WOLKITE UNIVERSITY

COLLEGE OF COMPUTIING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

INDUSTRIAL PROJECT TITLE:-

WEB BASED COST SHARING MANAGEMENT SYSTEM

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May,2021

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WEB BASED COST SHARING MANAGEMENT SYSTEM

SUBMITED TO :- DEPARTMENT OF COMPUTRE SCIENCE IN PARTAIL FULLFILMENT OF THE REQUIREMENT FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTRE SCIENCE

BY

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May , 2021

DECLARATION

This is to declare that this project work which is done under the supervision of Mr. Zerihun Ebabu and having the title web based Cost Sharing Management system is the sole contribution of:

Hiwot yitayew

Samrawit alene

Biniam wallelign

No part of the project work has been reproduced illegally (copy and paste) which can be considered as Plagiarism. All referenced parts have been used to argue the idea and have been cited properly. We will be responsible and liable for any consequence if violation of this declaration is proven.

Date: May, 2021

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Hiwot yitayew	
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APPROVAL FORM

This is to confirm that the project report entitled Cost Sharing System submitted to Wolkite University, College of Computing and Informatics Department of computer sciences by: Hiwot Yitayew, Samrawit Alene, Biniam Wallelign is approved for submission.

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Acknowledgment

We would like to acknowledge those who help us in working this project. Before all we would like to thank to our GOD he gives us strength and knowledge to do our project. Next we would like to thank our advisor Mr. zerihun ebabu. he helps us with his all heart and Employees of Wolkite university registrar Mr. Tesfaye Munta and Mr. Abrham Assefa and others to give the required information regarding to cost sharing Finally, we thank our instructors and friends in College of computing and informatics and every person help us in different way.

Table Contents

List of Figure

List of Table

List of Acronyms and Abbreviation

CSMS	Cost sharing management system
CSS	Cascading Sheet Style
DB	Database
DBMS	Database Management System
HTML	Hyper Text Markup Language
PHP	Hypertext Pre processor
UML	Unified Modeling Language
MYSQL	MY Structured Quire Language
GB	Gigabyte
HTTP	Hyper Text Transfer Protocol
WCSMS	Web based Cost Sharing Management System
CD	Compact Disc
DVD	Digital Versatile Disc
GUI	Graphical User Interface
BR	Business Rule
CPU	Central processing unit

Abstract

This system aims to alter the existing manual system in different directions by removing the bulky process of cost sharing preparation by a computerized System. This involves creating a centralized information system that generates and post cost sharing information automatically on the web.. This significantly best performance of the whole cost sharing process. The system follows client-server architecture. There is a centralized database used to save relevant data.

CHAPTER ONE

1. Introduction

Wolkite University, which is the home of technology It is one of the recently established public University working towards the implementation of the government's strategy of expanding quality of higher education in the country.

Wolkite university campus provides services like student's registration, library servicing, student cafeteria, store system, management servicing and cost sharing system etc, but our project done cost sharing management system.

Cost sharing is considered as a government loan program for higher education students to cover partial cost of services like health care, food, education and dormitory. Any student who has either graduated or under graduated from higher education of the public institution is required to share the cost sharing of his/her education, training and other Services based on cost sharing principle.

Wolkite University cost sharing management system works manually. Since the system is manual, customers face different problems related to waste time, resource and consume manpower. By observing the overall problems of Wolkite University cost sharing management system we are going to solve this problem by developing online cost sharing management system. In our project developing online cost sharing management system is better than that of the existing manual system in different ways related to the customer obtain information online ,to minimize power, wastage of time and money in addition to this online cost sharing system is more reliable than that of the existing system .

1.1 Background of the organization

Cost sharing management system is one of the activities in the higher educational organizations. Wolkite University is one of the higher educational organizations in Ethiopia. It was established in 2004 E.c, at Debub region especially cited in the SNN regional state, Gurage zone, about 150 km west of the capital.

1.1.1. Vision

WKU Cost Sharing Management System needs to give the base of students to serve out for activities.those are To see the customers when getting an access from the proposed system,To overcome the usual problems and see the customers pleasure.

1.1.2. Mission

In Wolkite university student cost sharing mission is creating suitable environment make enables the user to interact with the system and introduce customer to the system. The student cost sharing system is committed to render quality service to satisfy its customers use an automating the office with advanced software of the customers.

1.2. Statement of the problem

In Wolkite University campus there are many students those who are enrolled in different fields of study. Those students are expected to share the cost of living in the university related to food, shelter, education and materials. Now a day's Wolkite University cost sharing management system is very tedious since the system is manual. Due to these there are many problems in manual way of recording and reporting student's data. The aim of our project is to make the system automated and very comfortable to the users and employees that help to keep data safe, reduce man power, reduce time, reduce paper wastage and reduce duplication of data.

Problems associated with the current manual system:-

- It is very bulky and time consuming
- It is difficult to update, delete, and search data
- Wastage of resource like paper, labor
- Loss of data
- Inefficient way of managing records
- Difficulty of locating & finding files depending on each other.

1.3. Objective of the Project

1.3.1. General Objective

The general objective of our project is to develop online automated cost sharing management system.

1.3.2. Specific Objective

We can achieve the general objective by fulfilling the specific objective listed below:-

- To capable easily and quickly extract important information
- To design user friendly and attractive user interface
- Construct an efficient database that store Beneficiaries cost share file
- System analysis and object design
- Implement the proposed system
- To test and deployment the system

1.4. Feasibility Analysis

A feasibility analysis may be conducted for a project with an emphasis a financial viability, environmental integrity, cultural acceptability or political feasibility. It is the determination as to the likelihood of success and description of how that determination was achieved.

1.4.1 Technical Feasibility

It is the process of evaluating the organization ability to construct a proposed system. Our project well technically feasible, because it can generate outputs in a given time, easy to communicate and generally it satisfies the end-user's requirement. And also our new system can work the current technology and our focus well to develop well organized dynamic website that well technically efficient and effective for managing the cost share.

1.4.2. Operational feasibility

It Measures how the proposed system to solve the problem of the existing system. The new cost share management system well operationally feasible and it doesn't affect the organization structure. The new system well operationally feasible in terms of reliability, maintainability, supportability, usability and flexibility.

1.4.3. Economic Feasibility

The system will be economically feasible it can minimize the cost that spent for manual work. Let analyze the manual costs, there is around so many higher colleges in WKU and in each colleges there are many students which fill the cost sharing agreement in each year, So, too sore their data need a huge amount of paper and also there is other material cost,WKU also need a large file cabinet to handle and store these students cost share file the point is here these costs spent with every 1, 2, 3, ...Years, it will be a high cost for future. But if the system

is automated it is developed once, the cost of server, computers, network installation and other costs spent once then the system give services through the life time of the business, so this project is economically feasible.

1.5. Scope and Limitation of the Project

1.5.1. Scope of the project

The proposed system will be used for any university cost sharing management system. But we will develop this proposed system based on wolkite university cost sharing management system.

1.5.2. Limitation of the Project

- Does not connect to bank.

1.6. Significance of the project

Wolkite online cost sharing management system provides many advantages for the students and employees. This means, anywhere and anytime students are authorized to use this system effectively through internet accesses. Thus, it will document the student information in an organized manner.

Among this main significance some of them are listed below:-

- Minimize errors
- Eliminate paper based recording
- Reduce resource wastage
- Easy to use the system
- Minimize work load
- The system can be accessed by multiple users concurrently
- Accessing information's in fast way.
- Increased the speed to perform activities.

1.7. Beneficiary of the Project

- For students: Allow to fill the cost share form easily.
- For registrar: to facilitate the daily work easily and fastly.
- For cost sharing officer:to manage,view and store the data .
- For university:This system reduce the resource like paper, easily extraction of use full information, create well organized cost share data and handle student cost share file easily.

1.8. Methodology of the project

The methods that facilitate us to capture information about requested system is called Methodology. Starting from proposed system we gathered information and data through different mechanisms.

1.8.1. Data collection Tools/Techniques

To develop online cost sharing management system the primary task is collecting required data from different sources to perform further tasks.

The data will be gathered by using the following techniques:-

- Primary data sources:-

Observation:-We have observed some data physically by going to their office directly. We select observation to know the real world environment of the organization manual working. In the observation part we observe how the manual cost sharing management system is working.

Interview: -The other method we have used to get information about the general view of the system is by interviewing employee of cost share office and some students. It is fact finding technique where by the system analyst collects information from individual face to face interaction. It gives us an opportunity to motivate the interviewee to respond freely and openly.

We have asked different questions:-

- What is the current problem of the manual system?
- How do you work currently?
- How to process the current system?

Document analysis:-we also collected certain relevant information from written documents in the cost share office. Not only that but also we tried to review other relevant documents to develop our project proposal.

- Secondary data source:-

Internet:-internet aids us to see the available sample on the internet and to download different types of tutorials which help to do our project.

1.8.2 System Analysis and Design

We use object-oriented system analysis to analyze our proposed system. This technique has two phases those are:-

- Object oriented analysis (OOA): - During this phase our team use to model the function of the system (use case modeling), find and identify the business objects, organize the objects and identify the relationship between them and finally model the behavior of the objects in detail.
- Object oriented design (OOD): - During this phase use Edraw max and Microsoft visio 2010 software to refine the use case model and those for designing the class, sequence, collaboration, activity, state diagram and to model object interactions and behavior that support the use case scenario.

1.8.3. System Development Model

System development method is a frame work that is used to structure, plan and control the process of developing a system so to develop this project we have selected iterative system development method. The reason why we select this model.

It is unusual to design a complete project once. Therefore, to design this project we will required to review and redesign in each phase iteratively to meet user requirements.

1.8.4. System Testing Methodology

We will used unit testing, integration testing and acceptance testing.

- **Unit testing**: tested by our team members
  - ✓ Ensure how the sub procedures or functions are called correctly.
  - ✓ Ensure if the correct output is produced for different inputs.
  - ✓ Ensure the efficiency of the code with respect to the memory and CPU time.
- **Integration testing**: test how the new module integrate or work together with the existing one to achieve the goal of the system.

- **System testing**: is simply expanding integration testing, where we are testing the interfaces between programs in a system rather than testing the interfaces between modules in a program. System testing is also intended to demonstrate whether a system demonstrates its objectives it is final step of testing. In this step the team members test the entire system as a whole with all forms, codes, modules and test all the functionalities in the system

1.8.5. Development Tools and Technologies

1.8.5.1. Frontend Technologies

The first use of programming language these are:- HTML, Edraw max ,Microsoft visio 2010, CSS, and java script this helps to design client side etc.

1.8.5.2. Backend Technologies

- MYSQL DBMS for managing database it is a popular, free and open source database management system.
- Web browser :-to run our program or code from the server side
- PHP for server side coding: The reason why we choose PHP it is object-oriented, free, and compatible with many platforms, compatible with many DBMS and much secured scripting language.

1.8.5.3. Documentation and Modeling Tools

Documentation and modeling tools are:-

Software tools:-

- Client side: JavaScript, CSS, HTML.
- Server side:-PHP
- Edraw max and Microsoft visio 2010:- for UML modeling and diagram
- Visual studio or Sublime:- to write implementation or code
- Microsoft word 2016 for documentation
- Microsoft power point 2016 for presentation
- Apache: web server
- MYSQL-database:-for storing data in the database.
- PHP engine :-for running PHP scripts
- Web browser :-to run our program or code from the server side

Hard ware tools:-

- Personal computer:-almost all tasks of this project will performed on computer.
- Flash disk(8GB)
- Hard disk(500GB)
- Paper and pen
- generateer
- Scanner

1.9. Budget and Time Schedule of the Project

1.9.1. Budget of the Project

costs that refers to the hardware and software materials used. Some of the resources are given by the university and others are covered by the project team, but we have listed those costs of resources in order to show how much cost does it requires to develop the system.

CHAPTER TWO

2. Description of the Existing System

2.1. Introduction of Existing System

The current student cost sharing management in Wolkite University is manually based management system. This system mainly focus on the students fill out their biography and cost share file per each year. The latter is the student dean search a file to identify those students who want cash payment.

Registrar or college registrar approve the form which fill by students and store the student cost share file by using file cabinet and give one copy for students per each year.

The registrar of Wolkite University also sent the overall graduated students cost share file including the total calculated unpaid cost of each graduated students to Ethiopian inland revenue officer. Ethiopian inland revenue officer stores them students cost share file which sent from Wolkite University by using file cabinet.

When a beneficiary completely repays their cost share Ethiopian inland revenue officer prepare a letter that allow to take their original document and the university

registrar give the original document to beneficiary by checking the letter that sent from Ethiopian inland revenue officer.

2.2. Users of Existing System

❖ Students

- ✓ Receiving the cost share form from registrar and fill out their biography and the cost share for current academic year.
- ✓ Finally return back the cost share form to registrar or college registrar.
- ✓ Finally take their original document from learned university, if they are fully pay the cost share

❖ College Registrar

- ✓ Providing cost share form to the students
- ✓ Breakdown the cost share form for students per each year
- ✓ Collecting the form while students are registered
- ✓ Putting signature while students return the cost share on submitted date
- ✓ Calculate the total unpaid cost of each graduated students.
- ✓ generate those unpaid cost.

❖ University Registrar

- ✓ Collecting cost sharing form from the hole collage while students are graduate
- ✓ Finally take their original document from registrar, if they are fully pay cost .

❖ Inland revenue officer

- ✓ Post the information to university registrar and college registrar
- ✓ View the all over student information uploaded by the university registrar

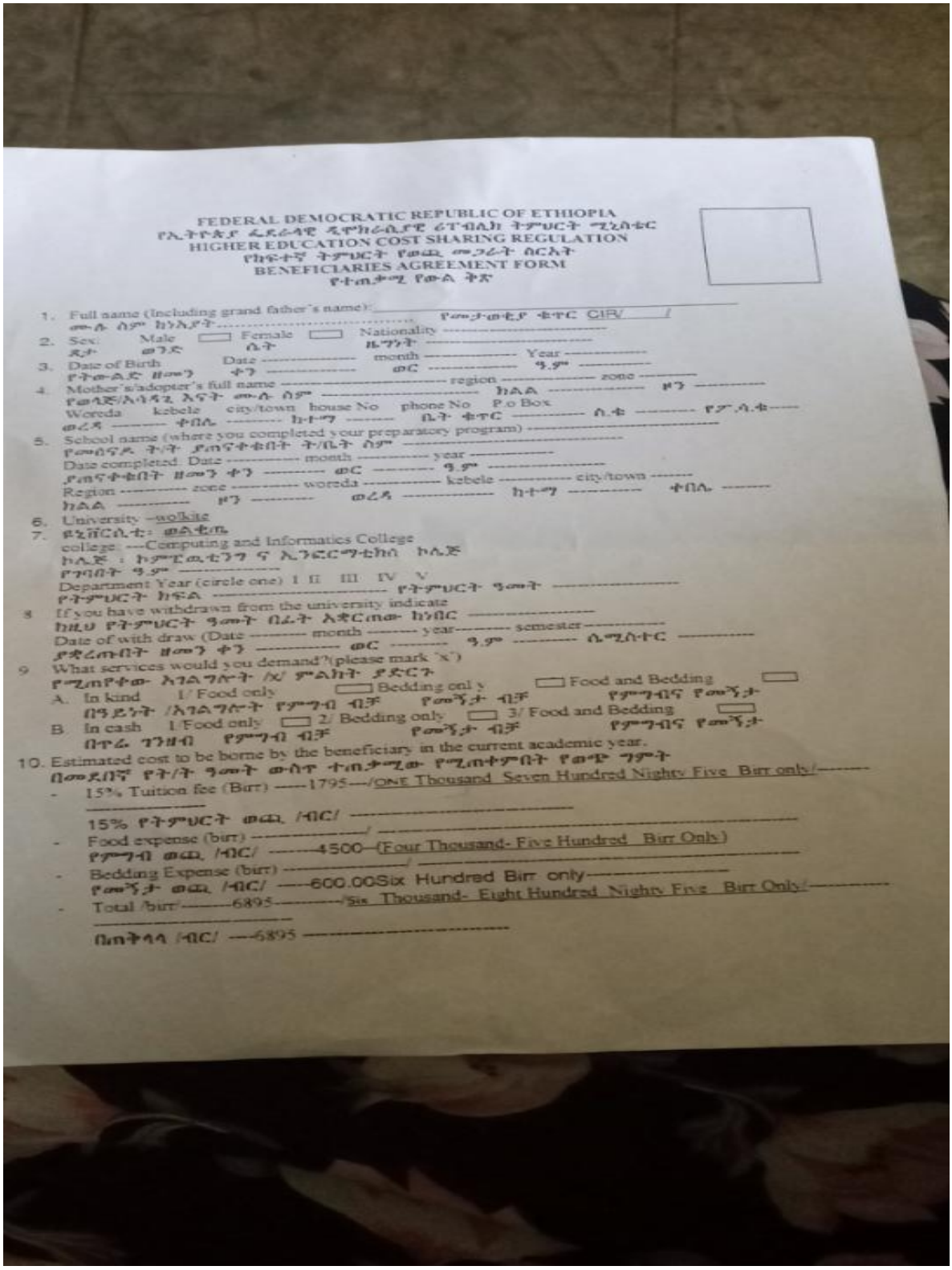
2.3. Major Functions of the Existing System

The major function of cost sharing is university students make an agreement per each year to accomplish their academic education process until they will be graduated.

The major function of cost sharing in Wolkite university are:-

- University of Registrar or cost sharing office distribute cost sharing regulation to each students.
- Students fill an agreement and put their photo on it then back to registrar.
- Registrar approved an agreement which fill by each students.
- Registrar to calculate the total cost of each graduated students.
- Registrar generate those cost to give the student.
- Universities student dean identifies which student is requiring the service in cash.
- Finally, beneficiaries get their original document after paid the cost share.

2.4. Forms and Other Documents of the Existing Systems



FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
የኢትዮጵያ ፌደራላዊ ዲሞክራሲያዊ ሪፐብሊክ ትምህርት ሚኒስቴር
HIGHER EDUCATION COST SHARING REGULATION
የከፍተኛ ትምህርት የወጪ መጋራት ስርአት
BENEFICIARIES AGREEMENT FORM
የተጠቃሚ የውል ቅጽ

1. Full name (Including grand father's name):_____
ሙሉ ስም ከነአያት..... የመታወቂያ ቁጥር CIR/ /
2. Sex: Male ☐ Female ☐ Nationality ----------
ጾታ ወንድ ሴት ዜግነት ----------
3. Date of Birth Date ---------- month ---------- Year ----------
የትውልድ ዘመን ቀን ---------- ወር ---------- ዓ.ም ----------
4. Mother's/adopter's full name ---------- region ---------- zone ----------
የወላጅ/አሳዳጊ እናት ሙሉ ስም ---------- ክልል ---------- ዞን ----------
Woreda kebele city/town house No phone No P.o Box
ወረዳ ---------- ቀበሌ ---------- ከተማ ---------- ቤት ቁጥር ---------- ስ.ቁ ---------- የ.ሳ.ቁ----
5. School name (where you completed your preparatory program) ----------
የመሰናዶ ት/ት ያጠናቀቁበት ት/ቤት ስም ----------
Date completed Date ---------- month ---------- year ----------
ያጠናቀቁበት ዘመን ቀን ---------- ወር ---------- ዓ.ም ----------
Region ---------- zone ---------- woreda ---------- kebele ---------- city/town ----------
ክልል ---------- ዞን ---------- ወረዳ ---------- ከተማ ---------- ቀበሌ ----------
6. University –wolkite
7. ዩኒቨርሲቲ: ወልቂጤ
college: ---Computing and Informatics College
ኮሌጅ : ኮምፒዉቲንግ ና ኢንፎርማቲክስ ኮሌጅ
የጥበቡት ዓ.ም ----------
Department Year (circle one) I II III IV V
የትምህርት ክፍል ---------- የትምህርት ዓመት ----------
8 If you have withdrawn from the university indicate
ከዚህ የትምህርት ዓመት በፊት አቋርጠው ከነበር ----------
Date of with draw (Date ---------- month ---------- year---------- semester----------
ያቋረጡበት ዘመን ቀን ---------- ወር ---------- ዓ.ም ---------- ሴሚስተር ----------
9 What services would you demand?(please mark 'X')
የሚጠየቀው አገልግሎት /ኦ/ ምልክት ያድርጉ
A. In kind 1/ Food only ☐ Bedding only ☐ Food and Bedding ☐
በዓይነት /አገልግሎት የምገብ ብቻ የመኝታ ብቻ የምገብና የመኝታ
B. In cash 1/Food only ☐ 2/ Bedding only ☐ 3/ Food and Bedding ☐
በጥሬ ገንዘብ የምገብ ብቻ የመኝታ ብቻ የምገብና የመኝታ
10. Estimated cost to be borne by the beneficiary in the current academic year.
በመደበኛ የት/ት ዓመት ውስጥ ተጠቃሚው የሚሸፍንበት የወጭ ግምት
- 15% Tuition fee (Birr) ----1795---/ONE Thousand Seven Hundred Nighty Five Birr only/-------
15% የትምህርት ወጪ /ብር/ ----------
- Food expense (birr) ----------/
የምገብ ወጪ /ብር/ ------4500--(Four Thousand- Five Hundred Birr Only)
- Bedding Expense (birr) ----------/
የመኝታ ወጪ /ብር/ ----600.00Six Hundred Birr only----------
- Total /birr/-------6895----------/Six Thousand- Eight Hundred Nighty Five Birr Only/----------
በጠቅላላ /ብር/ ---6895 ----------

Figure 1.Student cost sharing form

2.5. Drawbacks of the Existing System

Due to the existing system work manually it has it is own drawback

- Those organization spent much more cost fore need martial (like, paper,pen…)

  This means economically infeasible

- Time consuming, when processing cost sharing
- Difficult to handle students cost sharing file
- Loss of vital document
- Make an error during calculating cost
- Difficult to generate report and extracting useful information

2.6. Business Rules of the Existing System

The organization has rules and regulations that should be performed when they give a service for the students. Those are:-

BR1: All enrolled students are eligible to enter into an agreement for cost sharing and future repayments.

BR2: Every student should fill cost sharing for his/her partial cost of education, dormitory, and meal services once per year.

BR3: When the students incoming from the other university, they expected to fill cost sharing form for total year stayed even one semester fill half annual cost sharing.

BR4: When students dismissed from the university by academic, discipline, other cases; he/she doesn't expected to fill cost sharing at that year.

BR5: Any beneficiary student who completes his education shall be given a document stating the amount owed in cost sharing.

BR6: Every graduate student should fill cost sharing for all years unless he/she can't get Temporary degree.

BR7: Every alumnus person to finish the payment he/she get the official transcript otherwise he/she can't get.

CHAPTER THREE

3 .Proposed System

By observing the overall problem of the manual system, we develop online cost sharing management system better than that of the existing system in different aspects. Online WKU cost sharing management system is basically designed to access easily different level of users. In this system, the actors are performing their regular duties in less time and easily. The proposed system uses the functionality of existing system to advance speed, performance, security and reliability of the system. Our proposed system will eliminate or improve the weaknesses of the existing system by providing online service.

A requirement is a feature that the system must have or a constraint that it must satisfy to be accepted by the cost sharing officer. It determines the needs of everyone who will be the user of the proposed system of our project such as students, registrar officer, Inland Revenue officers and cost sharing officers.

Generally the requirement of the new system can be viewed as:-

A. Functional requirement and
B. Nonfunctional requirement

3.1. Functional Requirements

- **Login**:-The system should allow all users to login.
- **Fill cost share student information** :- The system should allow for students to fill their cost share.
- **Update cost :-**The system should allow updating the beneficiaries cost share.
- **Register Actual cost :-** the university registrar should allow register the actual cost per each year.

- **Calculate Cost:**-Calculating the cost that spent for bedding, food and tuition with respective percentage.
- **Generate cost share:-**the system to calculate and then generate this and send to the user.
- **Manage notice:-**the system view and post notifies the user if new messages are entering into the system.
- **View cost share:-**the user to allow viewing the calculated cost.
- **Upload student information:-**the university registrar to uploaded total graduated student to inland revenue officer.
- **View student information:-**the user should allow viewing the all over student information and costs.
- **Manage feedback:-**the student and college registrar can be send and view the notification(message or comment).
- **Create accoun**t:-The administrator can Create Account for All users
- **Update account**:-The administrator can update Account for All user
- **Disable account:**-The administrator can dis active Account for All user.
- **Enable account**:-The administrator can activate Account for All user.
- **Logout:** All user logout from the system after accomplish their task.

3.2. Non-functional Requirements

Non-functional requirements describe how the system works, while functional requirements describe what the system should do. They specify criteria that judge the operation of system qualities to capture the required properties of the system.
Then the team is going to develop its own non-functional requirements, such as:-

- **Security:** Security is major problem now a day. People's knowledge and ability to bypass security measures is also one constraint to build more secured systems. Besides the usual authorization and authentication (deals with identifying a user and what a user is allowed to do respectively) such as username and passwords. The new cost sharing management system considers these security risks.
- **Performance:** The response time that the system uses to process, query and retrieve cost sharing data and information from database is very short. That

means it takes short response time for a given piece of work. The designed system will use low utilization of system resource in terms of space and time. Many tasks can be performed on the same time that in turns provide time and cost effective services.

- **Usability:** The online cost sharing management system is simple to understand, easy to use and user friendly because it making questioners in native language.
- **Efficiency:** Accommodating vast amount of information on a computer and processes cost sharing management system in fraction of seconds.
- **Modification/ maintainability:** Through time there should be changes in when the user needs another additional functionalities and new features, when the cost share administrator identifies the system need to be modified, while the cost share system work style is changed and depending on different reasons. This can be easily done because the whole system development tasks divided into several smaller work parts. Since the system was modularized not the whole system should be maintained rather only the specific modules that need modification will be modified and maintained. Some of the user interface and basic modification can be performed by the collection of developers but the system developers are the right persons to update the system.
- **Graphical user interface:** The system we are going to develop will have a user friendly graphical user interface (GUI) which allows users to interact with the system easily. The user is expected to have knowledge of using device and also navigating through this device interfaces.
- **Error handling: -** When a user interacts with the system errors may occur. To control this kind of inaccuracies system will generate different user friendly messages. To do this, most of the system execution buttons will be controlled according to the sequence which the user is expected to follow, or this can be done by generating different system responses to the input of the user.

3.2.1. User Interface and Human Factors

In order to make high level proposed system more attractive, user friendly and also easy to use we use different front end technologies like JavaScript, CSS, HTML and Bootstrap. Due to this we can minimize the training cost.

3.2.2. Hardware Consideration

Because of this system is design and implement by PHP server-side scripting Language that support platform independent, the proposed system is compatible for any hardware; it can run on any platform.

3.2.3. Security Issues

This proposed system provides a high level of security by authenticate authorized user and encrypt the user's username and password through encryption to prevent the readability of username and password in the database. The system also provides restriction in using system functionality and information access by its user.

3.2.4. Performance Consideration

This system developed by using PHP server side scripting language which can increase a system performance and also MySQL query optimization using indexes the query response time is very fast.

3.2.5. Error Handling and Validation

When the users of the system interact with the system error may appear. To control these inaccuracies, the system makes validation and display different messages to the user. The system also handle exceptions like input mismatch exception such as interchanging numeric and characters, username and password mismatch by displaying alerts.

3.2.6. Quality Issues

In terms of reliability system shall provide reliable and accurate information which help in increasing efficiency of the process and for ease of management decision. There could be multiple parameters to meet for achieving reliability which depends on server infrastructure, database implementation tool. In terms of availability this system able to be accessed by its end users and behaves as expected when it is accessed. In terms robustness this system has an ability of tolerating error that may affect the system functionality.

3.2.7. Backup and Recovery

To reduce data loss and other risk there we use a frequent and full back up mechanism to avoid any information loss using copy of the system to restore when hardware and software failure is occur. In addition to this we use different storage devices like Hard Disk, CD, and DVD to duplicate the data.

3.2.8. Physical Environment

This web-based cost sharing management system deployed to Wolkite University.

3.2.9. Resource Issues

As our system is a web-based application it should use less resource.

3.2.10. Documentation

The proposed system provides required full documentation, help contents and tips to allow further maintainability and to support and guide user how to use the system. The system documentation will provide information about how to use it and all the essential information about the system.

CHAPTER FOUR

4. System Analysis

4.1. System Model

A system model is composed of a use case diagram and accompanying documentation describing the use cases, actors and associations. It helps to analysts to understand the functionality of the system and models are used to communicate with the customer.

4.1.1. Use Case Model

The Use Case Model describes the proposed functionality of the new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system. Use Cases are typically related to 'actors'. An actor is a human or machine entity that interacts with the system to perform meaningful work.

There are four actors in the current proposed system those are:-

- Student
- college registrar
- university registrar
- Inland revenue officer

4.1.1.1. Use Case Diagram

Use case diagram is one of the unified modeling language which represents user's interaction with the system and depicting the specifications of a use case. The purposes of use case diagrams can be as follows:-

- Used to gather requirements of a system
- Used to get an outside view of a system
- Identify external and internal factors influencing the system

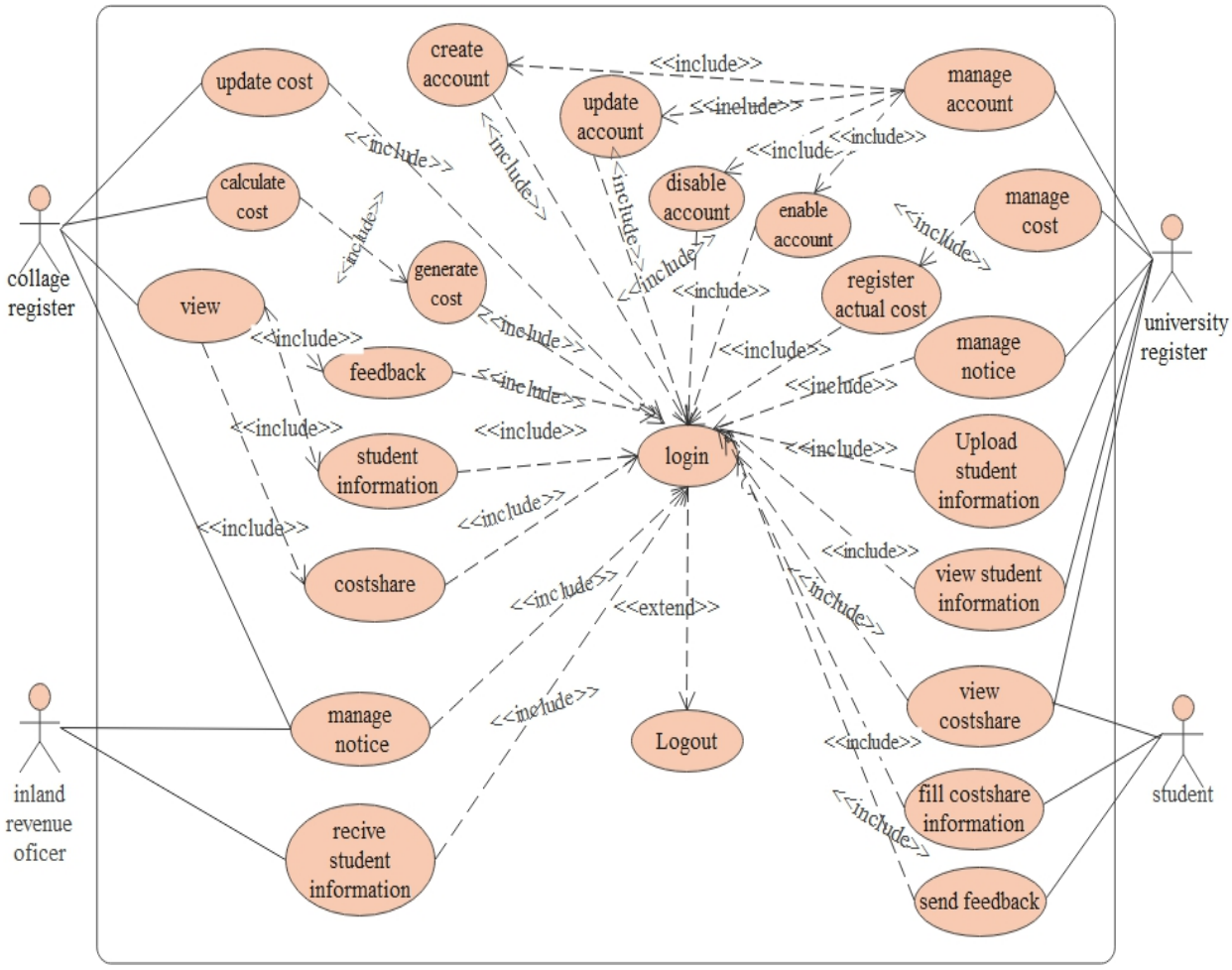


Figure 2.use case diagram

4.1.1.2. Use Case Description

ID: Give an identification number that enables you to make the use case traceable.

Name: The name that you have used in the use case model.

Actor: who interacts with the system either internally or externally?

Pre-condition: what is the expected situation before the use case can be started.

Main scenario (Basic flow of event): which use case performs when it is started?

Alternative scenario (alternative course of action): it is optional but it is the activity done when basic course of actions failed.

Post-condition: what is expected?

Table 1:Use Case Description for Login

Name	Login	
Use case id	UC01	
Brief description	When the user enter user name, password and select user type, it checks the input from database, if it is valid the user can access, if not it displays error message.	
Actors	college registrar, student and university registrar and inland revenue officer	
Pre condition	User must be authorized user who has username and password	
Post condition	The user is authenticated and the system displays all features available for the role for the user is associated.	
Basic flow of events	User action	System response
	1. The student, college registrar, and university registrar and inland revenue officer are want to login to the system. 3. The college registrar, student, and university registrar and inland revenue officer Enter user name ,password and select user type then request to login	2. The system display login form 4. The system verifies that all the filled have been filled out and valid. 5. The system successfully logged in. 6. Use case ends.
Alternate Flow of events		
Title	Description	

A. the user fill invalid data	1. The system display message “invalid username or password or user type” 2. The system prompts the user to reenter the valid information 3. Use case continues with step 2

Table 2. Use case Description for Create Account

Name	Create account	
Use case id	UC02	
Brief description	the university registrar create account for users	
Actor(s)	university registrar	
Pre condition	they must be authorized	
Post condition	Create account for users	
Basic flow of events	User action	System response
	1. The university registrar request to create account 3. The university registrar fill information that included id, full name, sex, phone, user name and select user type 4.the university registrar request to create	2. The system display create account Form 5. The system display message “account created successfully” 6. use case ends
Alternate flow of events		
Title	Description	
A. The university registrar inserts invalid user account information	1. The system display message “account not successfully created” 2. The system prompts the user to reenter the valid information 3. Use case continues with step 2	

Table 3.Use case Description for Update Account

<table>
<tr><td>Name</td><td colspan="2">Update account</td></tr>
<tr><td>Use case id</td><td colspan="2">UC03</td></tr>
<tr><td>Brief description</td><td colspan="2">The university registrar update their account created before because of security</td></tr>
<tr><td>Actor(s)</td><td colspan="2">University registrar</td></tr>
<tr><td>Pre condition</td><td colspan="2">They must be authenticated</td></tr>
<tr><td>Post condition</td><td colspan="2">The authenticated users able to update their account</td></tr>
<tr><td rowspan="2">Basic flow of events</td><td>User actions</td><td>System response</td></tr>
<tr><td>1.the university registrar with the system to update account
3.the university registrar entered the required information that include
3.1 user name
3.2 old password
3.3 new password
3.4 confirm new password
4. the user request to update</td><td>2.the system display the form
5. the system validate the entered data
6. the system display message ”successfully updated”
7.use case ends</td></tr>
<tr><td colspan="3">Alternate flow of event</td></tr>
<tr><td colspan="2">Title</td><td>description</td></tr>
<tr><td colspan="2">A. Enter invalid data entry</td><td>1. The system describes which entered data was invalid
2. Re-enter the valid data
3. Go to step 2</td></tr>
</table>

Table 4. Use case Description for View Account

Name	Disable account	
Use case id	UC04	
Brief description	User may graduate or stop because of some problems so user account will be disable.	
Actor(s)	university registrar	
Pre condition	The account should be created	
Post condition	the account is enable or disable	
Basic flow of events		
Include:- Disable account Enable account	User action	System response
	1.the university registrar want to enable or disable user account 3.The university registrar search any user account he/she wants using id 5.User request to enable or disable the searched account	2.the system display the form 4.the system validate the existence of the account and display searched account 6. the system display message 7. use case ends
Alternate flow of events		
Title	Description	
A. the university registrar enter invalid data	1. system display error message 2. the system prompts to re-enter field 3. use case continues with step 2	

Table 5.Use case Description for Fill Cost Sharing Information

Use case Name	Fill cost Sharing	
Use case id	UC05	
Brief description	The students fill cost sharing information based on cost sharing information principles	
Actor(s)	Student	
Pre condition	student wants to fill cost share agreement form	
Post condition	Store the Information into database	
Basic flow of events	User actions	System response
	1.Students want to fill cost sharing information 3. Student fills all necessary information 4. choose photo if any 5. student press submit button after filling the form	2. the system displays the form 6. The system make sure all inputs are filled (check the input is valid or not) 7. The system saves the input data 8. The system display" fill successfully" message 9. Use case ends
Alternate flow of events		
Title	Description	
A. Enter invalid data entry	1. The system display the entry data is invalid 2. Go to step 2 3. Use case ends	

Table 6.Use case Description for Register Actual Cost

Name	Register Actual Cost	
Use case id	UC06	
Brief description	the university registrar register the cost of food, dormitory, education base on the year and department	
Actor(s)	University registrar	
Pre condition	the university registrar must login successfully	
Post condition	The cost data has been registered	
Basic flow of events	User action	System response
	1.The university registrar want to register cost 3. the university registrar fills all necessary information to the form such as:- 3.1. Select department 3.2. Select year Enter price for:- 3.3. Education 3.4. Food 3.5. Dormitory 4.the university registrar request to submit	2.The system displays register form 5. the system validate the entered data and then display ”successfully registered” message 6.Use case ends
Alternate flow of event		
Title	Description	
A. Enter invalid data	1. System display error message 2. Use case continues with step 2	

Table 7.Use case Description for Update Cost

<table>
<tr><td>Name</td><td colspan="2">Update Cost</td></tr>
<tr><td>Use case id</td><td colspan="2">UC07</td></tr>
<tr><td>Brief description</td><td colspan="2">It allows the college registrar to update the cost</td></tr>
<tr><td>Actor(s)</td><td colspan="2">college registrar</td></tr>
<tr><td>Pre condition</td><td colspan="2">the college registrar must login successfully</td></tr>
<tr><td>Post condition</td><td colspan="2">The cost of food, education, dormitory data has been updated</td></tr>
<tr><td rowspan="2">Basic flow of events</td><td>User action</td><td>System response</td></tr>
<tr><td>1.The college registrar want to update cost
3. the college registrar fills all necessary information to the form such as:-
3.1. Select department
3.2. Select year
Enter price for:-
1.3. Education
1.4. Food
1.5. Dormitory
4.the user request to update</td><td>2.The system displays update form
5. the system validate the entered data and then display ”successfully updated” message
6.Use case ends</td></tr>
<tr><td colspan="3">Alternate flow of event</td></tr>
<tr><td colspan="2">Title</td><td>Description</td></tr>
<tr><td colspan="2">A. Enter invalid data</td><td>1. System display error message
2. Use case continues with step2</td></tr>
</table>

Table 8.Use case Description for Send Feedback

Name	Send Feedback	
Use case id	UC09	
Brief description	Describing about strength and weakness of the system	
Actor(s)	Student	
Pre condition	The student successfully login	
Post condition	Give comment	
Basic flow of events	User action	System response
	1. the Student request to comment 3. the student write comment and then request to submit	2. The system display the form 4. The system save comments 5. The system display "successfully sent" message 6. The use case ends
Alternate flow of events		
Title	Description	
A. if the text area is empty	1. The system display "please write comment" message 2. Go-to step 2	

Table 9.Use case Description for View Feedback

Name	View Feedback	
Use case id	UC10	
Brief description	the college registrar can view the feedback sent by students	
Actor(s)	college registrar	
Pre condition	The feedback requested from the student	
Post condition	To view the feedback	
Basic flow of events	User actions	System response
	1.The college registrar want to view the feedback 3.The college registrar view feedback and then give response	2.The system displays the requested feedback 4.Use case ends

Table 10.Use case Description for Manage Notice

Name	Manage Notice	
Use case id	UC11	
Brief description	The college registrar, university registrar and inland revenue officer can be view and post notice	
Actor(s)	college registrar	
Pre condition	They are successfully login	
Post condition	view and post notice they required	
Basic flow of events for post notice	User action	System response
	1. college registrar,university registrar and inland revenue officer want to post notice 3. college registrar,university registrar and inland revenue officer enter the required data such as:- 3.1. Notice number 3.2. body 4.The college registrar,university registrar and inland revenue officer request to post	2.the system displays notice form 5.the system display "successfully sent message" 6.use case ends
Alternate flow of events	If the user entered invalid data then The system describes which entered data was invalid and Re-enter the valid data and go to step 2	
Basic flow of events for view notice	User action	System response
	1.The college registrar,university registrar and inland revenue officer request to view notice 3. The registrar officer and student views the posted notice	2.the system display the posted notice 4. Use case ends.
Alternate flow of events	If no information found the system will display the warning message like" no information are posted"	

Table 11.Use case Description for View Student List

Name	View Student List	
Use case id	UC15	
Brief description	The university registrar and college registrar view student list upload by registrar	
Actor(s)	university registrar, college registrar	
Per condition	They must be login successfully	
Post condition	To view students	
Basic flow of events	User action	System
	1.the users with the system to view student list 3. the users select department or batch 4. the user request to view	2.the system display the form 5.the system validate the entered data display student information 6.use case ends

Table 12.Use case Description for generate Cost Share

Name	generate cost share	
Use case id	UC16	
Brief description	It is allow college registrar generate cost share	
Actor(s)	college registrar	
Pre condition	They must be successfully login	
Post condition	generate the filled cost share	
Basic flow of events	User action	System response
	1.The college registrar want to generate the cost share of student's 3. The college registrar enter student id and select year then press search 5. The college registrar request to generate	2.The system display the form 4.the system validate the entered data and display the selected student information 6. The system generate the files 7. use case ends
Alternate flow of events		
Title	Description	
A. If the college registrar enter invalid id or year	1. the system display "the student not register "or "the student not fill cost share at this year" message 2. the system allow to re-enter 3. go to step 2	

Table 13.Use case Description for View Student Cost Share

Name	View cost share	
Use case id	UC17	
Brief description	The cost share must be filled by students	
Actor(s)	university registrar ,student, college registrar	
Pre condition	The cost share must be filled by student	
Post condition	View student cost share	
Basic flow of events	User action	System response
	1.The user want to see student cost share 3.The user enter the required data include:- 2.1 id 2.2 year 4.the user request to search	2.The system display the form 5.the system validate the entered data and display the student cost share status 6.use case ends
Alternate flow of events	If the user entered invalid data then The system display error message and allow to Re-enter the valid data and then go to step 2	

4.1.1.3. Use case scenario

The following describes scenario of how the user use the systems to perform operations.

Scenario name: login

Participant actor: All users

1. The user click a login link
2. The system displays the login form
3. The user inputs his/her username, password and role
4. The user click login Button
5. The system validate the input
6. The user login to the system and display the user page

Extension

Incorrect username and password

Resume at step 5 of basic flow

Scenario name: fill cost share

Actor: student

1. The user click fills cost sharing link
2. The system displays the form
3. The user fill the cost sharing
4. The user click submit button
5. The system validate the input
6. The user fill the cost sharing successfully and the input data store in database

   Extension

   Invalid cost sharing information

   Resume at step 5 of basic flow

Scenario name: update cost share

Actor: college registrar

1. The user click update cost sharing link
2. The system displays the form
3. The user fill the request information
4. The user click search button
5. The system validate the input
6. The system displays the searched form
7. The user fill the update information(cost sharing)
8. The user click update button
9. The system display success full information and the input data store in database

   Extension

   Invalid cost sharing (request) information

   Resume at step 5 of basic flow

4.2. Object Model

The object model visualizes the elements in a software application in terms of objects. An object is a real-world element in an object-oriented environment that may have a physical or conceptual existence. Each object has identity that distinguishes it from other objects in the system, state that determines the properties of objects as well as the values of the properties that the object holds, behavior that represents externally visible activities performed by an object in terms of changes in its state.

4.2.1 Class Diagram

The class diagram is the main building block of object-oriented modeling. It is used for general conceptual modeling of the structure of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. The classes in a class diagram represent both the main elements, interactions in the application, and the classes to be programmed.

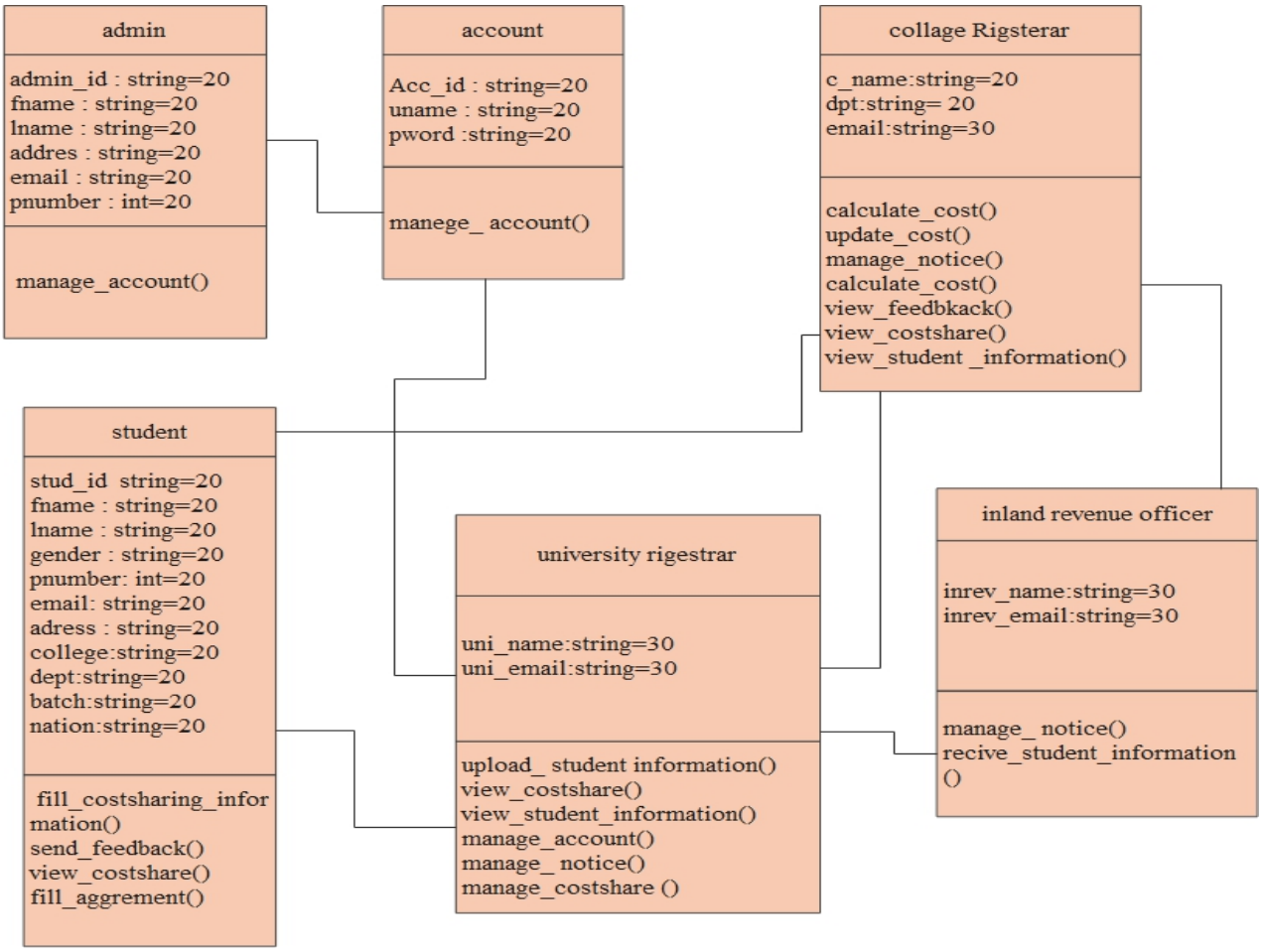


Figure 3.class diagram for CSMS

4.2.2. class diagram description

Table 14.Data Dictionary for Admin

Entity	Attribute	Description	Data type	Data size	Constraint
Admin	Admin-id	Identification number of Admin	Varchar	20	Primary key
	F name	First name of Admin	Varchar	20	Not Null
	L name	Admin last Name	Varchar	20	Not Null
	Address	Admin address	Varchar	20	Not Null
	Email	Admin email	Varchar	20	Not Null
	PNumber	Admin phonenumber	int	20	Unique

Table 15.Data Dictionary for Account

Entity	Attribute	Description	Data type	Data size	constraint
Account	Acc_id	Identification number of account	Varchar	10	Primary key
	Uname	Username of account holder	Varchar	20	Not Null
	pword	Password of account	Varchar	20	Unique

Table 16.Data Dictionary for University of registrar

Entity Name	Attribute	Description	Data type	Data Size	Constraint
University_registrar	Uni-name	Name of the university	Varchar	20	Not NULL
	Uni_Email	Representative Email	Varchar	20	Not NULL

Table 17.Data Dictionary for Inland revenue officer

Entity Name	Attribute	Description	Data type	Data Size	Constraint
Inland revenue officer	Inrev_name	Name of the Inland revenue officer	Varchar	20	Not NULL
	Inrev_Email	Inland revenue officer Email	Varchar	20	Not NULL

Table 18.Data Dictionary for Student

Entity	Attribute	Description	Data type	Data Size	Constraint
Student	Stuid	Identification of students	Varchar	10	Primary key
	Fname	First name of the student	Varchar	20	Not null
	Lname	The student last name	Varchar	20	Not null
	Gender	The gender of student	Varchar	5	Not null
	nation	nationality of student	Varchar	20	Not Null
	College	College of student	Varchar	20	Not Null

	Department	Department of student	Varchar	20	Not Null
	Email	Email of student	varchar	20	Not Null
	PNumber	phonenumber of student	int	10	Not Null
	Address	Address of student	varchar	20	Not Null
	batch	Batch of student	varchar	20	Not Null

Table 19.Data Dictionary for collage of registrar

Entity	**Attribute**	**Description**	**Data Type**	**Data Size**	**Constraint**
College of register	C_name	Name of collage	Varchar	20	Not Null
	dpt	Name of department	Varchar	20	Not Null
	email	representative	Varchar	20	Not Null

4.3. Dynamic model

4.3.1. Sequence Diagram

A Sequence diagram is an interaction diagram that shows how objects operate with one another and in what order. A sequence diagram shows object interactions arranged in time sequence. Sequence diagrams are sometimes called event diagrams or event scenarios.

- Represent the details of a UML use case
- Model the logic of a sophisticated procedure, function, or operation
- See how tasks are moved between objects or components of a process
- Plan and understand the detailed functionality of an existing or future scenario

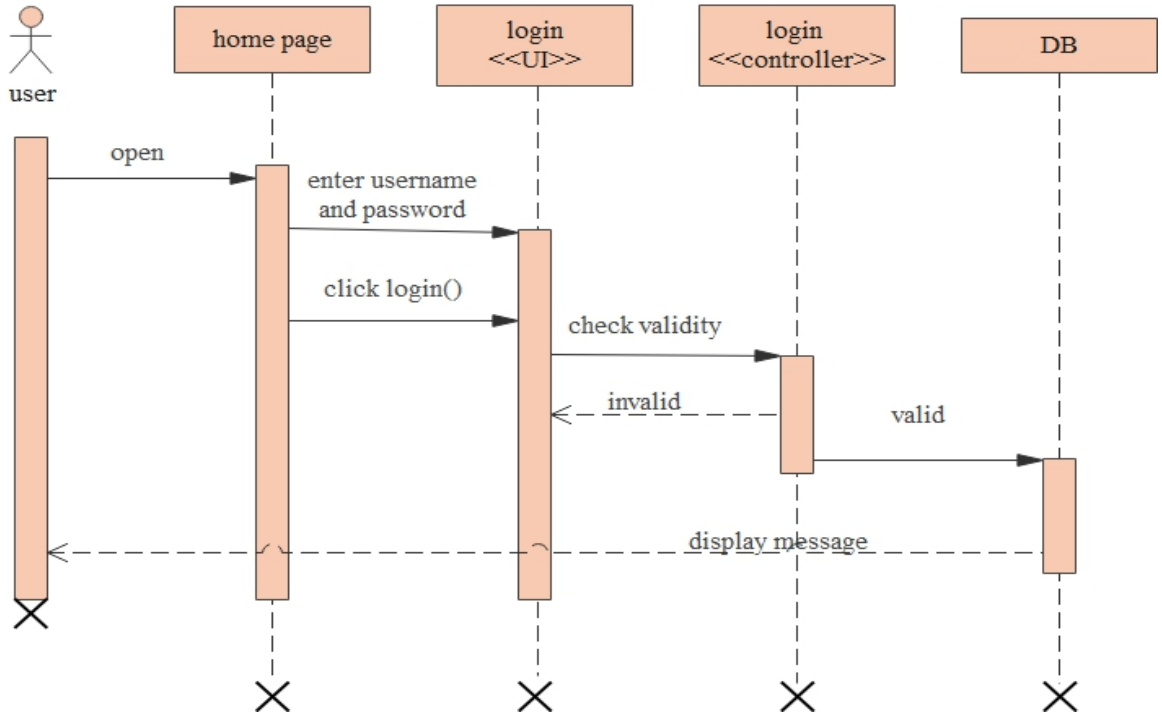


Figure 4.Sequence diagram for login form

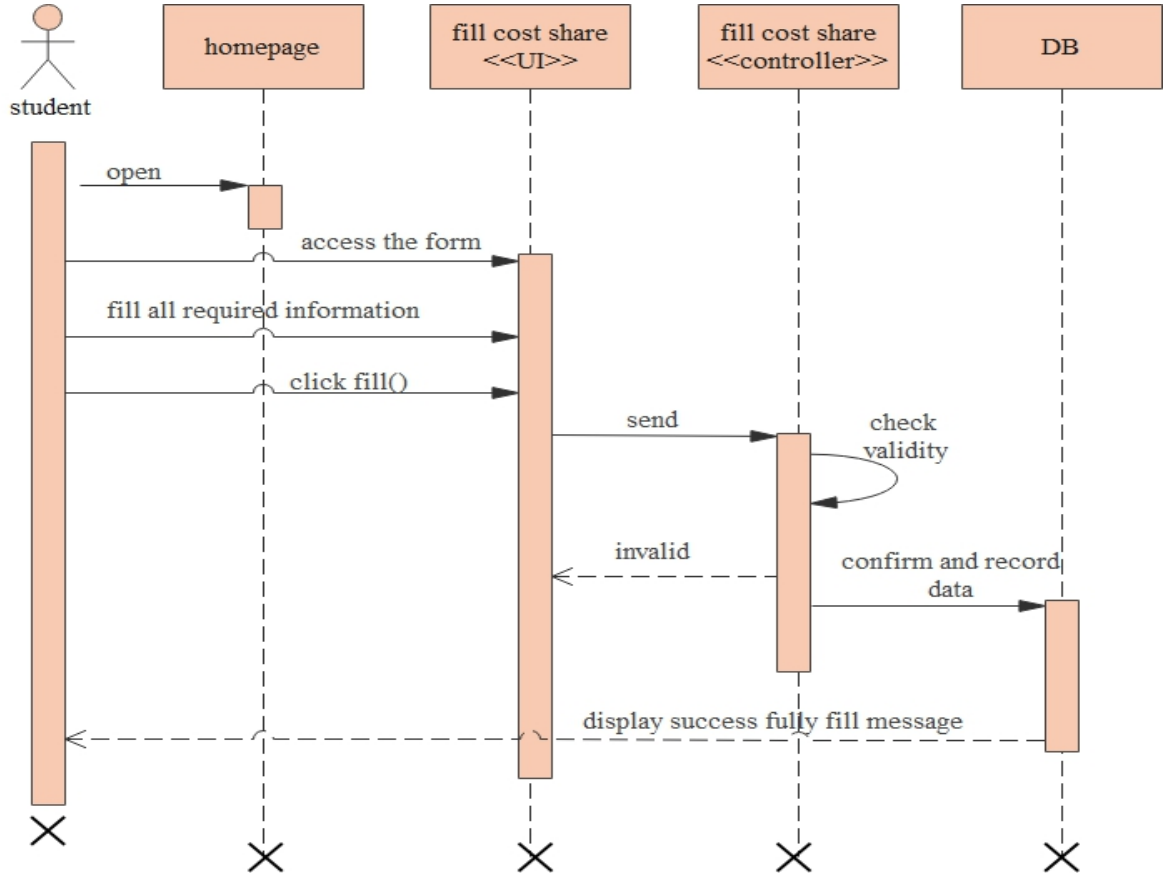


Figure 5.Sequence diagram for student fill cost sharing information

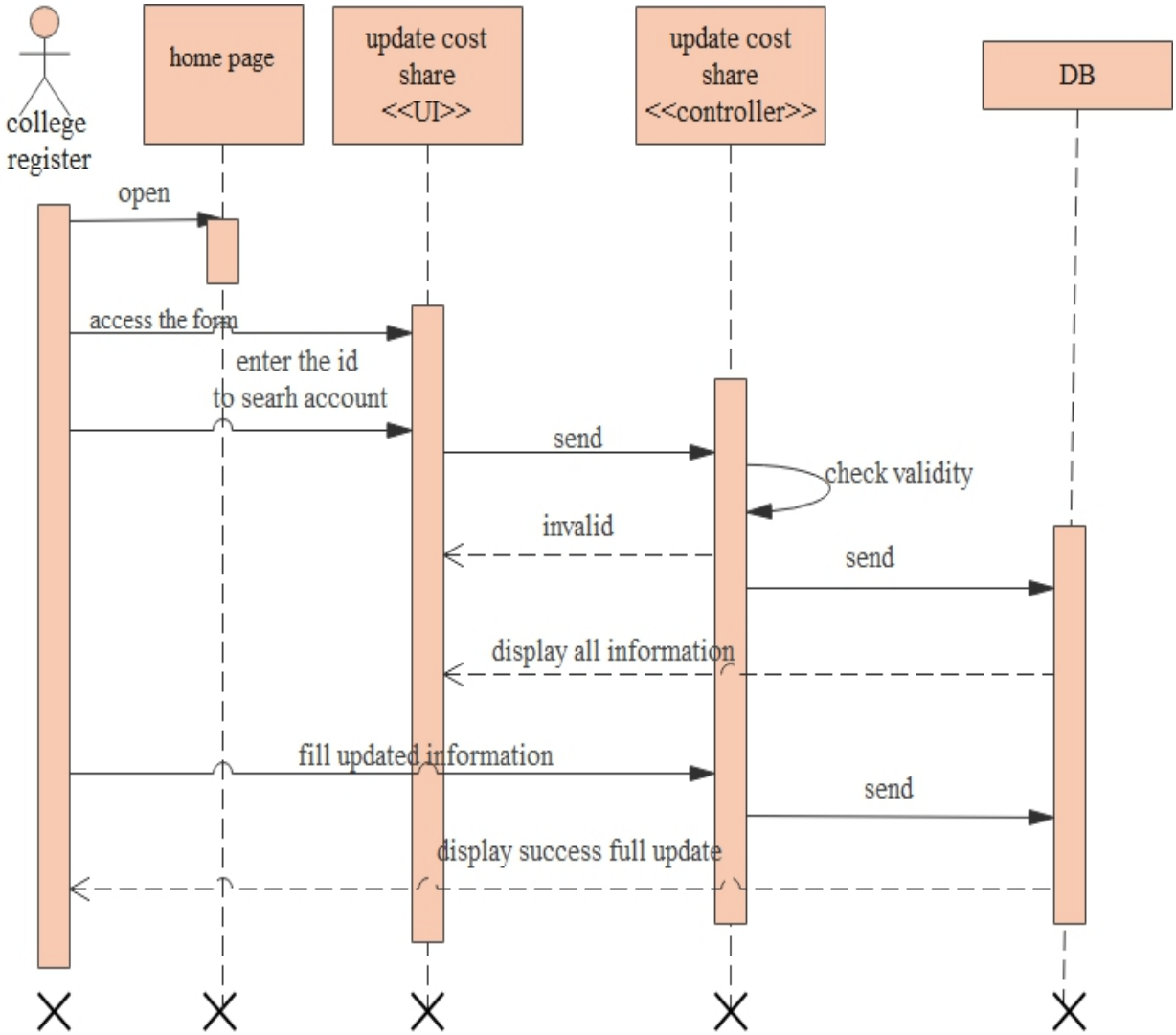


Figure 6.Sequence diagram for update cost share status

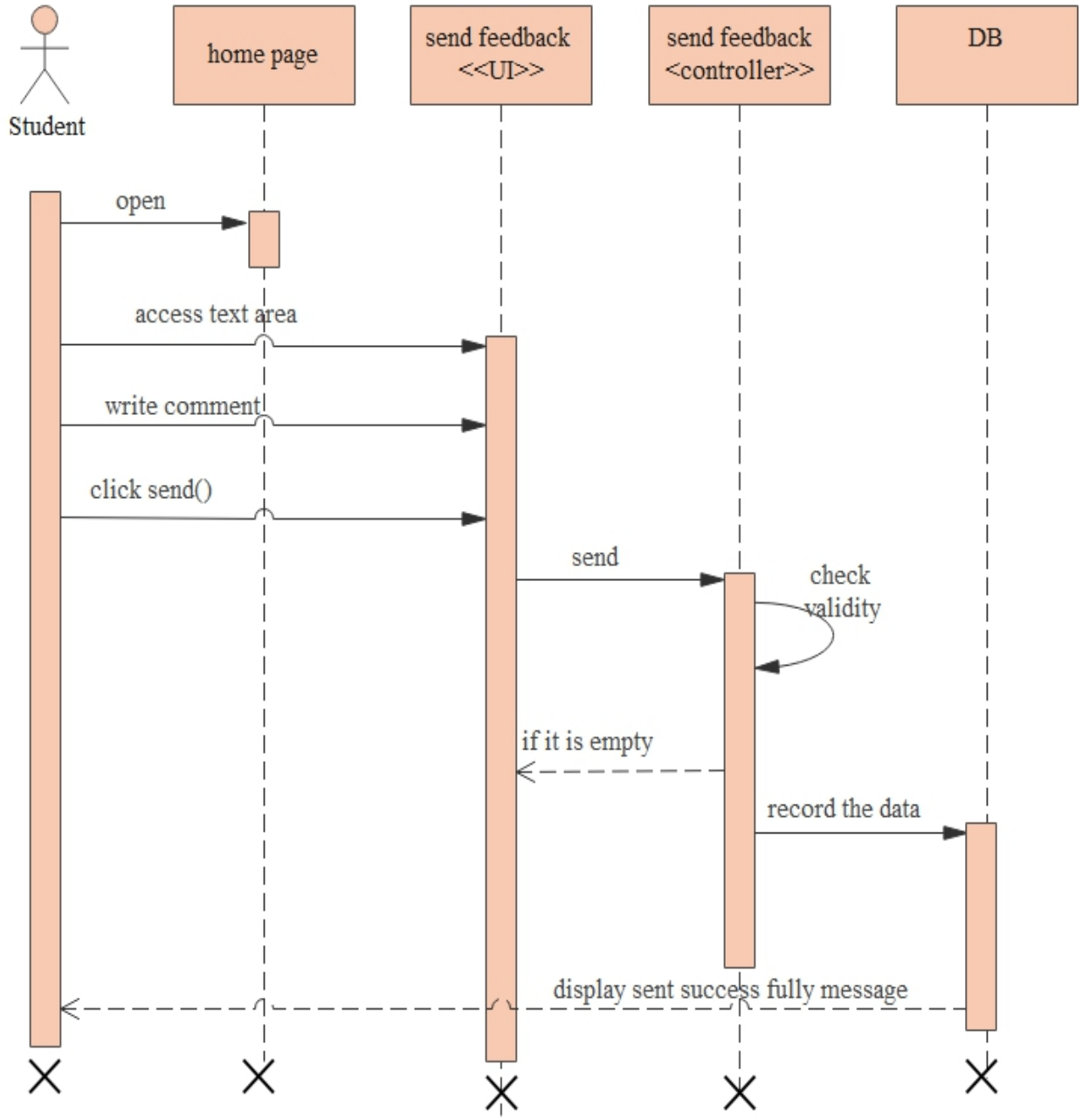


Figure 7.Sequence diagram for send feedback

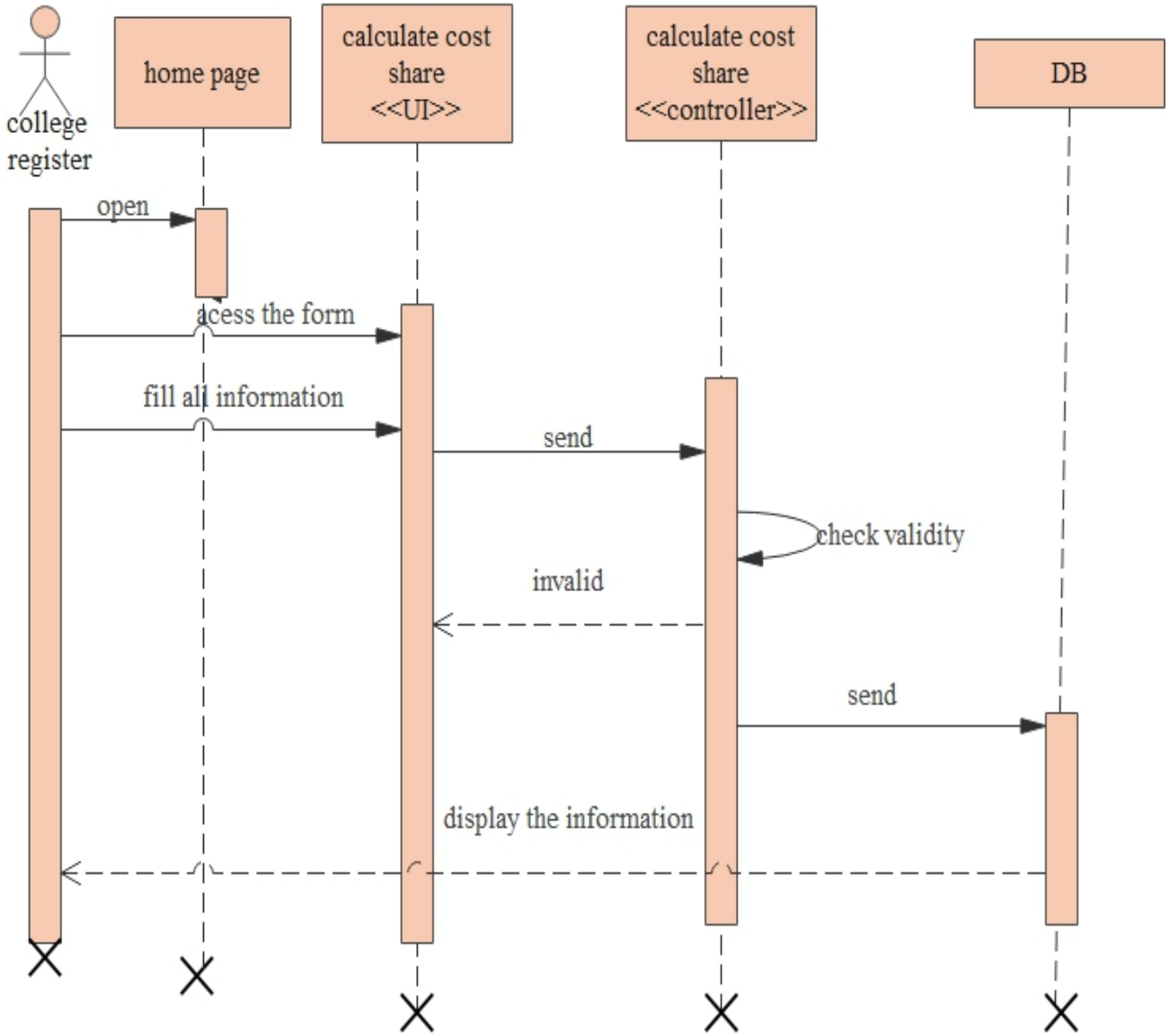


Figure 8.Sequence diagram for calculate cost

4.3.2. Activity Diagram

Activity diagram represent work flows in a graphical way. Activity diagram is basically a flow chart to represent the flow form one activity to another activity. Activity diagram is diagram in UML used to describe dynamic aspects of the system. The purposes of activity diagram can be described as:

- Demonstrate the logic of an algorithm
- Illustrate a business process or work flow between users and the system
- Simplify and improve any process by clarifying complicated use cases

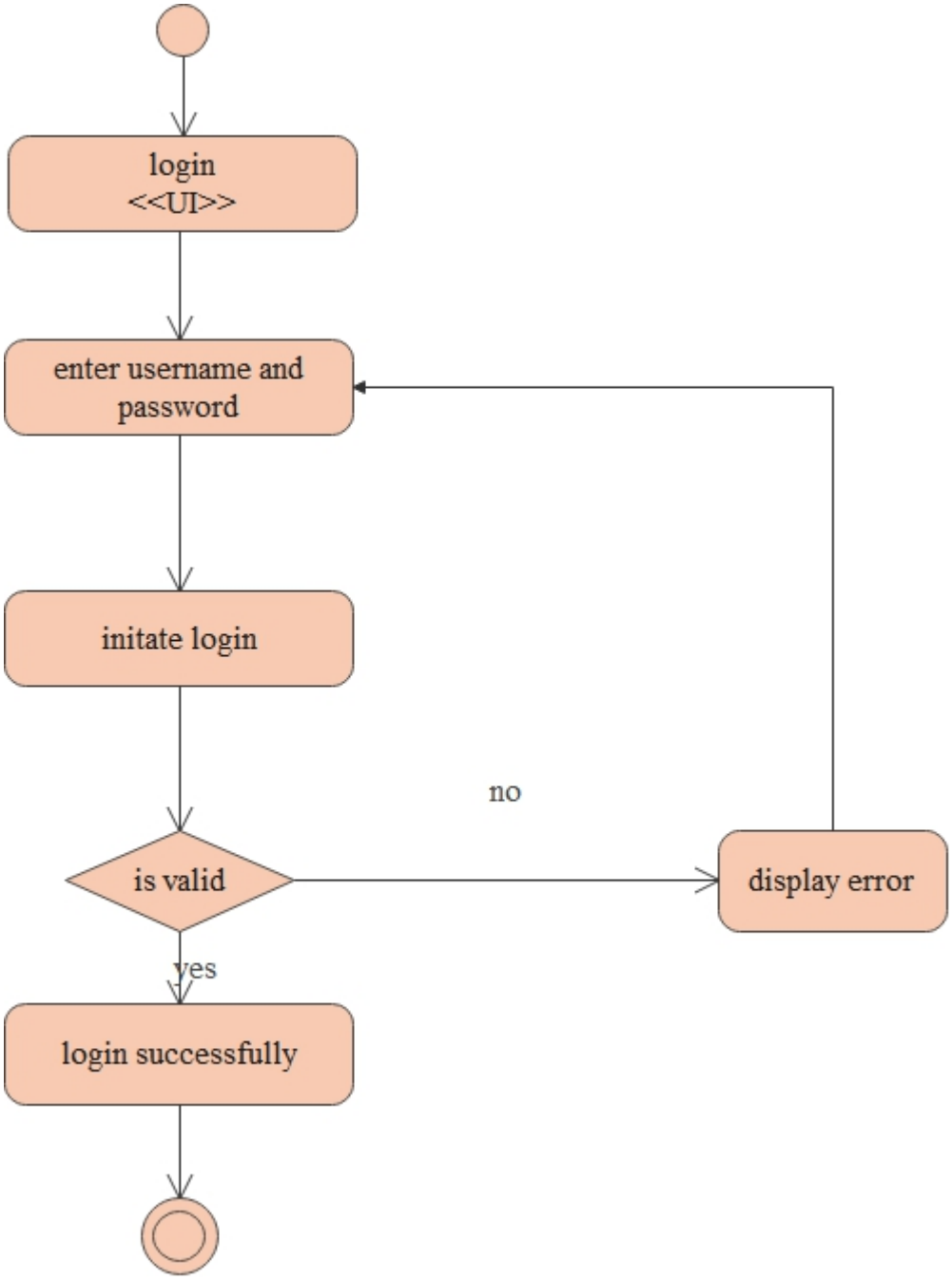


Figure 9.Activity diagram for login

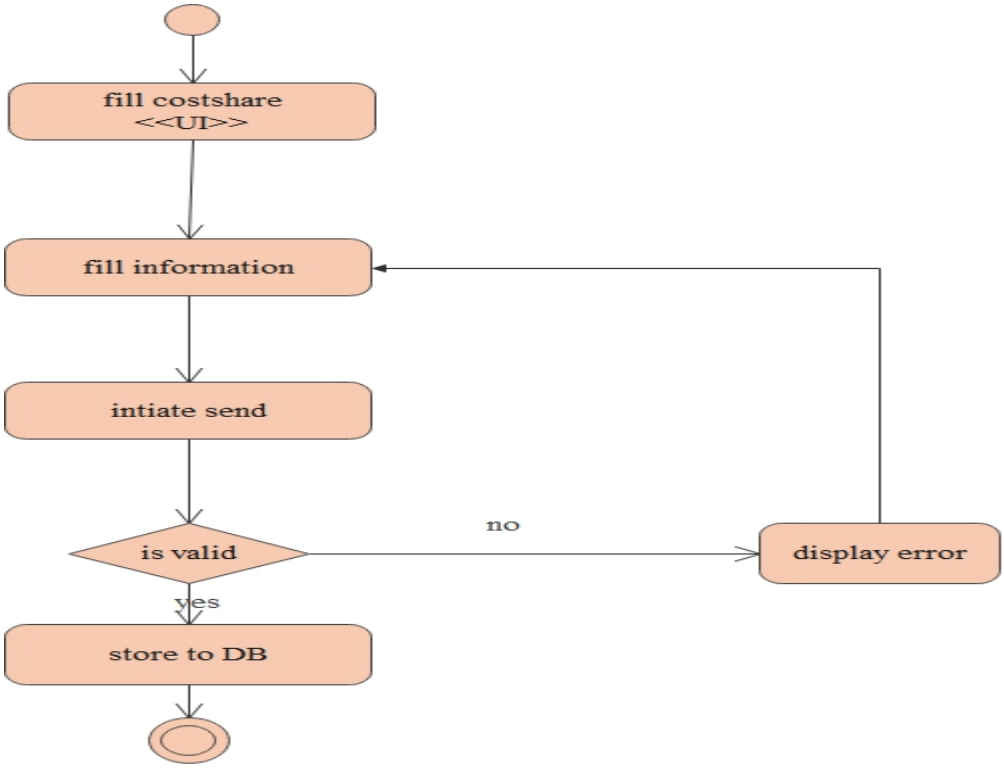


Figure 10.Activity diagram for fill cost share information

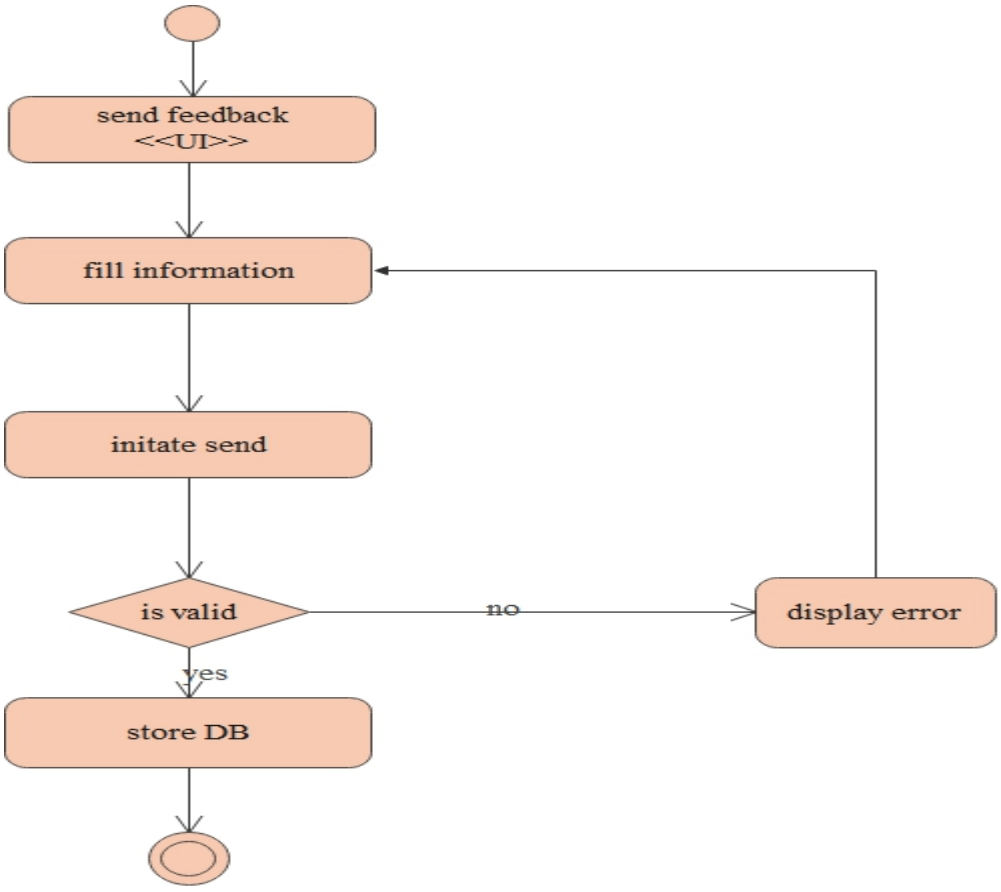


Figure 11.Activity diagram for send feedback

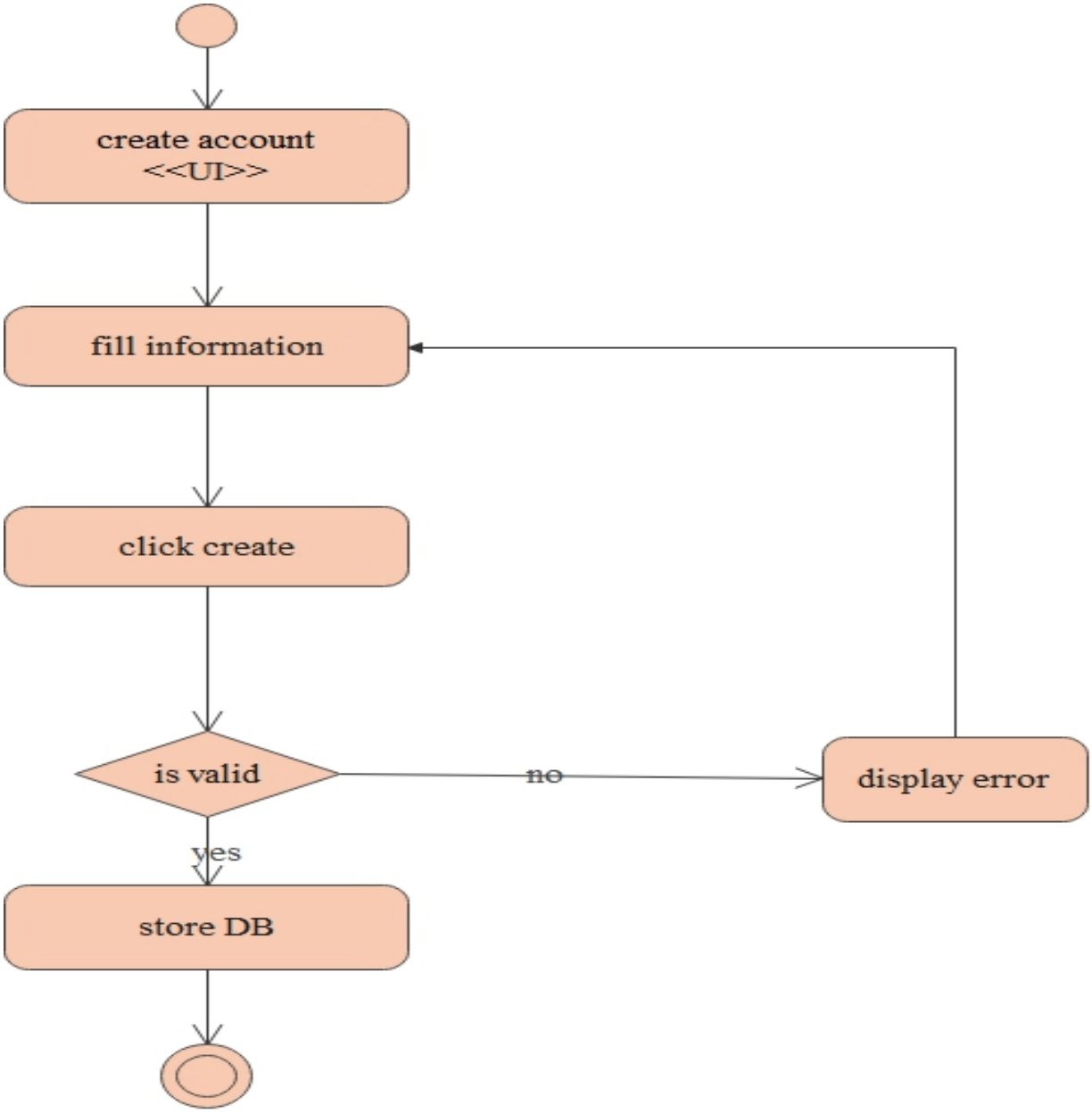


Figure 12.Activity diagram for create Account

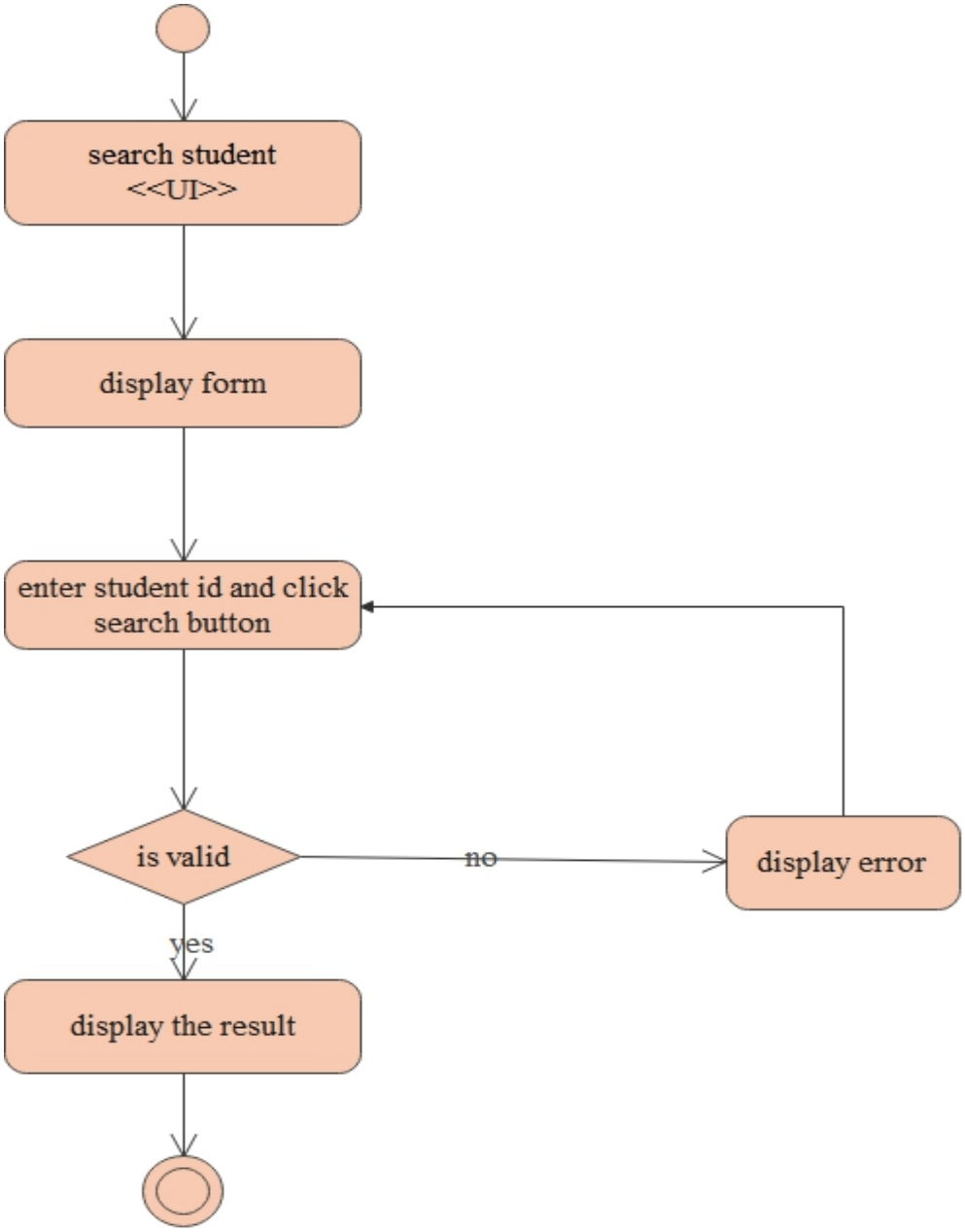


Figure 13.Activity diagram for search result

4.3.3. State Chart Diagram

State chart diagram describes the flow of control from one state to another state. States are defined as a condition in which an object exists and it changes when some event is triggered. The most important purpose of State chart diagram is to model lifetime of an object from creation to termination.

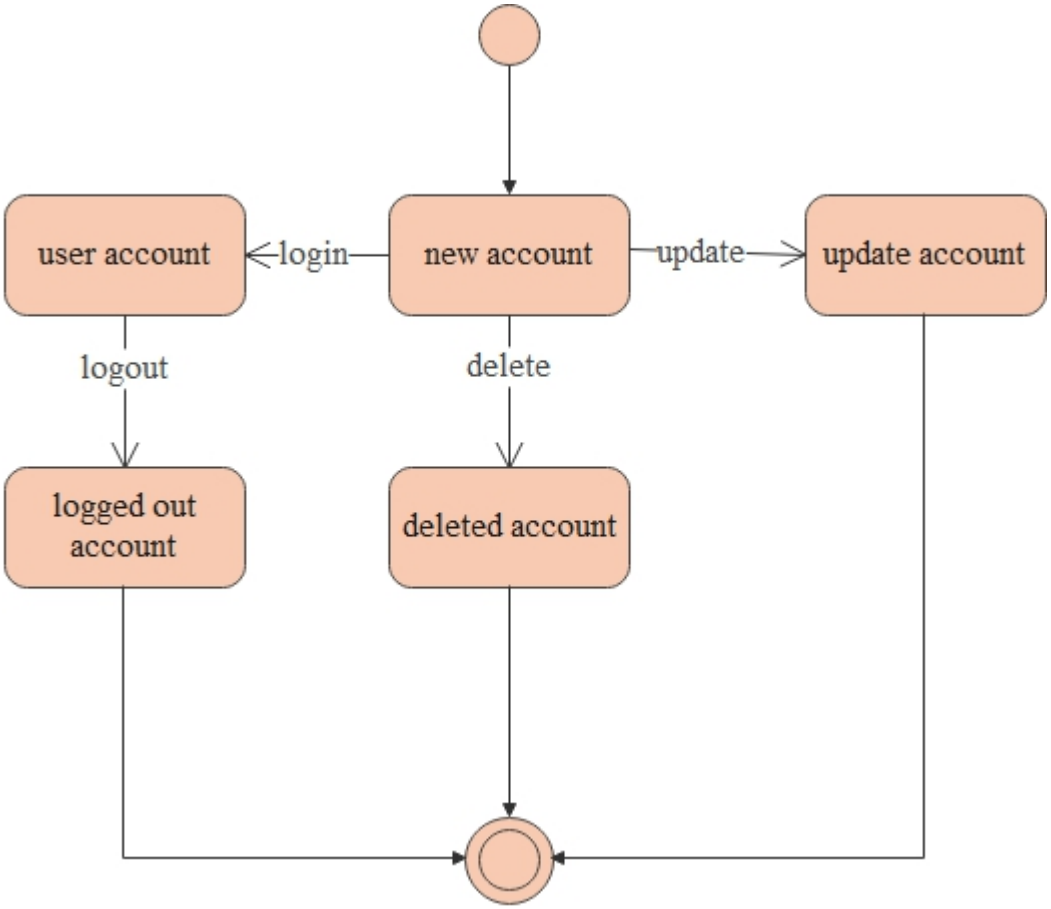


Figure 14.State chart diagram for Manage Account

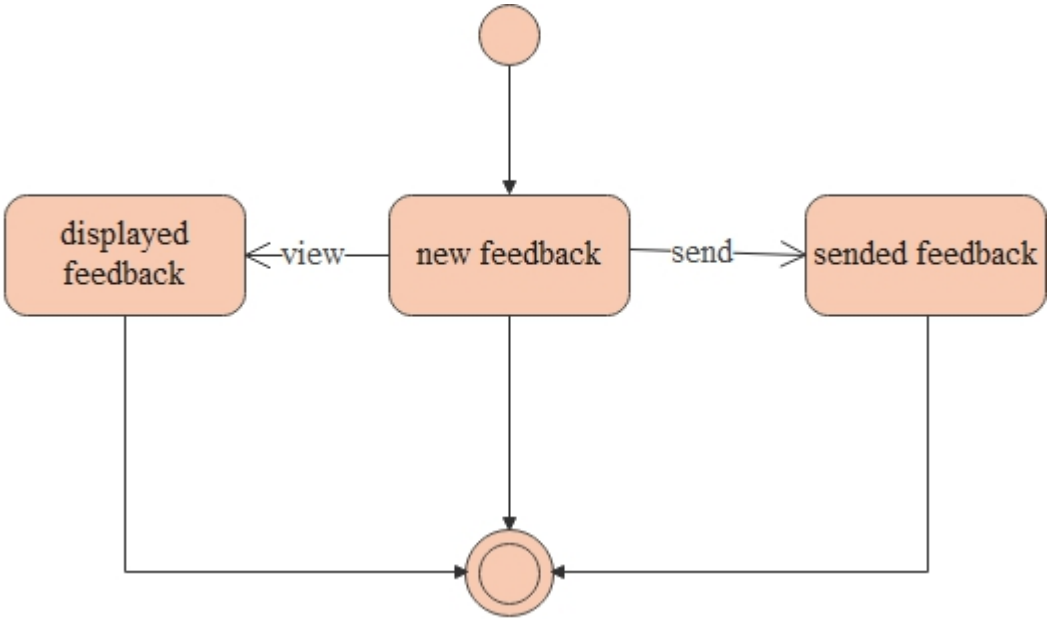


Figure 15.State chart diagram for Manage Feedback

CHAPTE FIVE

5. System Design

5.1. Design Goal

Design goal primarily emerged from nonfunctional requirement of the system and the objectives of the design goal are to model a system with high quality that should achieved, and addressed during the design of the system. The designer creates the nature of the design and it is more important for the programmer to implement a high quality and error free system.

5.1.1. Performance

The system should meet the following performance criteria's; Response time: The speed imposed on the system. The system should responsive maximum number of tasks with minimum times; Throughput: number of tasks accomplished in a fixed period of times; Memory: memory space available for speed optimizations should use efficiently. These performance issues should have to be meeting in our system.

5.1.2. Dependability

The cost sharing management system should achieve the following dependability characteristics in order to resist crash and be available and reliable.

Robustness: Since the system is a web based system that mainly uses a menu driven entry there wouldn't be an input problem by the user side. But for the server side there might be an error during the process of entering a data. In this time the system will provide an error page and the system will continue without failure or crush.

Security: the system should be secured, i.e., not allow unauthorized users to access the database system.

Reliability: the information provided by the system is as reliable as it is presented on the web page interface, and this is maintained by the persistent database.

5.1.3. Maintenance

In time of failure or need modification the system need to be maintained. To be maintainable the system should meet the following maintenance criteria

Extensibility: if it is needed to add new functionality to the system, this must be achieved by only making a separate page and integrate this page with the existing system.

Modifiability: if in the system, some functionality requires to be modified, this modification must be done specifically to that function or page without affecting the overall system organization.

5.2. Current Software Architecture

The existing system of cost sharing management system is manual system and there is no current software architecture that will be considered. As a result we only describe the software architecture of newly proposed system.

5.3. Proposed Software Architecture

It is the architecture that determines the type of interactions that the components are going to have. The architecture of CSMS that does this work uses Client/Server architecture. In this type of architecture the server is responsible to receive a request from the client and respond to the request, whereas the client is responsible to interact with that of the users of the system. The server does two types:-the first type of server is a application server and second type of server is a DB server.

Client side: - is a web browser which receives requests from the user of the system and responds to the request by communicating with the web server. If the user has a

request on data, the browser passes the request to the web server then the web server pass the request to the database server.

Application server: - which is responsible to receive browsers' request through http protocol and responds accordingly or the core part of the web based health insurance management system that means the web server and business logic.

Database server: - which is responsible to provide the requested database services to the web server. The database server is generally responsible for modification and insertion of data to the database. It can only communicate with the web server.

The Figure below shows the architecture of the system.

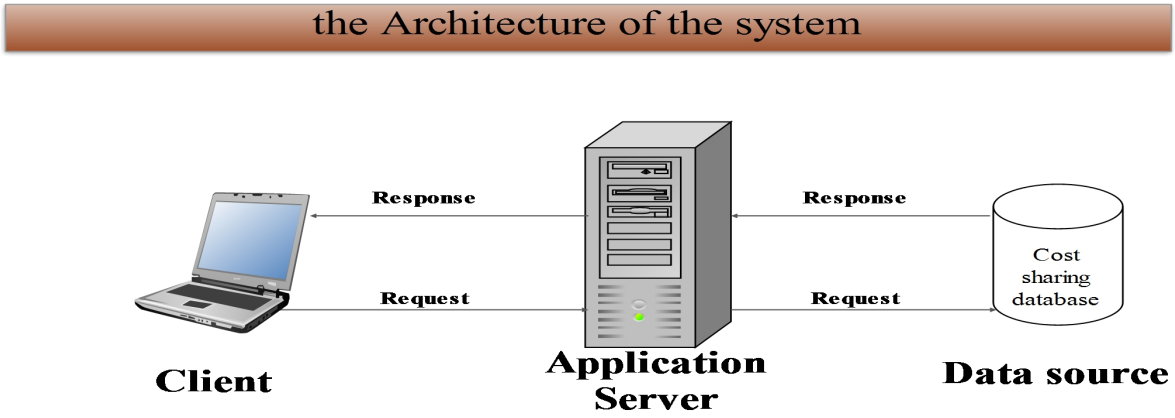


Figure 16.Proposed System Architecture

5.3.1. Subsystem Decomposition and Description

- **Manage account subsystem**: - in this subsystem, Managing of information regard to account and perform.

✓ Create account
✓ Update account
✓ Enable and disable account

- **Manage feedback Subsystem: -** this subsystem allows for managing feedback information and performs this operation.

✓ Send feedback
✓ View feedback

- **Manage Notice Subsystem: -** this subsystem allows for managing Notification information and performs this operation.

- ✓ Post notice
- ✓ View notice

- **Manage cost subsystem: -** this subsystem allows for managing cost and performs this operation.

- ✓ Register actual cost
- ✓ Update cost
- ✓ generate cost
- ✓ Calculate cost

Database connection subsystem:-this subsystem used for established connection between business class and database management system.

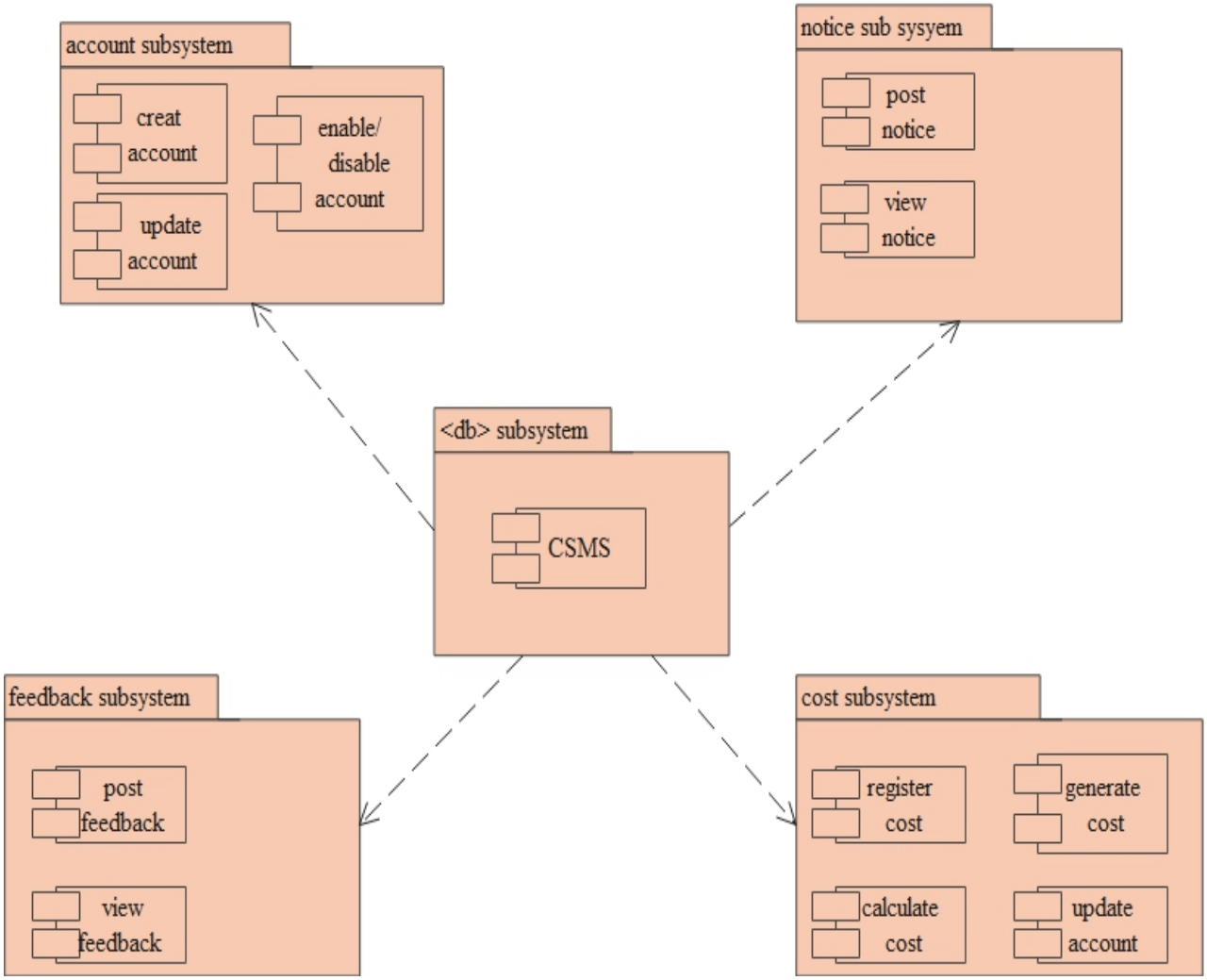


Figure 17.Sub System Diagram

5.3.2. Hardware/software Mapping

Deployment diagrams are used to visualize the topology of the physical components of a system, where the software components are deployed. Deployment diagrams are used to describe the static deployment view of a system. Deployment diagrams consist of nodes and their relationships. We have the following deployment diagram with three components like client server, database server, and application server.

CSMS Deployment Diagram

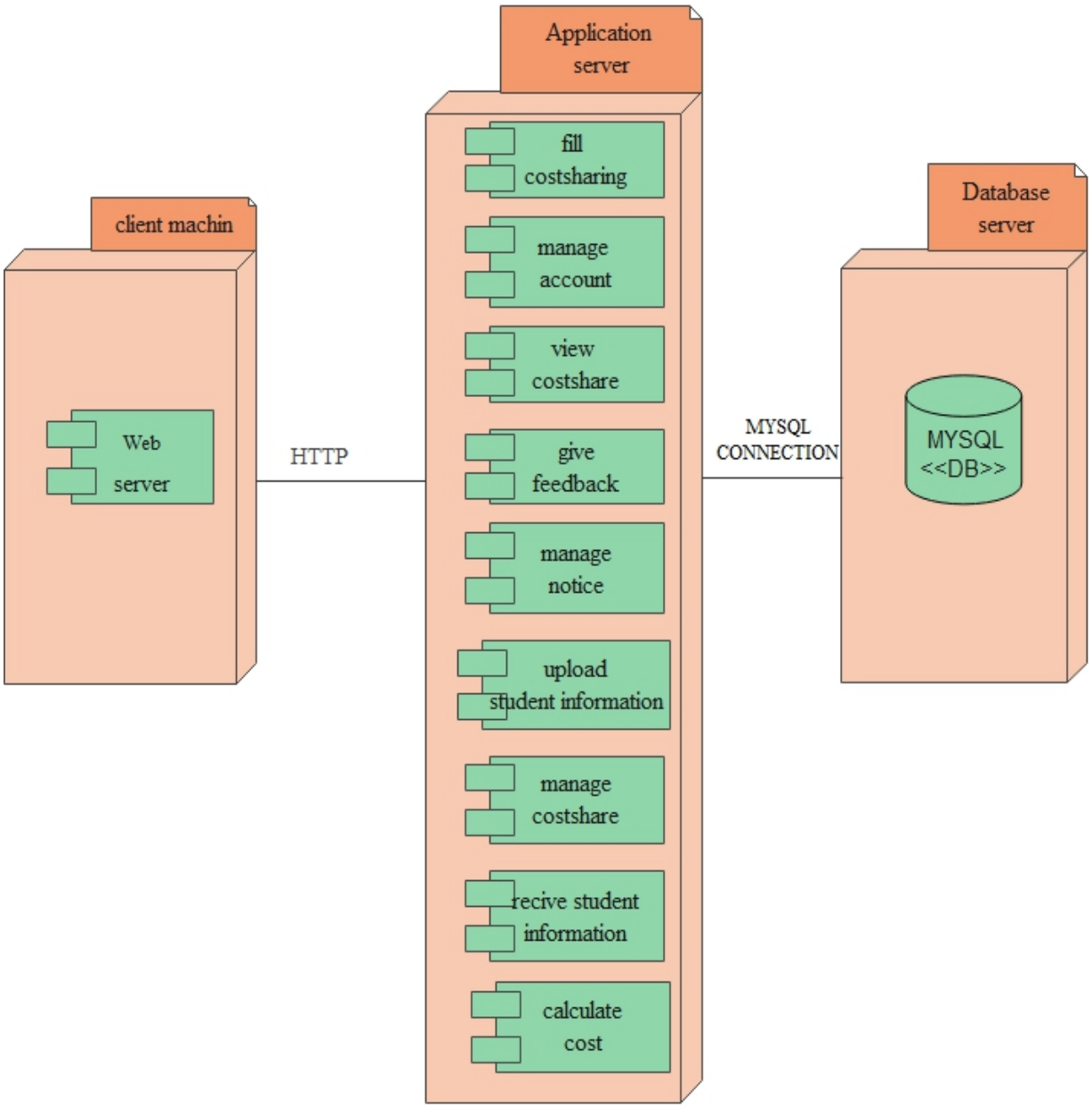


Figure 18.Deployment Diagram

5.3.3. Detail class diagram

The detail class diagram is the main building block of object-oriented modeling. It is used for general conceptual modeling of the structure of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling.

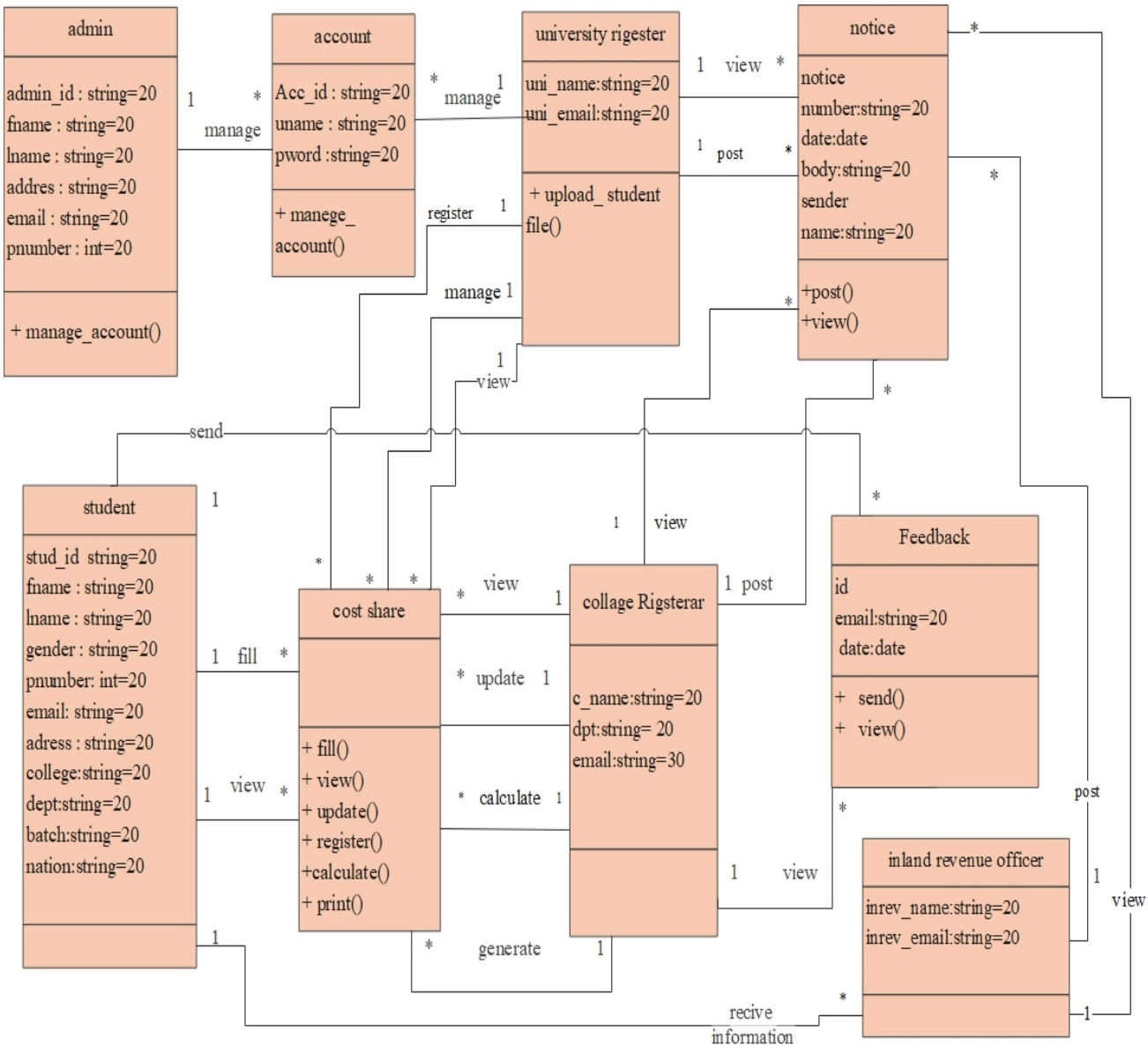
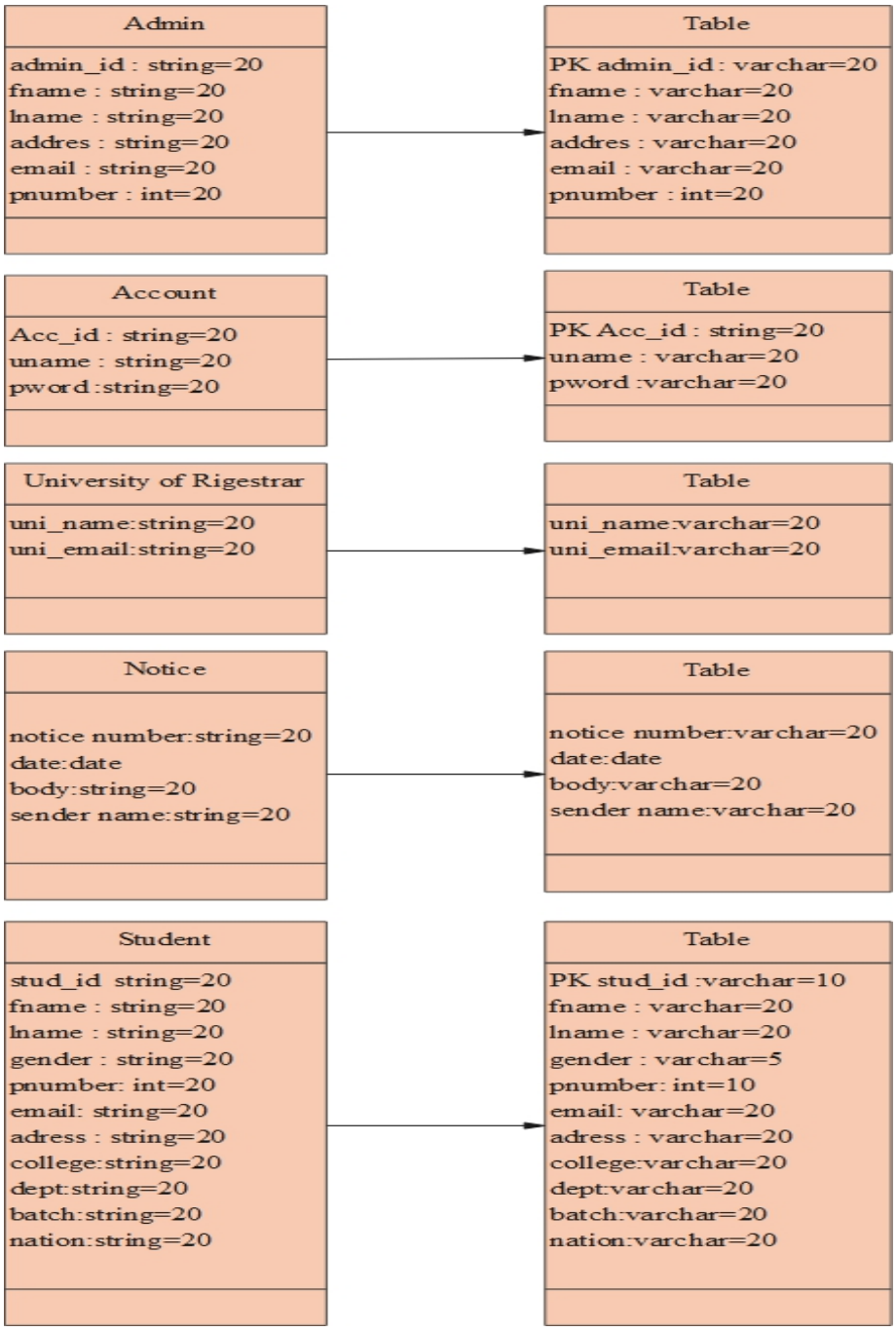


Figure 19.Detail Class Diagram

5.3.4. Persistence Modeling For Relational Database

Persistent data are the data that are stored in a database permanently. This section typically includes the description of data schemes, the selection of a database. Our system will use MYSQL with relational databases management system. The purpose of persistence modeling required to stored data persistently. Information related to user, account, notice, feedback, cost share, student profile are persistent data, which should be stored in database. Moreover, storing data in a database enables the system to perform complex queries on a large data set.



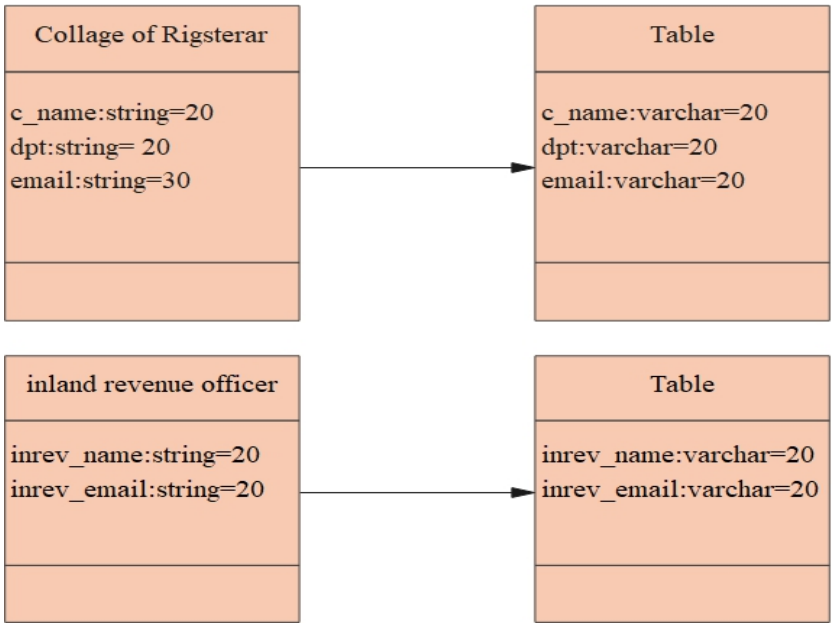


Figure 20.Persistent Data Management Diagram

5.3.5. Access control and security

Access control is a security technique that regulates who or what can view or use resources in a computing environment. Access control is a security feature that controls accessibility to a system and even minimizes security risks.

Table 20.Access control and security

Activity	**University registrar**	**College register**	**Inland revenue officer**	**Student**
Login	✓	✓	✓	✓
Manage Account	✓			
Fill cost sharing information				✓
Manage cost		✓		
View cost	✓	✓		✓
View notice	✓	✓	✓	
View feedback		✓		
Send feedback				✓

View student information	✓	✓	✓	
View cost share	✓	✓		✓
Post notice	✓	✓	✓	
Calculate cost share		✓		
Search	✓	✓		✓
Upload student information	✓			
	✓			

5.4. Packages

A package is a grouping of model elements which means that a package can contain model elements of different kinds, including other packages to create hierarchies.

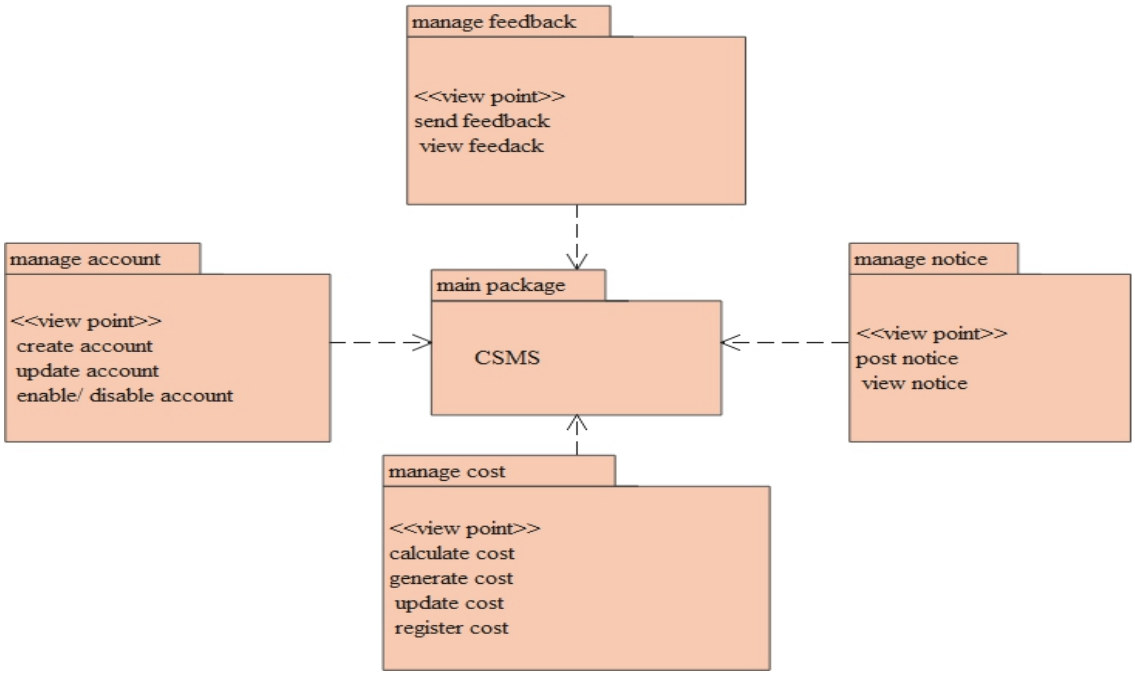


Figure 21.Package Diagram

5.5 Algorithm Design

An algorithm is a procedure or formula for solving a problem, based on conducting a sequence of specified actions. It is a step by step process carried out to solve the given problem.

Algorithm Design for login

1. Go to login page.

2. Fill out the field's username and password and click Login.

3. The page process the fields, send them to MySQL database, and check it. If the Fields is correct, go to step 5. If not, to step 4.

4. Show error page.

5. Start session; go to home page after login.

Algorithm Design for fill cost sharing

1. Go to fill cost sharing page.

2. Fill out the fields.

3. The page process the fields, send them to MySQL database, and check it. If the

Fields is correct, go to step 4. If not, to step 5.

4. Display successfully submit message.

5. Show incorrect input error.

5.6. User Interface Design

User interface is the interaction between a user and software running on a web server. The user interface is the web browser and rendered. Since this system is a web based system we designed a web interface to interact the users to the system.

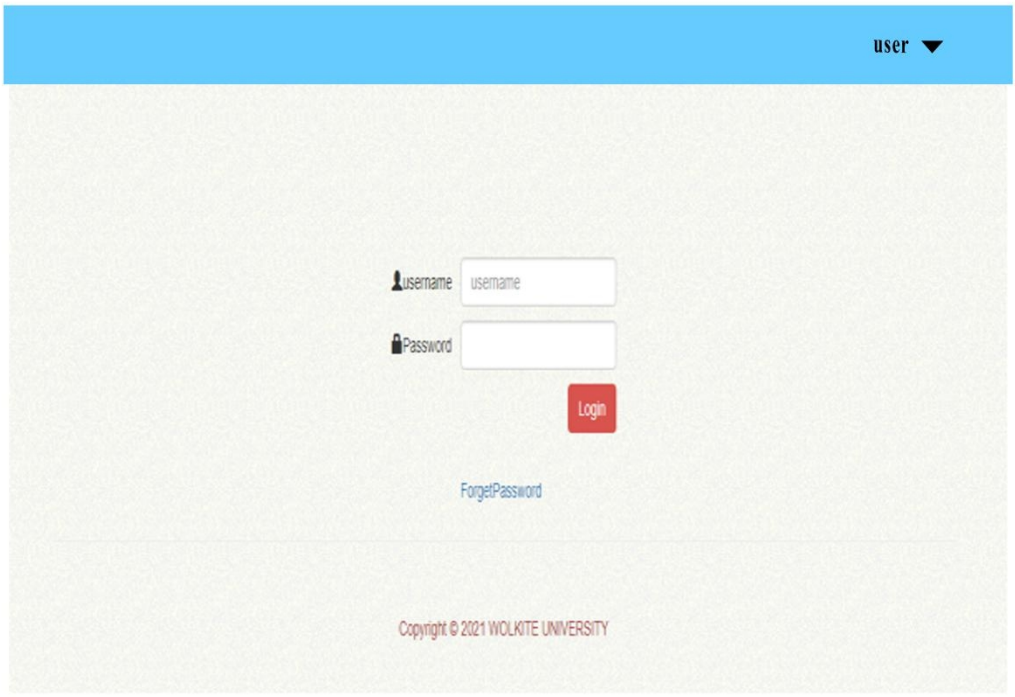


Figure 22.user interface for login

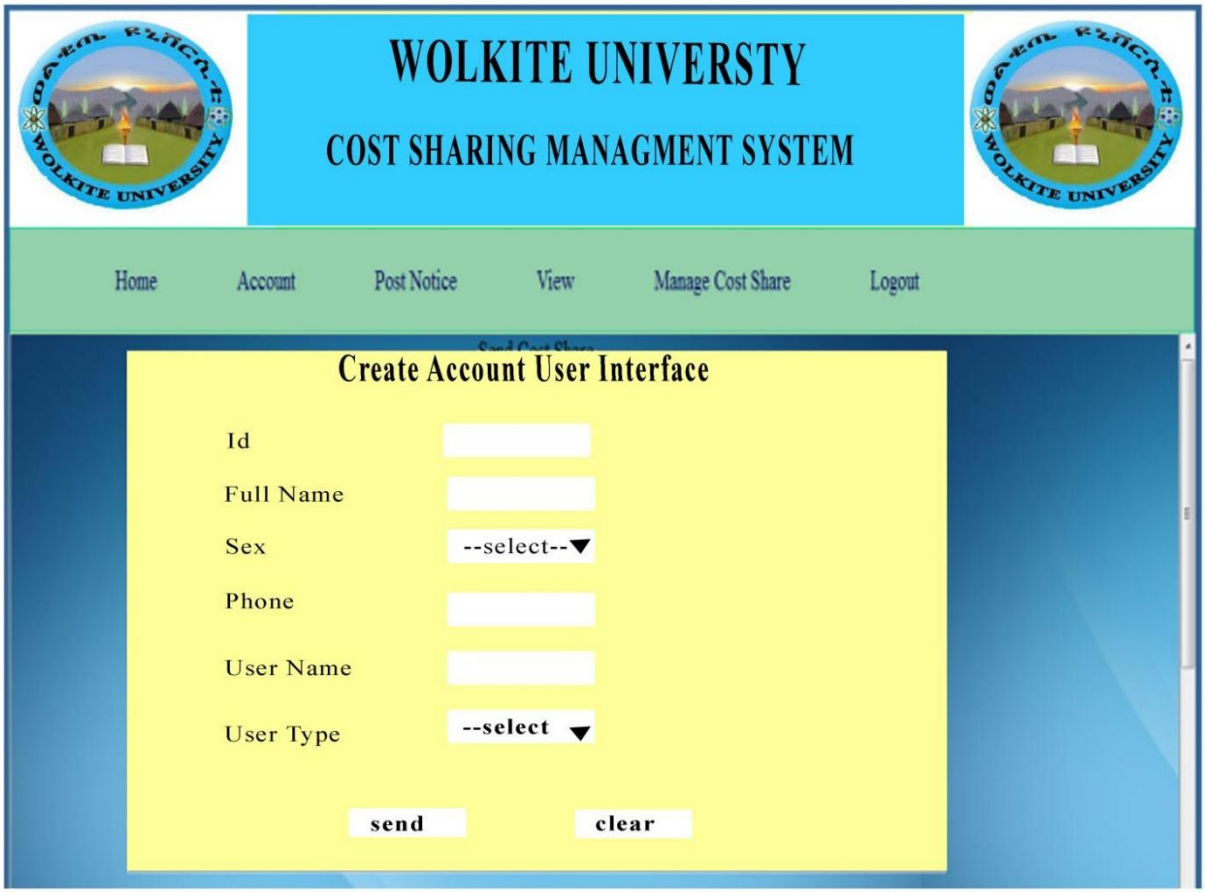


Figure 23. User Interface for Create Account

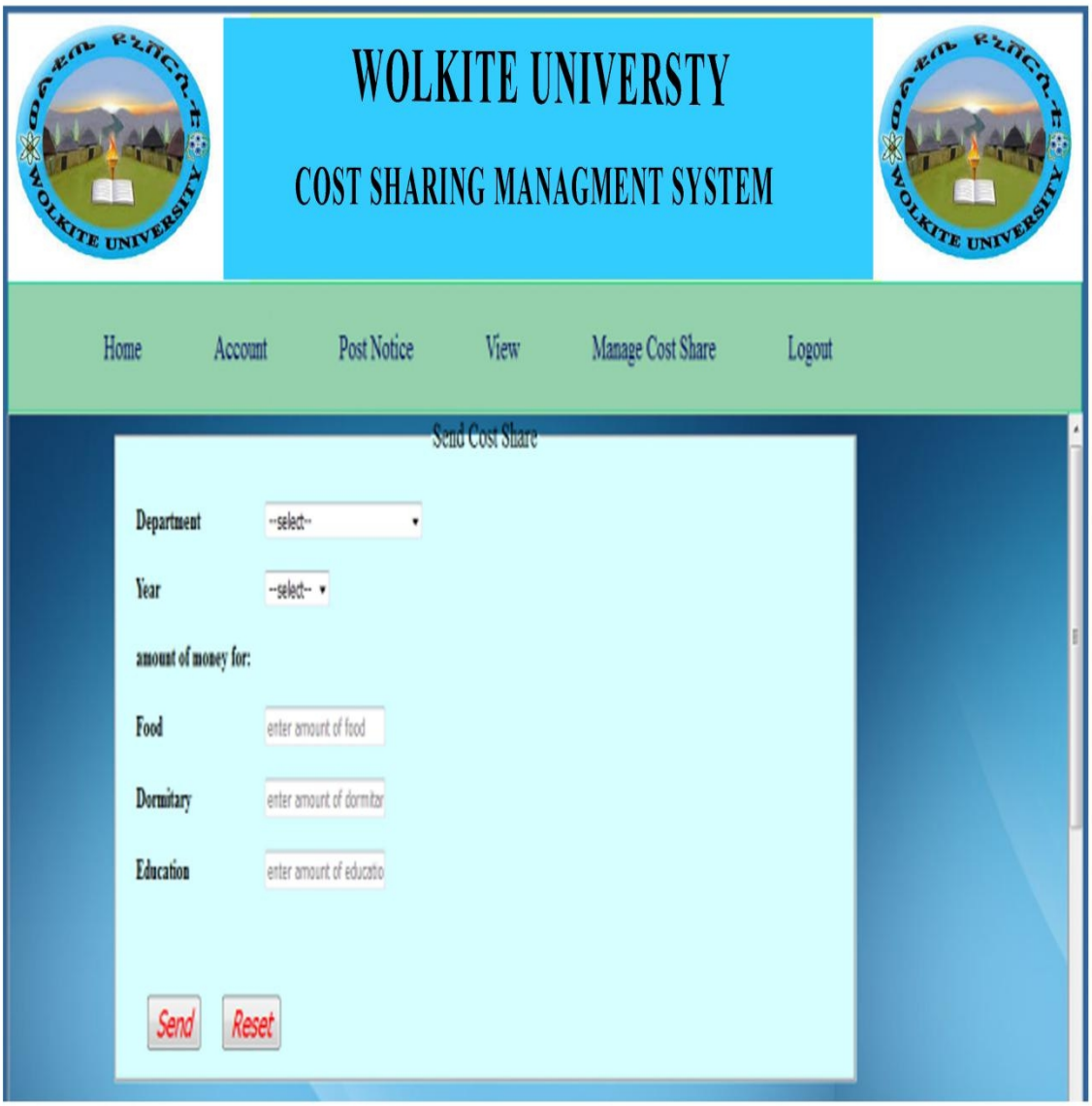


Figure 24.user interface for register cost share

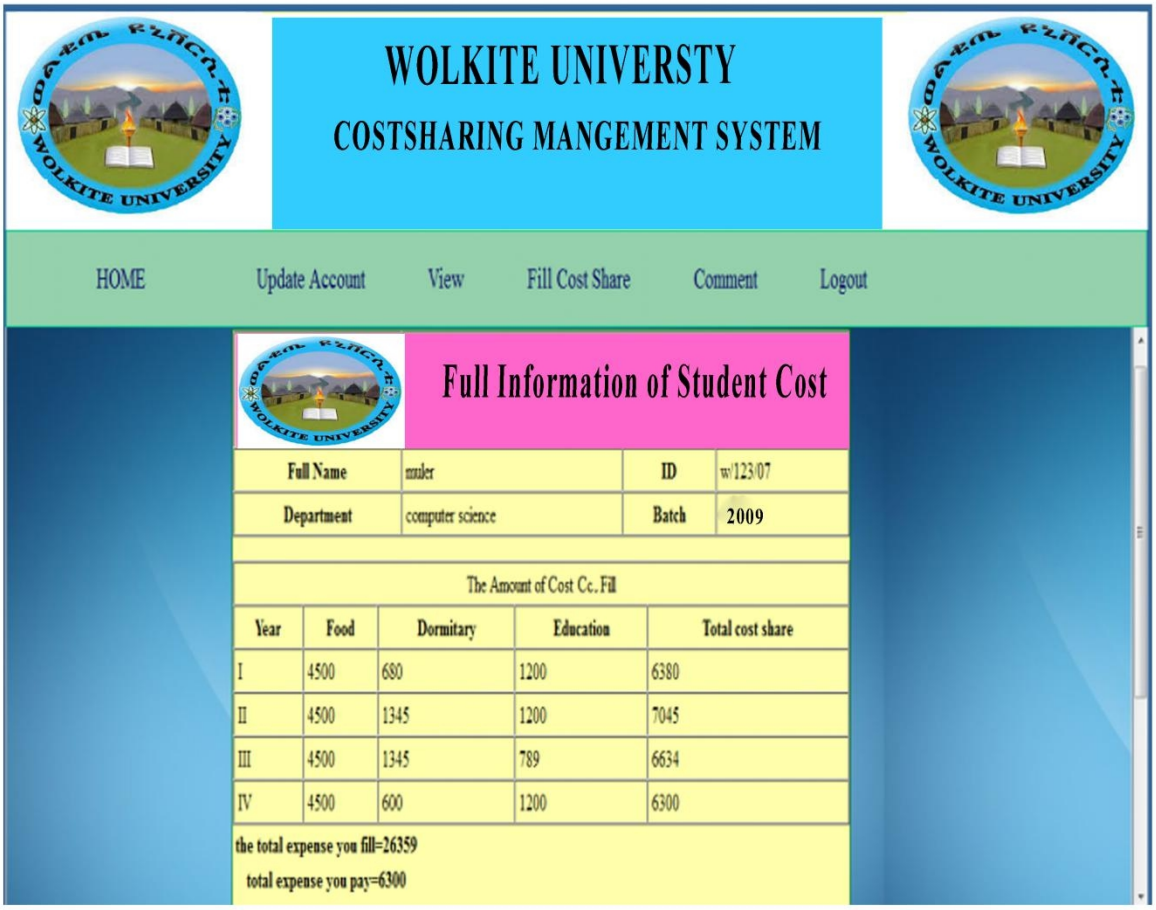


Figure 5. 12 user interface for displayed cost share information

Reference

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