity.
Exception	1. Unrecognized user-name or user id. 2. Incorrect Password. 3. User is blocked.
Priority	Essential, must be implemented.
When Available	First increment.
Frequency of Use	Many times per day.

Use Case Description (a): Log in
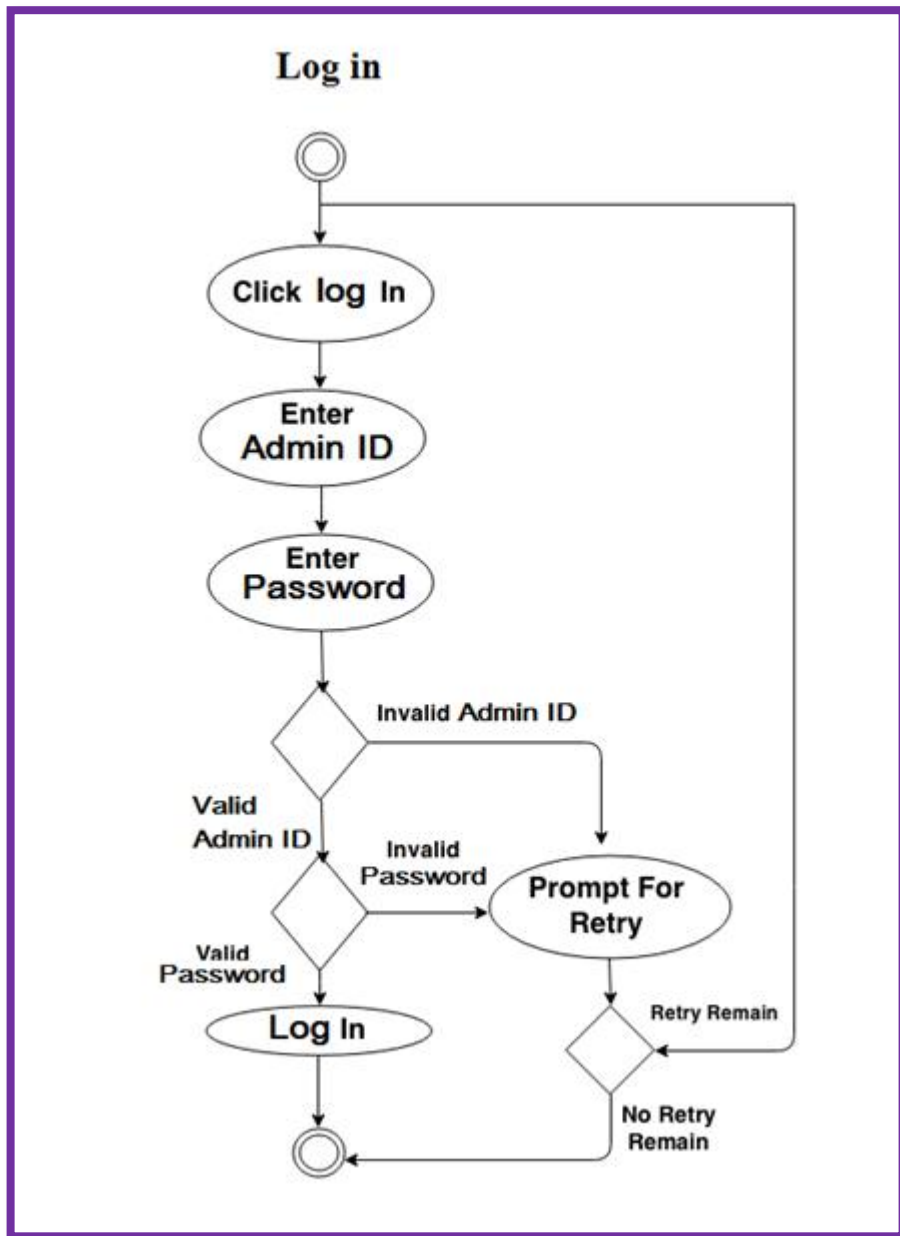
Fig: Activity diagram (a): Log in (level 1.1.1)

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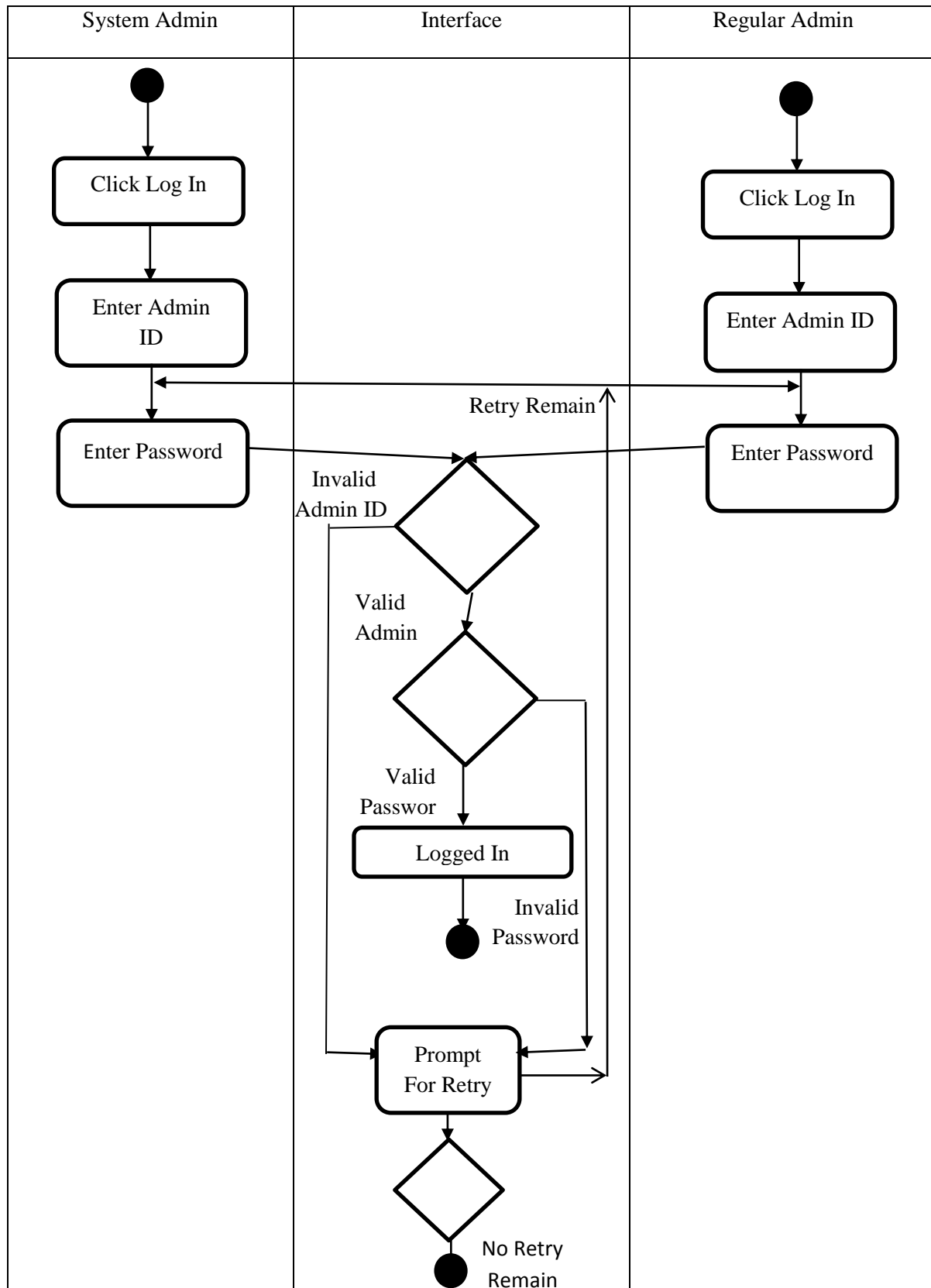
Log In

Fig: Swimlane diagram (a): Log in (level 1.1.1)

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(b) Use Case Description: **Log Out**

Use Case Id	Level 1.1.2
Use Case Name	**Log Out**
Primary Actor	System Admin, Regular Admin
Secondary Actor	none
Goal in Context	To exit from the system.
Precondition	Must be logged in.
Scenario	1. Click the 'Log Out' button. 2. Get out of the system.
Exception	1. System error. 2. Network error.
Priority	Essential, must be implemented.
When Available	Last increment.
Frequency of Use	Many times per day.

Use Case Description Table (b): Log Out

Automated Cyber Cafe System
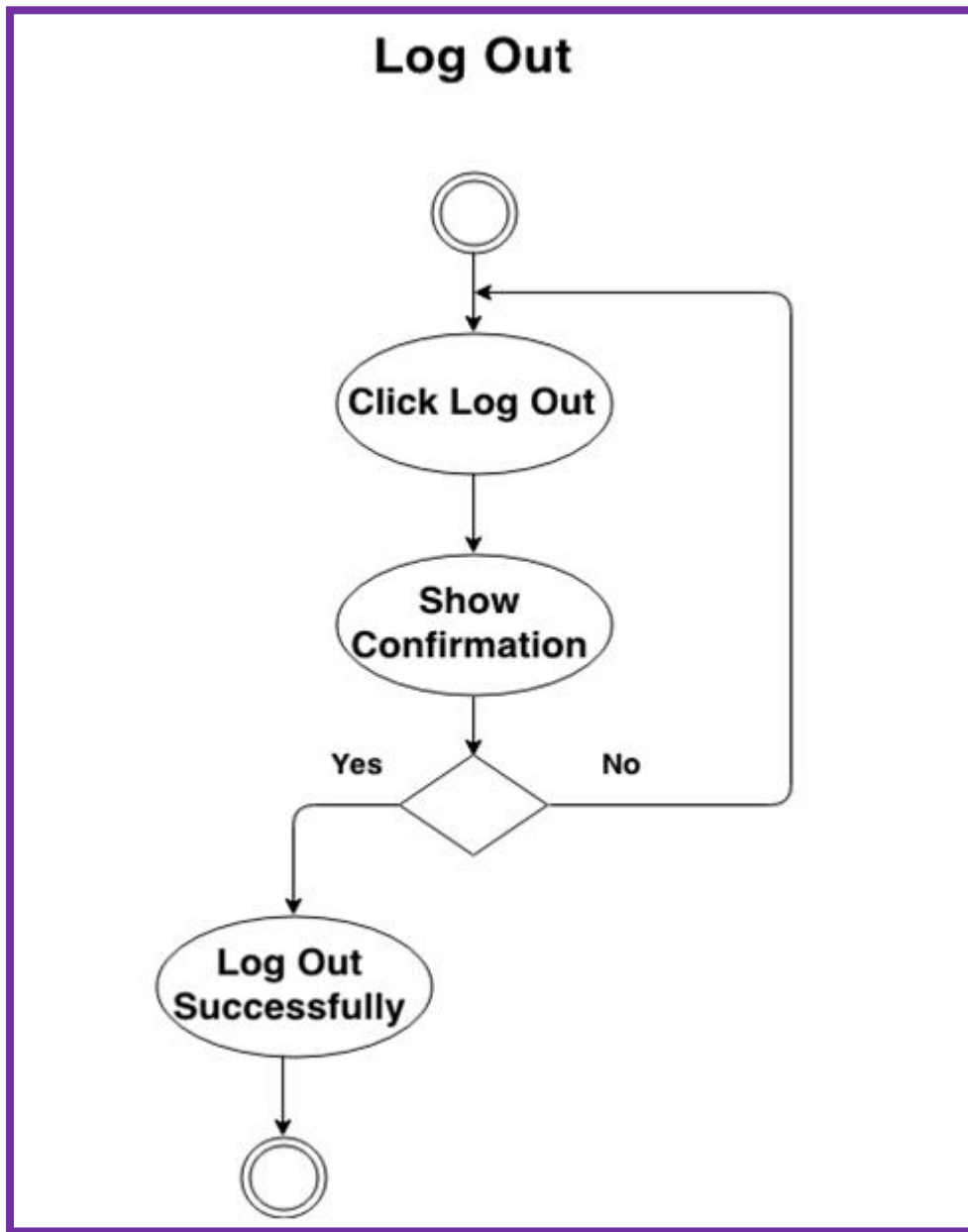
Log Out

Fig: Activity diagram (b): Log out (level 1.1.2)

Automated Cyber Cafe System

Log Out

System Admin	Interface	Regular Admin

Click Log Out

Ask for Confirmation

No

Yes

Log Out Successfull

Click Log Out
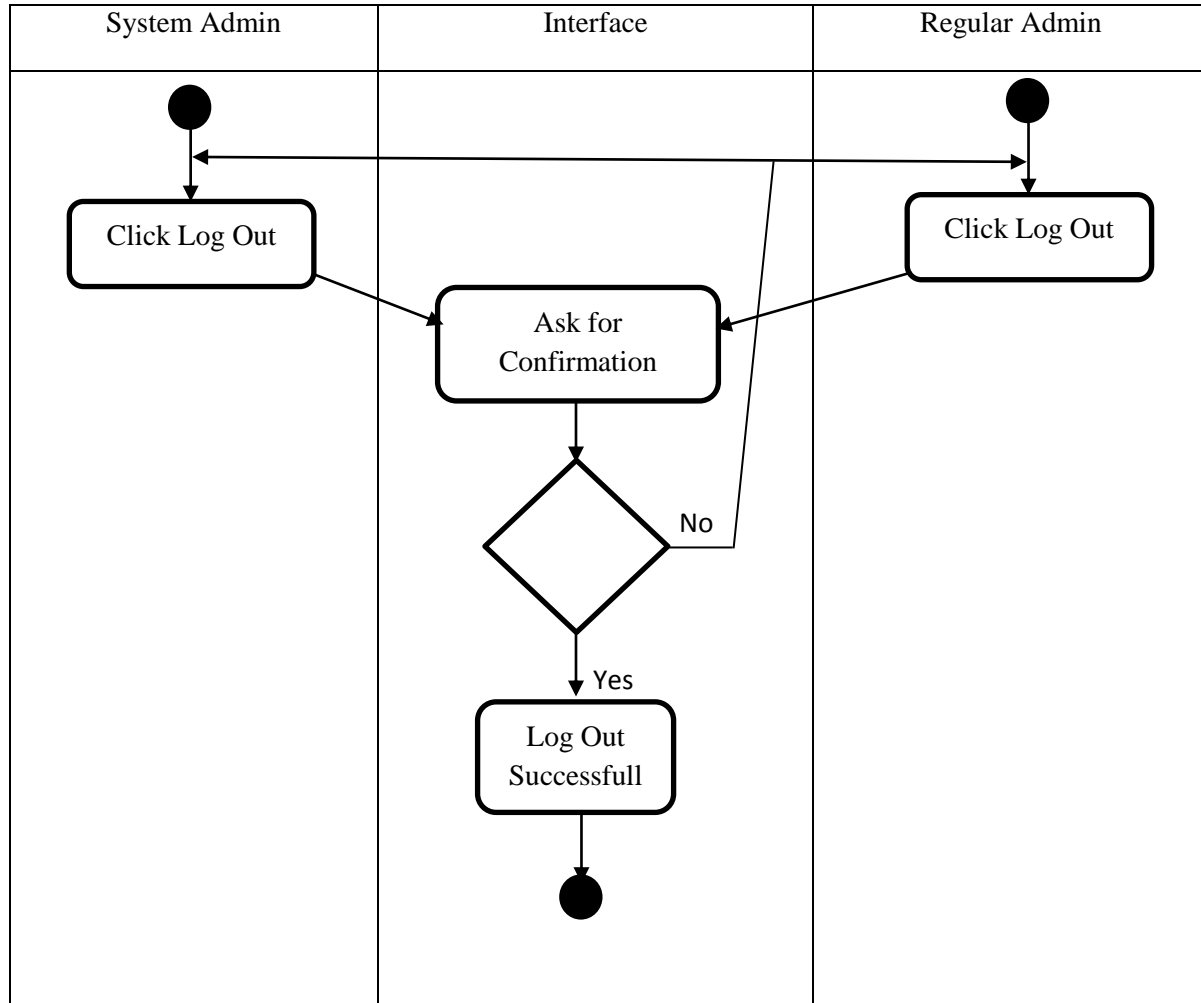
Fig: Swimlane diagram (b): Log Out (level 1.1.2)

Automated Cyber Cafe System
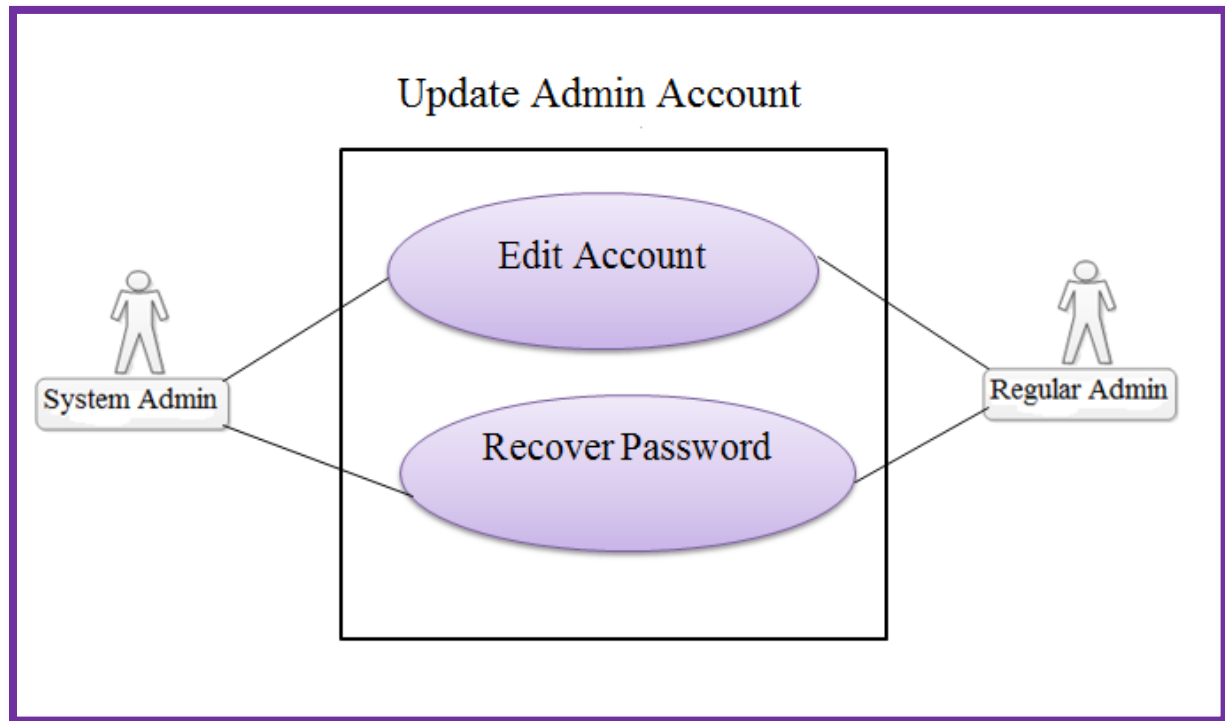
Fig: Use case (d): Update Admin Account (level 1.2)

Automated Cyber Cafe System

(c) Use Case Description: **Edit Account**

Use Case Id	Level 1.2.1
Use Case Name	**Edit Account**
Primary Actor	System Admin, Regular Admin
Secondary Actor	none
Goal in Context	To update one's information.
Precondition	Must have an account on this system.
Scenario	1. Log in to the system. 2. Click 'Edit Account' button. 3. Change information. 4. Save changes.
Exception	1. Function not configured for the system. 2. Unable to update. 3. Null information.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Moderate frequency.

Use Case Description Table (c): Edit Account

Automated Cyber Cafe System
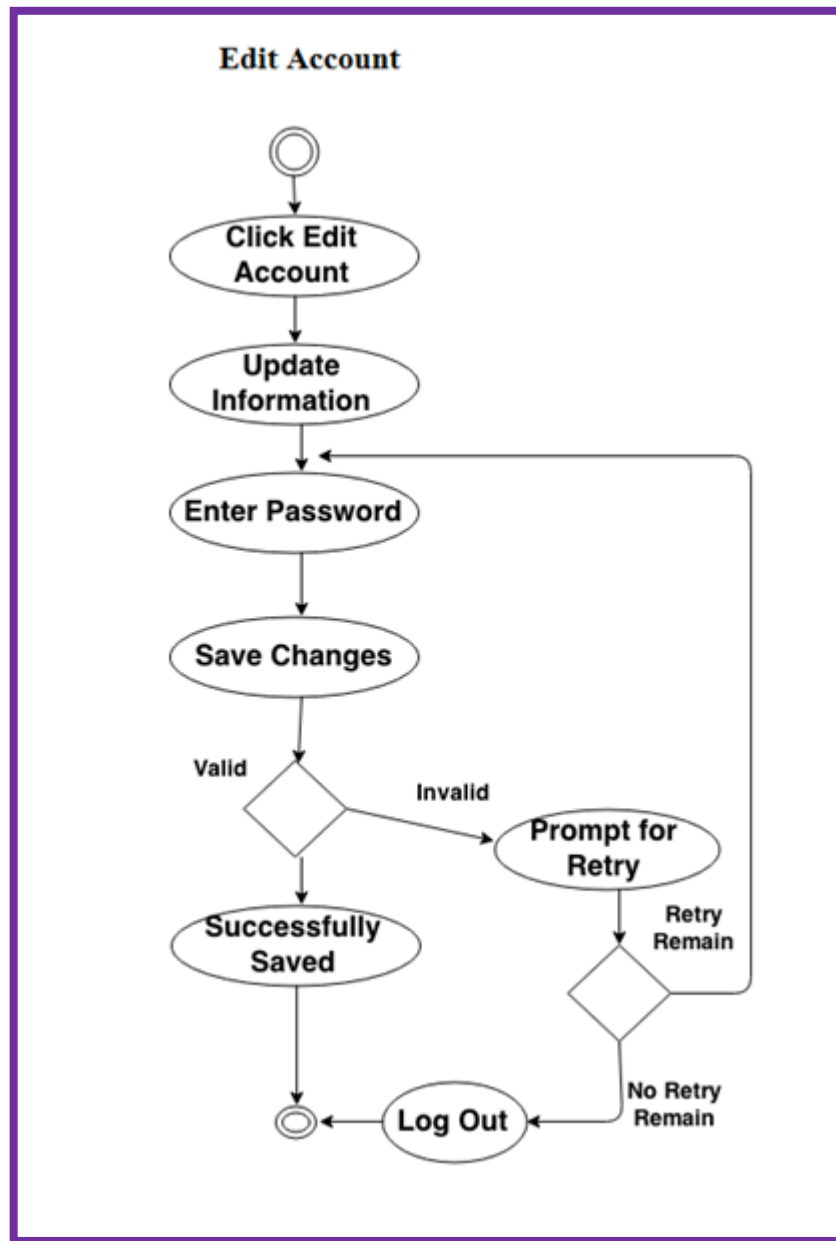
Fig: Activity diagram (b): Edit Account (level 1.2.1)

Automated Cyber Cafe System
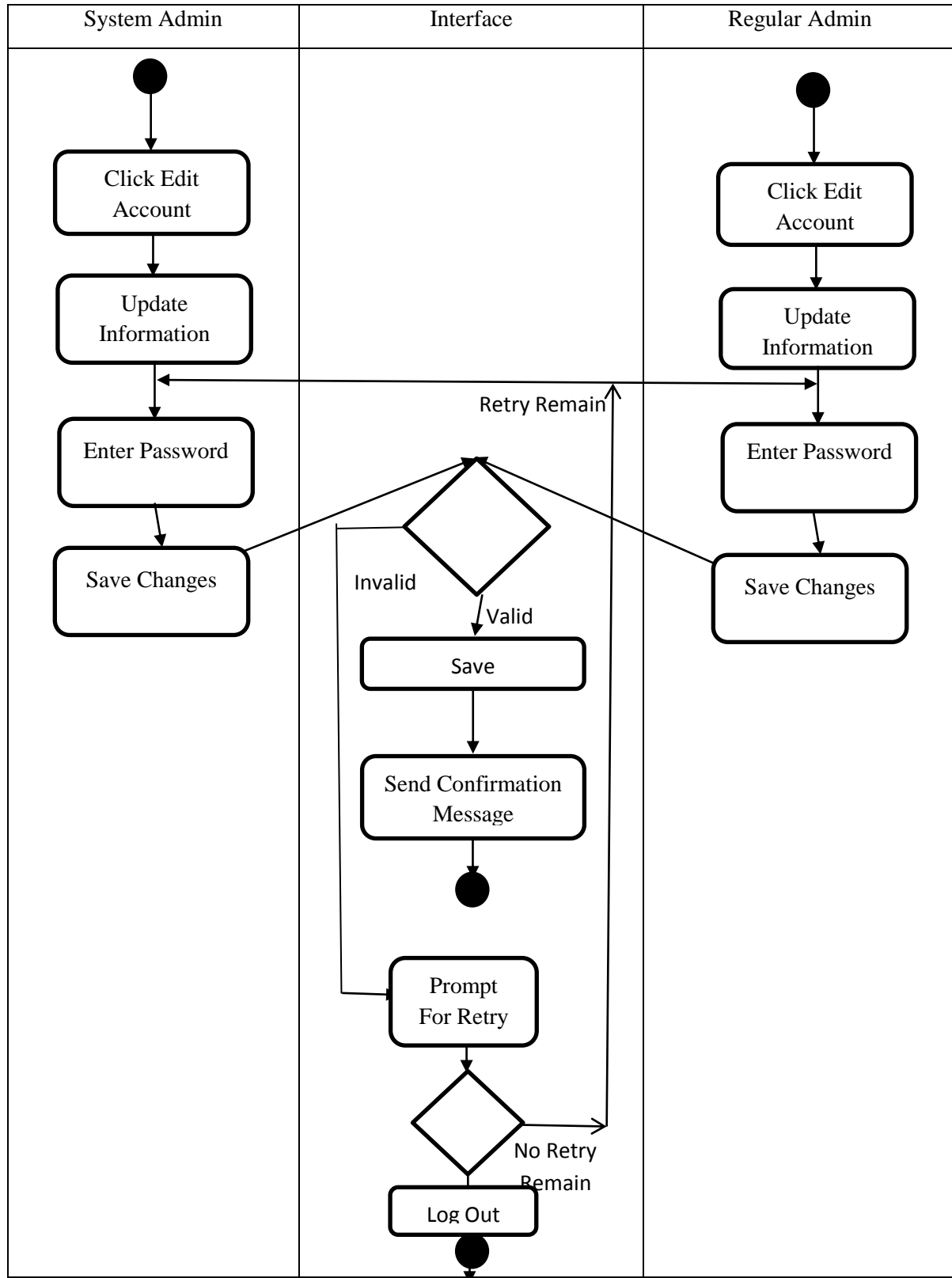
Edit Account

Fig: Swimlane diagram (c): Edit Account (level 1.2.1)

Automated Cyber Cafe System

(d) Use Case Description: **Recover Password**

Use Case Id	Level 1.2.2
Use Case Name	**Recover Password**
Primary Actor	System Admin, Regular Admin
Secondary Actor	none
Goal in Context	Change password with email verification
Precondition	Must have an account on this system and a valid email to recover password.
Scenario	1. Click "Recover Password Link button". 2. Enter registered email address on this system. 3. Click on the verification link. 4. Enter new password 5. Save Changes.
Exception	1. Unregistered email. 2. Link is not verified. 3. Account is blocked.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Moderate frequency.

Use Case Description Table (d): Recover Password

Automated Cyber Cafe System
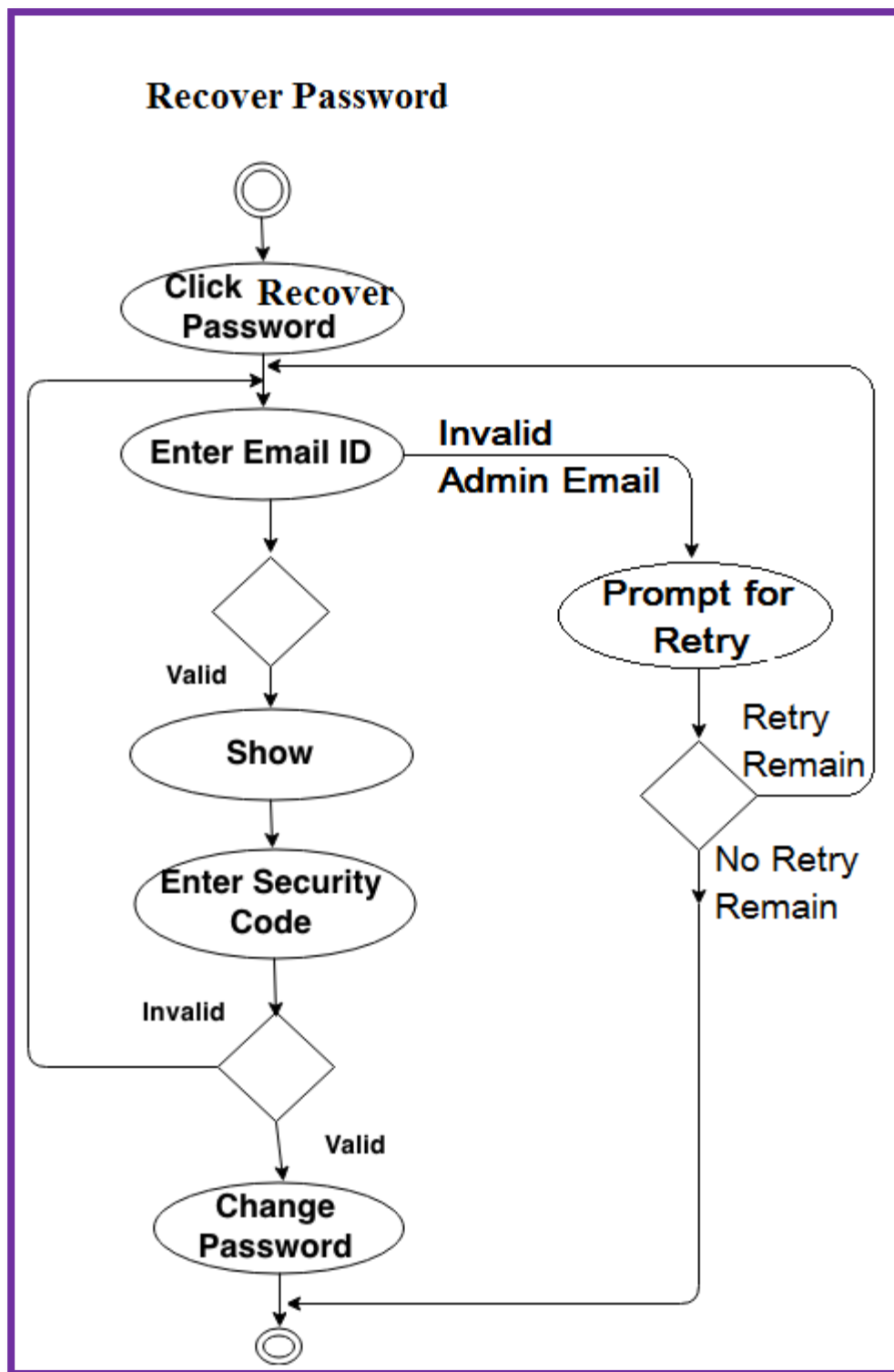
Fig: Activity diagram (d): Recover Password (level 1.2.2)

Automated Cyber Cafe System
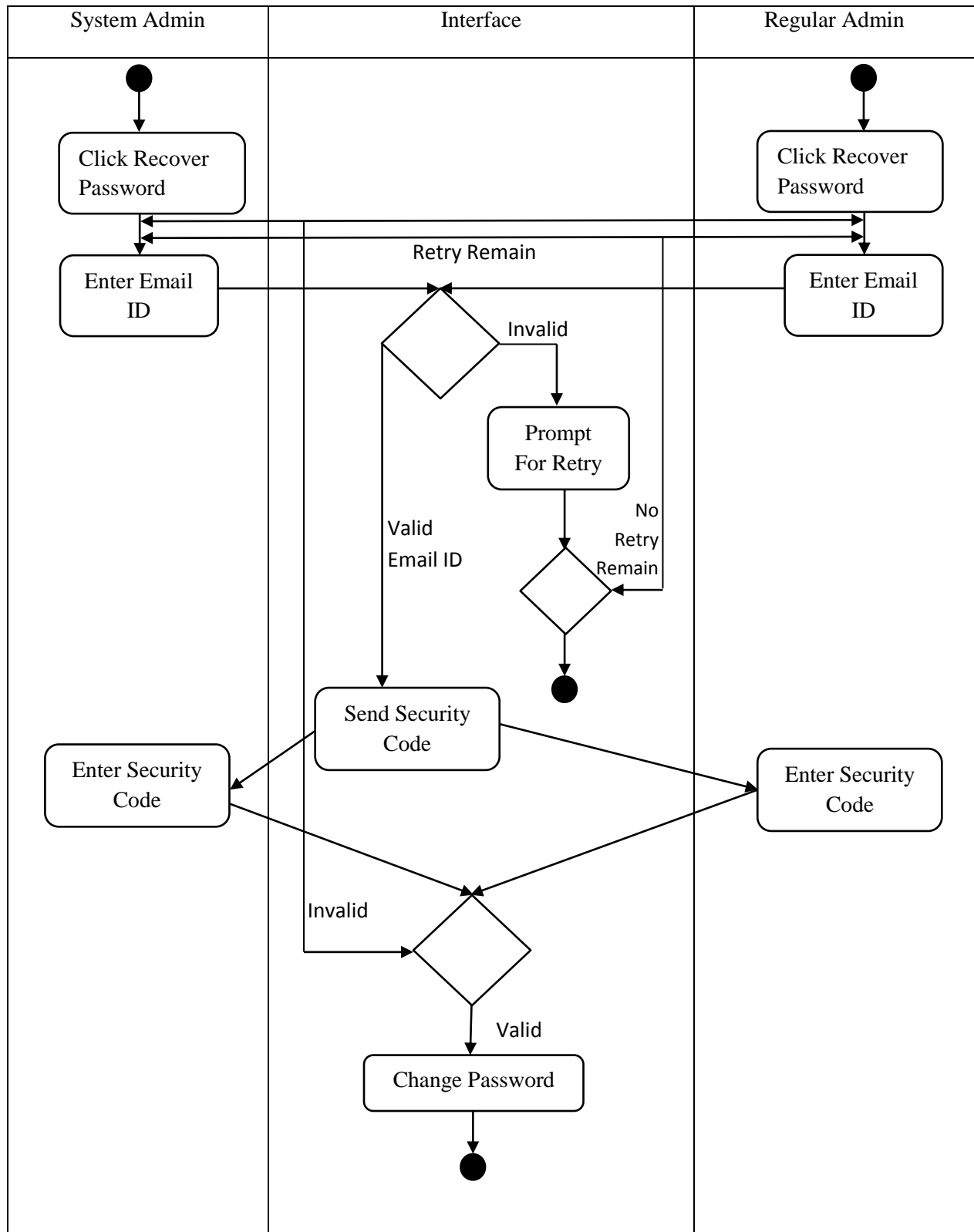
Recover Password

Fig: Swimlane diagram (d): Recover Password (level 1.2.2)

Automated Cyber Cafe System

(e) Use Case Description: **Generate Cards**

Use Case Id	Level 1.3
Use Case Name	**Generate Cards**
Primary Actor	System Admin
Secondary Actor	none
Goal in Context	To Generate Card Numbers and Pin numbers
Precondition	Must be logged in to the system
Scenario	1. Click "Generate Card". 2. Select preferable produce date. 3. Select numbers of cards to be produced 4. Click generate spread sheet 5. Click preview 6. Save file. /cancel.
Exception	1. Invalid date 2. Card number exceeds limit. 3. File not found.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	One time for every month.

Use Case Description Table (e): Generate Cards

Automated Cyber Cafe System
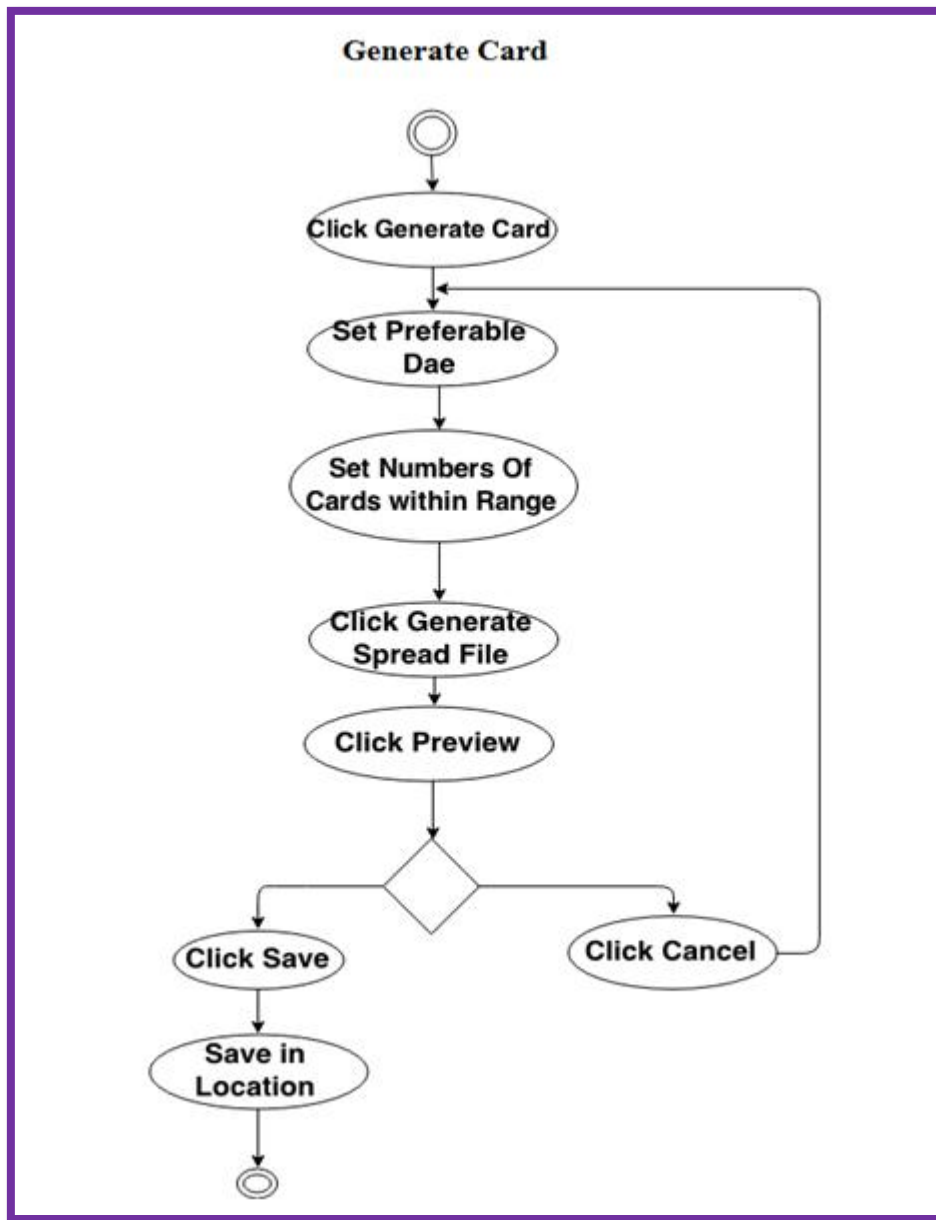
Fig: Activity diagram (e): Generate Cards (level 1.3)

Automated Cyber Cafe System
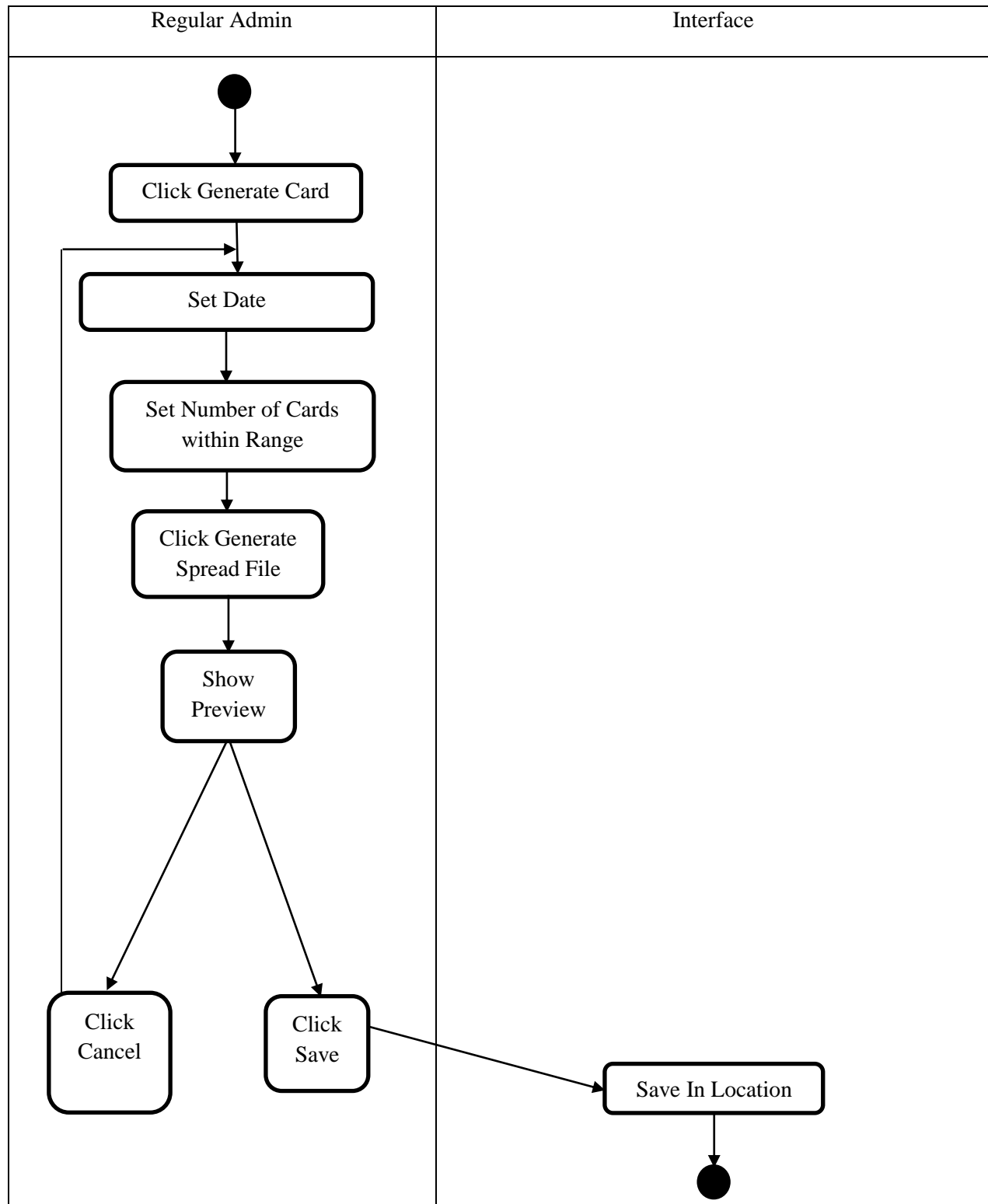
Generate Card

Fig: Swimlane diagram (e): Generate Cards (level 1.3)

Automated Cyber Cafe System

(f) Use Case Description: **Register User**

Use Case Id	Level 1.4
Use Case Name	**Register User**
Primary Actor	System Admin, regular admin
Secondary Actor	None
Goal in Context	To register student into the system
Precondition	Must be logged in to the system
Scenario	1. Click register student 2. Input student's information 3. Input Card information 4. Register
Exception	1. Invalid input 2. Network error
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (f): Register User

Automated Cyber Cafe System
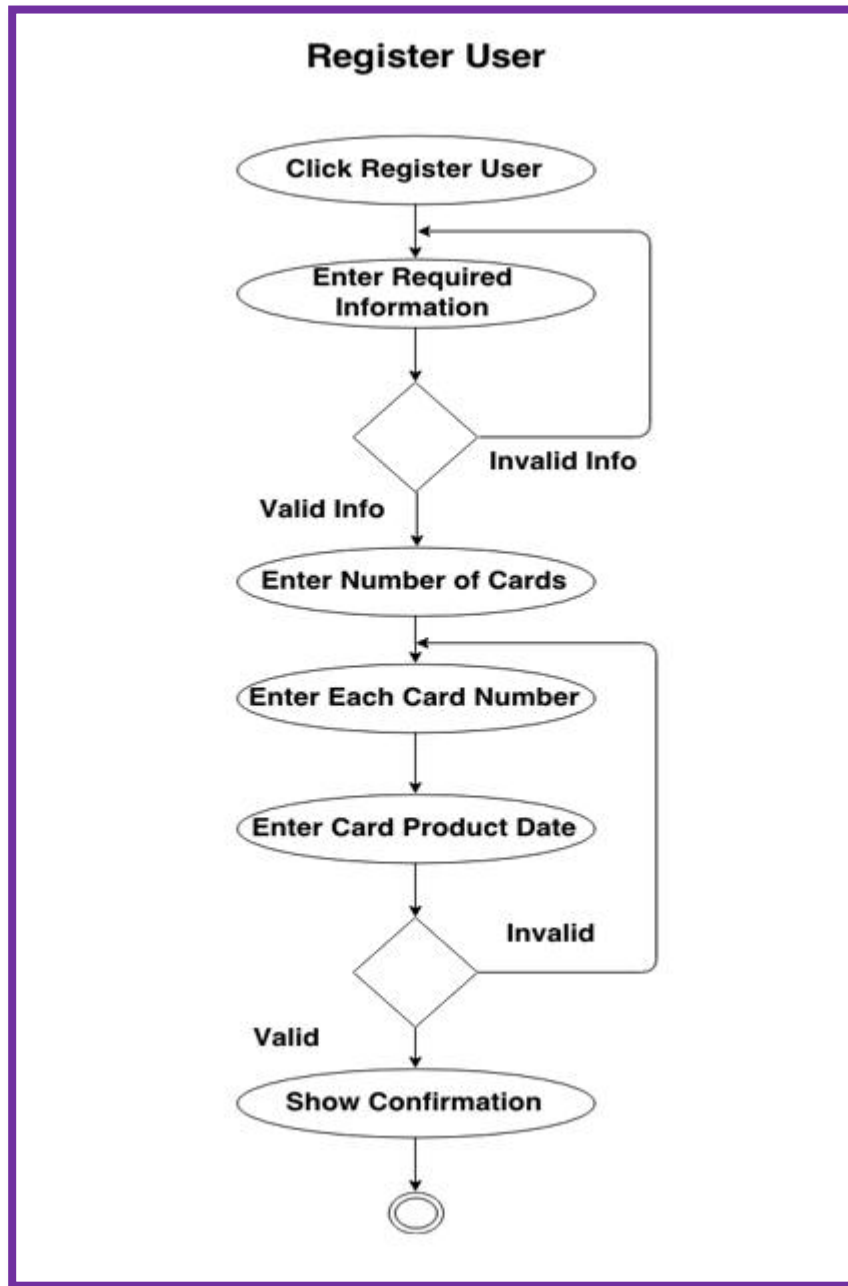
Fig: Activity diagram (f): Register User (level 1.4)

Automated Cyber Cafe System
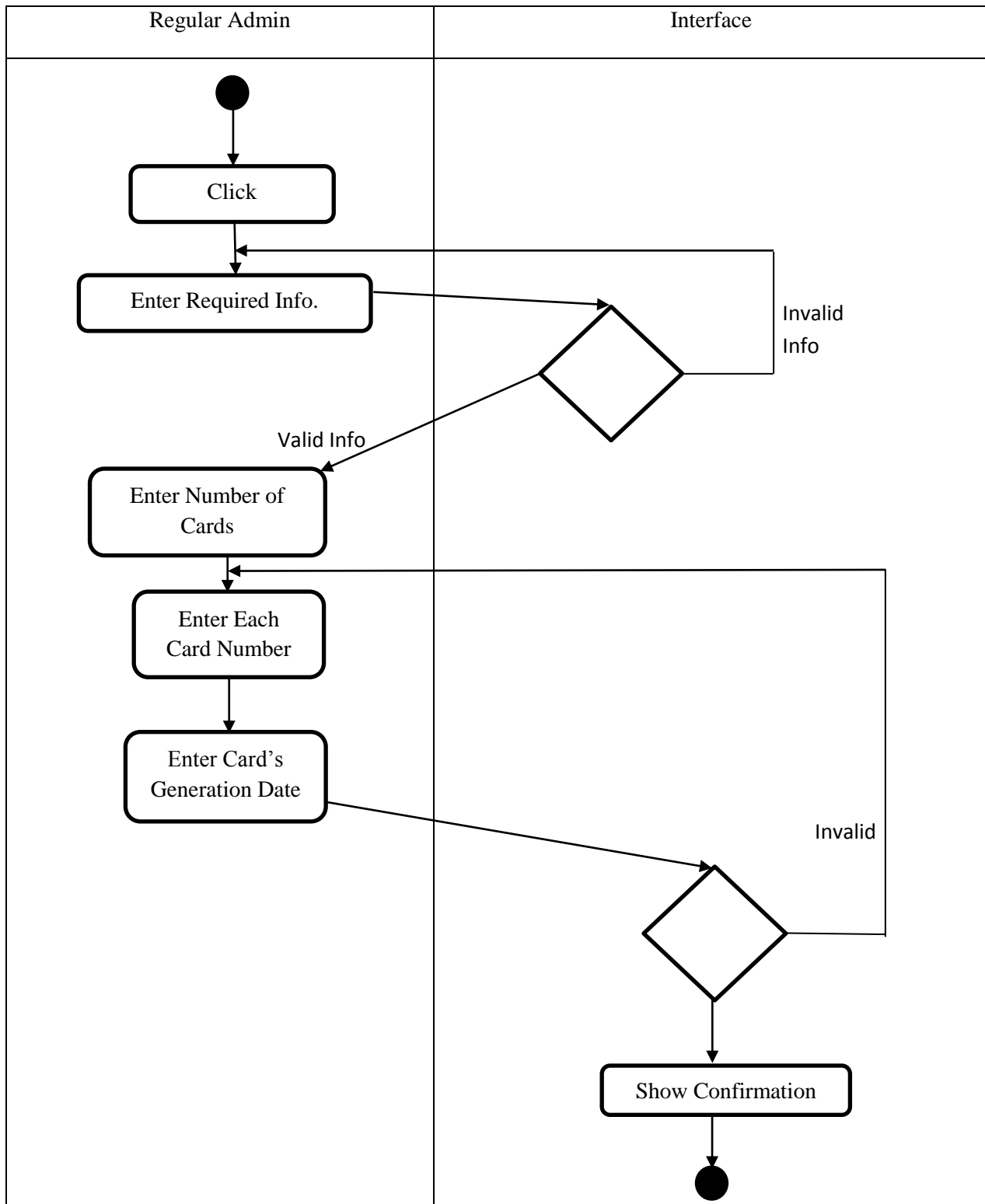
Register User

Fig: Swimlane diagram (f): Register User (level 1.4)

Automated Cyber Cafe System
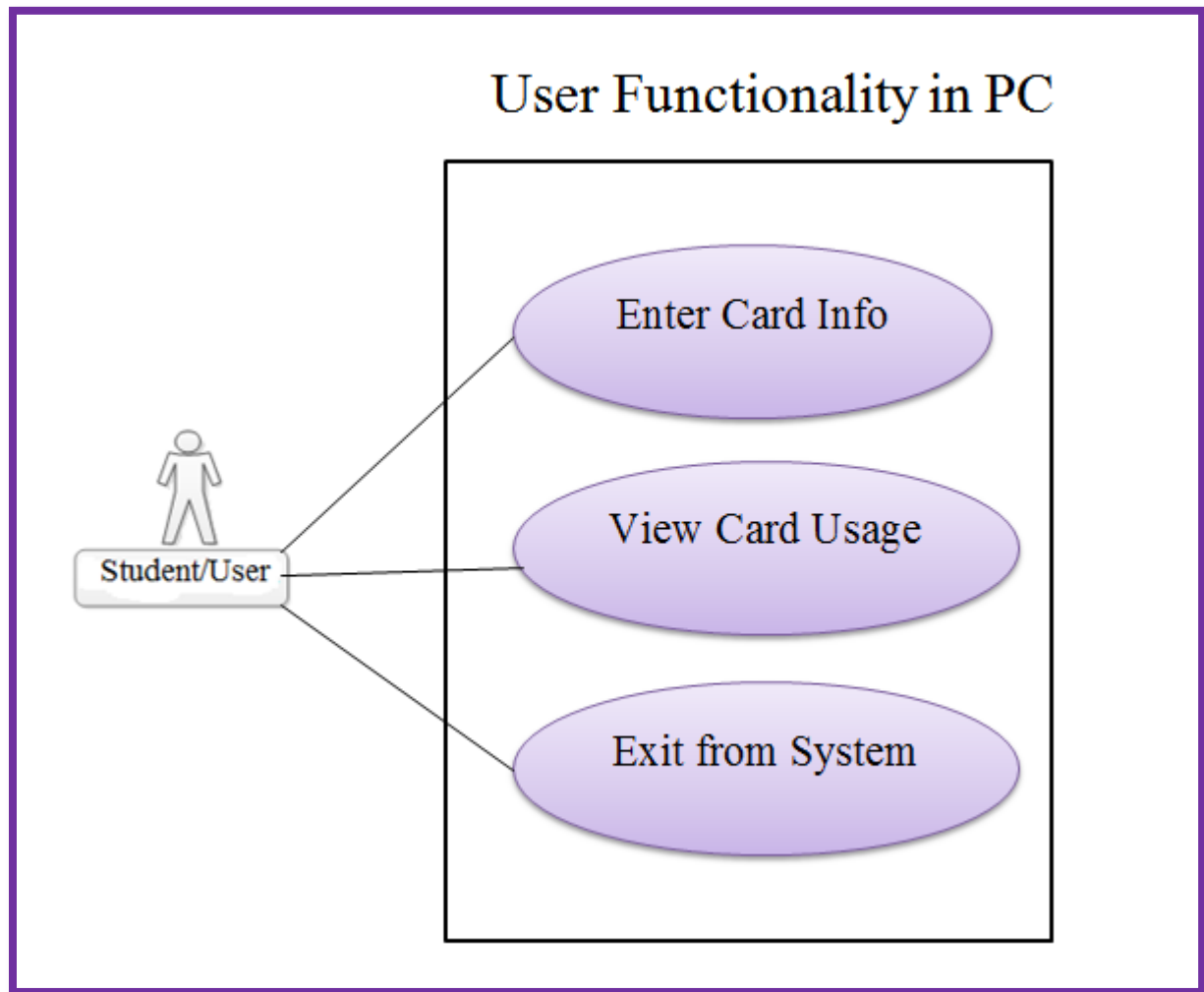
Fig: Use case (e): User Functionality in PC (level 1.5)

Automated Cyber Cafe System

(g)Use Case Description: **Enter Card Info**

Use Case Id	Level 1.5.1
Use Case Name	**Enter Card Info**
Primary Actor	Student
Secondary Actor	none
Goal in Context	To enter the PC desktop for using
Precondition	Must be registered on this system
Scenario	1. Turn On the PC. 2. Window will be shown. 3. Input Card number & Pin number. 4. Click "Submit" button.
Exception	1. Unrecognized card number. 2. Incorrect pin number 3. Card is expired. 4. Card is used by another user.
Priority	Essential, must be implemented.
When Available	First increment.
Frequency of Use	Many times per day.

Use Case Description Table (g): Enter Card Info

Automated Cyber Cafe System

Fig: Activity diagram (g): Enter Card Info (level 1.5.1)

Automated Cyber Cafe System
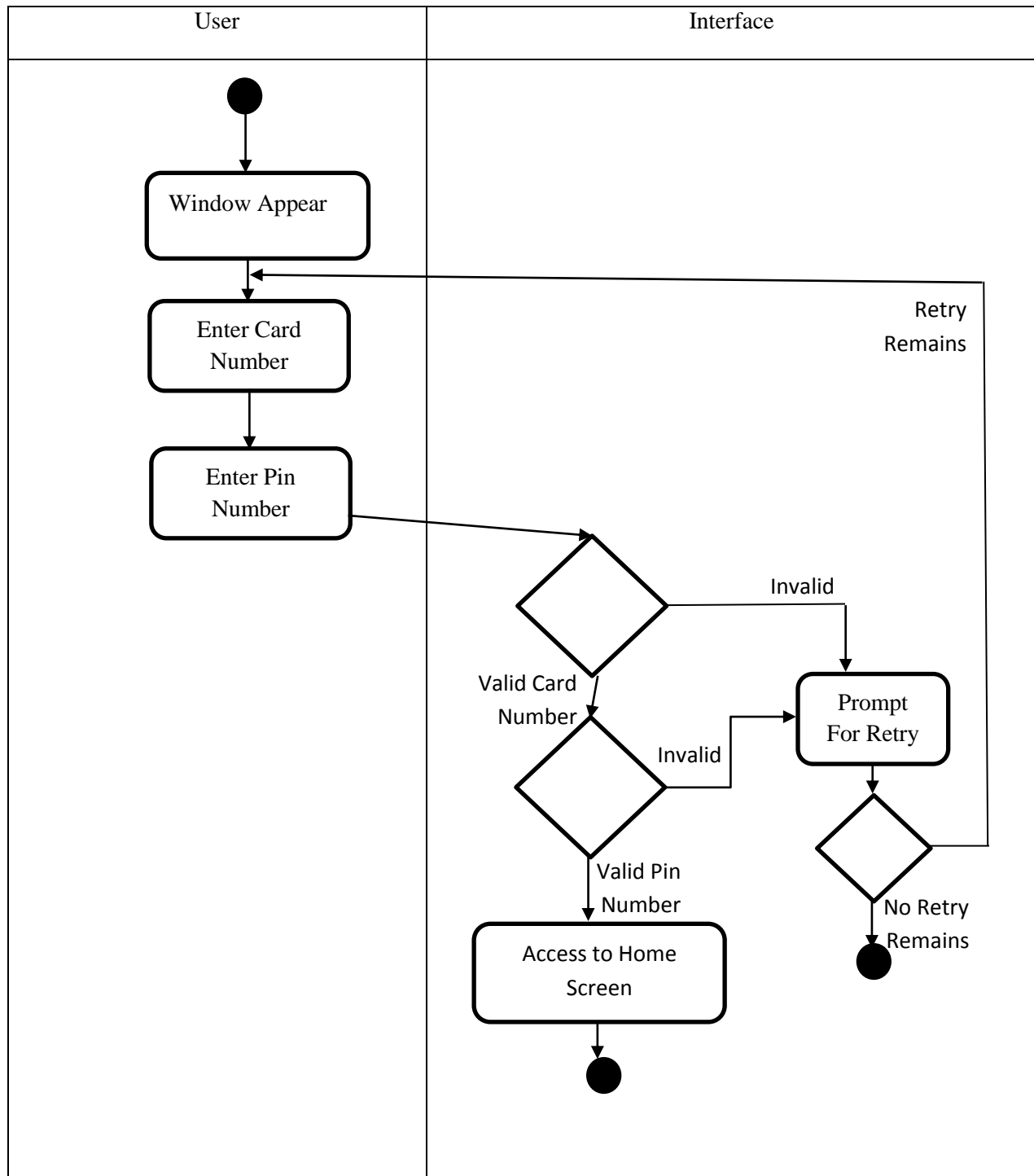
Enter Card Info

Fig: Swimlane diagram (g): Enter Card Info (level 1.5.1)

Automated Cyber Cafe System

(h) Use Case Description: **View Card Usage**

Use Case Id	Level 1.5.2
Use Case Name	**View Card Usage**
Primary Actor	Student
Secondary Actor	none
Goal in Context	To observe one's card usage.
Precondition	Must be accessed to the system.
Scenario	1. Click "View Usage" button. 2. Usage is shown in a new page or window.
Exception	1. View is not available 2. System error. 3. Network error.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (h): View Card Usage

Automated Cyber Cafe System
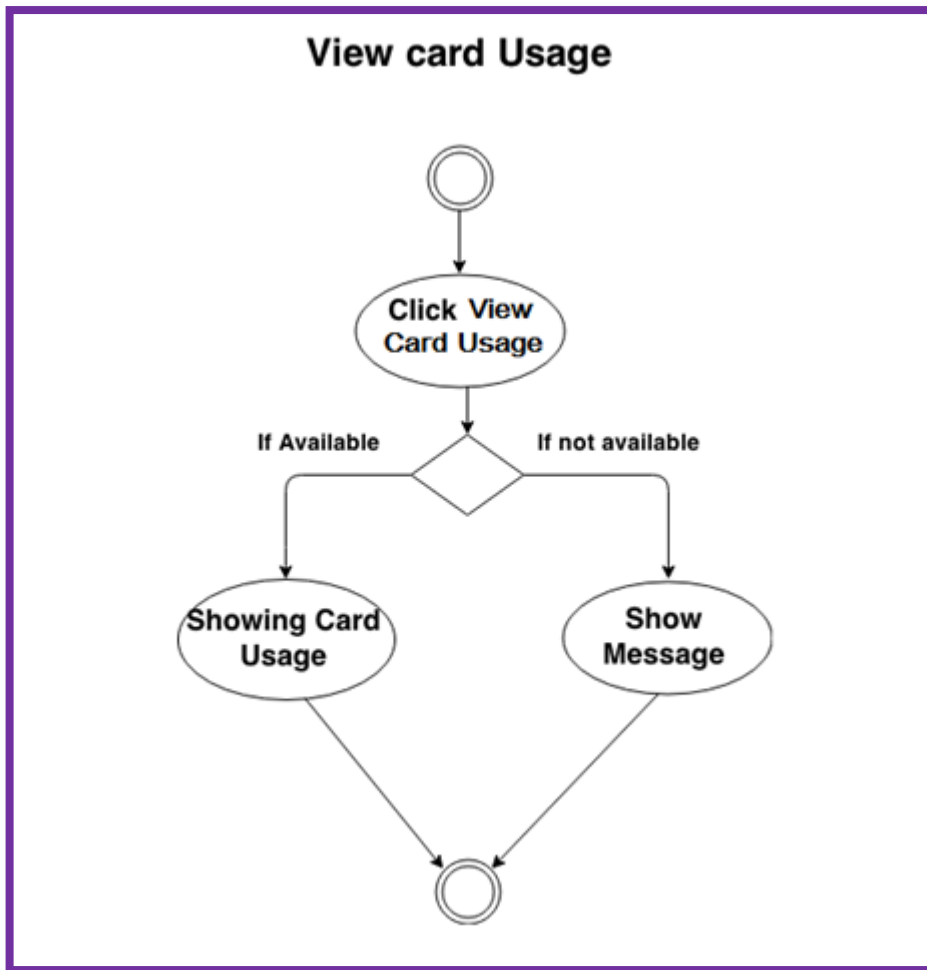
Fig: Activity diagram (h): View Card Usage (level 1.5.2)

Automated Cyber Cafe System

View Card Usage

User	Interface
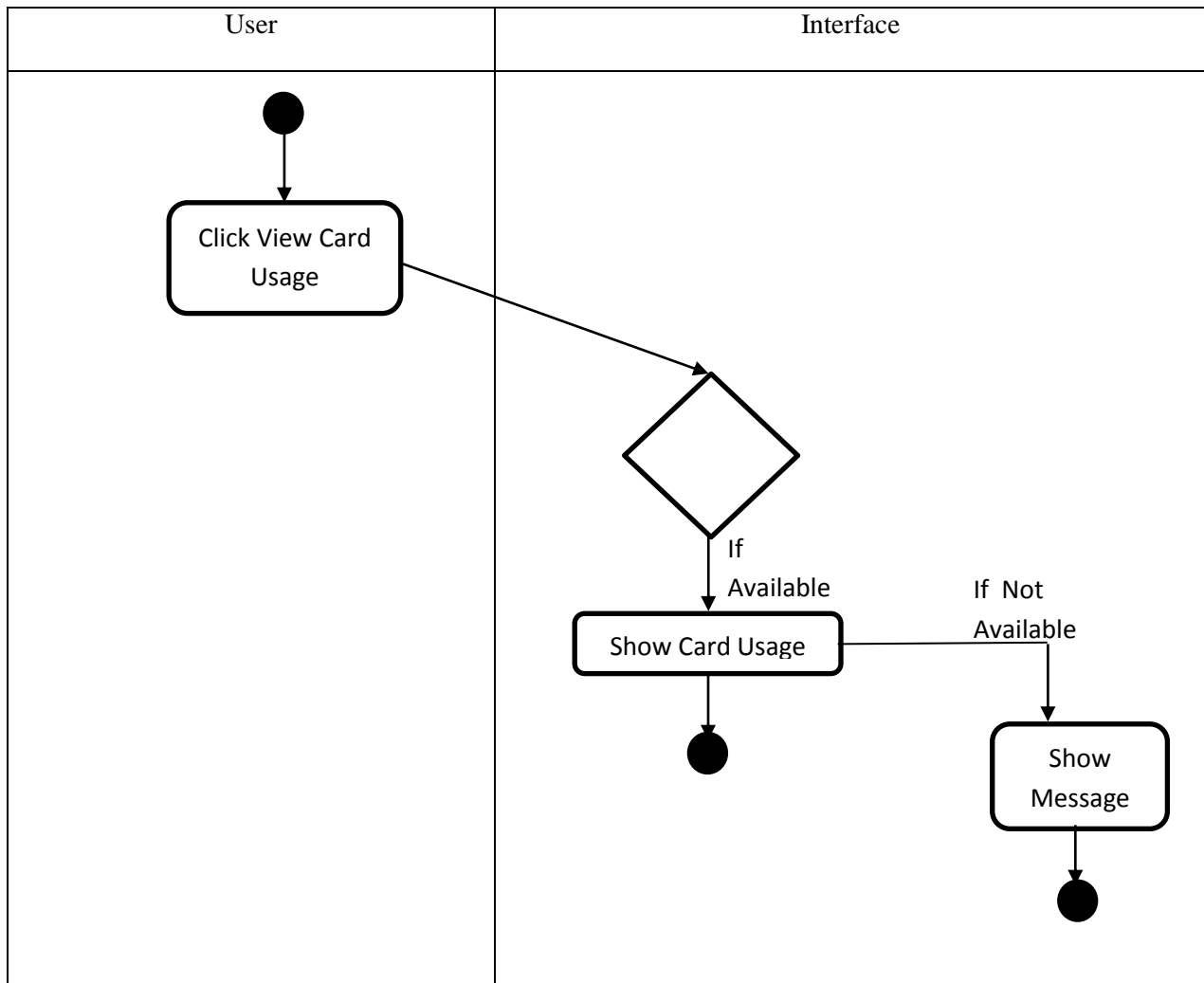
Fig: Swimlane diagram (h): View Card Usage (level 1.5.2)

Automated Cyber Cafe System

(i) Use Case Description: **Exit from System**

Use Case Id	Level 1.5.3
Use Case Name	**Exit from System**
Primary Actor	Student
Secondary Actor	none
Goal in Context	Stop using and to exit from the system
Precondition	Must be accessed to this system
Scenario	1. Click the 'Exit' button. 2. Get out of the system and PC home screen.
Exception	1. System error. 2. Network error.
Priority	Essential, must be implemented.
When Available	Last increment.
Frequency of Use	Many times per day.

Use Case Description Table (i): Exit from System

Automated Cyber Cafe System
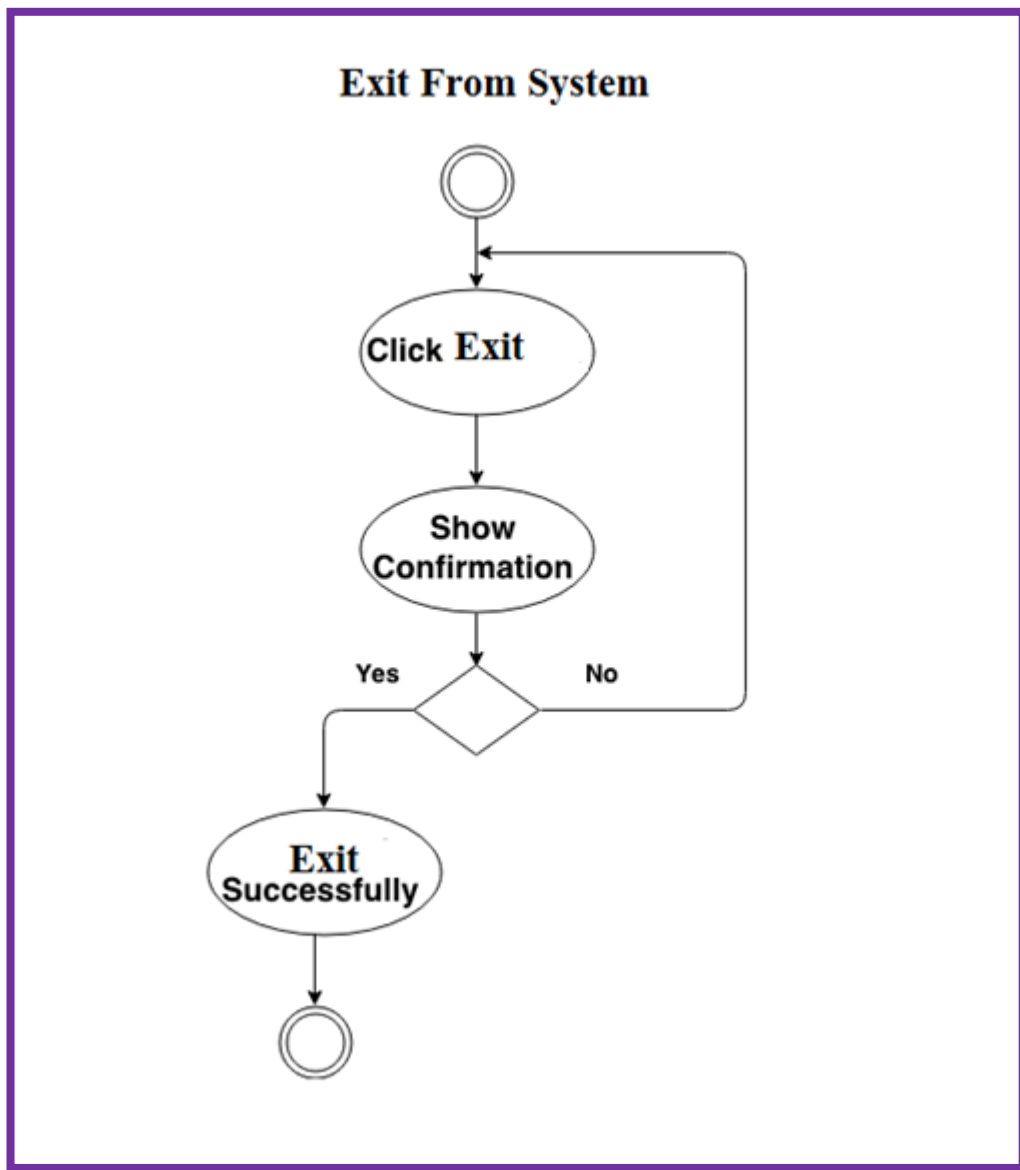
Exit From System

Fig: Activity diagram (i): Exit from System (level 1.5.3)

Automated Cyber Cafe System

Exit from System

User	Interface
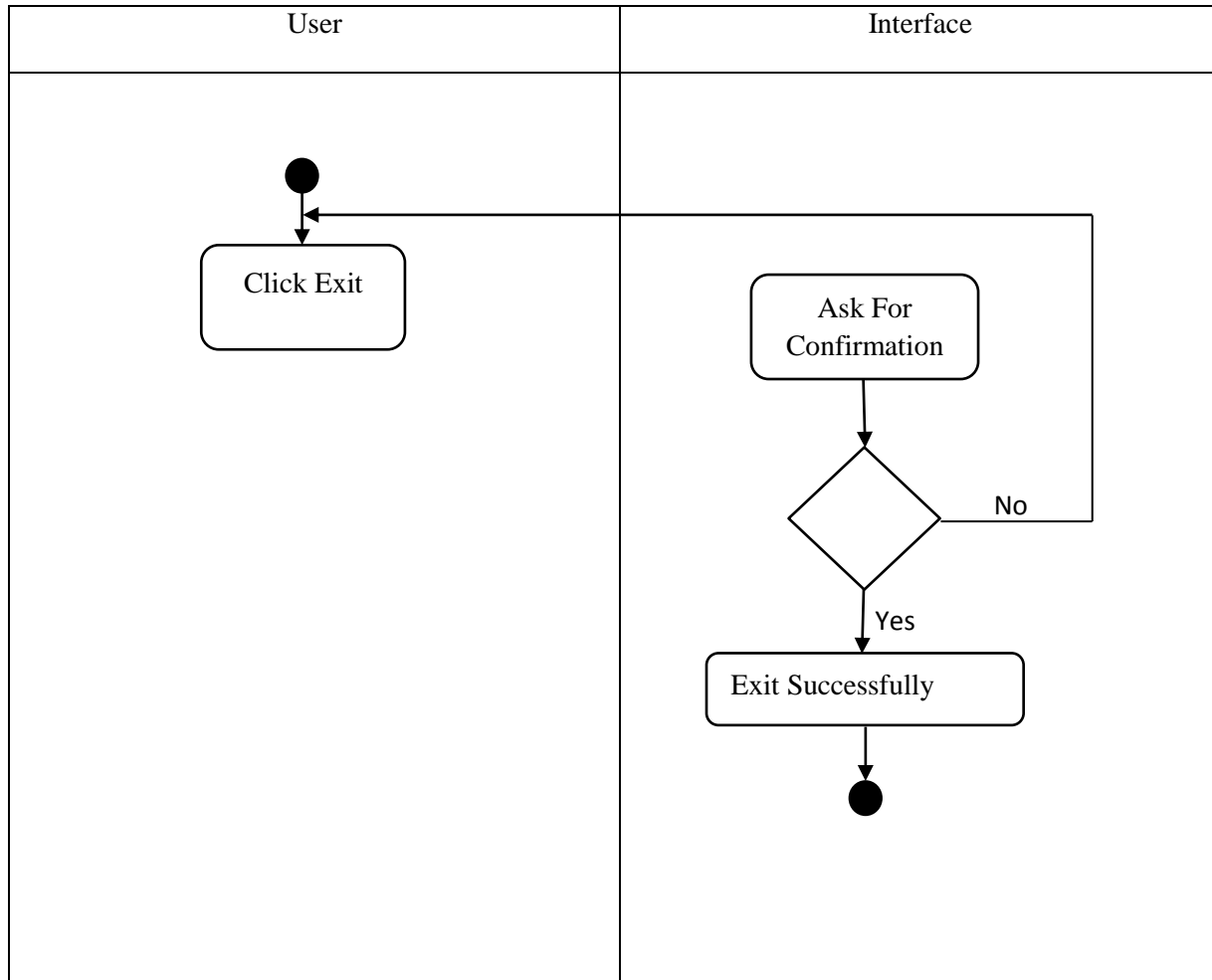
Fig: Swimlane diagram (i): Exit from System (level 1.5.3)

Automated Cyber Cafe System
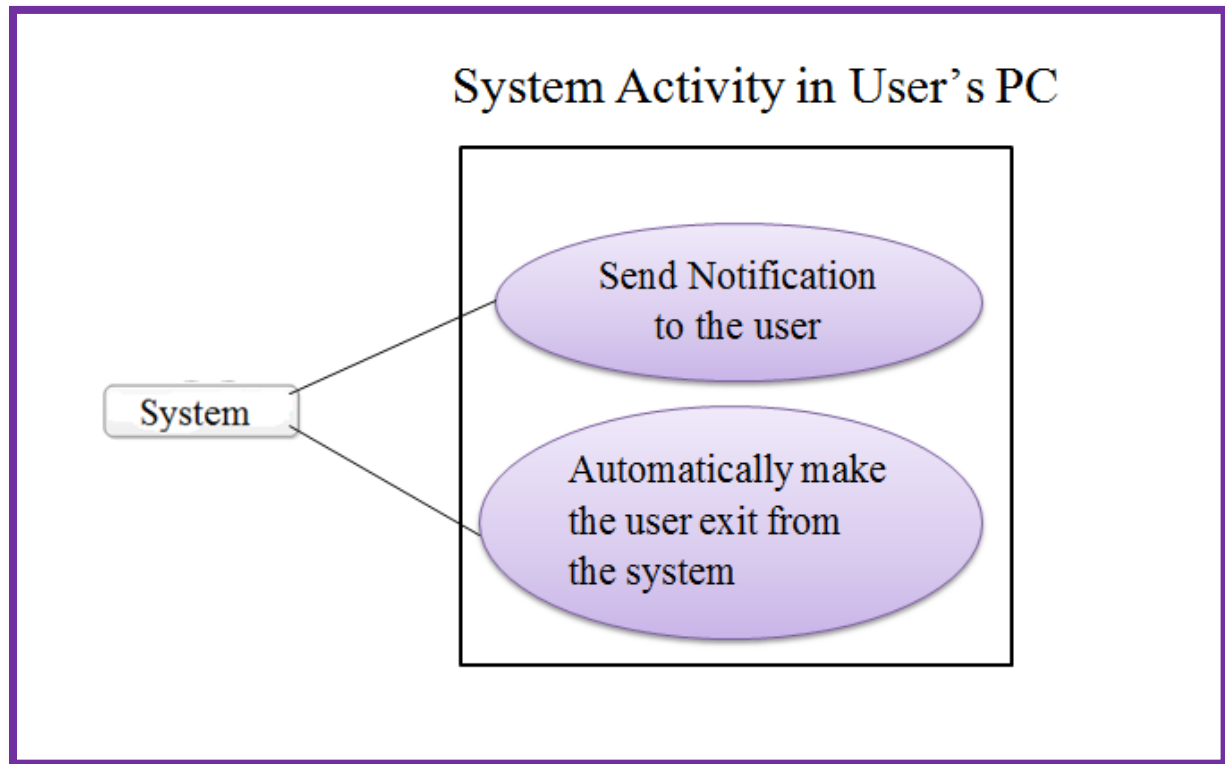
Fig: Use case (f): System Activity in User PC (level 1.6)

Automated Cyber Cafe System

(j) Usage Case Description: **System activity in user PC**

Use Case Id	Level 1.6
Use Case Name	**System activity in user PC**
Primary Actor	System.
Secondary Actor	student
Goal in Context	To notify user.
Precondition	Student must be signed in to the system.
Scenario	1. Checking remaining time 2. If reaming time is less than 15 minutes 3. Notify user
Exception	1. Accessing to home screen of pc when remaining time is less than 15 minutes 2. Accessing to home screen of pc when remaining time is less than 15 minutes
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (j): System Activity in User PC

Automated Cyber Cafe System

System Activity in User PC

Fig: Activity diagram (j): System Activity in User Pc (level 1.6)

Automated Cyber Cafe System

System Activity in User

System   **Interface**   **System**

Check Remaining Time

Time<15 Minute

Time=15 Minute

Send 15 Minute Notification

Time=5 Minute

Send Emergency

Send 5 Minute Notification

Time=0

Make Auto Exit user from system
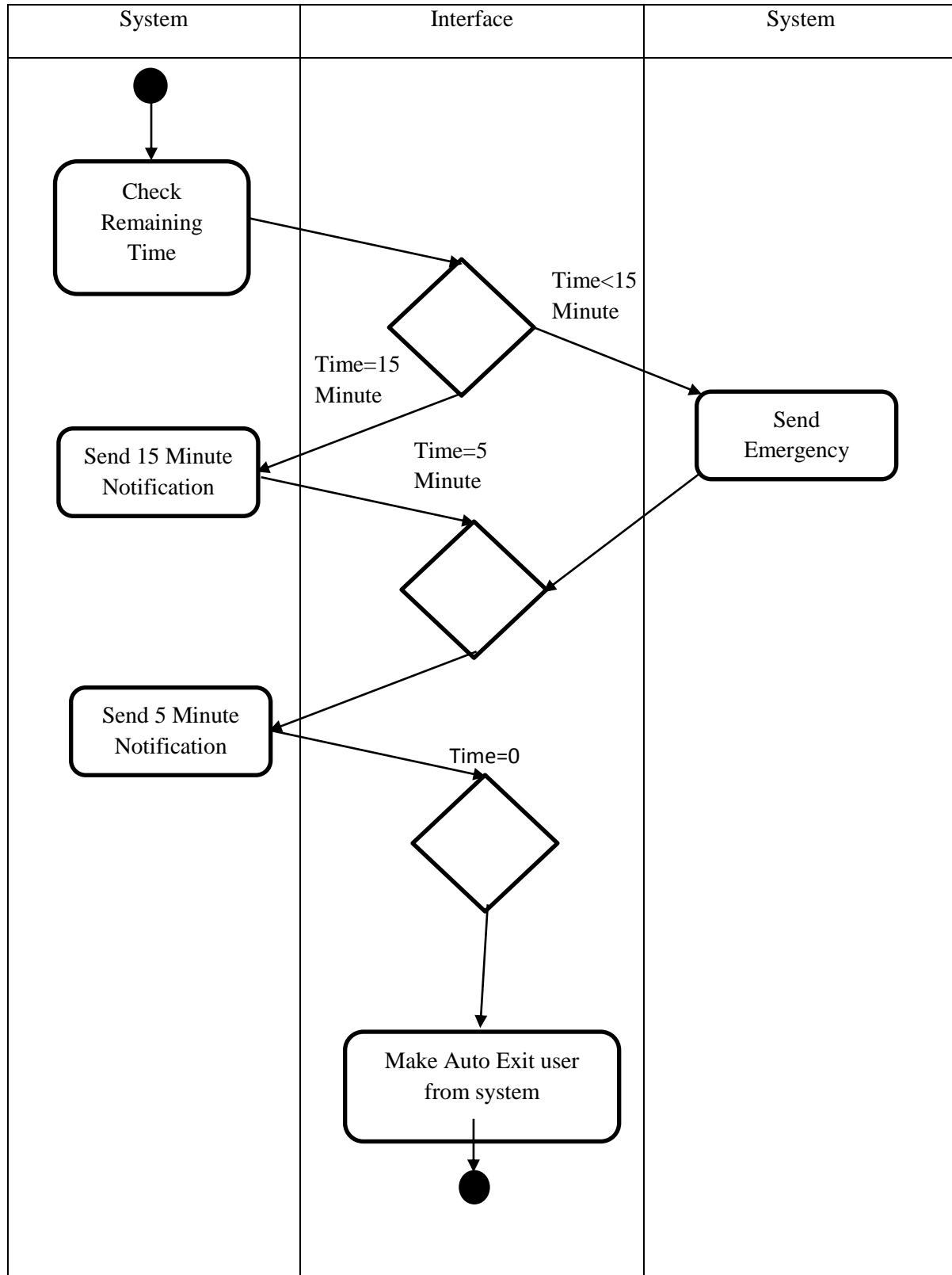
Fig: Swimlane diagram (j): System Activity in User Pc (level 1.6)

Automated Cyber Cafe System
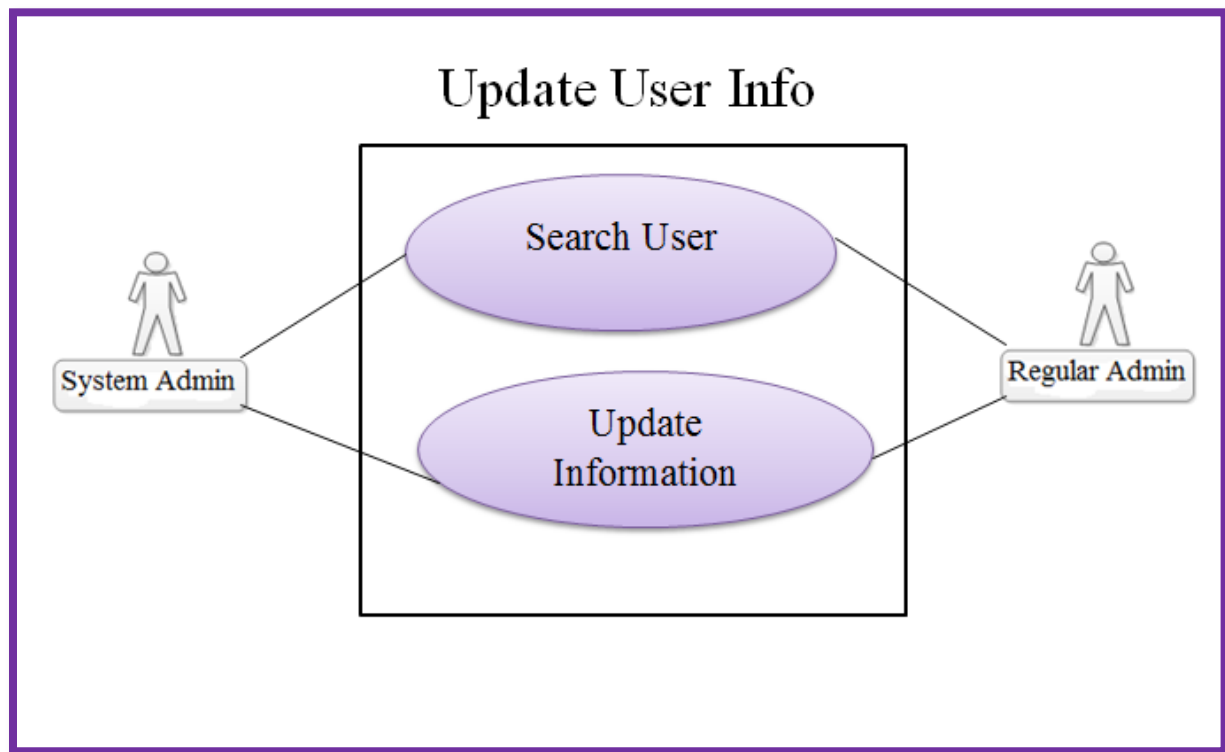
Fig: Use case (g): Update User Information (level 1.7)

Automated Cyber Cafe System

(k) Usage Case Description: **Search User**

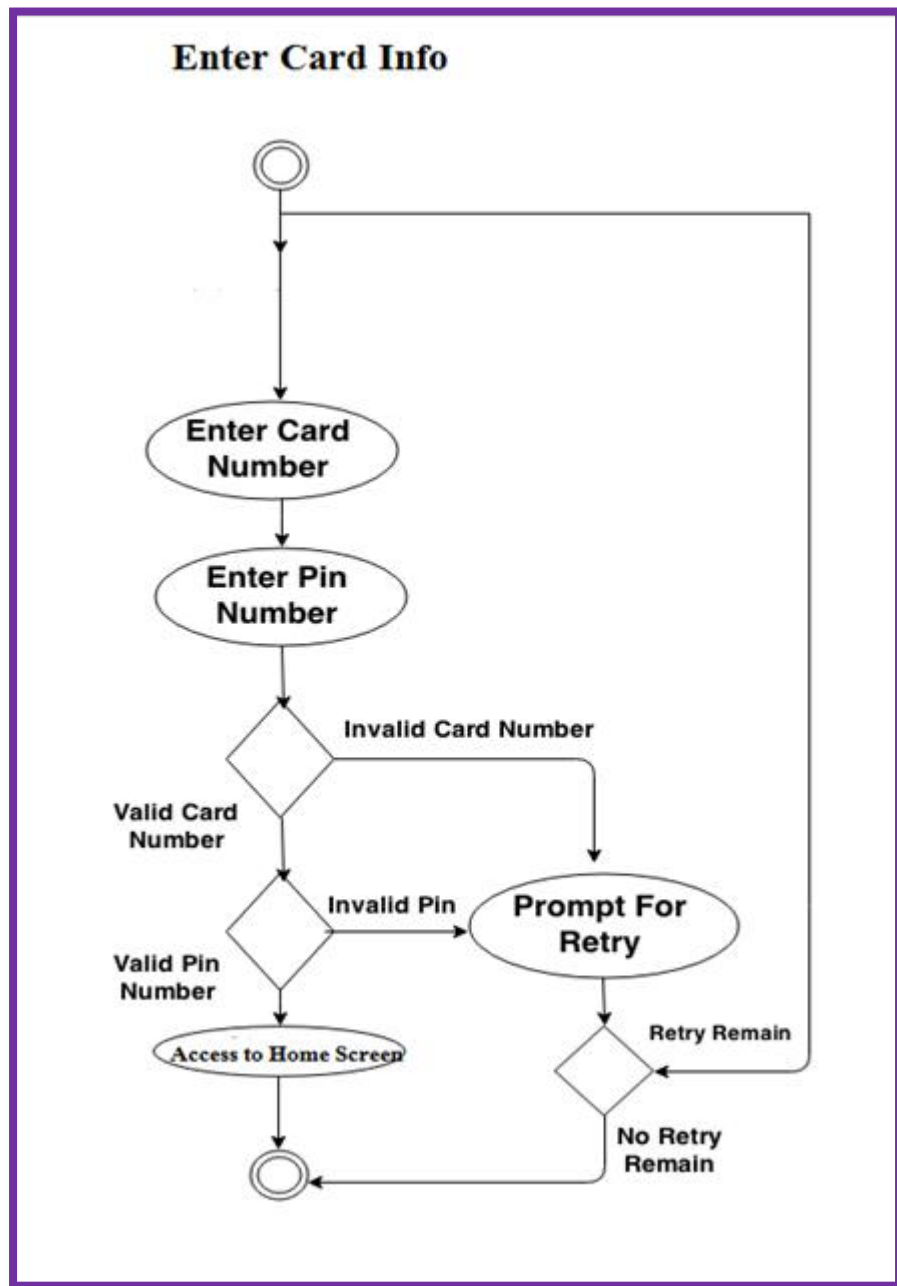| Use Case Id	Level 1.7.1
Use Case Name	Search User
Primary Actor	System Admin, regular admin
Secondary Actor	none
Goal in Context	To search registered student information.
Precondition	Student must be registered on the system.
Scenario	1. Click "Update info" button. 2. Enter search key. 3. View search result
Exception	1. Invalid search key 2. Search key does not find
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

**Use Case Description Table (k): Search User**

Automated Cyber Cafe System

Fig: Activity diagram (k): Search User (level 1.7.1)

Automated Cyber Cafe System

Search User

Automated Cyber Cafe System

(l) Usage Case Description: **Update info**

Use Case Id	Level 1.7.2
Use Case Name	**Update info**
Primary Actor	System admin, regular admin
Secondary Actor	none
Goal in Context	To update registered student information
Precondition	Student must be registered on the system and search key must be found.
Scenario	1. Select User from search result 2. Chose option "Edit basic info" or "Add new card" 3. Update Card Number or student basic information 4. Save changes.
Exception	1. Invalid card number 2. Invalid information.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (l): Update Info

Automated Cyber Cafe System

Fig: Activity diagram (l): Update Info (level 1.7.2)

Automated Cyber Cafe System

Update Info

Fig: Swimlane diagram (l): Update Info (level 1.7.2)

Automated Cyber Cafe System

(m) Usage Case Description: **Monthly Balance Sheet**

Use Case Id	Level 1.8
Use Case Name	**Monthly Balance Sheet**
Primary Actor	System Admin
Secondary Actor	none
Goal in Context	To view or generate monthly balance sheet.
Precondition	Must be logged in to the system
Scenario	1. Click "Balance Sheet" button. 2. Select Option "View Balance Sheet" or "Generate Balance Sheet" 3. Select month and show monthly balance sheet. 4. Enter deposited amount and date 5. Generate balance sheet.
Exception	1. System Error 2. Network Error 3. View does not available right that moment. 4. Month is not ended at all.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day(View Balance Sheet),One time for every month(Generate balance sheet)

Use Case Description Table (m): Monthly Balance Sheet

Automated Cyber Cafe System
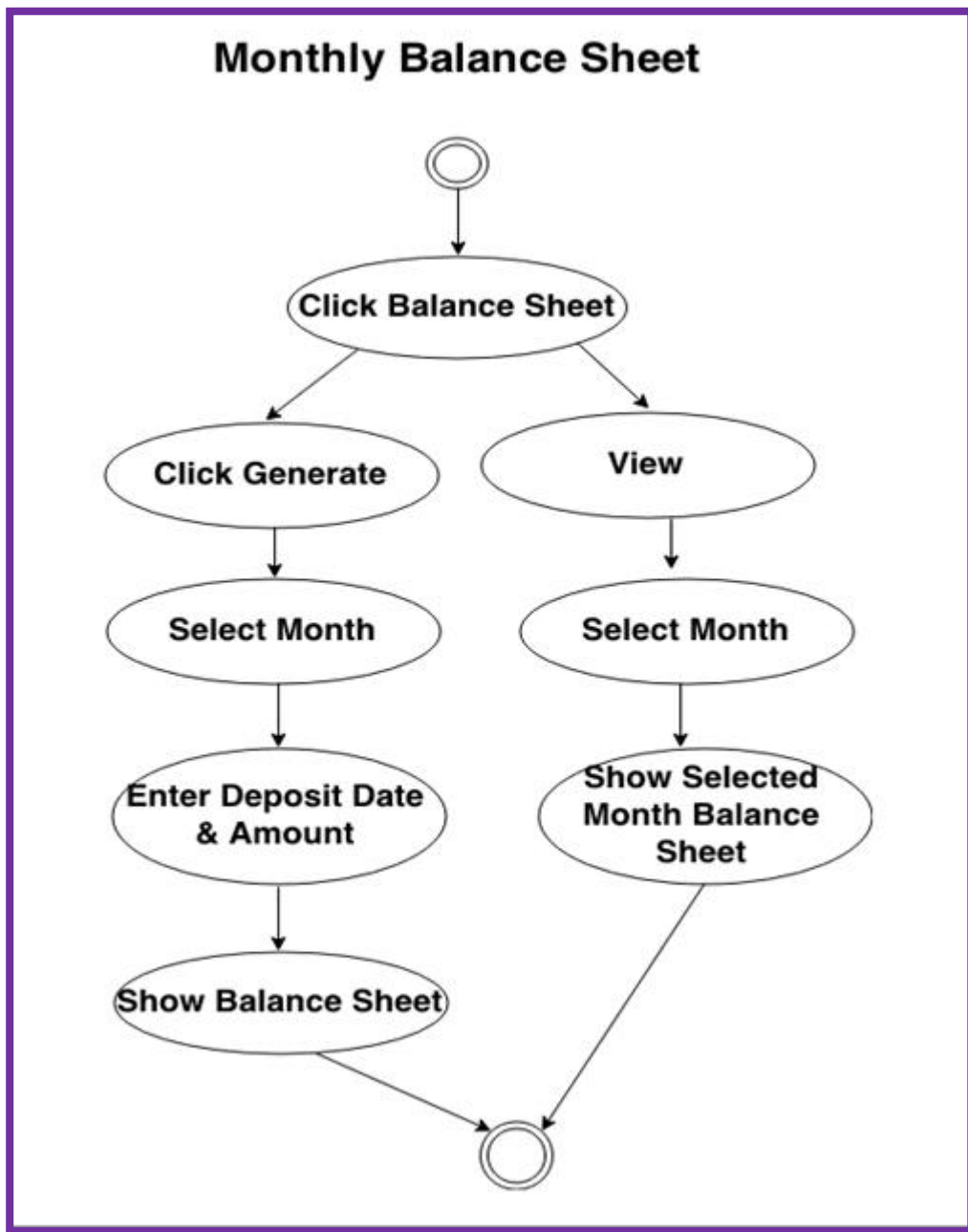
Fig: Activity diagram (m): Monthly Balance Sheet (level 1.8)

Automated Cyber Cafe System

Monthly Balance Sheet
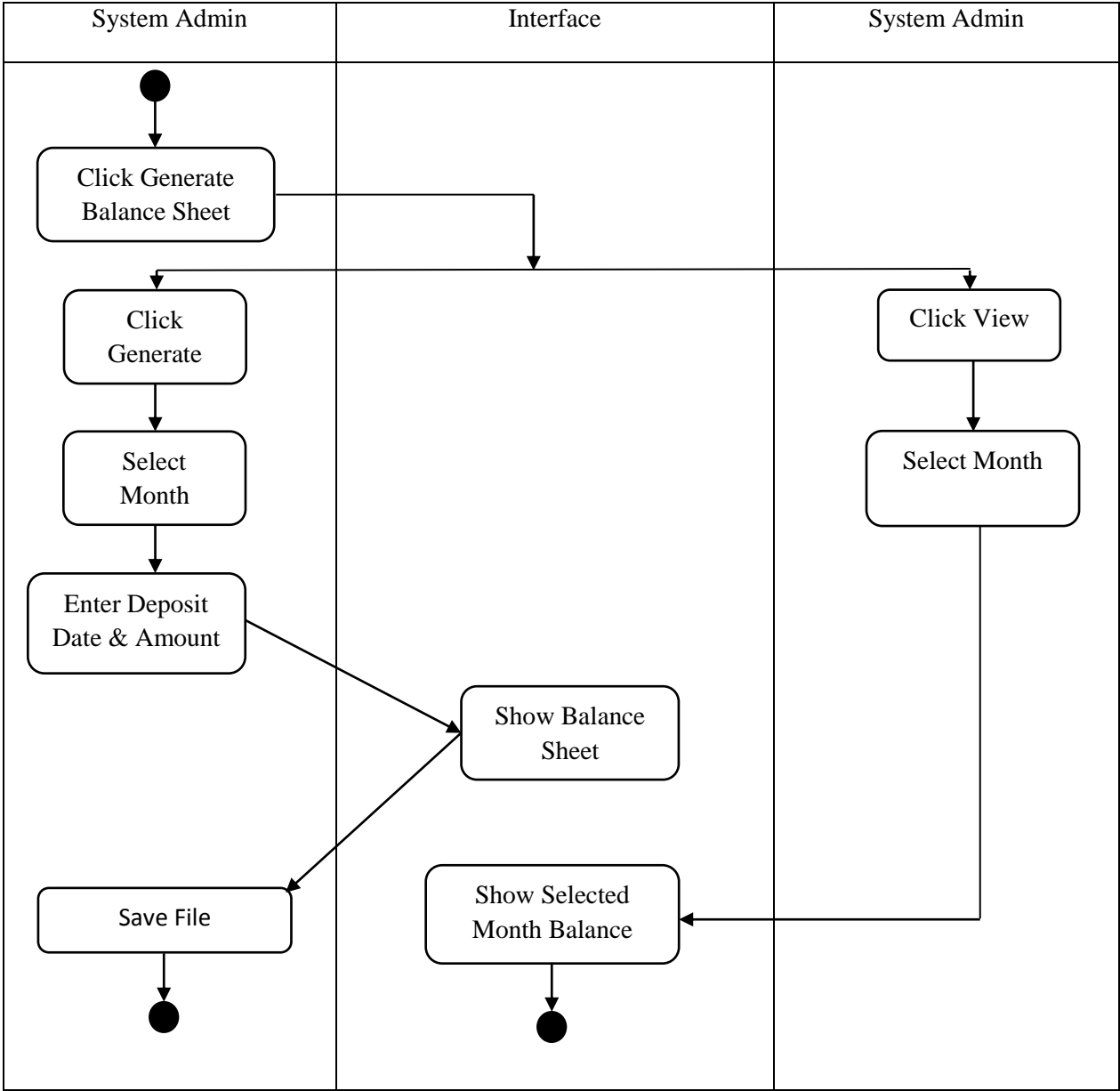
Fig: Swimlane diagram (m): Monthly Balance Sheet (level 1.8)

Automated Cyber Cafe System
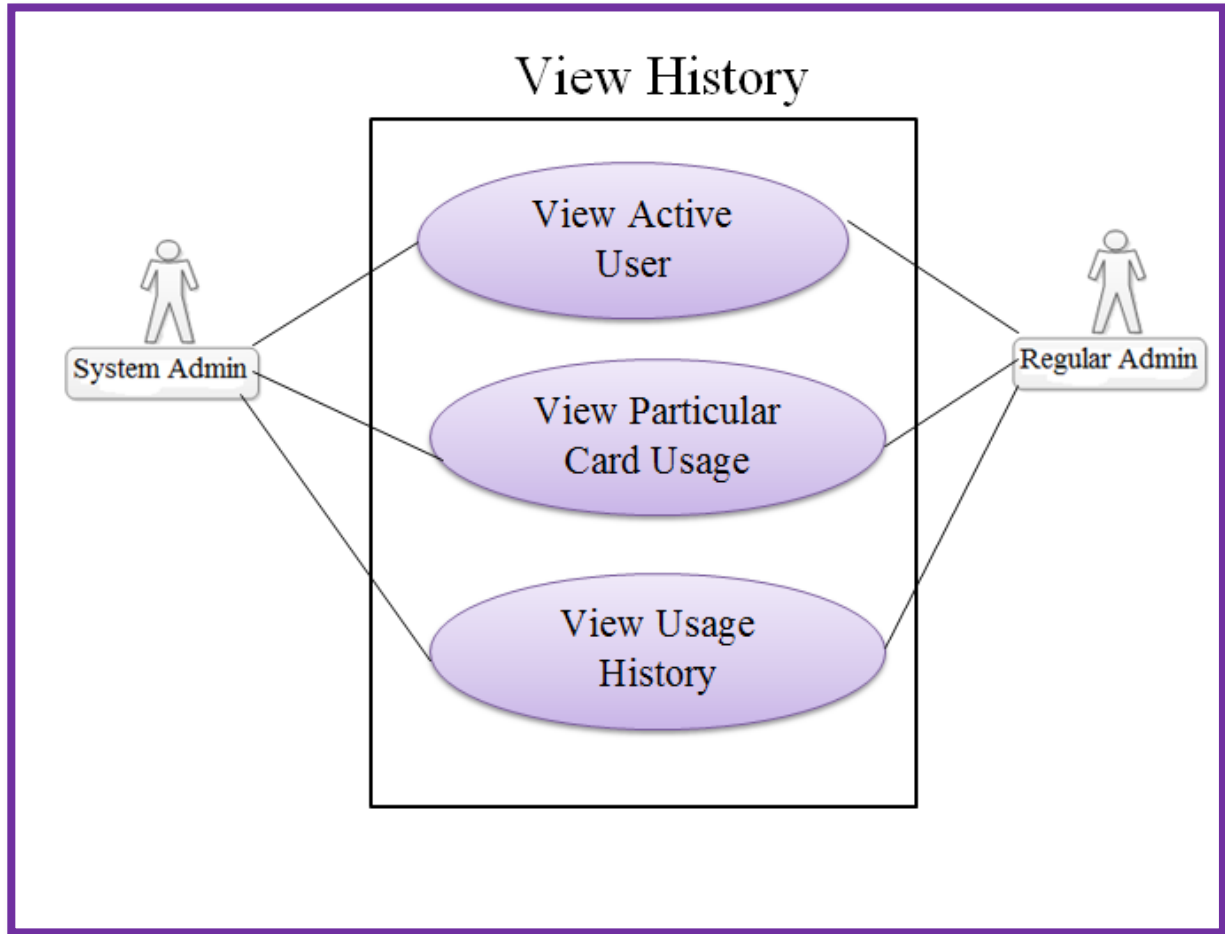
Fig: Use case (h) View History (level 1.9)

Automated Cyber Cafe System

(n) Usage Case Description: **View Active user**

Use Case Id	Level 1.9.1
Use Case Name	**View Active user**
Primary Actor	System Admin, regular admin
Secondary Actor	none
Goal in Context	To observe active user activity on the system
Precondition	Must be logged in to the system
Scenario	1. Click "View active user" button. 2. View active user list
Exception	1. System Error 2. Network Error 3. View does not available right that moment.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

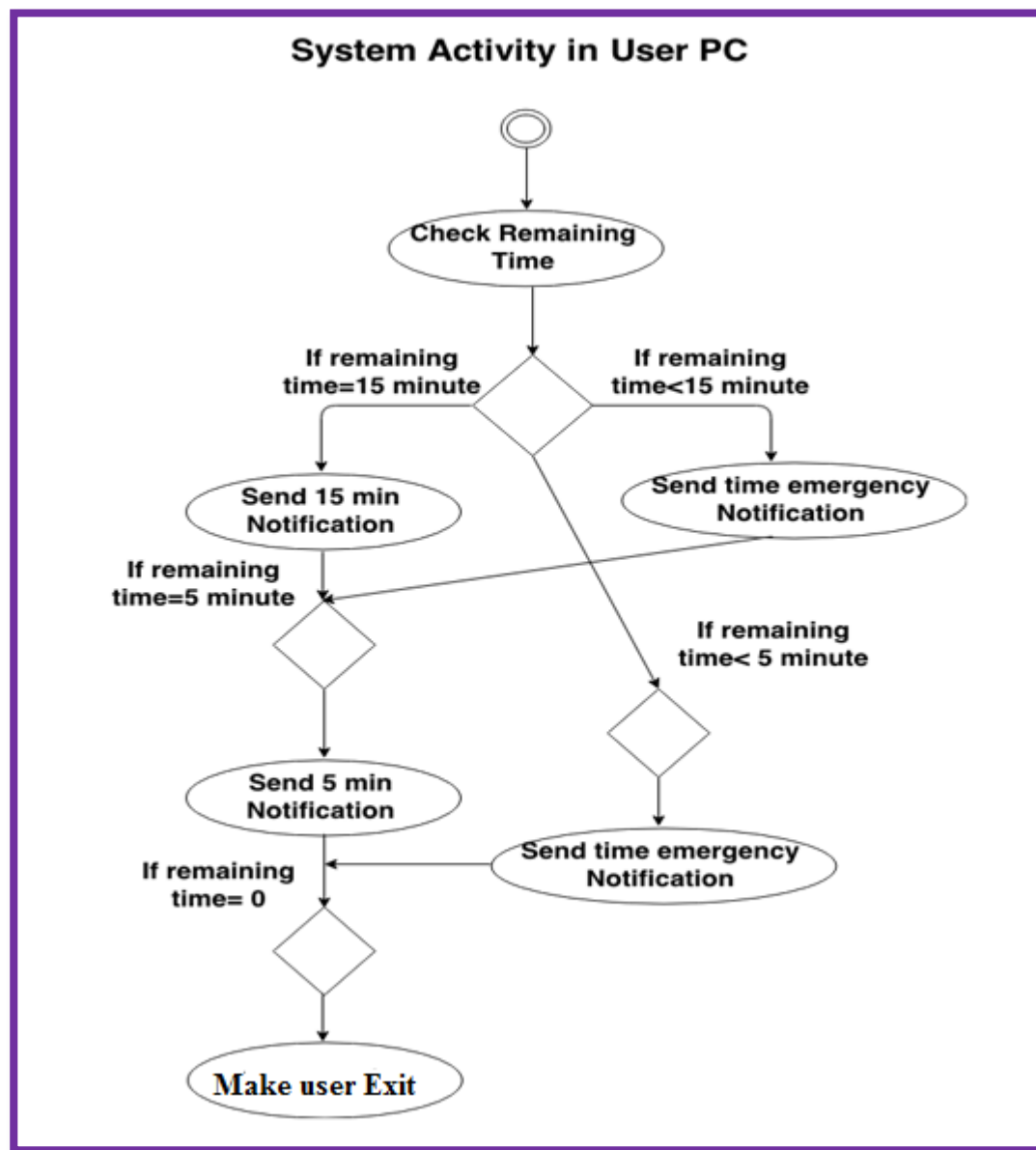**Use Case Description Table (n): View Active User**

Automated Cyber Cafe System
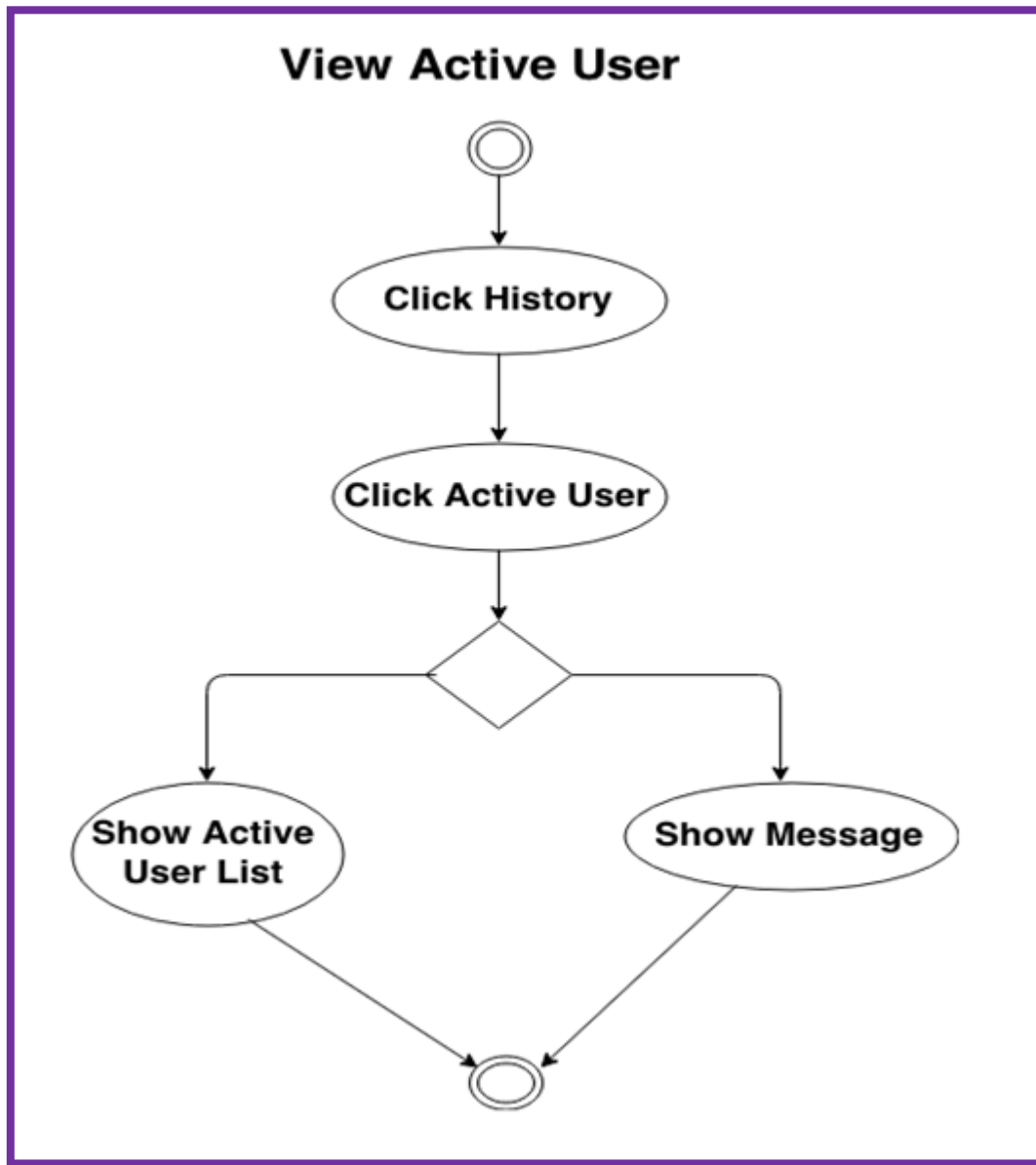
View Active User

Fig: Activity diagram (n): View active User (level 1.9.1)

Automated Cyber Cafe System

View Active User

System Admin	Interface	Regular Admin

Click History

Click Active User

Click History

Click Active User

Show Active User

Automated Cyber Cafe System

(o) Usage Case Description: **View Particular Card Usage**

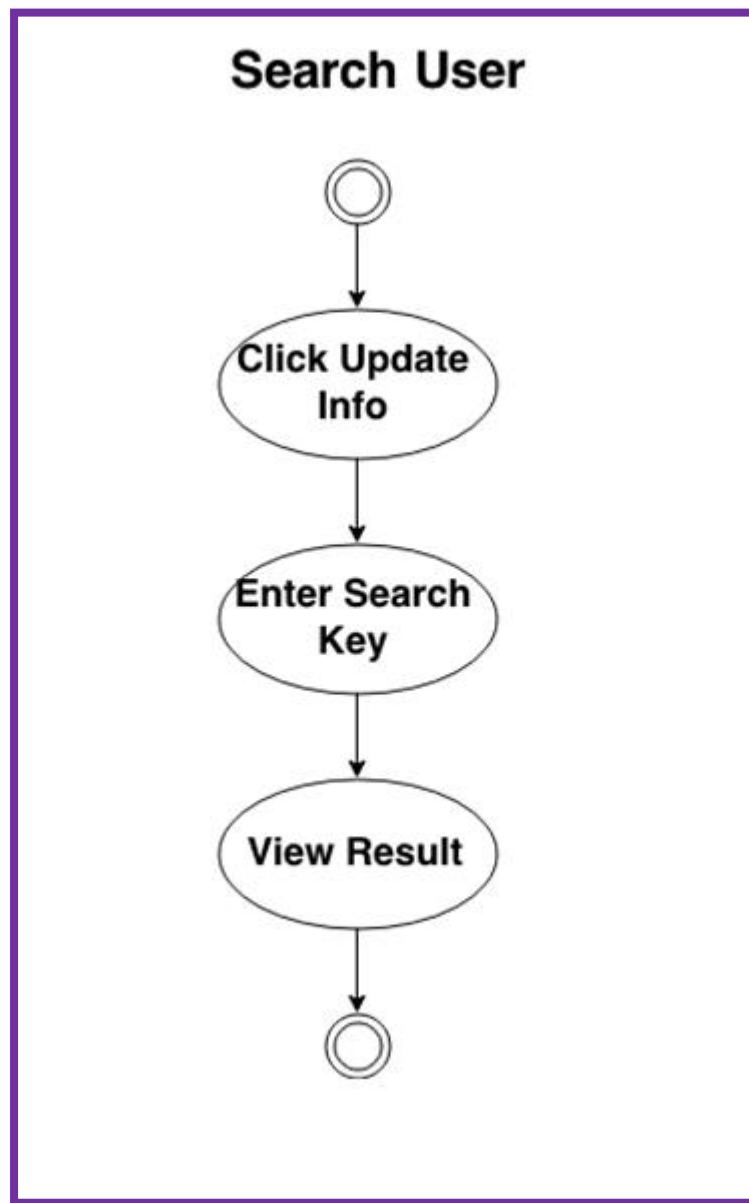| Use Case Id	Level 1.9.2
Use Case Name	**View Particular Card Usage**
Primary Actor	System Admin, regular admin
Secondary Actor	none
Goal in Context	To observe particular card usage history in the system
Precondition	Must be logged in to the system
Scenario	1. Click "View particular card usage" button. 2. Enter card number 3. Click "View Usage". 4. Show Particular Card Usage.
Exception	1. System Error 2. Network Error 3. Invalid Card Number 4. Card is not registered. 5. View does not available right that moment.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (o): View Particular Card Usage

Automated Cyber Cafe System
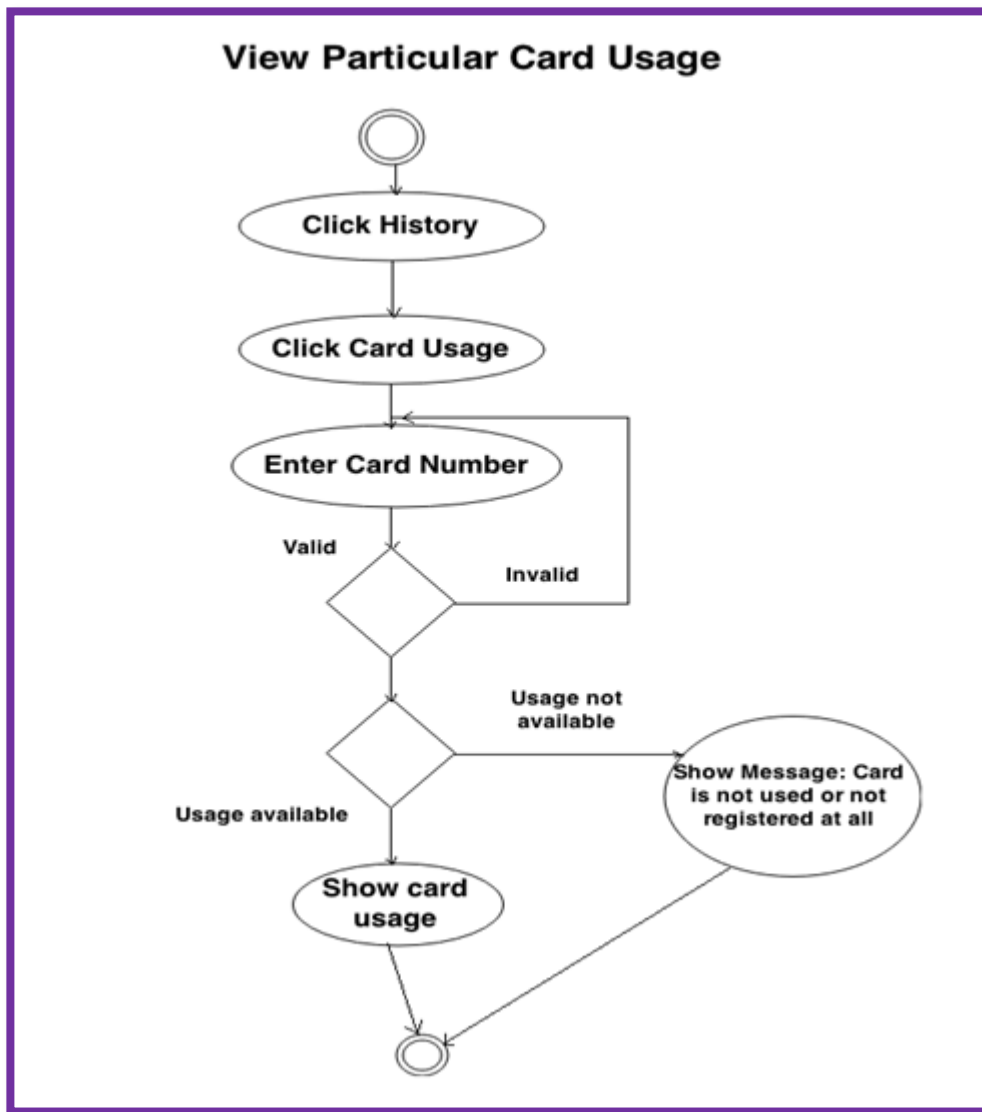
Fig: Activity diagram (o): View Particular Card Usage (level 1.9.2)

Automated Cyber Cafe System

View Particular Usage

(p) Usage Case Description: **View Usage History**

Use Case Id	Level 1.9.3
Use Case Name	View Usage History
Primary Actor	System Admin, regular admin
Secondary Actor	None
Goal in Context	To observe user history between two specific date.
Precondition	Must be logged in to the system
Scenario	1. Click "View usage history" button. 2. Select two specific date. 3. Click "View history" 4. Show Card Usage history.
Exception	1. System Error 2. Network Error 3. View does not available right that moment.
Priority	Essential, must be implemented.
When Available	Second increment.
Frequency of Use	Many times per day.

Use Case Description Table (p): View History
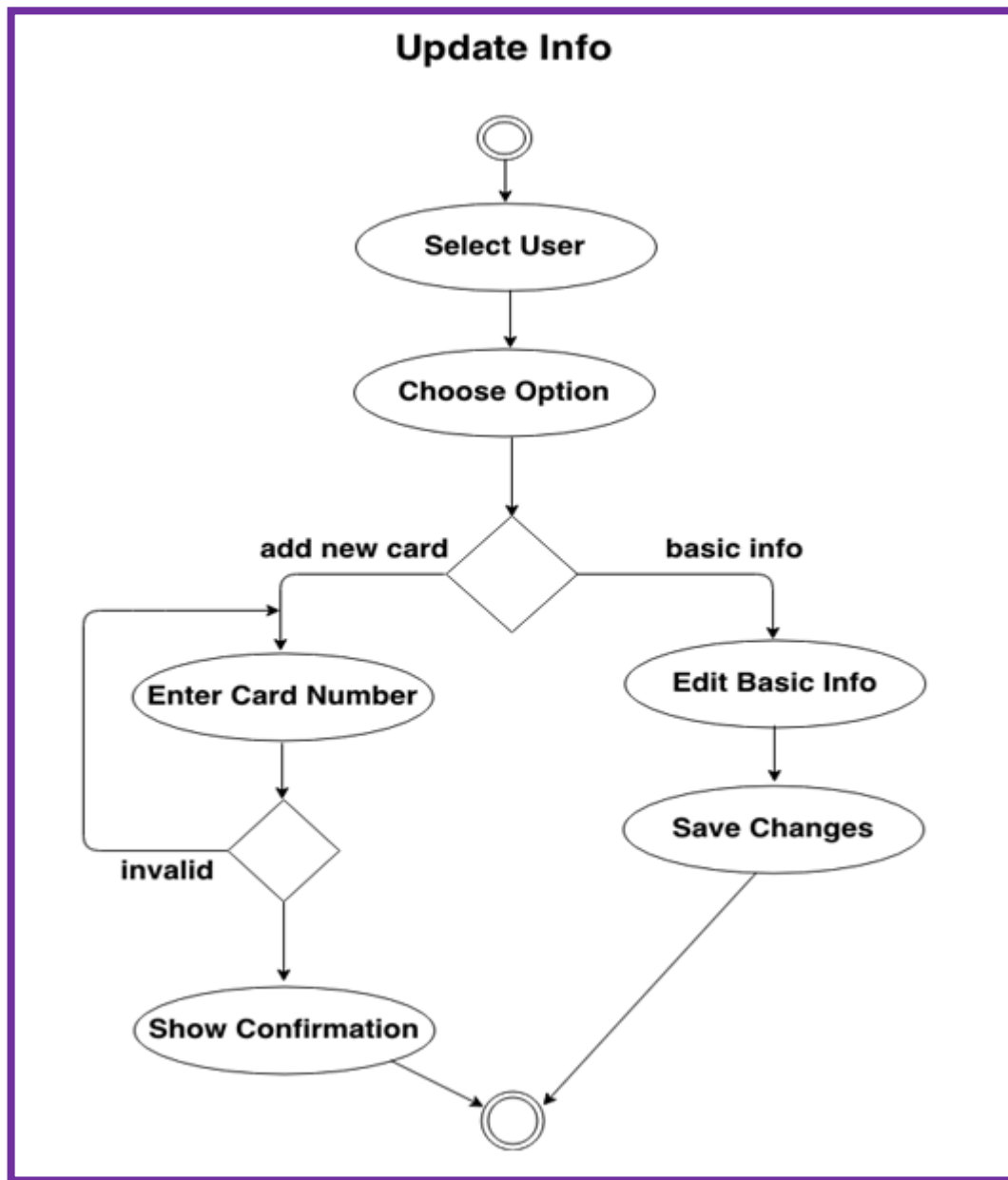
Automated Cyber Cafe System
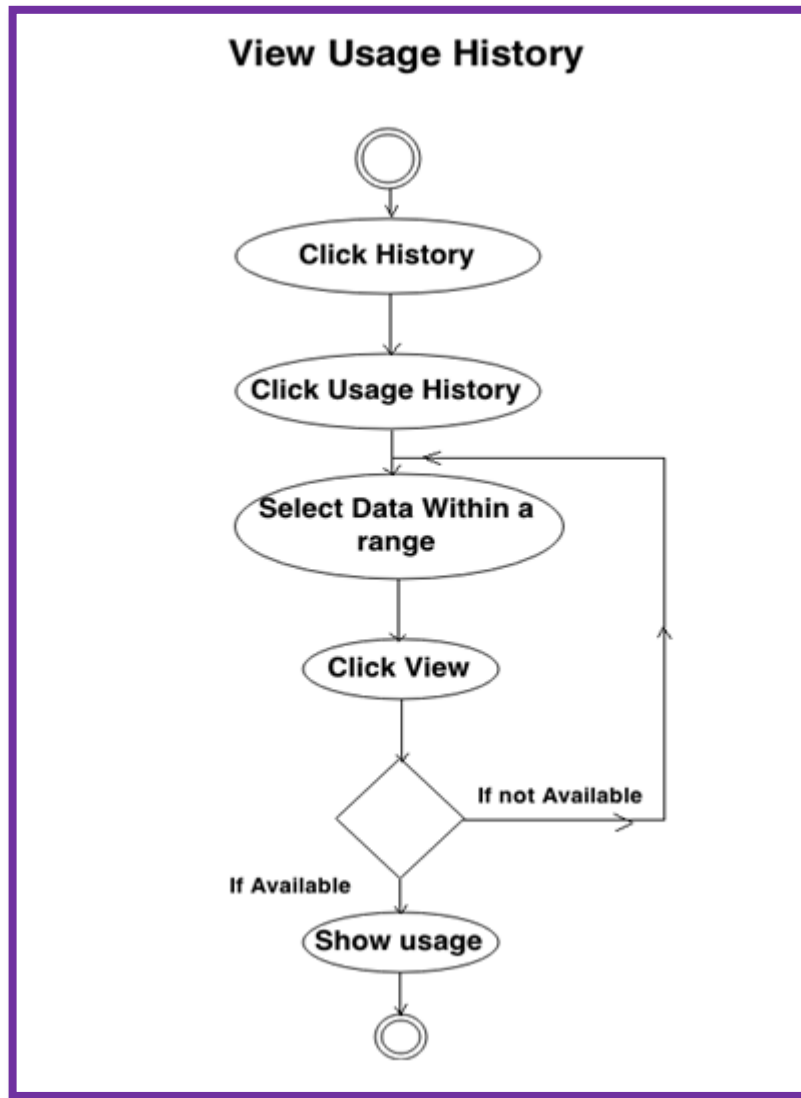
Fig: Activity diagram (p): View History (level 1.9.3)

Automated Cyber Cafe System

View Usage History
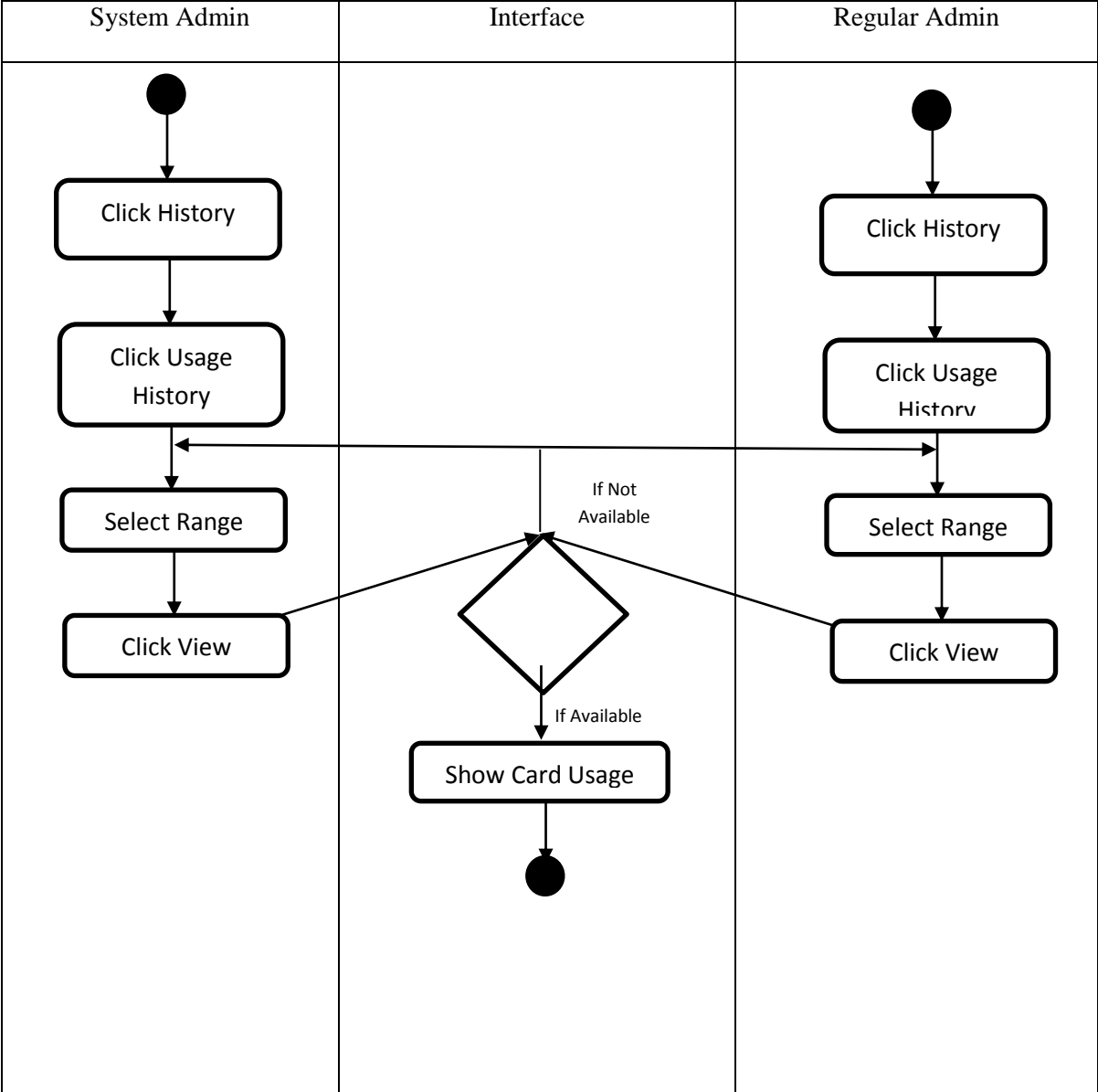
Fig: Swimlane diagram (p): View History (level 1.9.3)

Automated Cyber Cafe System

4.3 Conclusion

We have done this part to develop the scenario. In the next chapter data based model is appeared.

1. Date 25/02/2015

Place: IIT DU
Meeting agenda: **Discussion on Scenario based modeling.**
Group Members:

> ➢ Mobashir Sadat (BSSE-0507)

> ➢ Md Rakib Hossain (BSSE-0516)

> ➢ A.H.M. Azimul Haque (BSSE-0519)

Group supervisor

> ➢ Alim Ul Gias (Lecturer at IIT DU)

Automated Cyber Cafe System

Chapter 5

Data Model of Automated Cyber Cafe System

5.1 Data Modeling Concept

Data modeling is a common activity in the software development process of information systems, which typically use database management systems to store information. The output of this activity is the data model, which describes the static information structure in terms of data entities and their relationships. This structure is often represented graphically in entity-relationship diagrams (ERD).

The data model of our project contains important architectural information and serves the following practical purposes:

- Provide a conceptual design of objects in the system's domain and their relationships.
- Provide a blueprint for creating the database structure.
- Guide implementation of code units that access the database.
- Guide performance enhancement in data access operations.

A set of following activities is done to design the Data Model.

- Data Identification and Define Attributes for each Data

- Create Data Relationship Diagram

- ER Diagram

- Table or Schema Generation

5.2 Data Identification and Define Attributes for each Data

A data object or data is a representation of information which has different properties or attributes that must be understood by the software. To identify a data object all the nouns of the scenario are needed to be analyzed. So we prepared a noun table to identify the data objects.

Noun Table

Nouns	Accepted/Rejected	Comments
Cyber Center	Rejected	
Automated cyber cafe system	Rejected	
University of Dhaka	Rejected	
Central Library	Rejected	
Students	**Accepted**	Contains student information
Authority of DU Cyber Center	Rejected	
Predefined processes	Rejected	
Administrators of DU Cyber Center	Rejected	Contains admin information
System administrator	Rejected	Type of admin
Regular administrator	Rejected	Type of admin
Card distribution system	Rejected	
Registration process	Rejected	
Prepaid card	**Accepted**	Contains card information
Internet facilities	Rejected	
Computing facilities	Rejected	
Unit price	Rejected	
60 taka	Rejected	
300 minutes	Rejected	
Validity of these prepaid cards	Rejected	Attribute of Card
180 days	Rejected	
Cardholder	Rejected	
Card number	Rejected	Attribute of Card
Pin number	Rejected	Attribute of Card
10 digits	Rejected	
Serial number	Rejected	
Eight character	Rejected	
Spread sheet		Attribute of balance sheet
Desired rang	Rejected	
Minimum number	Rejected	
Maximum number	Rejected	
Well-designed card paper	Rejected	
Official logo	Rejected	
Instructions	Rejected	

Automated Cyber Cafe System

Deposit 60 taka	Rejected	
Data entry operator.	Rejected	
Student's information		
A ledger book	Rejected	
Student's identity card	Rejected	
Student's name	Rejected	Attributes of student
Department name	Rejected	Attributes of student
current academic year	Rejected	Attributes of student
Department roll	Rejected	Attributes of student
Attached hall name	Rejected	Attributes of student
Generated prepaid card	Rejected	
Student information	Rejected	Attributes of student
Owner	Rejected	
Computer screen	Rejected	
Case sensitive	Rejected	
Small timer window	Rejected	
Countdown	Rejected	
15.00 minutes	Rejected	
5.00 minutes.	Rejected	
Expired card	Rejected	
Valid card	Rejected	
Card usage	**Accepted**	Contains card usage information
Card owner's name	Rejected	
Date	Rejected	Attributes of Card
PC No	**Accepted**	Contains pc information
Starting Time	Rejected	Attributes of Card Usage
Ending Time	Rejected	Attributes of Card Usage
Using Time	Rejected	
Remaining Time	Rejected	Attributes of Card Usage
Card validity	Rejected	
Cards generating	Rejected	
Monthly Balance Sheet	**Accepted**	Contains balance sheet information
Date	Rejected	Attributes of balance sheet
Unit price	Rejected	
Amount	Rejected	
Bank Deposited & date	Rejected	
Bank deposit amount	Rejected	
Deposit's date	Rejected	
Active User	Rejected	

Table 5(a): Data Object identification

Automated Cyber Cafe System

5.3 Create Data Relationship Diagram

From the noun table above we identified the following data objects and attributes:

Data Object: Card

Attributes
- ➢ **Card_number**
- ➢ **Pin_number**
- ➢ **Produce_date**
- ➢ **Purchasing_date**

Data Object: Student

Attributes
- ➢ **ID**
- ➢ **First_name**
- ➢ **Last_name**
- ➢ **Department_name**
- ➢ **Department_roll**
- ➢ **Academic_year**
- ➢ **Attached_hall**

Data Object: Admin

Attributes
- ➢ **Id**
- ➢ **Type**
- ➢ **Name**
- ➢ **Email**
- ➢ **Password**
- ➢ **Phone_number**

Data Object: PC

Attributes
- ➢ **Id**
- ➢ **Mac-Id**
- ➢ **PC_name**

Data Object: Card Usage

Attributes
- ➢ **Starting_time**
- ➢ **Finishing_time**
- ➢ **Remaning _time**

Data Object: Balance_sheet

Attributes
- ➢ **Id**
- ➢ **Month**
- ➢ **Year**
- ➢ **File**

Automated Cyber Cafe System

Student — Purchases → Card

Admin — Generates → Card

Admin — Generates → Balance sheet

Card — Has → Card usage

Card_usage — Contains → PC

Fig 5(a): Data Relationship Diagram

Automated Cyber Cafe System

5.4 Entity Relationship(ER) Diagram and Schema Diagram

Pin_number

Card_number

Produces_date

Purchasing _date

Card

Last_name

Dep_name

First_name

Dep_roll

ID

Student

Aca_year

Attached_hall

Purchase

Generate

Has

Password

Email

Admin

Name

Card Usage

Remining time

Starting_time

Finishing_time

Type

ID

Contains

Generate

Balance sheet

File

PC

PC_name

Mac_ID

ID

Cyber Cafe System

Year

Month

PC_ID

Fig 5(b): Schema Diagram

Card

Card_number(varchar)
Pin_number(varchar)
Produce_date(date)
Purchasing_date(date)

Purchase

Card_number (varchar)
Student_id (int)

Admin

Id(varchar)
Type(varchar)
Name(varchar)
Email(varchar)
Password(varchar)
Phone_number(varchar)

PC

PC-id(varchar)
Mac_id (varchar)
PC_name(varchar)

Balance_Sheet_session

Admin_id(varchar)
Balanch_sheet_id(varchar)

Student

Student_id (int)
First_name(varchar)
Last_name(varchar)
Department_name(varchar)
Department_roll(varchar)
Academic_year(varchar)
Attached_hall(varchar)

Card_usage

Card_number(varchar)
Starting_time(date)
Finishing_time(date)
Remaning_time(varchar)
PC_id(varchar)

Balance_sheet

Balanch_sheet_id(varchar)
month (varchar)
year(varchar)
Sheet(file)

Card_session

Admin_id(varchar)
Produce_date(date)

Automated Cyber Cafe System

Card

__Card_number(varchar)__
Pin_number(varchar)
Produce_date(date)
Purchasing_date(date)

Student

__Student_id__ (int)
First_name(varchar)
Last_name(varchar)
Department_name(
varchar)
Department_roll(varchar)
Academic_year(varchar)
Attached_hall(varchar)

Purchase

__Card_number__ (varchar)
__Student_id__ (int)

Card_session

__Admin_id(varchar)__
__Produce_date(date)__

Card_usage

__Card_number(varchar)__
Starting_time(date)
Finishing_time(date)
Remaning_time(varchar)
__PC_id(varchar)__

Admin

__Id(varchar)__
Type(varchar)
Name(varchar)
Email(varchar)
Password(varchar)
Phone_number(varchar)

PC

__PC-id(varchar)__
Mac_id (varchar)
PC_name(varchar)

Balance_Sheet_session

__Admin_id(varchar)__
__Balanch_sheet_id(varchar)__

Balance_sheet

__Balanch_sheet_id(varchar)__
month (varchar)
year(varchar)
Sheet(file)

Fig 5(c): Schema relation diagram

Automated Cyber Cafe System

5.5 Conclusion

We have identified all the nouns and their attributes. We have established relationships among the data objects. Class based model is described in the next chapter.

1. Date 05/03/2015

Place: IIT DU
Meeting agenda: **Discussion on Data based modeling.**
Group Members:

> Mobashir Sadat (BSSE-0507)

> Md Rakib Hossain (BSSE-0516)

> A.H.M. Azimul Haque (BSSE-0519)

Automated Cyber Cafe System

Chapter 6

Class-based model of Automated Cyber Cafe System

This Chapter is intended to describe class based modeling of automated cyber cafe system.

6.1 Class Based Modeling Concept

Class-based modeling represents the objects that the system will manipulate, the operations that will be applied to the objects, relationships between the objects and the collaborations that occur between the classes that are defined. The elements of a class-based model include classes and objects, attributes, operations, class-responsibility-collaborator (CRC) models, class diagrams.

6.2 Identifying Analysis Classes

Examining all the nouns from the usage scenario potential classes can be identified. For class identification we have to go through the following steps.

Step 1

Identifying and categorize all nouns in following ways:

- **External Entities** (e.g. other systems, devices, people) that produce or consume information to be used by a computer-based-system.
- **Things** (e.g. report, displays, letters, signals) that are part of the information domain for the problem.
- **Occurrence or events** (e.g. a property transfer or the completion of a series of robot movements) that occur within the context of system operation.
- **Roles** (e.g. manager, engineer) played by people who interact with the system.
- **Organizational units** (e.g. division, group, and team) that is relevant to an application.
- **Places** (e.g. manufacturing floor or loading dock) that establish of the problem and the overall function of the system.
- **Structures** (e.g. sensors, vehicles or computer) that define a class of objects or related classes of object.

Step 2

Selection of potential class is performed by considering six selection characteristics.

1. *Retained information*: The potential class will be useful during analysis only if information about it must be remembered so that the system can function.

2. *Needed services:* The potential class must have a set of identifiable operations that can change the value of its attributes in some way.

3. *Multiple attribute:* During requirement analysis, the focus should be on "major" information; a class with a single attribute may, in fact, be useful during design, but is probably better represented as an attribute of another class during the analysis activity.

4. *Common attribute:* A set of attributes can be defined for the potential class and these attributes apply to all instances of the class.

5. *Common operation:* A set of operations can be defined for the potential class and these operations apply to all instances of the class.

6. *Essential requirements:* External entities that appear in the problem space and produce or consume information essential to the operation of any solution for the system will almost always be defined as classes in the requirements model.

Potential class table:

Nouns	General Classifications	Characteristic Numbers
Cyber Center	Places	
Automated cyber cafe system	Name	
University of Dhaka	Places	
Central Library	Places	
Students	External entities, roles, organizational unit	1,2,3,4,5, Accepted
Authority of DU Cyber Center	External entities, organizational unit	2,3,5 Rejected
Predefined processes	Occurrence or events	1,2 Rejected
Administrators of DU Cyber Center	External entities, organizational unit	2,3,5, Rejected
System administrator	External entities, roles	1,2,3,4,5, Accepted
Regular administrator	External entities, roles	1,2,3,4,5, Accepted
Card Generation	Occurrences ,events	1,2,3,4,5, Accepted
Registration process	Occurrences, events	2,3,4,5 Rejected
Prepaid card	things	
Internet facilities		
Computing facilities		

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Unit price	things	1,rejected
60 taka		
300 minutes		
Validity of these prepaid cards		1,rejected
180 days		
Cardholder	External entities, roles, organizational unit	
Card number	things	1 Rejected
Pin number	things	1 Rejected
10 digits	things	1 Rejected
First six digits	things	1 Rejected
Last four digits	things	1 Rejected
Serial number	things	1 Rejected
Eight character	things	
Spread sheet	things	
Desired rang	things	
Minimum number	things	
Maximum number	things	
Well-designed card paper	things	
Official logo	things	
Instructions	things	
Deposit 60 taka		
Data entry operator.	External entities, roles,	similar of regular admin
Student's information	Things	Similar of student
A ledger book	Things	
Student's identity card	Things	1 Rejected
Student's name	Things	1 Rejected
Department name	Things	1 Rejected
current academic year	Things	1 Rejected
Department roll	Things	1 Rejected
Attached hall name	Things	1 Rejected
Generated prepaid card	Things	Similar of card generation
Owner	External entities, roles, organizational unit	Similar of student
Computer screen	things	
Case sensitive		
Small timer window	Things, occurrence or events	
Countdown	occurrence or events	
15.00 minutes		
5.00 minutes.		
Expired card	things	
Valid card	things	
Card usage	things	
Card number	things	1 Rejected

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Pin numbers	things	1 Rejected
Card owner's name	things	Similar of student
Date	things	1 Rejected
PC No	things	1 Rejected
Starting Time	things	1 Rejected
Ending Time	things	1 Rejected
Using Time	things	1 Rejected
Remaining Time	things	1 Rejected
Card validity	things	1 Rejected
Particular tasks	things	
Cards generating	Occurrences or events	Similar of card generation
Monthly Balance Sheet	things	1,2,3,4,5, Accepted
Date	things	1 Rejected
Cards	things	1 Rejected
Unit price	things	1 Rejected
Amount	things	1 Rejected
Bank Deposited & date	things	1 Rejected
Bank deposit amount	things	1 Rejected
Deposit date	things	1 Rejected
Active User	External entities, roles, organizational unit	3,4,5 Accepted
PC No	Things	1 Rejected
Card number	Things	1 Rejected
Cardholder Name	Things	Similar of student name
Starting Time	Things	1 Rejected
Running Time	Things	1 Rejected
Remaining Time	Things	1 Rejected
Particular Card Usage	Things	3,4, 5 Accepted
From a specific date	Things	1 Rejected
To another specific date	Things	1 Rejected
All Users History	Things	3,4, 5 Accepted
Further usage	Things	1 Rejected

Table 6 (a): Potential Class identification table

Automated Cyber Cafe System

6.3 Specifying Attributes

Attributes describe a class that has been selected for inclusion in the requirements model. In essence, it is the attributes that define the class—that clarify what is meant by the class in the context of the problem space.

We can represent the attributes of selected classes in the following manner:

Class Name	Attributes
Student	id + first_name + last_name + department_name +department_roll +academic_year +attached_hall + purches_card_number
Regular_admin	id + name +email +password +phone_number +view_card_usage
System_admin	id + name +email +password +phone_number + card_generator +blance_sheet_generator + view_card_usage
View_Card_Usage	card_number +user_id +cardholder_name + PC_no + starting_time + finishing_time + remaning_time+card_validity.
Active_Card_Usage	running_time+active
Particular_card_uasge	student
History	from_date + to_date
Card_generator	produce_date + number_of_cards
Balance_sheet_generator	month+ deposite_date +deposite_amount +unit_prise
System	remening_time + notification_message+total_time

Table 6(b): Specifying Attributes.

Automated Cyber Cafe System

6.4 Defining Operations

Operations define the behavior of an object. The operations or methods are given below:

Class Name	Methods
Student	get () +set () + accessing_into_system () + exit_from_system() + view_card_usage ()
Regular_admin	get()+set()+log_in()+log_out()+update_account()+register_student() +update_student()+view_active_user()+view_particular_card_usage()+ view_history()
System_admin	generate cards () + generate_balance_sheet () + view_balance_sheet ()
View_Card_Usage	get () +set () +view_usage ()
Active_Card_Usage	get () +set () +view_usage ()
Particular_card_uasge	get () +set () +view_usage ()
History	get () +set () +view usage ()
Card_generator	get () +set () +produce_card_number () + produce_pin_number ()
Balance_sheet_generator	get () +set () +prepare_balance_sheet () +show_balance_sheet ()
System	get () +set () +auto_exit_from_system() +count_down () +show_notification ()

Table 6(c): Defining Operation.

Automated Cyber Cafe System

6.5 Class Diagram for Automated Cyber Cafe System

Student

id
first_name
last_name
department_name
department_roll
academic_year
attached_hall
purches_card_number

get ()
set ()
access_into_system()
exit_from_system()

view_card_usage ()

Regular Admin

id
name
email
password
phone_number
view_card-usage

get()
set()
log_in()
log_out()
update_account()
register_student()
update_student()
view_active_user()
view_particular_card_usage()
view_history()

View_Card_Usage

card_number
user_id
cardholder_name
PC_no
starting_time
finishing_time
remaning_time
card_validity.

get ()
set ()
view_usage ()

System admin

Card_generator
Blance_sheet_generator

generate cards ()
generate_balance_sheet ()
view_balance_sheet ()

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Active_Card_Usage

running_time
active

get ()
set ()
view_usage ()

System

remening_time
notification_message
total_time

get ()
set ()
auto_exit_from_system()
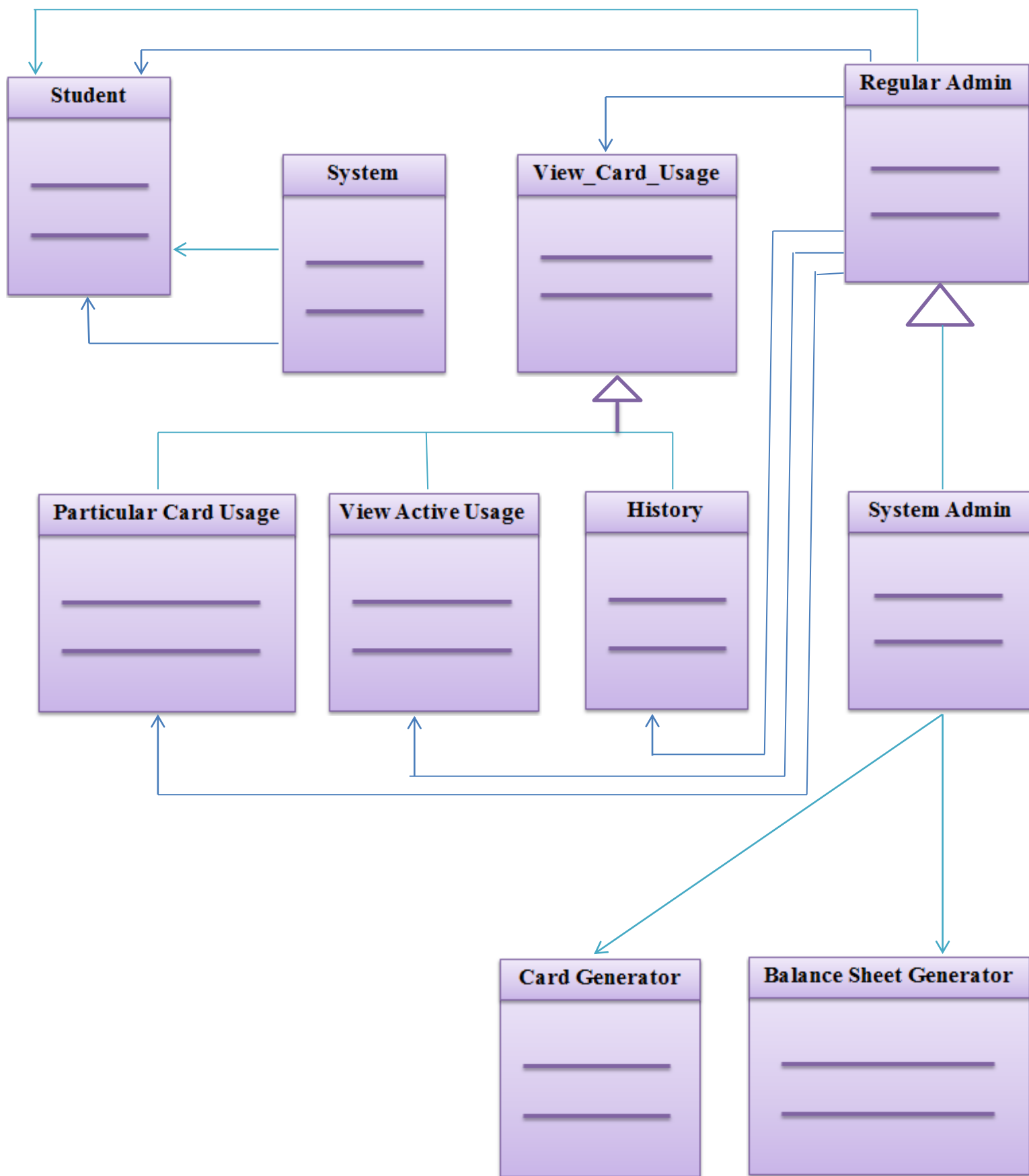count_down ()
show_notification ()

Particular_card_uasge

student

get ()
set ()
view_usage ()

Card_generator

produce_date
number_of_cards

get ()
set ()
produce_card_number ()
produce_pin_number ()

History

from_date
to_date

get ()
set ()
view_usage ()

Balance_sheet_generator

month
deposite_date
deposite_amount
unit_prise

get ()
set ()
prepare_balance_sheet ()
show_balance_sheet ()

Fig 6(a): Class diagram

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Student

System

View_Card_Usage

Regular Admin

Particular Card Usage

View Active Usage

History

System Admin

Card Generator

Balance Sheet Generator

Automated Cyber Cafe System

6.6 Class-responsibility-collaboration card

Class name: Student	
Responsibility	Collaborator
✓ **Allow student accessing into the system** ✓ **Allow student view card usage** ✓ **Allow student exit from the system**	System

Class name: Regular Admin	
Responsibility	Collaborator
✓ **Make the student registered** ✓ **Updating student information** ✓ **Viewing all types of card usage**	Student View_card_usage View_active_card_usage View_prticular_card_usage View_history

Class name: System Admin	
Responsibility	Collaborator
✓ **Generating Prepaid Cards** ✓ **Generating monthly balance sheet** ✓ **Making the student registered** ✓ **Updating student information** ✓ **Viewing all types of card usage**	Student View_card_usage View_active_card_usage View_prticular_card_usage View_history Card_generator Balance_sheet_generator

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Class name: View Card Usage	
Responsibility	Collaborator
✓ **Allow admin to view card usage**	Regular_admin System_admin

Class name: View Active Card Usage	
Responsibility	Collaborator
✓ **Allow admin to view active card usage**	Regular_admin System_admin

Class name: View Particular Card Usage	
Responsibility	**Collaborator**
✓ **Allow admin to view a particular card usage**	Regular_admin System_admin Student

Class name: History	
Responsibility	Collaborator
✓ **Allow admin to view all card usage**	Regular_admin System_admin

Class name: Card generator	
Responsibility	Collaborator
✓ **Generating Prepaid Cards Numbers** ✓ **Generating Pin Numbers**	System_admin

Automated Cyber Cafe System

Class name: Balance Sheet Generator	
Responsibility	Collaborator
✓ **Preparing balance sheet** ✓ **Allow admin to view balance sheet**	System_admin

Class name: System	
Responsibility	Collaborator
✓ **Sending notification to the user** ✓ **Automatically make the user exit from the system**	Student

Fig 6(b): Class Responsibility Collaboration Card

6.7 Conclusion

We have identified all potential classes, drawn class diagram and developed CRC. Next chapter is about dataflow model.

1. Date: 14/03/2015

Place: IIT DU
Meeting agenda: **Discussion on Class based modeling.**
Group Members:

- ➢ Mobashir Sadat (BSSE-0507)

- ➢ Md Rakib Hossain (BSSE-0516)

- ➢ A.H.M. Azimul Haque (BSSE-0519)

Automated Cyber Cafe System

Chapter 7

Data Flow Model of Automated Cyber Cafe System

7.1. Introduction

Although data flow-oriented modeling is perceived as an outdated technique by some software engineers, it continues to be one of the most widely used requirements analysis notations in use today.

7.2. Data Flow Diagram (DFD)

A data flow diagram is a graphical representation that depicts information flow and the transforms that are applied as data move from input to output. The DFD takes an input-process-output view of a system. In the figures, data objects are represented by labeled arrows and transformations are represented by circles. The DFD of our system is given below:
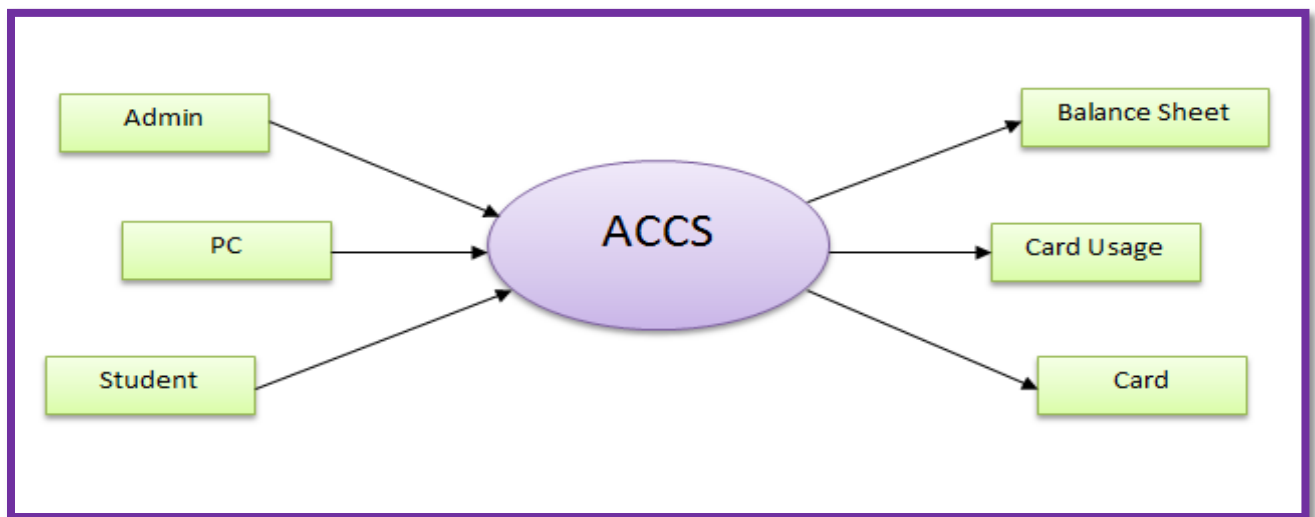

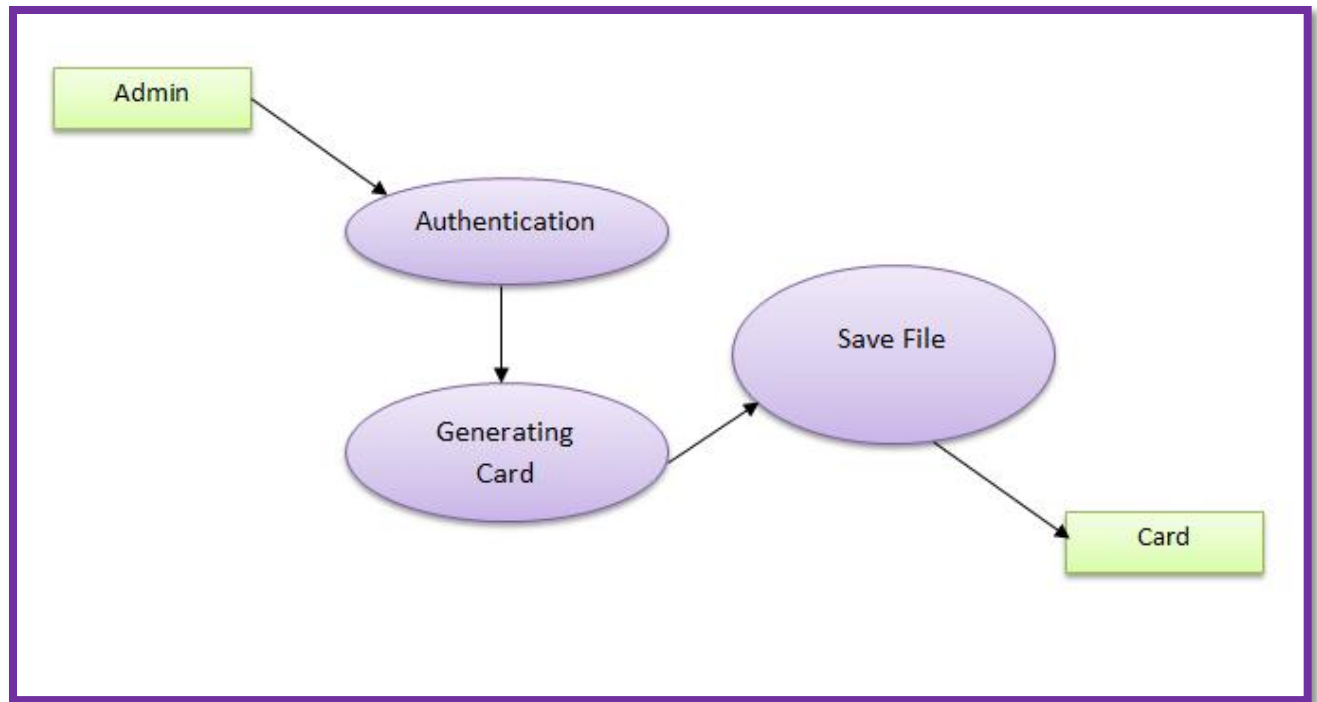**Fig 7(a): data-flow diagram (level 0)**
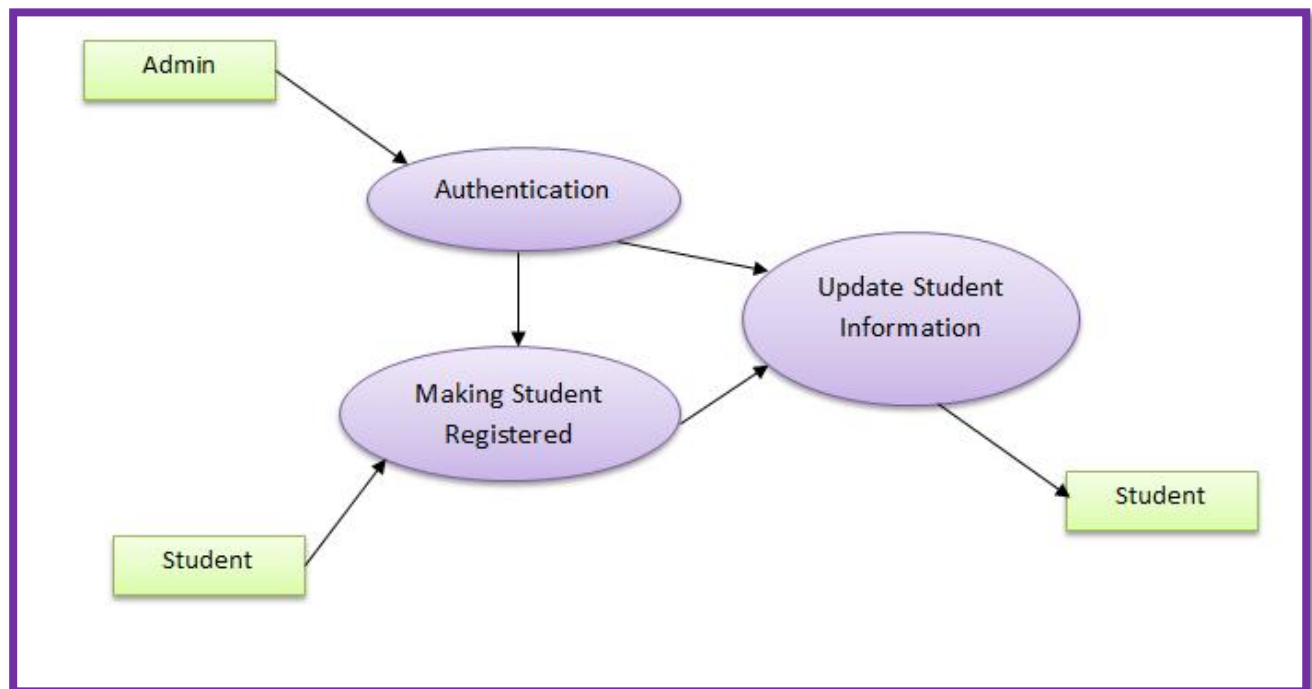
Fig 7(b): data-flow diagram (level 1)

Fig 7(c): data-flow diagram (level 2)

Automated Cyber Cafe System
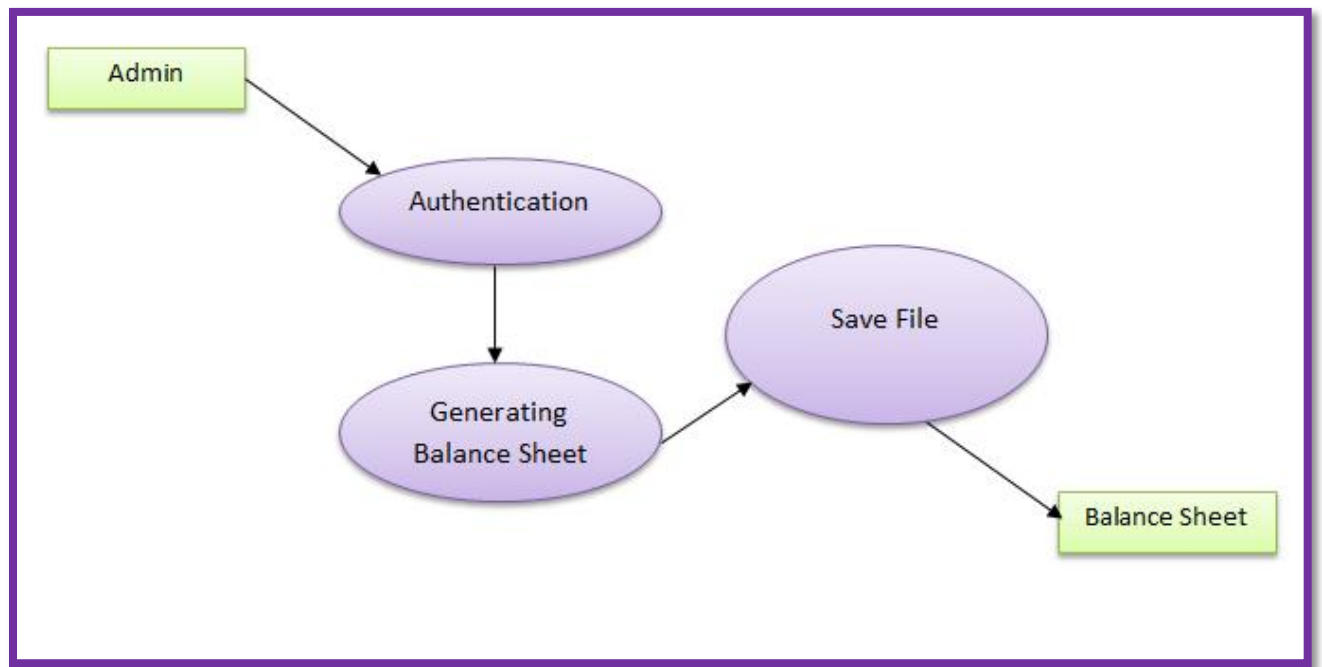
Fig 7(d): data-flow diagram (level 3)
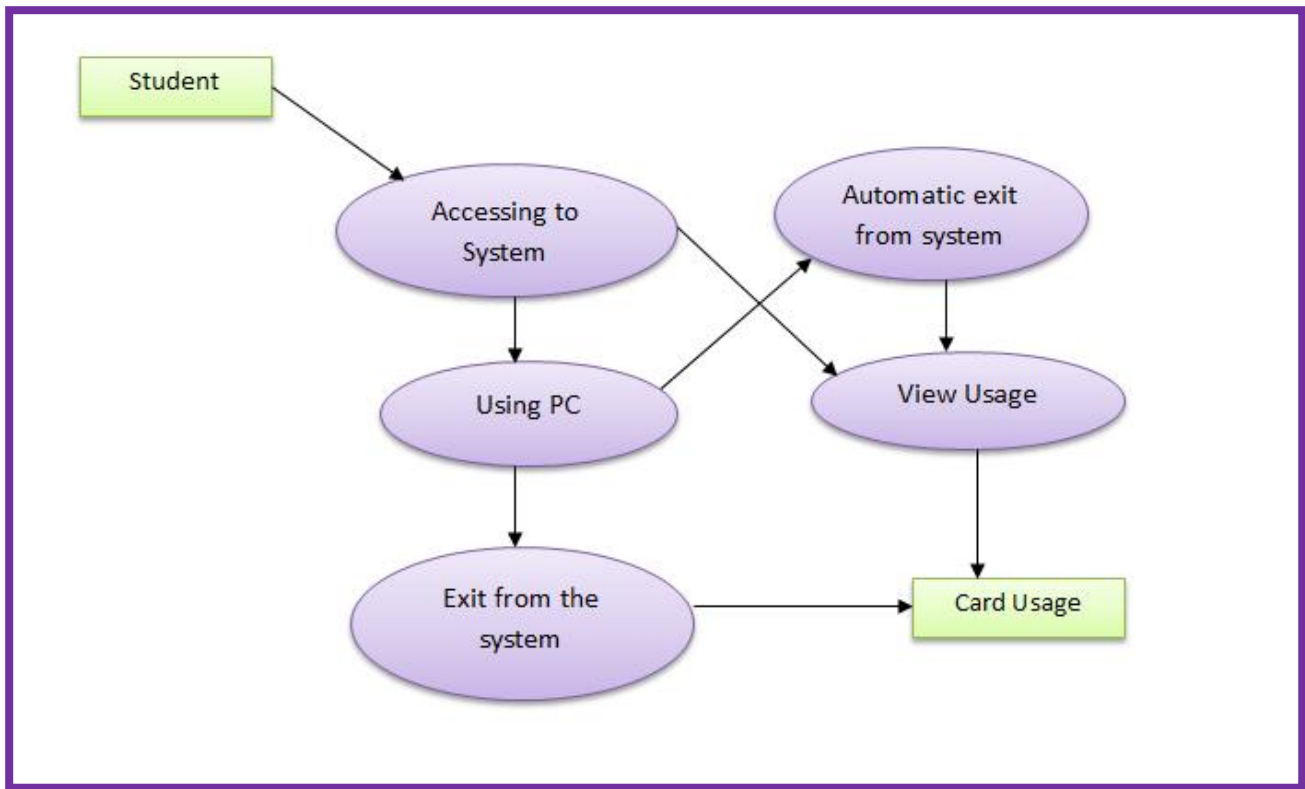
Automated Cyber Cafe System

Fig 7(e): data-flow diagram (level 4)

7.3 Conclusion

In dataflow model, we have provided an input process output view of our system. Behavioral model is on next chapter.

Automated Cyber Cafe System

Behavioral Model of Automated Cyber Cafe System

8.1. Introduction

Behavioral model describes the control structure of a dynamic system. This can be things like:

- Sequence of operations
- Object states and
- Object interactions

The behavioral model indicates how the software responses to external events. Here, we first identified all the events from the use case, then we drew state diagram for analysis class and we drew sequence diagram.

8.2. Identifying Events with the Use Case

We identified the following events from the scenario:

- ➢ System admin generates cards.
- ➢ System admin/regular admin makes the student registered.
- ➢ System admin/regular admin updates student information
- ➢ System admin prepares balance sheet
- ➢ System admin views balance sheet
- ➢ Student views card usage
- ➢ System admin/regular views active card usage
- ➢ System admin/regular views particular card usage
- ➢ System admin/regular views history
- ➢ System automatically makes the user exit from the system.

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The table for the events identification is:

No	Event	Initiator	Collaborator
1	Generating Cards	System admin	Card Generator
2	Making student registered	System admin/regular admin	Student
3	Updating student information	System admin/regular admin	Student
4	Preparing balance sheet	System admin	Balance sheet generator
5	Observing balance sheet	System admin	Balance sheet generator
6	Viewing card usage	Student	Viewing particular card usage
7	Viewing active card usage	System admin/regular admin	Active card usage
8	Viewing particular card usage	System admin/regular admin	Particular card usage
9	Viewing history	System admin/regular admin	History
10	Making the user exit from the system automatically	System	Student

Table 8(a): Events identification table

8.3. State diagram for analysis classes

One component of a behavioral model is a state diagram that represents active states for each class and the events that cause changes between these active states. We consider two different characterization of state:

a) The state of each class as the system perform its function

b) The state of the system as observed from the outside as the system performs its function.

The state of the class takes on both active and passive state. State diagram for the analysis class of our system is given below:
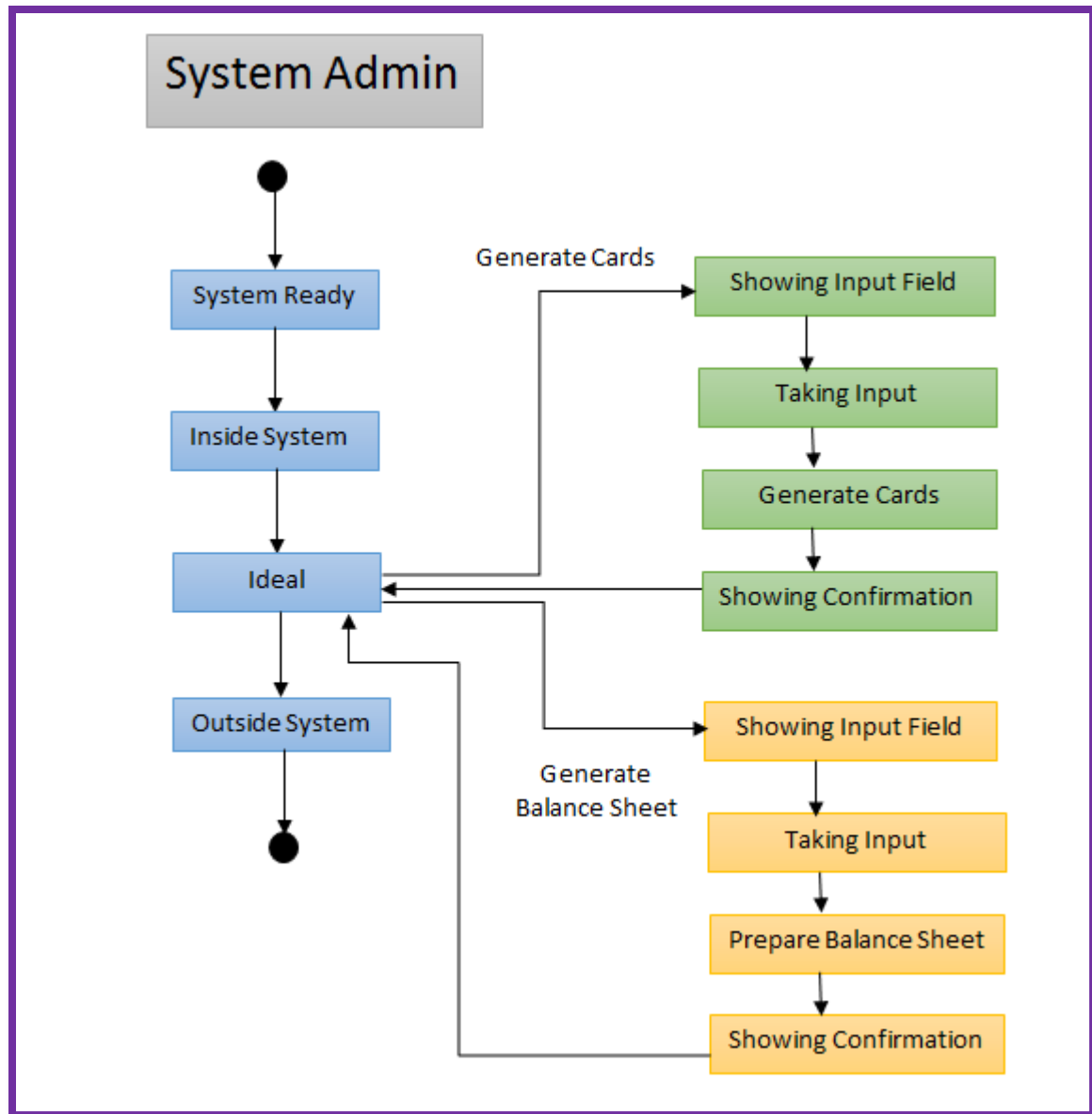
Automated Cyber Cafe System

Fig: State transition diagram (a): System Admin

Automated Cyber Cafe System
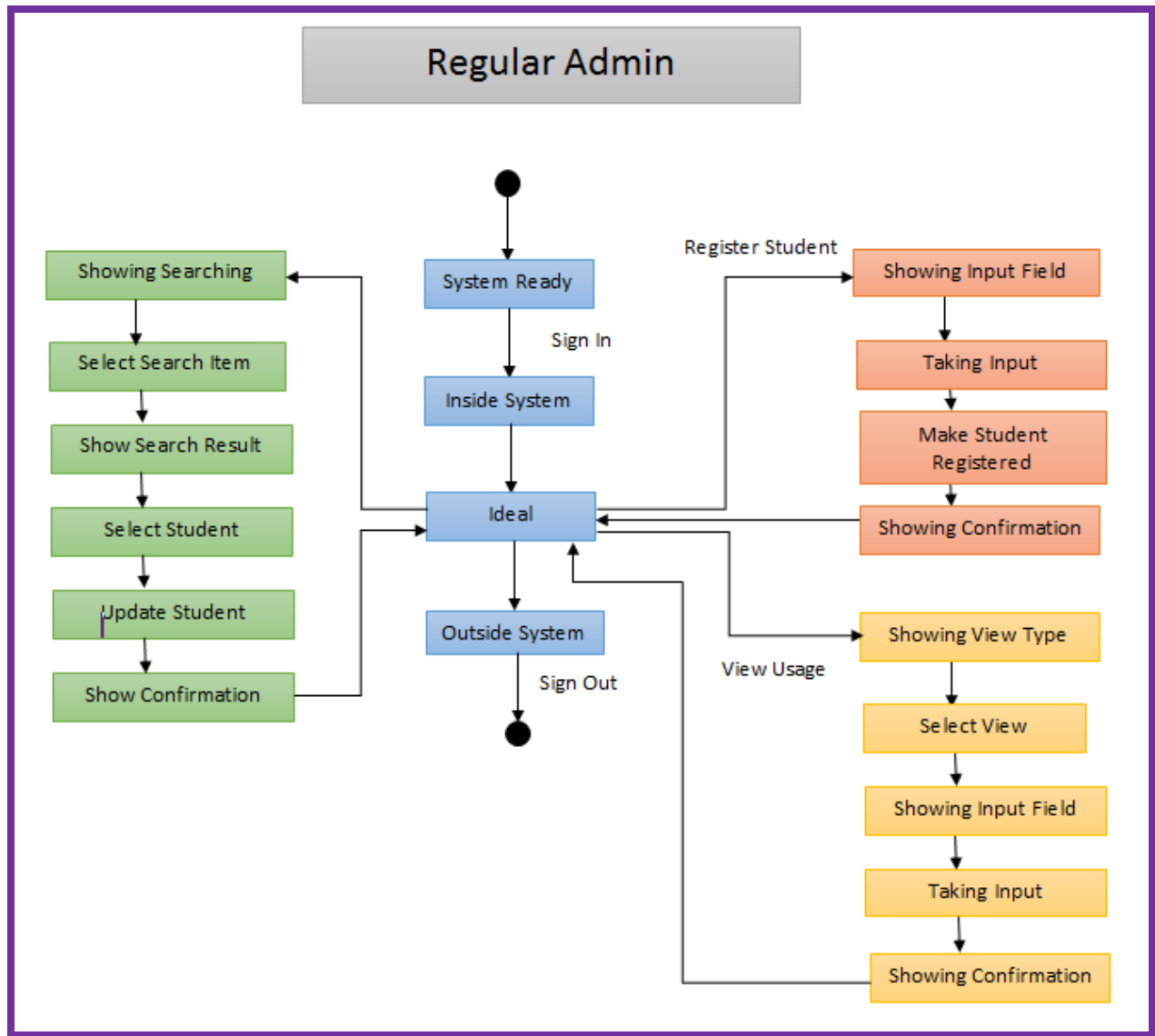
Fig: State transition diagram (b): Regular Admin

Automated Cyber Cafe System
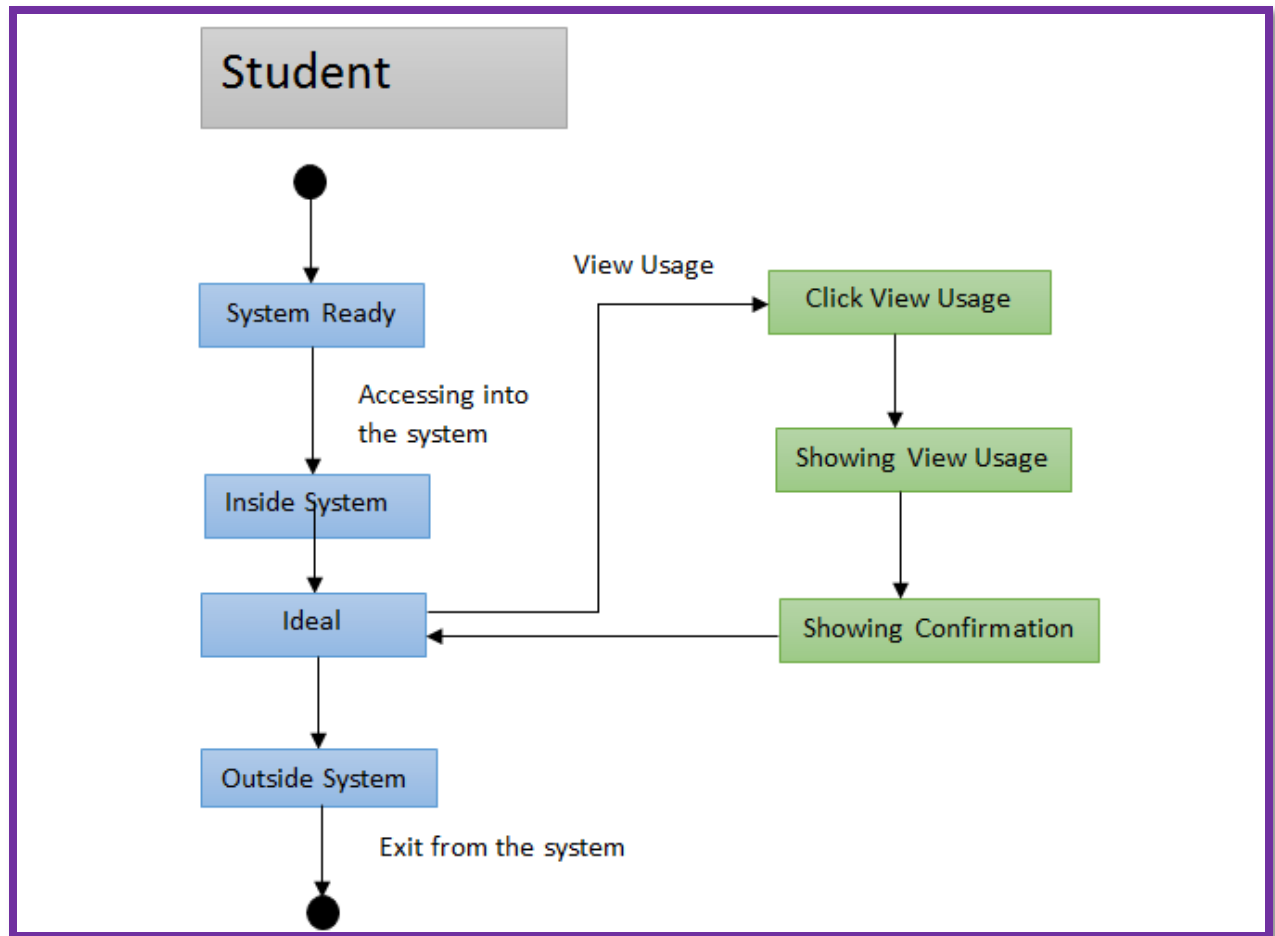
Fig: State transition diagram (c): Student

Automated Cyber Cafe System
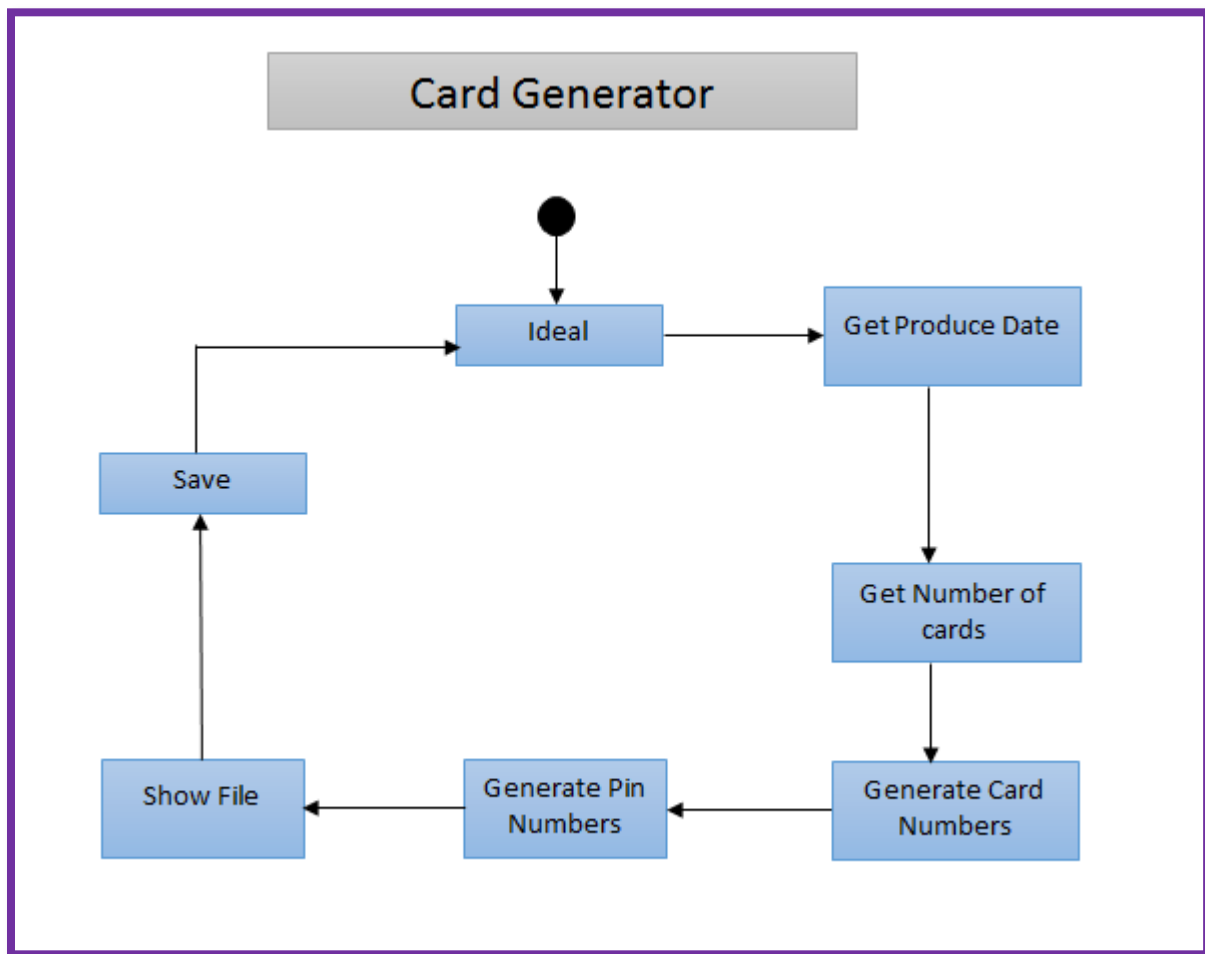
Fig: State transition diagram (d): Card Generator

Automated Cyber Cafe System
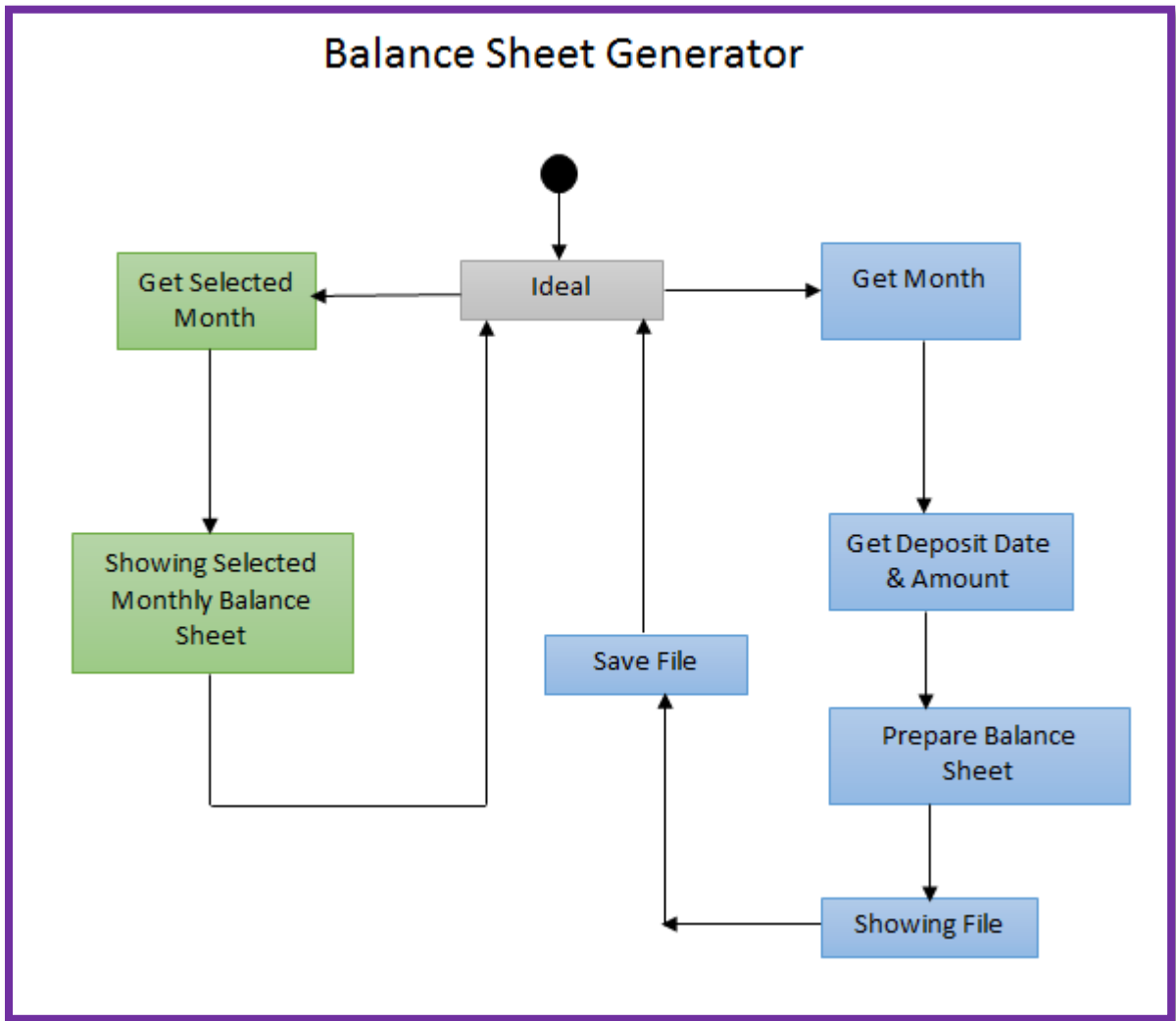
Fig: State transition diagram (e): Balance Sheet Generator

Automated Cyber Cafe System
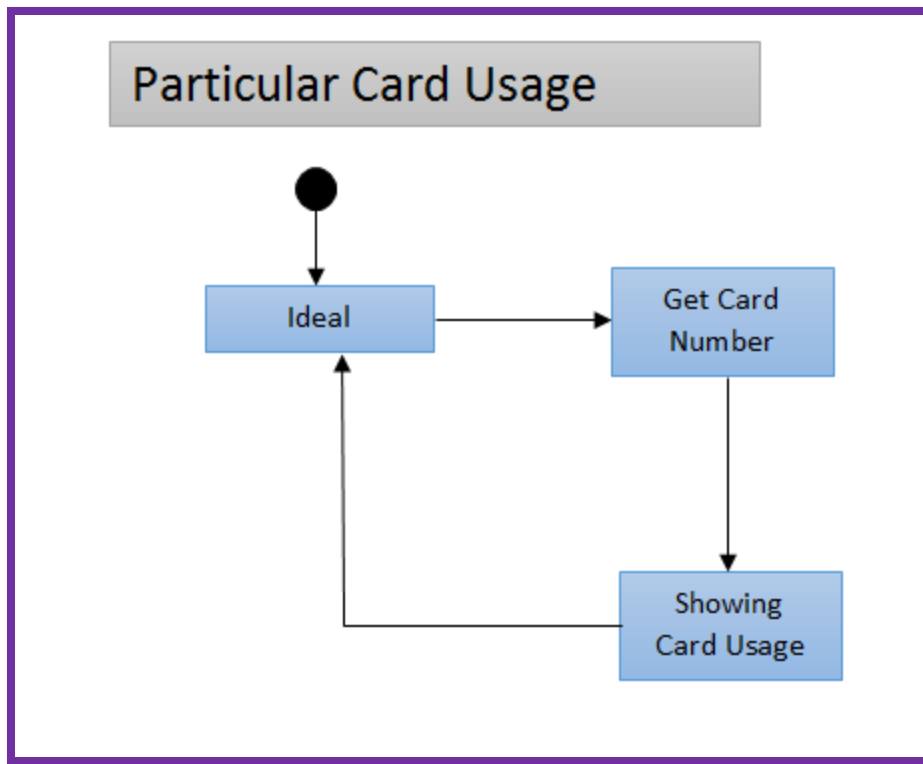
Fig: State transition diagram (f): Particular card usage
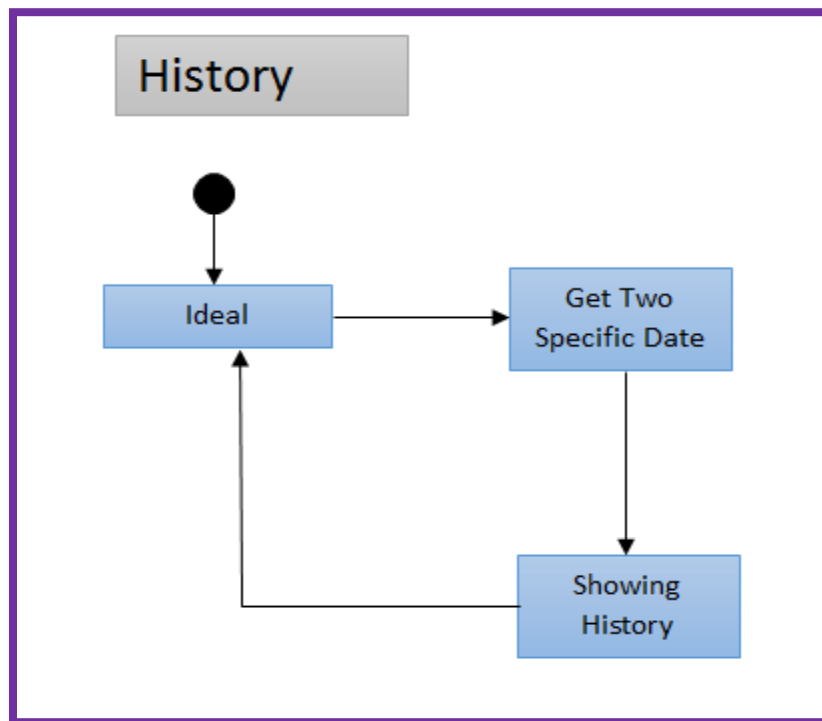
Fig: State transition diagram (f): History

Automated Cyber Cafe System
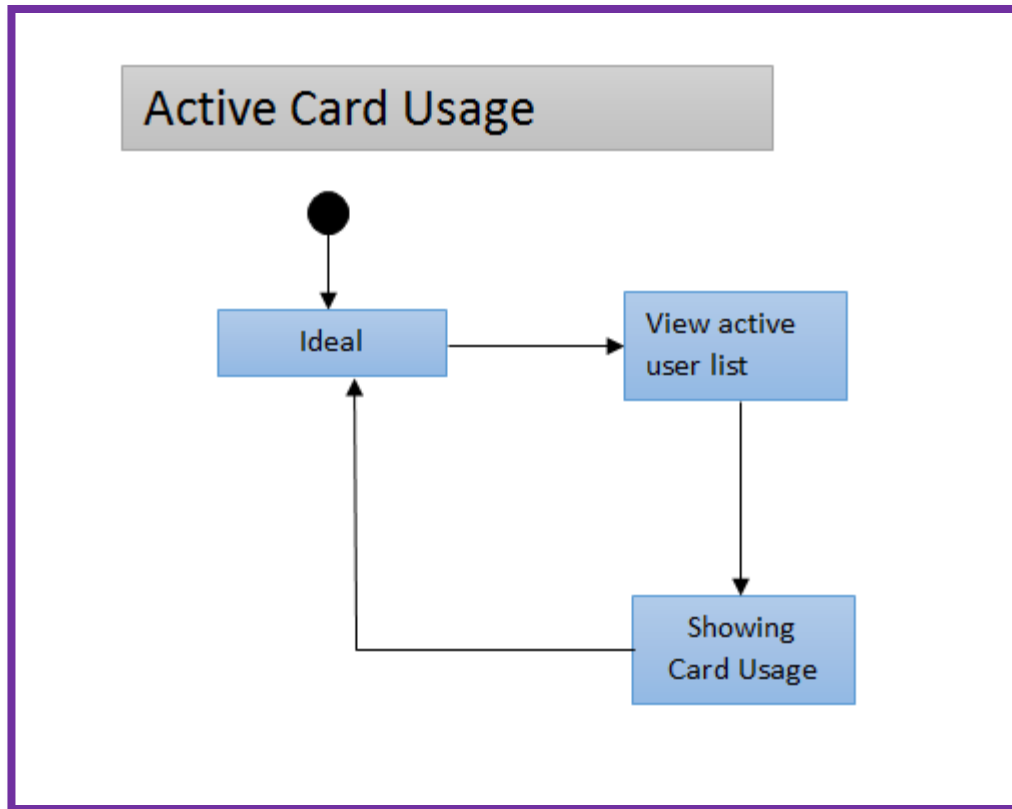
Fig: State transition diagram (g): Active Card Usage

Automated Cyber Cafe System

8.4. Sequence diagram

Sequence diagram indicates how events cause transitions from object to object. They are given below
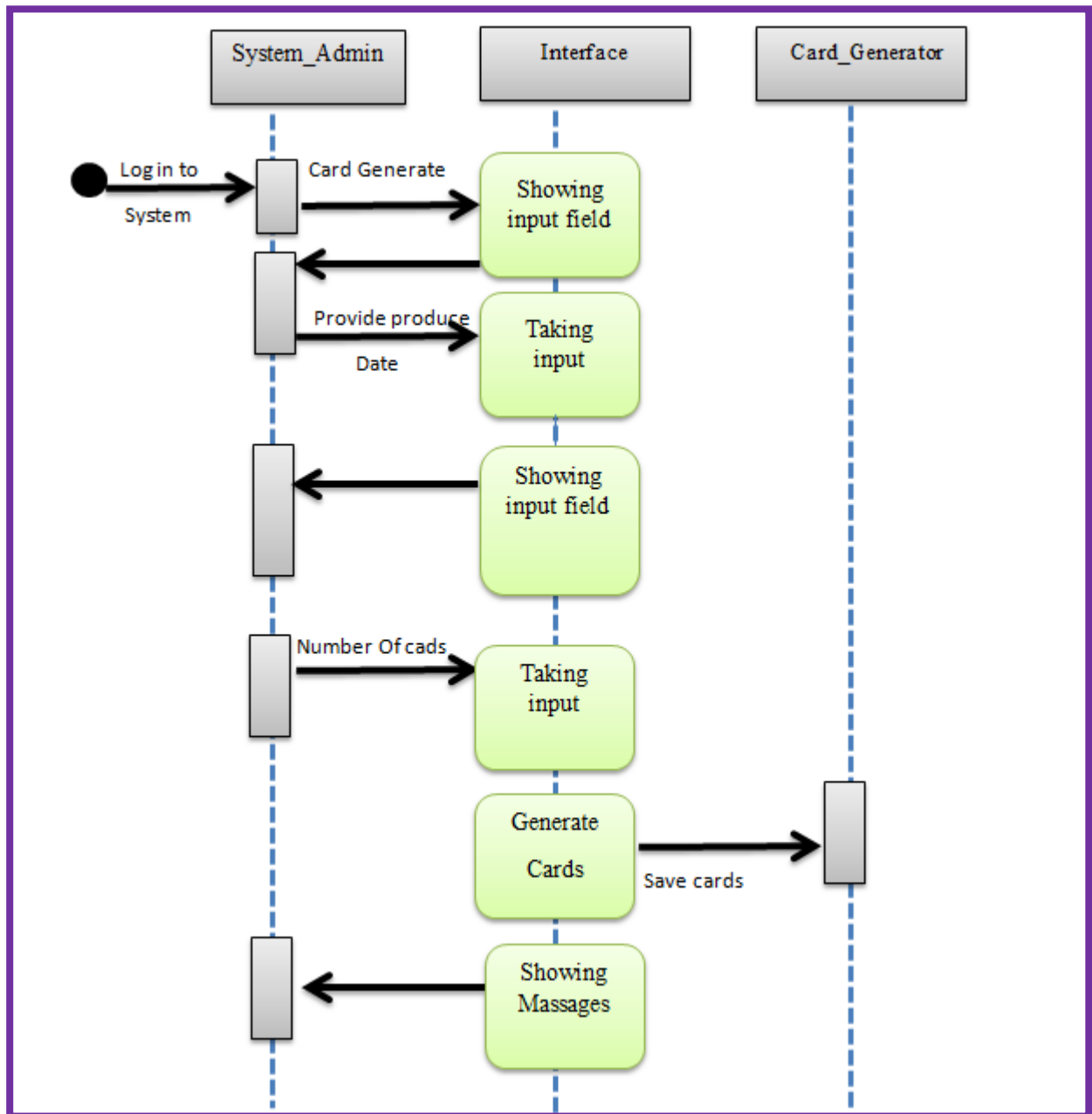
Fig: Sequence diagram (a): System Admin Generates Cards

Automated Cyber Cafe System
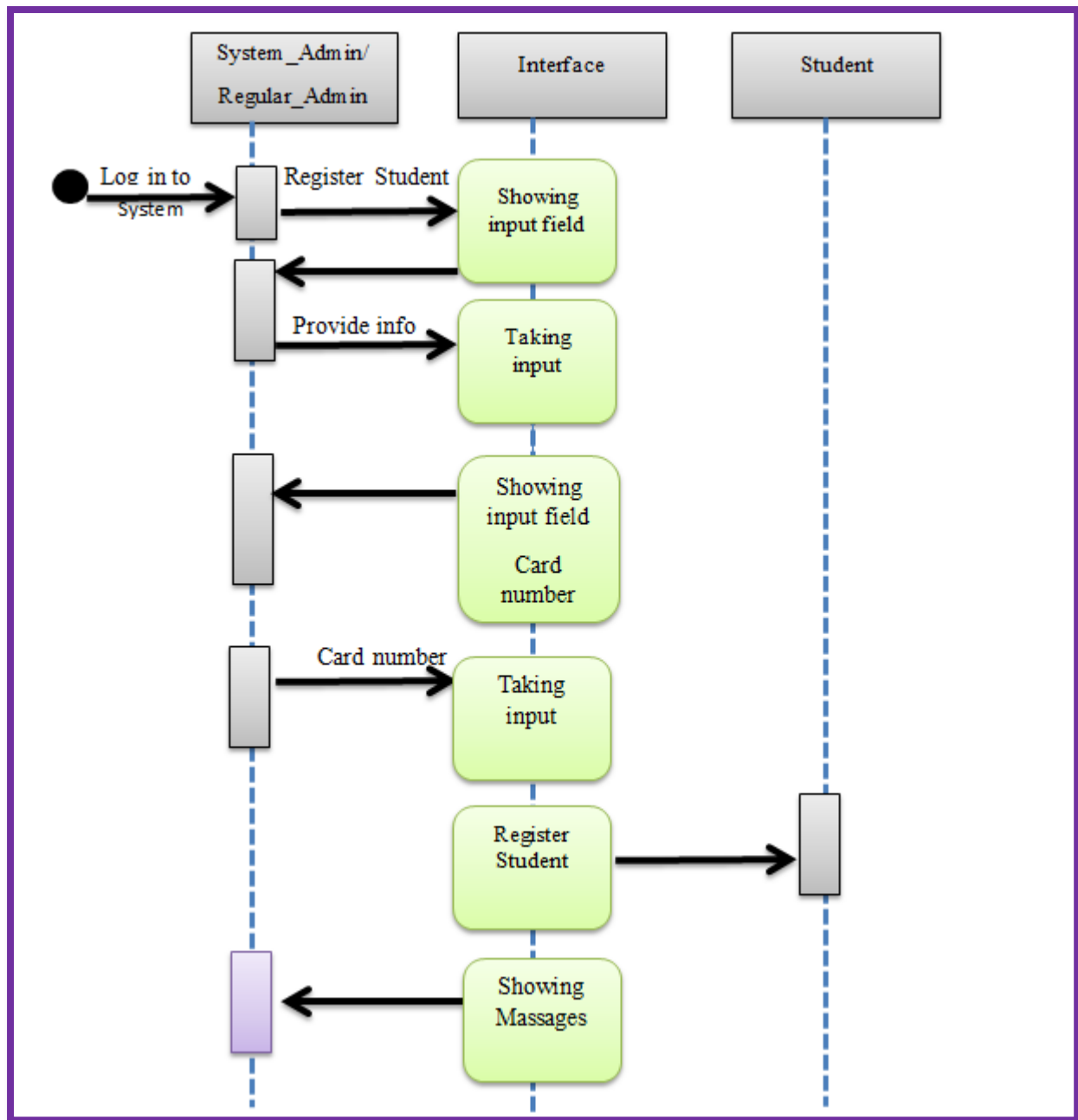
Fig: Sequence diagram (b): Admins Register Student

Automated Cyber Cafe System
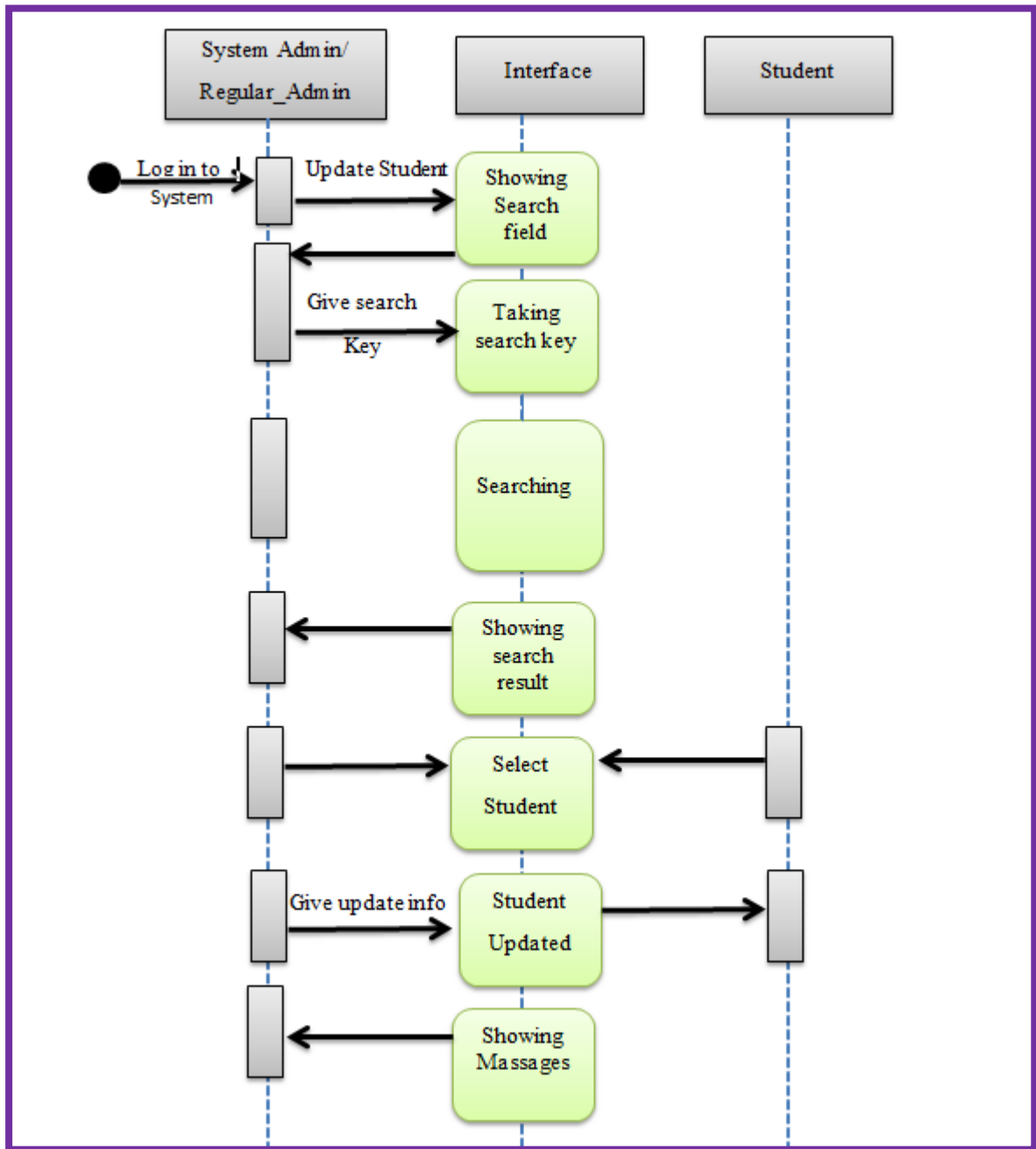
Fig: Sequence diagram (c): Admins updates student information

Automated Cyber Cafe System
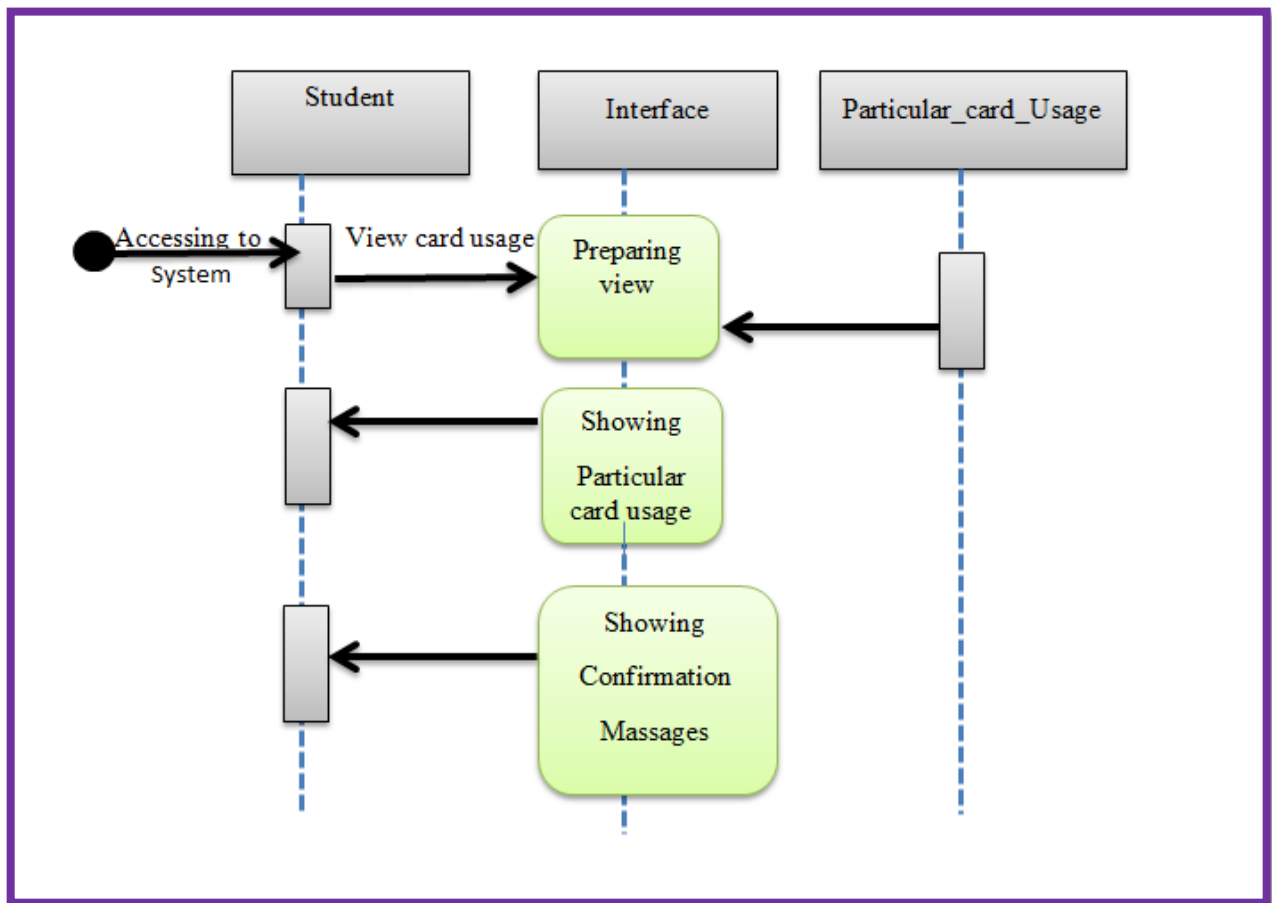
Fig: Sequence diagram (d): Student views card usage

Automated Cyber Cafe System
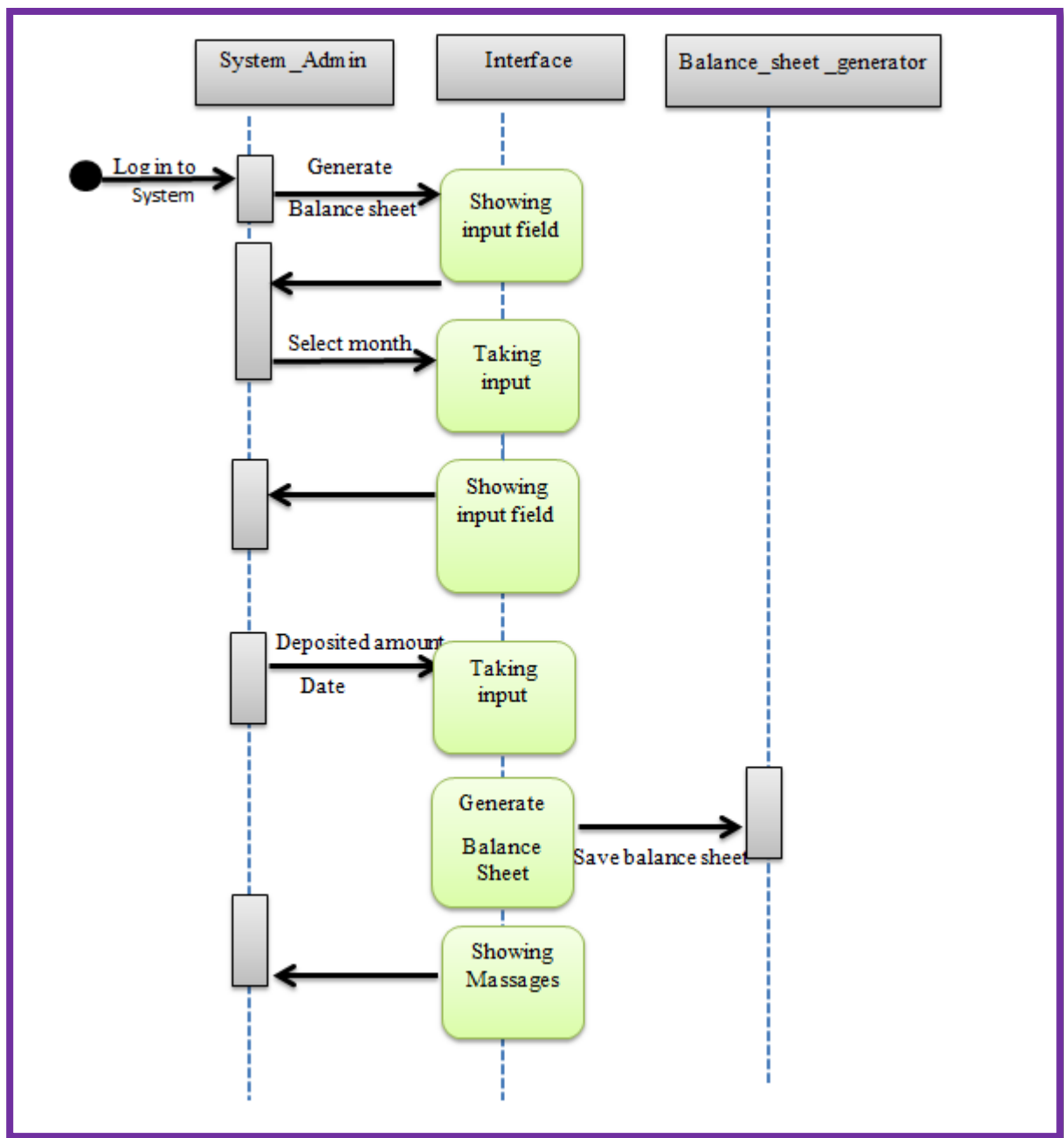
Fig: Sequence diagram (e): System Admin generates balance sheet

Automated Cyber Cafe System
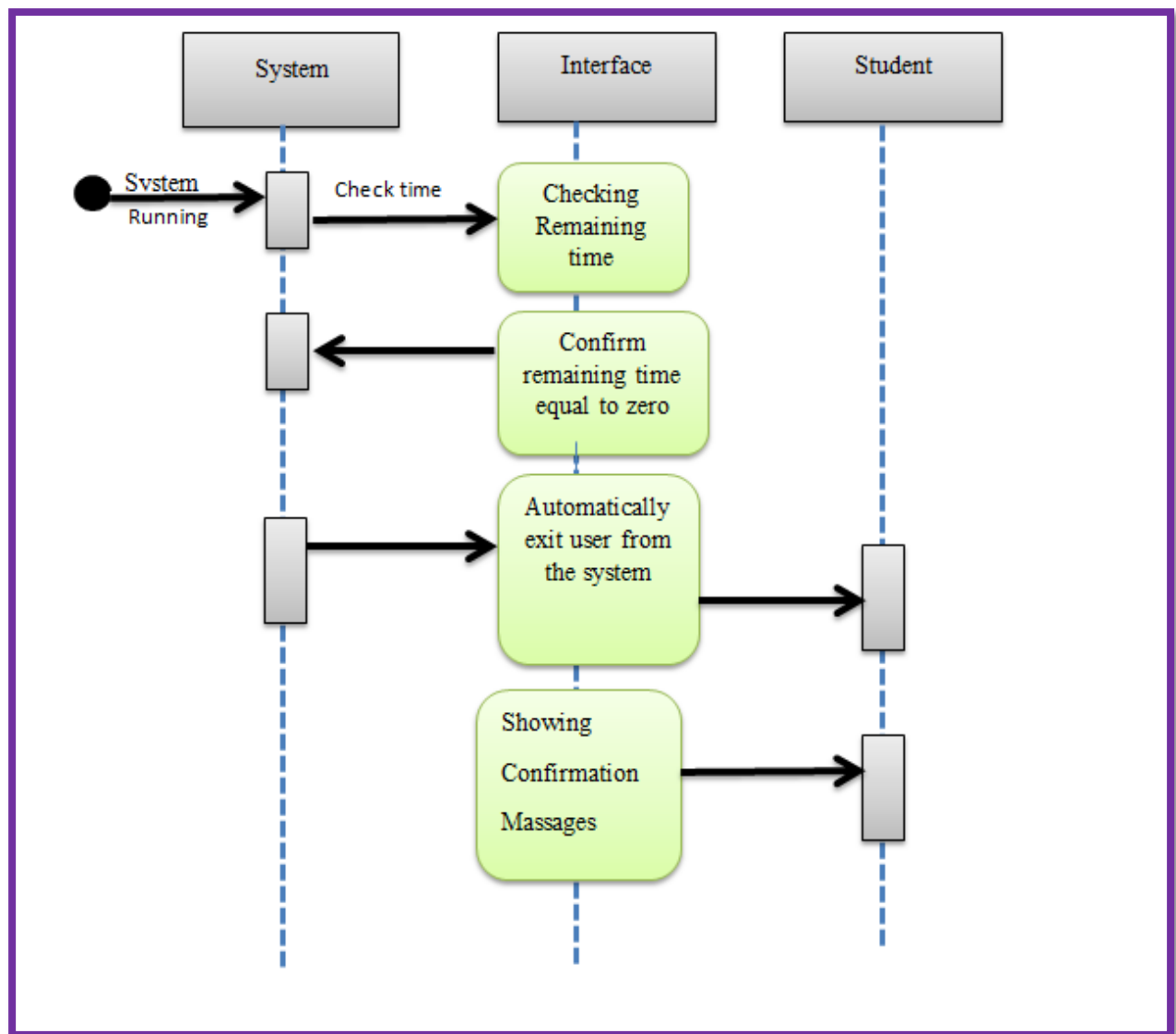
Fig: Sequence diagram (f): System automatically exits students from the system.

Automated Cyber Cafe System
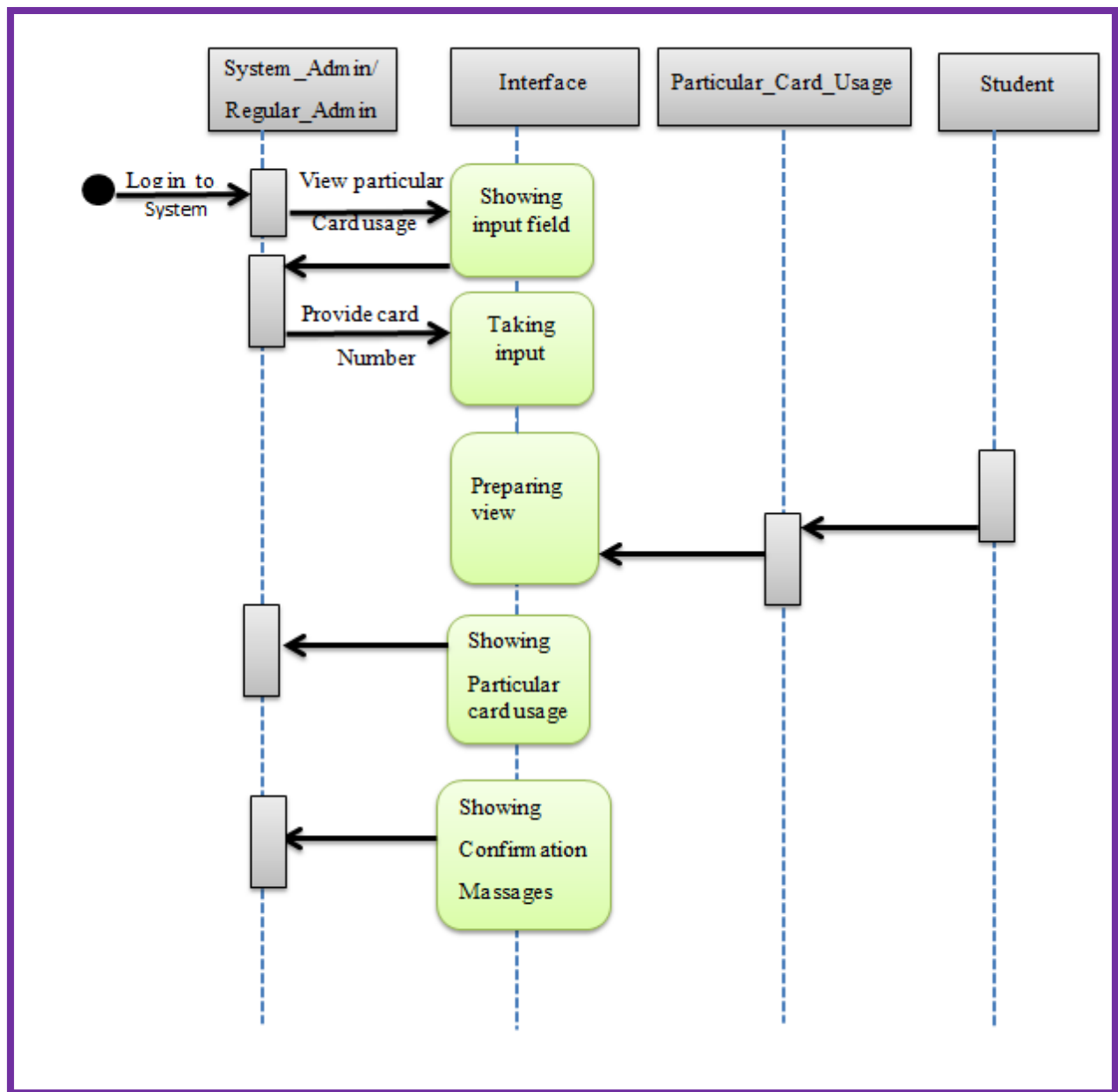
Fig: Sequence diagram (g): Admin views particular card usage

Automated Cyber Cafe System
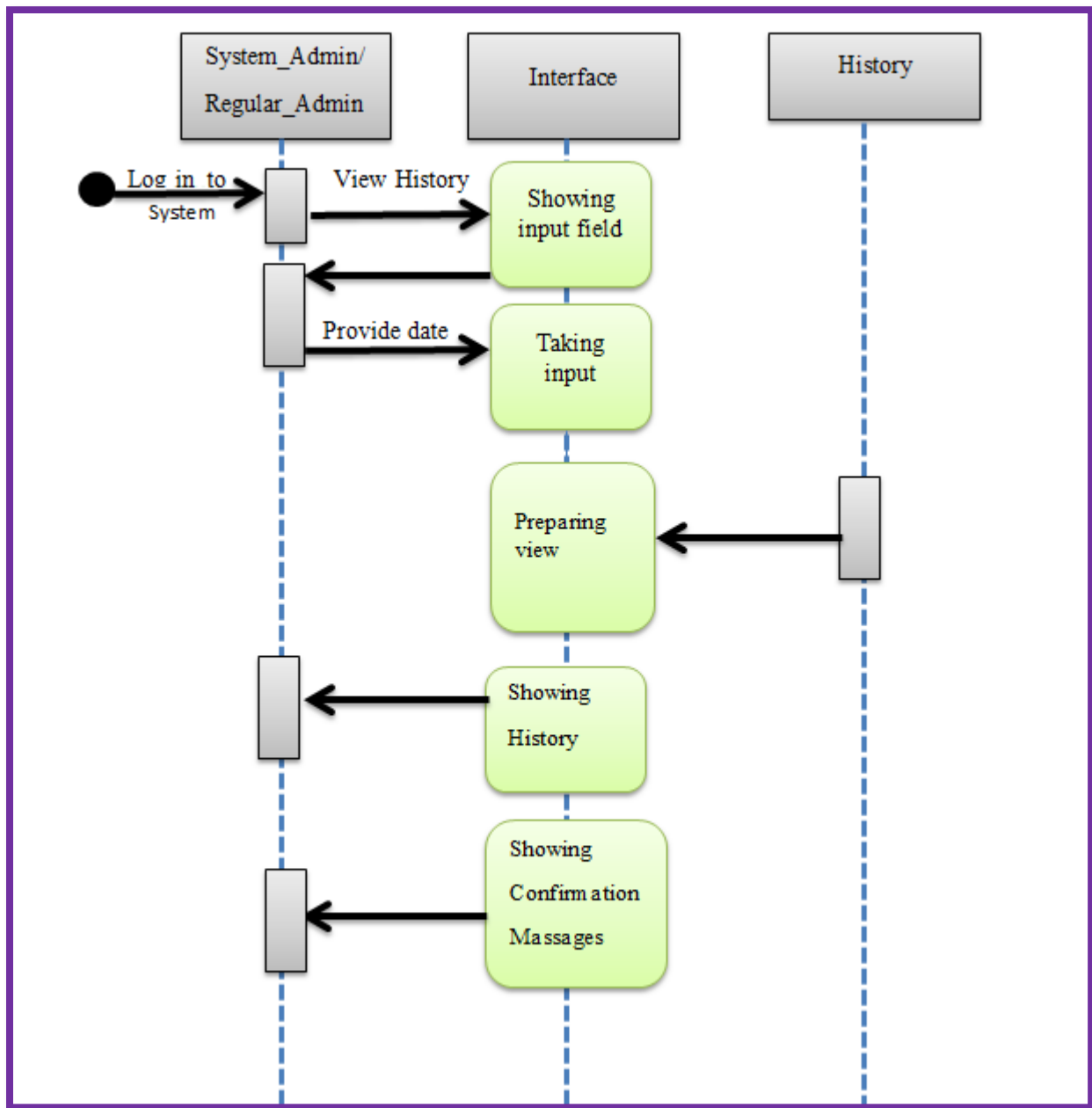
Fig: Sequence diagram (h): Admin views card usage history

Automated Cyber Cafe System

8.5 Conclusion

In this chapter we have identified all events. Based on these events we have drawn state diagram and sequential diagram.

1. Date 23/03/2015

Place: IIT DU
Meeting agenda: **Discussion on Data based modeling.**
Group Members:

- ➢ Mobashir Sadat (BSSE-0507)

- ➢ Md Rakib Hossain (BSSE-0516)

- ➢ A.H.M Azimul Haque (BSSE-0519)

Automated Cyber Cafe System

Chapter 9

Conclusion

After a lot of hard working, at last we are able to complete the final SRS report on Automated Cyber Cafe System Software. Here we have tried our best to identify necessary requirements from our stakeholders and based on the requirements, we have illustrated different models with diagrams which will help the developers, software designers and other people associated with it to understand about the system and to do their tasks in a better way. Students as well as teachers may use this document as academic learning resource. We hope that the readers will get benefit from the document.

Chapter 10

Appendix and References

10.1 Questionnaires

- What are the functionalities of your old automated cyber cafe system?
  - ✓ **Answer:** The users purchase prepaid cards for using internet only for 300 minutes. The cards contains card number and pin number which are used for logging in the computer. After finishing the 300 minutes their card becomes invalid. Besides after passing 180 days the card considers as invalid.
- Who directly interacts with the system?
  - ✓ **Answer:** The Users use the system and the authority of DU Cyber Center maintains the system.
- Who has the administrator power over the software?
  - ✓ **Answer:** System administrator.
- Is there any multiple admins or only one admin?
  - ✓ **Answer:** Yes, there is also a regular admin
- How you want to serve your client as the old system or in a new way?
  - ✓ **Answer:** As the old system did, but with some supportive features.
- Do you expect the same features as you are provided by the old software?
  - ✓ **Answer:** Yes, as the same features, but well secured, organized and maintainable
- Are there any major problems you face from the old software? What are the problems?
  - ✓ **Answer:** Yes, the problem is it didn't show the active user list.
- How do you want to solve these problems?
  - ✓ **Answer:** Find an option that show us active user list.
- How do you serve your clients?
  - ✓ **Answer:** Distributing this card through registration.

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- ➢ Mainly who is the user of your Cyber Cafe? This system serves only DU Students or any other People?
  - ✓ **Answer:** Only the hall registered students of University of Dhaka.
- ➢ What is the information of the user you store in the ledger book when students are registered as a client?
  - ✓ **Answer:** Registration date, student name, department name, department roll, currently academic year, attached hall name.
- ➢ What is the information that card contains?
  - ✓ **Answer:** card number and a pin number corresponding to the card number.
- ➢ After registration how they use this card to get the services?
  - ✓ **Answer:** Students use this cards number and pin number for using internet and other computing facilities through by logging into the computer.
- ➢ How do you want to generate these cards? Generate one card when one user is registered or many cards for many users as well as for future uses?
  - ✓ **Answer:** Many cards at the same time for future uses.
- ➢ If you generate many cards at one time then what is the maximum and minimum numbers of cards you want to generate at one time?
  - ✓ **Answer:** minimum 500 and maximum 2000.
- ➢ Who is responsible for generating the cards and distributing those cards?
  - ✓ **Answer:** System admin responsible for generating cards and regular admin is responsible for distributing cards and the registration.
- ➢ What types of information the card number and the pin number would be?
  - ✓ **Answer:** Card number is 10 digits long only numeric value, and pin number is 8 characters long alpha numeric value with the constraint of having only uppercase character.
- ➢ Is the account number and the pin randomly generated or having any preferable choice or any sequence related to the user's provided information?
  - ✓ **Answer:** In card number within these 10 digit first 6 digit indicates the date and last 4 digits indicates the card serial number and a pin number is correspondent to a card number

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- ➢ In which environment (Operating system) you want to run the new software?
  - ✓ **Answer:** For user the environment would be Windows XP but in future it will be upgraded. For the administrator the environment will be Linux.
- ➢ Is there any problem if we propose a new environment for the new software?
  - ✓ **Answer:** Yes, there is a compatibility issues and lack of hardware configuration.
- ➢ Do you need a user manual book for maintaining the software?
  - ✓ **Answer:** Yes,
- ➢ Do you provide a user manual book for your clients?
  - ✓ **Answer:** No, but the instructions on how to use this card is mention on the card.
- ➢ Are you in a need of some extra features that help your work?
  - ✓ **Answer:** Monthly balance sheet generating.
- ➢ Who is responsible for generating this monthly balance sheet?
  - ✓ **Answer:** System admin.
- ➢ What is the information the balance sheet contains?
  - ✓ **Answer:** The balance sheet contains date (from beginning to end of the month), Cards (how many cards are distributed in each date), Unit price (prices of each card), Amount (total amount of card unit price on each day), Bank Deposited & date (bank deposit amount and deposit's date).
  - ✓ To generate this report system administrator has to fill up bank deposit amount and the deposit's date in the balance Sheet. (On which date the system administrator deposited at bank and the deposited amount)

- ➢ If you are able to see the active user list then what is the information you want to see in the active user list?
  - ✓ **Answer:** This contains PC No (In which computer they are using), active user's Card number, Cardholder Name, Starting Time (when they started using), Running Time (how long they are using), Remaining Time.

- ➢ Can you see a particular card usage?
  - ✓ **Answer:** Yes, both the system admin and regular admin can see a particular card usage

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➢ What is the information particular card usage contains.

    ✓ **Answer:** The card usage contains card numbers, pin numbers, card owner's name, department name, department roll, attached hall name, date, PC No (which computer they used), Starting Time (when they started using), Ending Time (when they finished using), Using Time (how long they used), Remaining Time (how much time remain to finish 300 minutes) and Card validity (For how many days the card is validate).

➢ In case of electricity failure what are the steps taken by you?

    ✓ **Answer:** In case of electricity failure the students are requested to turn on the computer and enter their card number and pin number again for further usage.

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10.2 References

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