



WOLKITE UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

**Department Selection And Placement System for Wolkite
University**

By

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Presented in partial fulfillment of the requirement for the Degree of
Bachelor Science in Computer Science.

College of Computing and Informatics, Wolkite University

Declaration

We hereby declare that this BSc final project is our original work and has not been presented for a degree in any other university, and all sources of material used for this Project have been duly acknowledged.

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This BSc final project has been submitted for defense with my approval as a project advisor.

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Approval of Board of Examiners

We, the members of the board of examiners of the final open defense by ____ have read and evaluated his/her final project entitled “*department selection and placement system for Wolkite university*” and examined the candidates. This is, therefore, to certify that the project has been accepted in partial fulfillment of the requirement of the Degree of Computer Science.

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List of Abbreviation

APC	Academic Placement Committee
CSS	Cascading Style Sheet
HTTP	Hypertext Transfer Protocol
SQL	Structure Query Language
UI	User Interface
UML	Unified Modeling Language

EXCUTIVE SUMMERY

Wolkite University is one of the third-generation universities in Ethiopia and its mission and vision is being one of the top 10 East Africa universities in 2030 so to achieve this it needs the help of technology. In its field of studies for its students there is a problem on placing students to the departments due to the lack of technology-based systems. It causes a work load, time consumption for the workers and there are mistakes on existing placement system during department placement. So, we are going to develop a computerized way of stream selecting for field of study and department placement system for WKU colleges. To develop the system, for data collecting we use interviews, questionnaires and system observation. for documenting our requirements, we use word document, edraw-max for designing and for the front-end development we will use bootstraps, Django frame work and for the back end development we use PostgreSQL to the data base and Django frame work and after development we test our system by our group members. In general, the proposed system be provide a solution for the problems mentioned above by following those development methodologies.

CHAPTER ONE

1. INTRODUCTION

Now a time Technology is spreading in almost every day-to-day activities of human life. So with respect to this doing every activity in organizations with the help of technology facilitates their customers need and it makes the organization technologically competitive. The mission and vision of our university is being one of the top ten university's in East Africa. So, to realize this mission and vision of the organization it needs modernized and technology based working system to facilitate the growth and competitiveness of the organization by full filling the needs of its employees and its clients. Many developing countries are in a good position to exploit the opportunity of technology revolution.

Wolkite University has many colleges in each college there are many departments of studying. And students are placed to different field of studies through semi-automated, manual based system. So it is tedious, time consuming and during data encoding errors may occur that leads to appropriate system output. It causes many problems such as charges of complains by students.

Developing a system using technology has so many advantages for organizations. In our case, Wolkite University uses semi manual and semi-automated system for department placement. So, we are initiated to develop an automated system for department placement.

1.1. Background of organizations

Wolkite University (WKU) is one of the third-generation higher institutions that have been founded in 2004 E.C. The University is located in the Southern Nation Nationalities Regional State, in Gurage zone, 170 km southwest of the capital city, Addis Ababa, on the way to Jimma. In November 2001 E.C the late Prime Minister, his Excellency Mr. Meles Zenawi, laid the foundation stone of the University in a plain landscape which is quite ideal for academic pursuit. It is situated at Gubrye sub-city, 15 km away from Wolkite town, of the gubrye-butajira road.

The mission of Wolkite University is to produce graduates who have knowledge, attitudinal y mature and practically innovative. To supply relevant and demanded technology and knowledge that address national and community level development problem to help operations of

government and non-government organizations efficient, effective and competitive. To provide training and consulting services to the community and the government. The vision of the institution is to be one of 10 universities in East Africa 2035 G.C.

1.2. Statement of problem

- Students miss understanding about how the system works due to lack of information.
- When the arrangement is manually by employees their may be a bias during placement.
- Absent of students during orientation and miss important information's and they have no other way to get information.
- Although there is a simple system which is not complete automated also have manual works, most of the times there is an error during data encoding from manual information in to the system such as missing students name, encoding incorrect grade of students...etc. Due to these students will not place to the department they want and they qualified.
- Need more human resource for encoding and orientations.
- There is a complaint from students about the placement because of the data encoding error to the system.
- Data encoding for the current system delay and more time-consuming process.
- During department placement there is Inconsistency between the student and the department they are assigned to.
- It is a time and material consuming process for the collages (not efficient).
- The existing system is not complete automated which means it may be miss student information and make error during the department placement.

1.3. Objective of the project

1.3.1. General objective

The general objective of this project is to develop department placement lsystem for Wolkite University.

1.3.2. Specific objective

To achieve general objective of the project we have specifically categorized objective to meet the final goal into the following sub-divisions with some activities: -

- Analyze the details of existing system and identify problems found in the existing system.
- Identify and design the requirement of the new system.
- System design .
- Design database for the new system for efficient data retrieval.
- Develop the proposed system
- Evaluate and test the proposed system
- Deploy the final product of the project.

1.4. Feasibility analysis

1.4.1. Technical Feasibility

Since all the resources and materials needed for development of the new system is available in the organization here. We are utilizing the resources which are available already. So, it is technically feasible since there could not be much difficulty to have the required resources for system and maintaining the system as well.

1.4.2. Operational Feasibility

The new system will be operationally feasible, the system to be developed will provide accurate, active, secured service and decreases labor of workers. Since department selection and placement is web-based application, it is platform independent i.e. it runs in all operating system and supports all browser.

1.4.3. Economic Feasibility

Our system will be developed for solving problems of the department placement by reducing the consummation of human resource, time and it reduces unnecessary expenses so our system is economically feasible and it will be more beneficial than the current system.

1.5. Scope of the Project

The system will be done for placing students to departments for all collages of Wolkite University and it give a department description for the students who is going to choose a department.

1.6. Significance of the Project

- Allow students to get more information about the available department.
- Allow students to know their departments in short time without fatigue.
- Beside the collage reduce redundancy and inconsistency.
- It also avoids a complain come from students.
- By avoiding data Encoding error, it avoids errors occurred within placement.
- Save a time, material and cost for the human resources.
- It initiates the employees for work by reducing their work load.

1.7. Beneficiary of the Project

Students

- They have more information about the departments.
- They know their placement in short time.
- Since encoding error is avoided there is no problem with their placement.

Collage

- The time saved.
- Since the new system is automated all works are being easy.
- Reduce human resource.
- Save costs for material and human resources.

1.8. Methodology of the Project

1.8.1. Data Collection Tools/Techniques

- Interview: -we have to collect raw data or document by face-to-face conversation with collage heads as it is good to prove for more feedback which is used for the newly proposed system. And from other persons it looks.

- Questionnaires: - we are going to collect data by selecting number of individuals and sent them the questionnaire paper to obtaining large amount of information quickly and efficiently.

1.8.2. System Analysis and Design

We use an object-oriented approach for the design and analysis part of our system.

We use it to improve the quality and productivity of our system analysis and design by making it more usable.

In analysis phase, we use OO model it to identify the objects in problem domain, classifying them in terms of data and behavior.

1.8.3. System Development Model

For our system development we use agile model because it is flexible and it is suitable for static and changing requirements.

1.8.4. System Testing Methodology

- Unit testing: done by all our group members
- System testing: done by group members, other group members and including our advisor
- Functional Testing: By our group members and by other communities out of the group members by the college.

1.8.5. Development Tools and Technologies

1.8.5.1. Front-end Technologies

- The user interface is developed using CSS, and BOOTSTRAP since it easily designing the front end and connected into database realizing rapid application development
- Django: -high level python web frame work for front end development.

1.8.5.2. Back-end Technologies

- PostgreSQL: - for designing the database.
- Django: -high level python web frame work for back end development.

1.8.5.3. Documentation and Modeling

- Enterprise architecture and edraw-max: - for designing unified modeling language (UML) diagram.
- Microsoft word for documenting our SRS document.
- Microsoft PowerPoint for presentation.

1.8.5.4. Deployment Environment

For the deployment part it needs a server computer to deploy the system.

And the end users access the system using computers and their personal computers through web.

Hardware components

- Personal computer (PC): - since all task of our project are performed on computer.
- Network cable: - since our system is web based, it is very necessary requirement.

It is also help us to extract relevant information about our project from internet.

Software components

- Windows operating system: - will be used for the system since it is readily available and our system will work on windows operating system.

CHAPTER TWO

2. DESCRIPTION OF EXISTING SYSTEM

2.1. Introduction of existing system

The current department selection and placement system is already manual (paper based) system which needs more time and resource. In existing system there is APC (Academic Placement Committee) which is created for placement purpose and leads by the academic vice president. Here before placement students should complete the first semester of first academic year. The APC decide how many students should enroll in each collage. After the committee decides the quota of students for each collage , the students choose colleges and other students they don't choose college or those students choose a collage and not promoted in colleges are stay on their streams until the end of second semester of the first year. After the second semester of first year, all students select departments on papers prepared by the colleges and they placed to departments. Working in this way is very spadework.

The current system is not automated and the placement is done with paper and there may occur different errors during department placement. The proposed system will solve those problems by automating the work to be efficient, error free and work out of bias. By following the rules and criteria seated by the university for the department placement.

2.2. Users of Existing System

The main user of existing system is:-

Students

- ✓ Students fill necessary information in selection form paper and select the departments.
- ✓ They accepts or sees their result of placement.
- ✓ If they have complain present their complain for the collage deans or for college registrar nominal s.

APC (academic placement committee)

- ✓ Decide the number of students enroll in the collage.
- ✓ Based on placement criteria place students to the colleges.

Colleges

- ✓ Take the students assigned to colleges by APC and place them in to departments.
- ✓ Accept complains from students related to placement.

2.3. Major Functions of the Existing System

- ✓ Prepare a selection form for the students.
- ✓ The current system can **analysis the input**. The input for the current system is that collection of paper which contain selection form paper fulfilled by students and papers that are affirmation for the criteria such as entrance exam result paper, GPA slip....etc.
- ✓ The current system **processes the input** by collecting them and checks that all necessary things are completed.
- ✓ Finally through the criteria the placement is done and informed to the students through manually which is the **output** of current system.

2.4. Forms and Other Documents of the Existing Systems

The forms are listed in the appendix on *Figure A: department selection form* and *Figure B: collage selection form* .

2.5 Drawbacks of the Existing System

- ✓ Since in current system due to manual operation there is wastage of resource and time again.
- ✓ Students select collage and departments through paper during collecting those papers there may be a loss of vital paper.
- ✓ Takes a lot of time to inform their collages and department for students.
- ✓ Doing a placement for all students through manual operation is very delay process.
- ✓ The system is exposed for biases during placement.

2.6 Business Rules of the Existing System

Here in existing system there is an APC (academic placement committee) which leads by academic vice president for placement process. There are two kinds of students which one is natural stream student and the other one is social stream students.

First the students should finish first semester of first year. After finishing first semester of first year they can select four collages. This is for natural stream students they can select engineering technology collage, medicine college, pharmacy collage and for social stream students they can select school of law.

But before the selection the APC committee have to decide how many students should enroll in these four collages based on the criteria set by the university. These criteria are entrance exam result, first semester GPA and exist test results. There may be additional criteria such as affirmative action, disability etc. Here the students does not forced to select the collages, they have a right to not select. So based on these criteria the student who select the collages are placed.

The rest of students who does not select a collage and students who does not enroll or not pass due to the placement criteria continue with in their first social and natural stream until the end of second semester of the year.

On the starting of the first semester of second academic year students who have enroll in collage of engineering and technology they gone to allowed to select engineering collage and other three computing department i.e. computer science, information system and information technology department.

Here before the selection again another committee is created by collage deans, collage registrar and other staff to decide how many students should enroll in engineering collage and other three departments. Then based on criteria they are placed. Students who enroll in engineering collage are going to learn pre engineering.

Again here the rest of students who are in natural and social stream are allowed to select the rest of collage and department respectively and then they are gone to place.

At the end of second semester of second academic year students who are enrolled in engineering collage are select the departments in their collage.

Again before the placement of students to the departments the collage registrar decide how many students should enroll in the available departments in the collage. Then based on the placement criteria the students are placed to the departments. All of this process is done manually.

CHAPTER THREE

3. PROPOSED SYSTEM

Automating the current system is the objective of the proposed system specifically, improving its user's interactivity and features. The proposed system will also add functionalities and information is retrieved in better way. Therefore, the new system automate the existing (paper based) system highly. The proposed system takes problems of the existing system and improves it for the sake of better performance.

3.1. Functional requirements

- ✓ **Register:** - the proposed system allows registration of student personal information, store information, student choice field of study and student choice of collage.
- ✓ **Create account:** - the system allows students to create an account to accesses the system.
- ✓ **Login:** - if a student's once have an account the system allows them to login to their own accounts (pages) to access the system.
- ✓ **Department Selection:**-the system allows students to select an available departments in order of they want based on their stream they are in.
- ✓ **Re-selection (edit):**-the system allows students to edit their selection of department if they are not interested on their choice at first selection for five or six times.
- ✓ **Approve:**-the system approves the departments that are selected by students.
- ✓ **Placement:**-the system places a department to students by considering the basic criteria such as GPA, gender, disability and entrance exam result....etc.
- ✓ **View placement result:**-allow students to view their placement in short time though their page (inform back the placement).
- ✓ **Department description:**-allow students to search the department and get relevant information about the available departments.
- ✓ **Complain:**-if students have complain on the placement they can send complain.

3.2. Non Functional requirements

The following list of non-functional requirements is expected from the system:

3.2.1. User interface and Human factors

- ✓ The system provide user friendly (interactive) interface which is easy to use.
- ✓ The system provides web application user interfaces that are compatible browsers like Internet Explorer, Mozilla Firefox, Google Chrome, etc....
- ✓ The interface design is aims at a flexible front end communication to provide the user with clear information in navigating a user friendly interface.

3.2.2. Hardware Consideration

For the system, there is no need of extra hardware requirement to deploy the system. Simply it needs a server and for the users of the system they need any type of computer for accessing the system and use it like laptop, tablet, desktop computer and other computing devices.

3.2.3. Security Issues

- ✓ The system is protected with authentication and authorization security mechanism. Users who wants to login to the system must have a user account.
- ✓ The system does not allow all people to access it, the user must have authorized account with privileges to access the system.
- ✓ An authenticated user with predefined access right will only enter the information related to the database.
- ✓ To prevent credential data like password not easily viewed by anyone so, the system will encrypt those data or information by using cryptography.
- ✓ Only the administrator has an authority to control over the system so that unauthorized modification cannot be occurred.

3.2.4 Performance Consideration

To increase the performance of the system we will use different mechanisms, like front end scripting to decrease the load on the server. And by removing redundancy of code and by using best algorithm.

The system supports multiple users at a time to access.

3.2.5 Error handling and validation

- ✓ The system uses different validation mechanism to handle errors on the system.
- ✓ The system will handle invalid input i.e. display error message a user's invalid input.

- ✓ If someone tries to access the system with unauthorized ID the system will display error message.

3.2.6 Quality Issues

- ✓ The users have to get services from the system rapidly.
- ✓ The system will meet what the user expects.

3.2.7 Backup and Recovery

- ✓ The system admin is holding a backup of the data that available any time without interruption back with external devices or by another secondary devices.

3.2.8 Physical Environments

- ✓ The system is compatible with any environment.
- ✓ The system will work properly in the university and there is no environmental factor that affect the system.

3.2.9 Resource Issues

- ✓ For the deployment of the system it needs a server computer.
- ✓ To access the system students should have smart phone, personal computer and desktop computers.

3.2.10 Documentation

Document organization of this SRS document looks like this.

Chapter one is about introduction of the system.

Chapter two is description of the system.

Chapter tree about proposed system.

Chapter four is about system analysis.

Chapter five is about system design.

CHAPTER FOUR

4. SYSTEM ANALYSIS

4.1. System Model

System modelling involves the evaluation of system components in relationship with one another to determine their requirements and how to satisfy them. Some system modelling tools will be employed during the course of this project that will support development tasks, from analysis to design, then to implementation. This will be represented with the use of the sequence diagram, activity diagram, state chart diagram, and class diagram for the department selection and placement system.

4.1.1. Use Case Model

Use case and actors identified

Actor

System admin: - manage all management activities of the system.

Use case

Log in: - log in to the system.

Register students:- register all the students participate in the department selection.

Approve selection: - approves department selection.

Place student: - do the placement.

View selection: - view student's selection status.

View complain: - view complains created by students if there.

Actor

Student: - students select departments, view their results and they access the system based on the privilege granted.

Use case

Log in: - log in to the system by their account.

Select department: - select available departments.

Edit selection: - they can edit their selection if necessary.

View selection: - they can view their selections.

Complain:-they can make a complain if they have.

Create account: - they create their account to access the system.

Actor

College admin: - perform operation on collage level.

Use case

Log in: - log in to the system.

Write description: - writes the description of department under that collage.

View complain: - view complains created by students if there.

4.1.2. Use Case Diagram

Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. So when a system is analyzed to gather its functionalities use cases are prepared and actors are identified.

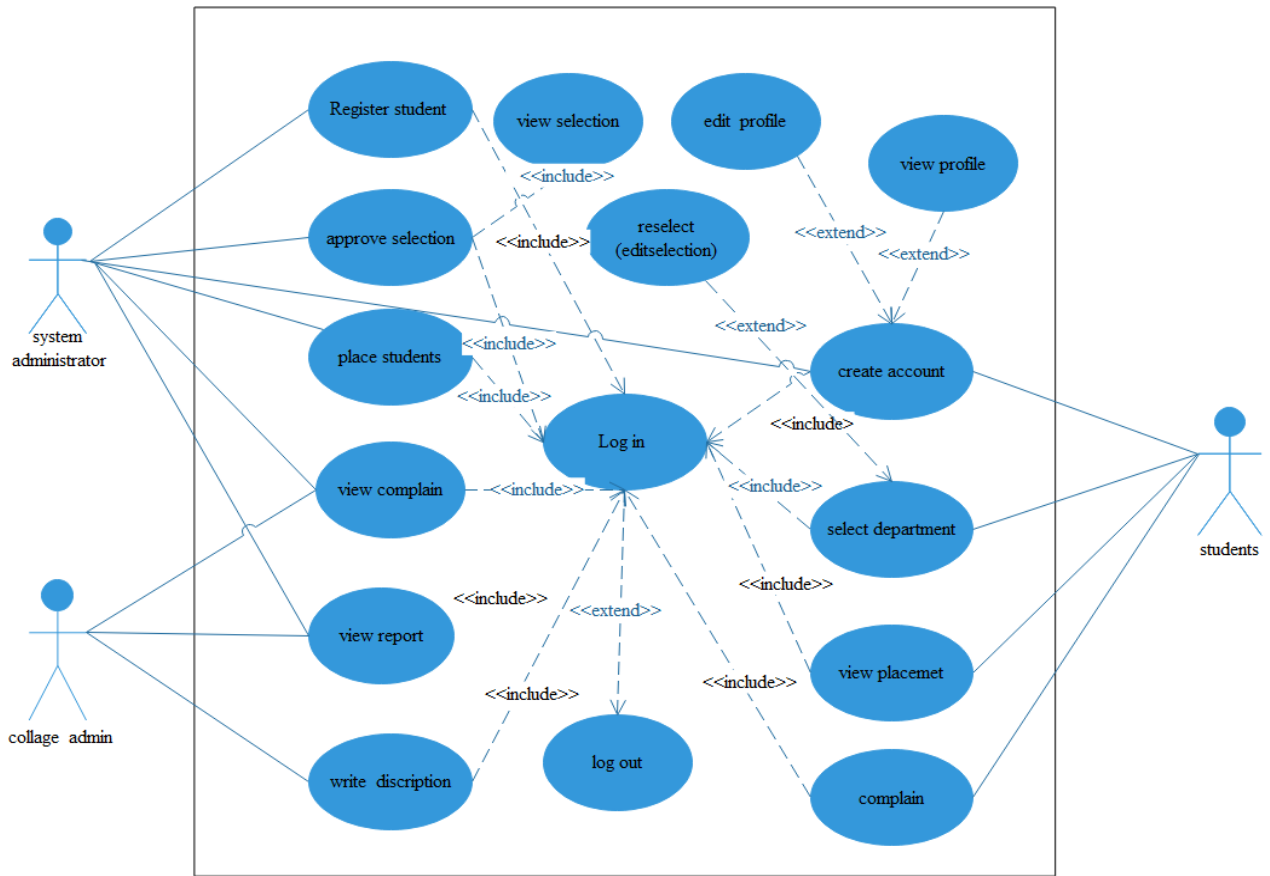


Figure 4. 1 : General use case diagram

4.1.3. Use Case Description

Usecase1: Register student

Table 4. 1 : register use case description

Use case name	Register student	
Actor	System admin	
Precondition	1.Actor should login to admin page 2.Student should not registered before	
Main flow	step	Action
	1	User click on register button page.
	2	The system displays the register form.

	3	The user fill an appropriate data(student information)
	4	User click on submit button.
	5	System stores the data.
Post condition	User receive successful conformation message.	
Alternative flow	1. If invalid details entered display error message. 2. Go to step three.	

Usecase2: Create account

Table 4. 2 : create account use case description

Use case name	Create account	
Actor	System admin and students.	
Precondition	Actor should not have an account before(should be new)	
Main flow	step	Action
	1	User click on create account button on home page.
	2	The system displays the create account form.
	3	The user fill an appropriate data(user name, password and confirm)
	4	User click on submit button.
	5	System stores the data.
Post condition	User receive successful conformation message.	
Alternative flow	1. If invalid details entered display error message. 2. Go to step three.	

Usecase3: Login

Table 4. 3 : log in use case description

Use case name	Login	
Actor	System admins and students.	
Precondition	Actor should have an account.	
Main flow	step	Action
	1	Actor request for login page.
	2	System ask user as who login.
	3	Actor chose.
	4	The system displays the form.
	5	Actor enters user name and password.
	6	The systems check validation.
	7	Click on login button.
	8	System login the user to user page
Post condition	Actors go in to its homepage.	
Alternative flow	1. If invalid user name and password entered. 2. Go to step 5.	

Usecase4: select department

Table 4. 4 : department selection description

Use case name	Select department
Actor	Students
Precondition	1. The admin should activate the system. 2. an actor have account and should be login to students page.

Main flow	step	Action
	1	User click on department selection button.
	2	System asks a user to select from two streams.
	3	Users select the stream.
	4	The system display department selection form or page.
	5	Users select an available department.
	6	User click on submit button.
7	System stores the data.	
Post condition	User receive successful conformation message.	
Alternative flow		

Usecase4: Re- select (edit)

Table 4. 5 : re-select(edit) use case description

Use case name	Re-select(edit)	
Actor	Students	
Precondition	<ol style="list-style-type: none"> 1. The admin should activate the system. 2. an actor should be login to students page before the system is down or with in specified time. 	
Main flow	step	Action
	1	User click on department selection button.
	2	System asks a user to select from two streams.
	3	Users select the stream.
	4	The system display department selection page within selected department already.
	5	Users click on re-select button.
	6	The system display department selection form or page.
7	User selects an available department again.	

	8	User click on submit button.
	9	System store data.
Post condition	User receive successful conformation message.	
Alternative flow		

Usecase5: Approve

Table 4. 6 :approve use case description

Use case name	Approve selection	
Actor	System admin	
Precondition	1.User should login to admin page 2. Student should finish department selection.	
Main flow	step	Action
	1	User click on view selections button.
	2	The system displays list of student and selected department by them.
	3	The user checks all information.
	4	User click on approve button.
	5	System approves the data.
Post condition	User gets approved.	
Alternative flow		

Usecase6: place students

Table 4. 7 : placement use case description

Use case name	Place students
---------------	----------------

Actor	System admin	
Precondition	1.User should login to admin page 2. Student department selection should be approved.	
Main flow	step	Action
	1	User click on place student department button.
	2	The system displays list of approved student and selected with their selection.
	3	The user click on place button.
	4	The system gives placements through placement criteria.
	5	System stores the data and send results to the students.
Post condition	User receive successful conformation message.	
Alternative flow		

Usecase7: View placement

Table 4. 8 : view placement use case description

Use case name	View placement	
Actor	Student	
Precondition	1. The placement process should be finished. 2. Student should be login to their account page.	
Main flow	step	Action
	1	User click on view placement button.
	2	System displays the placement.
	3	User sees the placement.
Post condition		
Alternative flow		

Usecase8: Complain

Table 4. 9 : complain use case description

Use case name	Complain	
Actor	Student	
Precondition	1. The placement process should be finished. 2. Student should be login student page.	
Main flow	step	Action
	1	User click on complain button.
	2	System displays complain box.
	3	User write complain.
	4	User click on send button.
	5	System saves data.
Post condition	User receive success message.	
Alternative flow	If the user tray to send empty the system display warning .the user fill again and send.	

4.1.4. Use case Scenario

Scenario name: register

Participant actor: system admin

Flow event:

- If a system admin want to register student information first must login to the system with valid user name and password.
- Then the system admin click on register button and system display the registration form,
- Then the system admin fill the appropriate student information and the systems check it.
- Finally the system stores the data on data base.

Scenario name: create account

Participant actor: student and system admin

Flow event:

- If a user is new for the system it should first create account to access the system.
- First the user click on create account button and the system display the form.
- User fill with appropriate data and click on submit button.
- Finally the system checks the validity and stores the data.

Scenario name: Login

Participant actor: student and system admin

Flow event:

- If the user want to login to its own home page first it should click on login button and enter a valid user name and password.
- Then a user click on login button and system check the validity.
- Finally if a user enter valid user name and password system display users home page else display error message and allow user to reenter a data.

Scenario name: department selection

Participant actor: student

Flow event:

- When a student should select there department first they login to their home page and click on department selection link.
- System allow them to first choose their stream and student choose the stream and system display an available department.
- Then student select the department in order to they want and click on submit button.
- Finally system save the data and send it to the system admin if complete

4.2. Object Model

4.2.1. Class Diagram

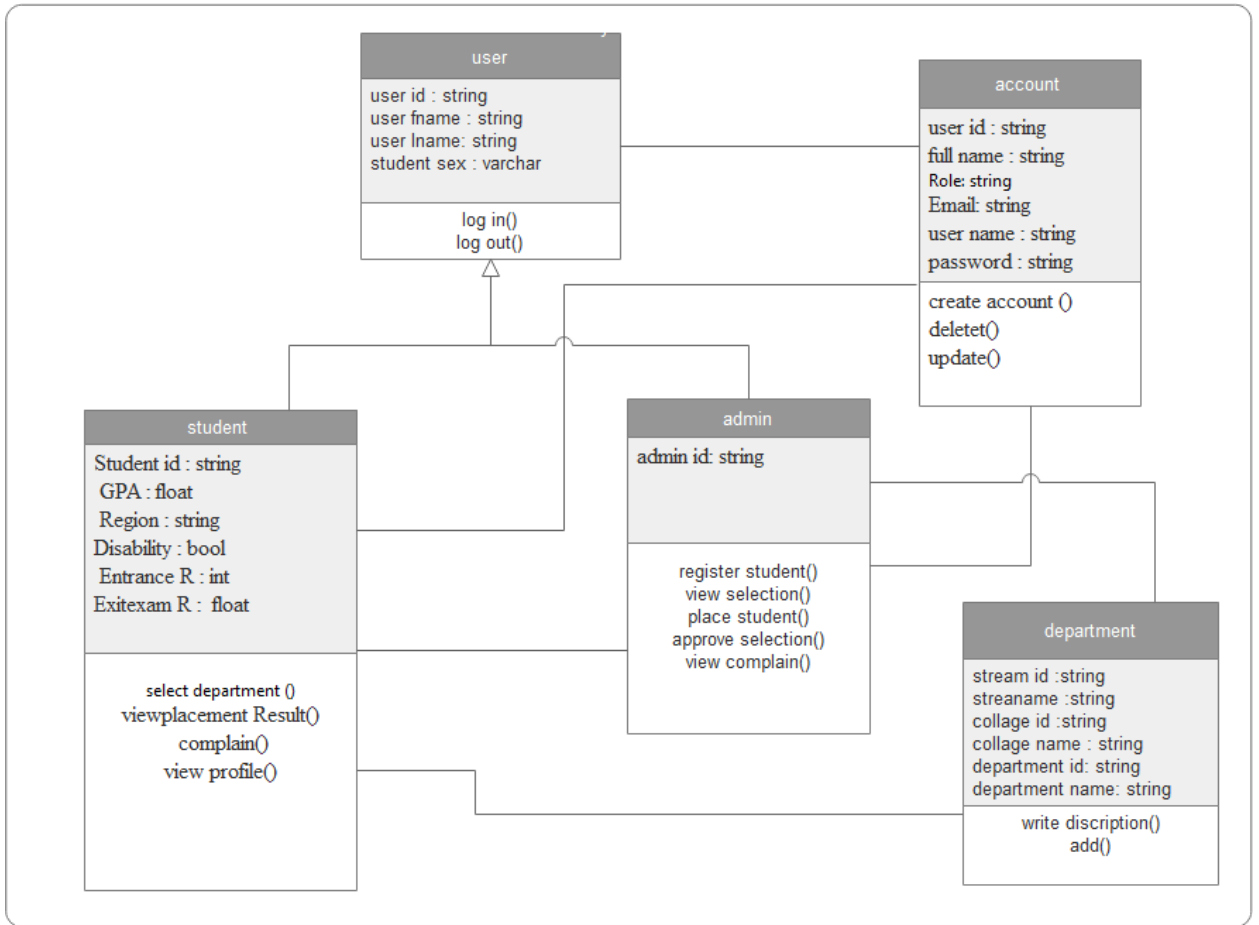


Figure 4. 2 : class diagram

4.2.2. Data Dictionary

Table 4. 10 : Data dictionary for student

Attribute	Data type	Data size	Key constraint	constraint
Student id	Var char	10	Primary key	Not null
Entrance R	Int			Not null
Exitexam R	Int			Not null

GPA	Float			Not null
disability	Boolean			Not null
region	String	25		Not null

Table 4. 11: Data dictionary for account

Attribute	Data type	Data size	Key constraint	constraint
User id	Var char	10	Primary key	Not null
Student full_name	String	30		Not null
Role				
Email address				
User name	String	30		Not null
Pass word	String	30		Not null

Table 4. 12 : Data dictionary for department

Attribute	Data type	Data size	Key constraint	constraint
Department id	Var char	10	Primary key	Not null
Department name	String	40		Not null
Collage id	Var char	10	Primary key	Not null
Collage name	String	30		Not null
Stream id	Var char	10	Primary key	Not null
Stream name	String	30		Not null

Table 4. 13 : Data dictionary for admin

Attribute	Data type	Data size	Key constraint	constraint
Admin id	Var char	10	Primary key	Not null

Table 4. 14 : Data dictionary for user

Attribute	Data type	Data size	Key constraint	constraint
user id	Var char	10	Primary key	Not null
Student fname	String	30		Not null
User lname	String	10		Not null
User sex	Var char	8		Not null

4.3. Dynamic Model

4.3.1. Sequence Diagram

Sequence diagram for dep selection

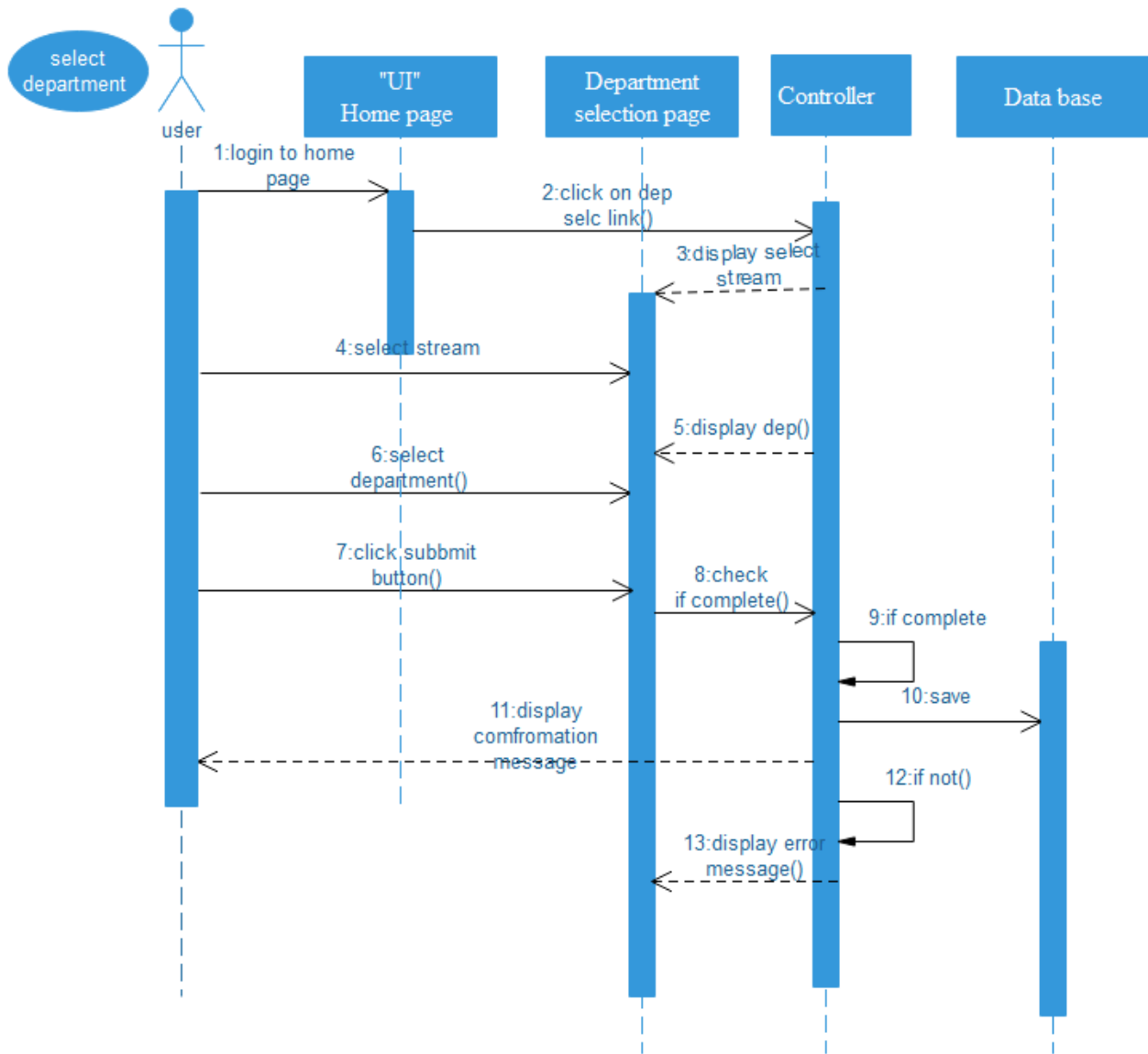


Figure 4. 3 :department selection sequence diagram

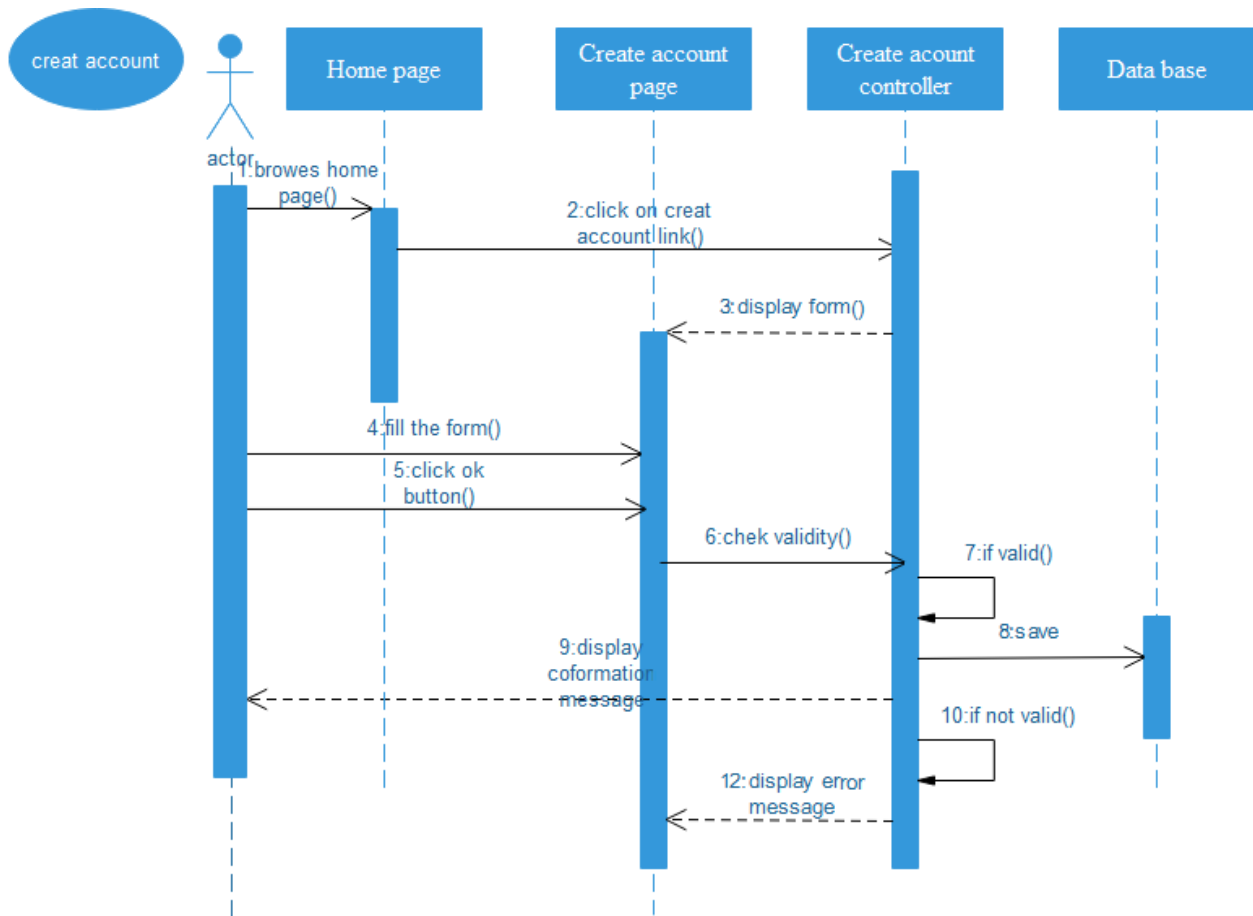


Figure 4. 4 : Sequence diagram for create account

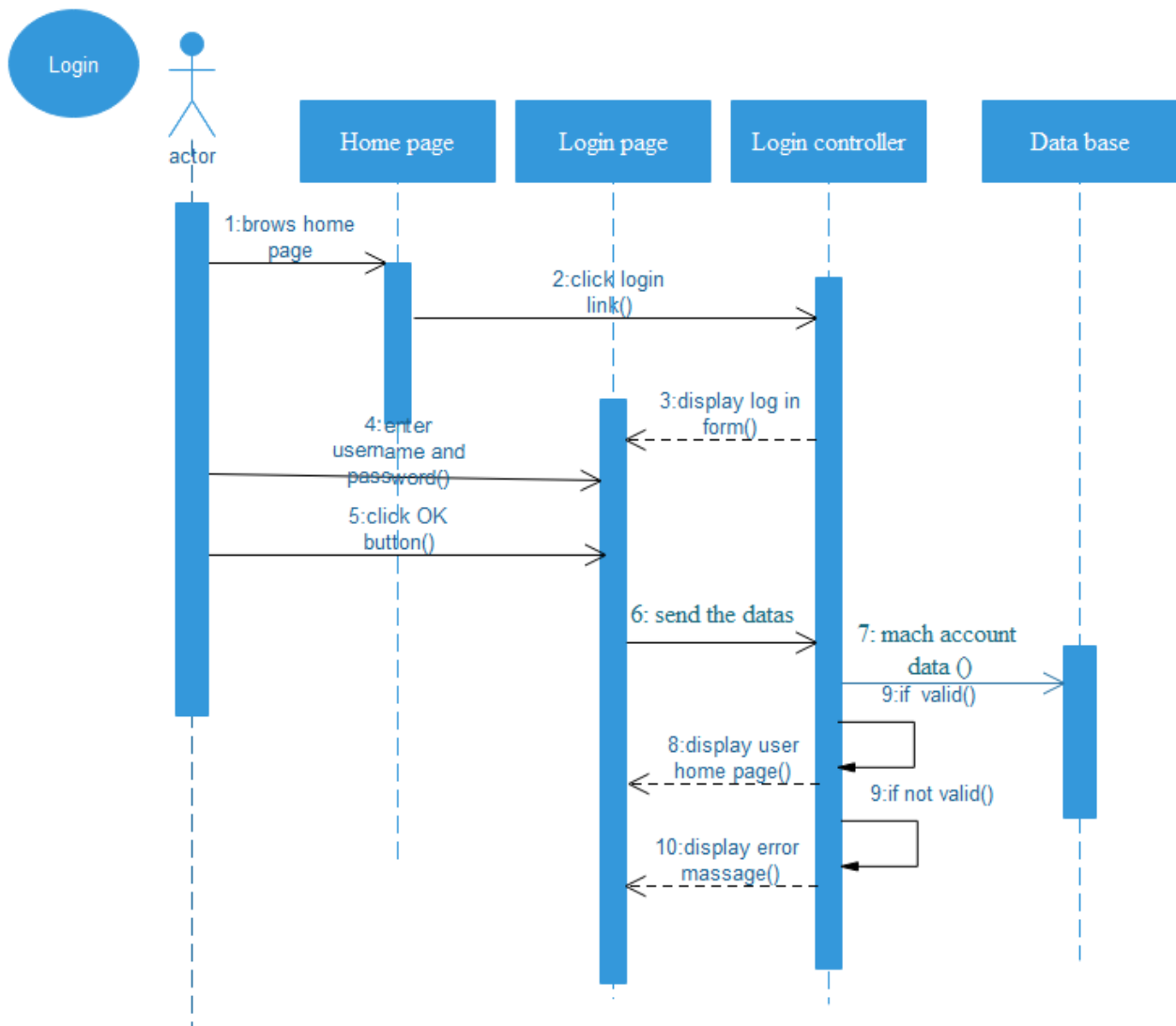


Figure 4. 5 : Sequence diagram for login

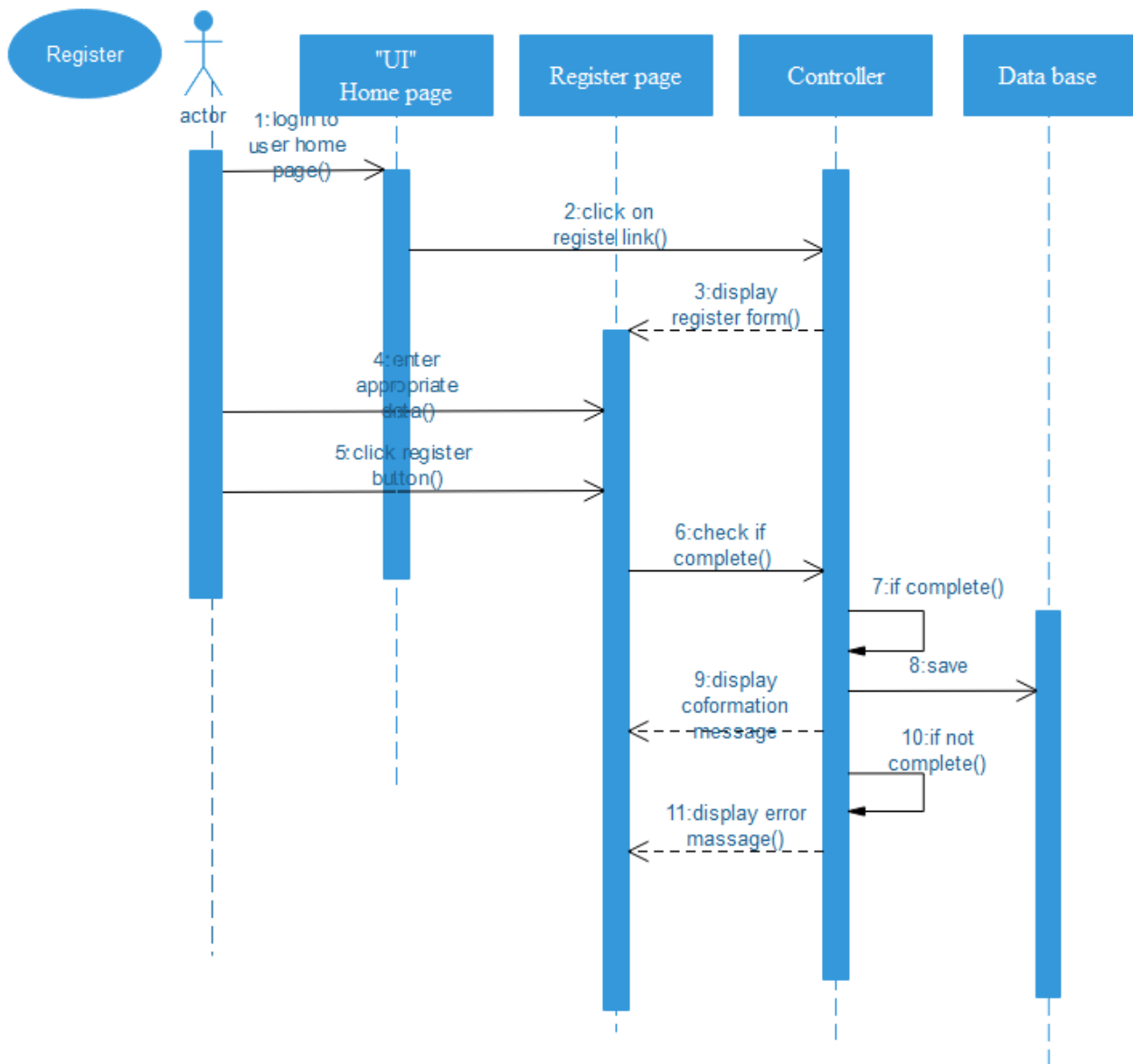


Figure 4. 6 : Sequence diagram for register

4.3.2. Activity Diagram

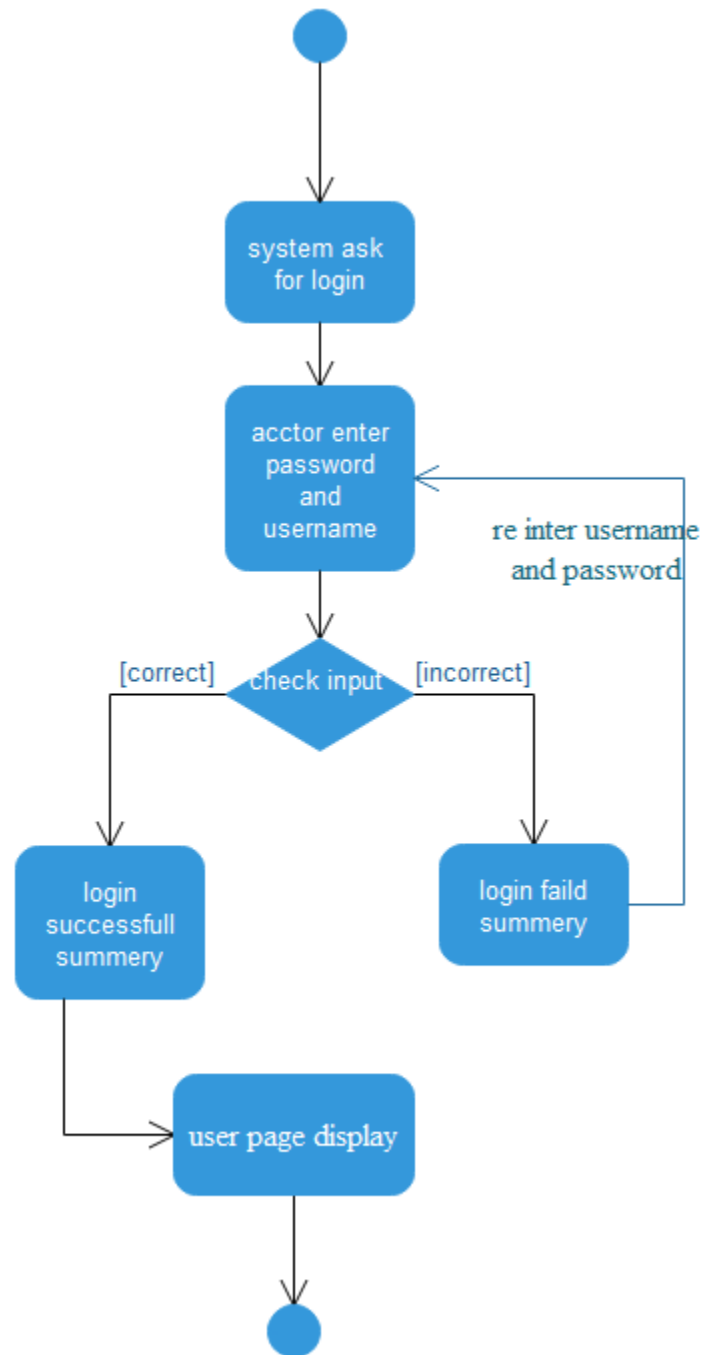


Figure 4. 7 : Activity diagram for log in

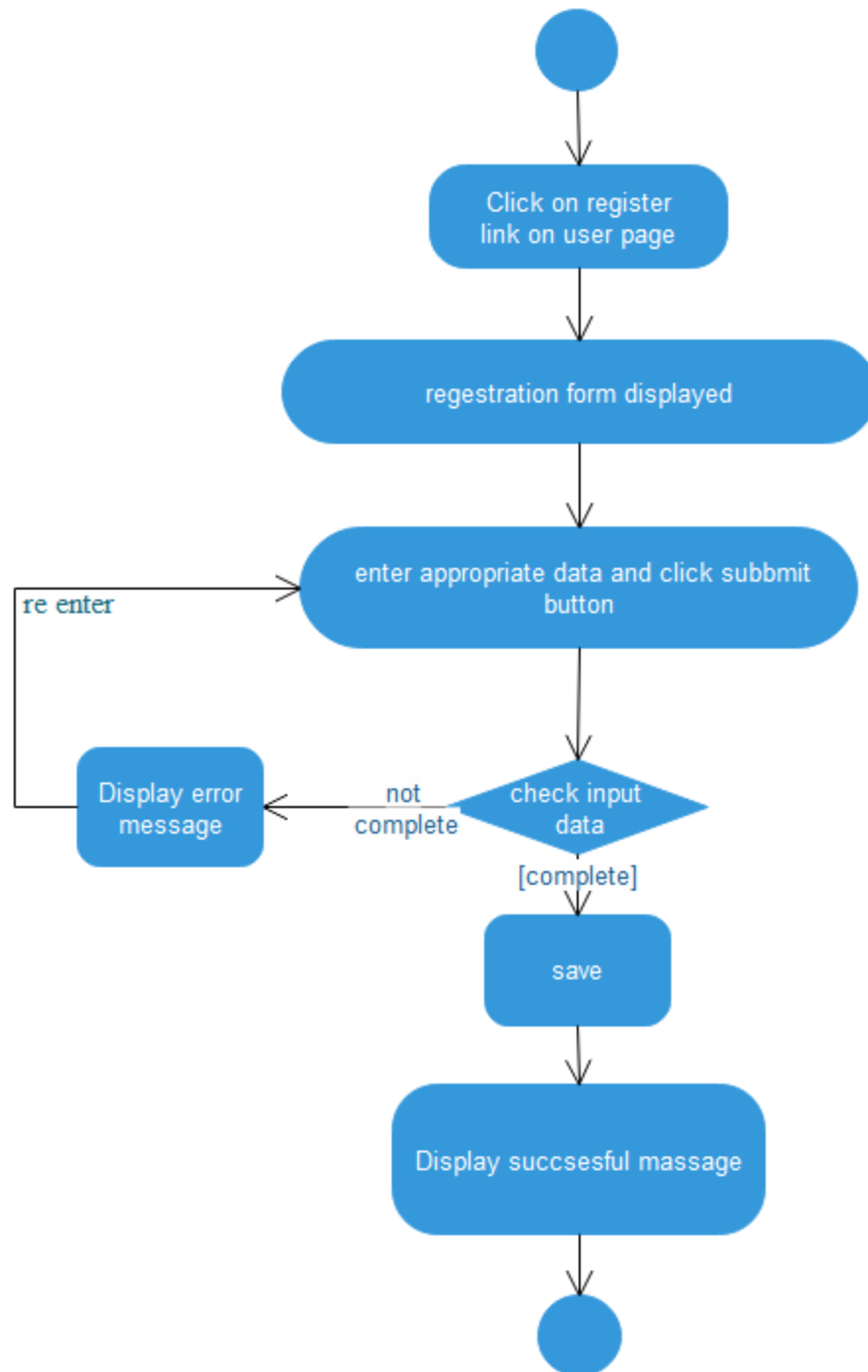


Figure 4. 8 : Activity diagram for register

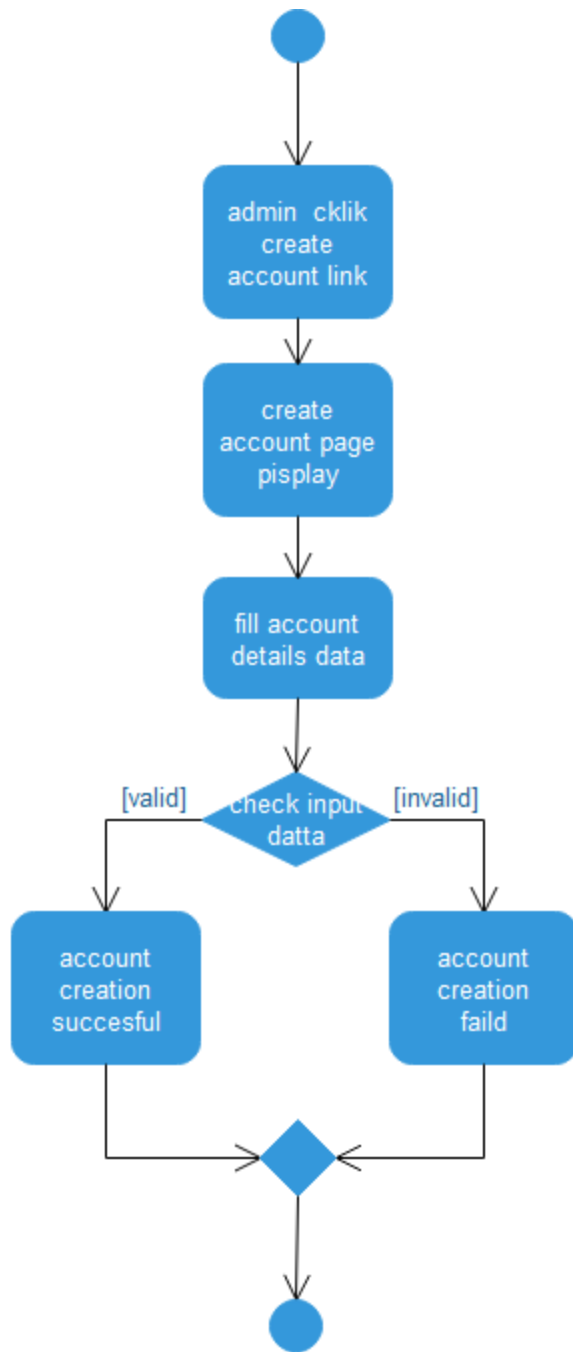


Figure 4. 9 : Activity diagram for create account

4.3.3. State Chart Diagram

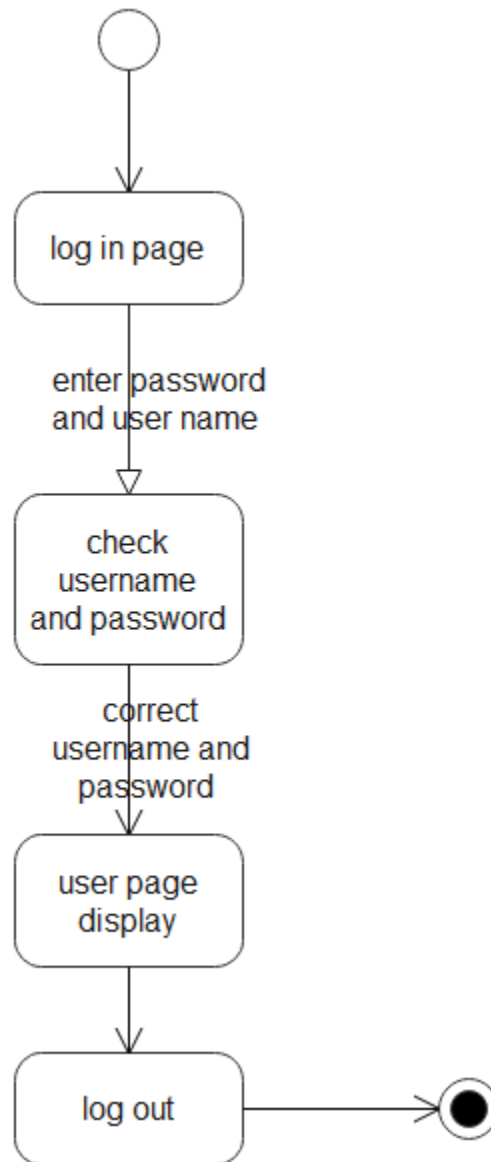


Figure 4. 10 : State chart diagram for log In

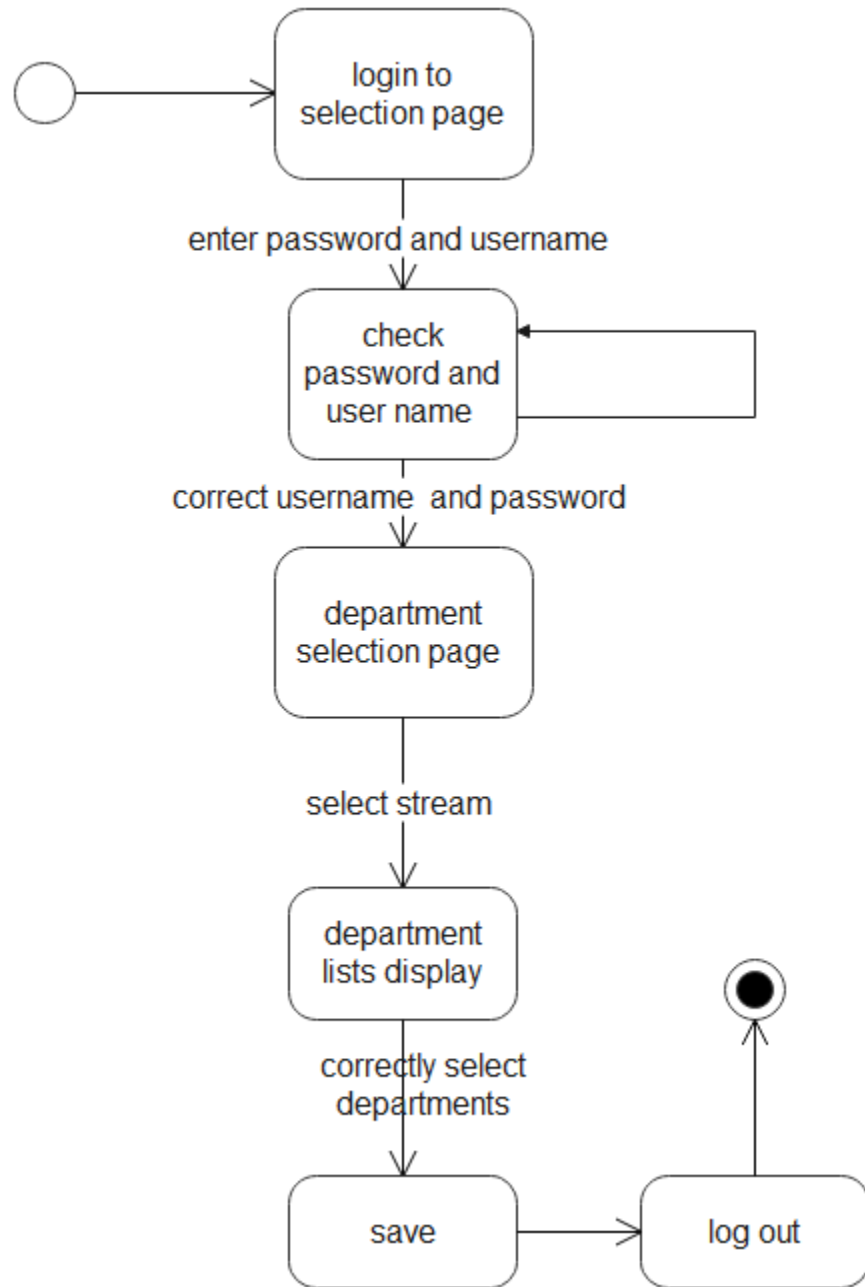


Figure 4. 11 : State chart diagram for select department

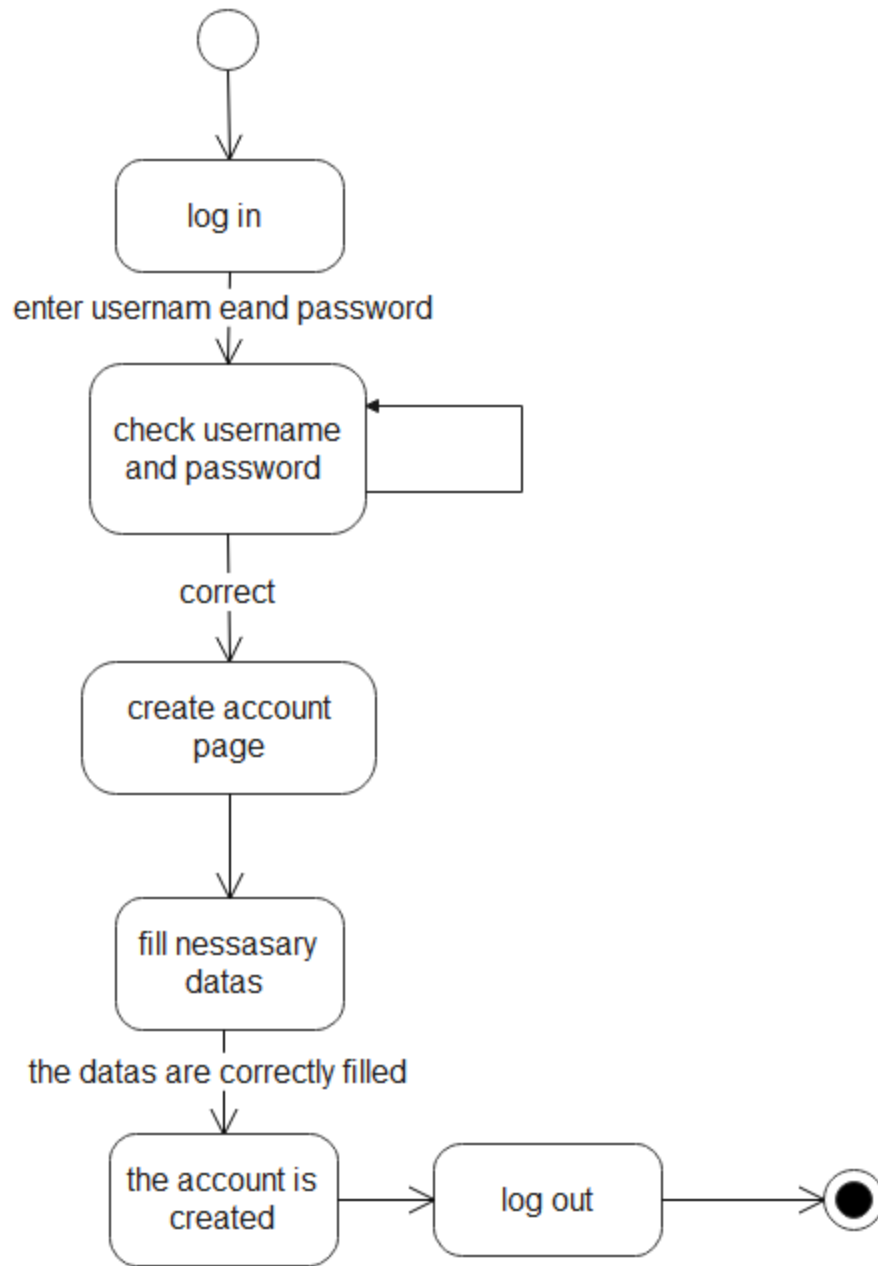


Figure 4. 12 : State chart diagram for create account

CHAPTER FIVE

5. SYSTEM DESIGN

5.1. Design Goals

5.1.1. User interface and Human factors

- ✓ The developed system provide user friendly (interactive) interface which is easy to use.
- ✓ The developed system provides web application user interfaces that are compatible browsers like Internet Explorer, Mozilla Firefox, Google Chrome, etc.....
- ✓ The interface design is aims at a flexible front end communication to provide the user with clear information in navigating a user friendly interface.

5.1.2. Hardware Consideration

For the system there is no need of extra hardware requirement to deploy the system .simply it needs a server. And for the users of the system they needs any type of computer for accessing the system and use it like laptop, tablet, desktop computer and other computing devices.

5.1.3. Security Issues

- ✓ The system is protected with authentication and authorization security mechanism. Any user who wants to login to the system must have a user account on the s.
- ✓ The system does not allow all people to access it, the user must have authorized account with privileges to access the system.
- ✓ An authenticated user with predefined access right will only enter the information related to the database.
- ✓ To prevent credential data like password not easily viewed by anyone so, the system will encrypt those data or information by using cryptography.
- ✓ The system allows only registered users to access the placement system and also allows the users' to create view, and update their own profile, not the other users' profile.
- ✓ Only the administrator has an authority to control over the system so that unauthorized modification cannot be occurred.

5.1.4. Performance Consideration

To increase the performance of the system we will use different mechanisms, like front end scripting to decrease the load on the server .The system support multiple users at a time to access.

5.1.5. Error handling and validation

- ✓ The system uses different validation mechanism to handle errors on the system.
- ✓ The system will handle invalid input i.e. display error message a user's invalid input.
- ✓ If someone tries to access the system with unauthorized ID the system will display error message.

5.2. Proposed System Architecture

Software architecture represents the system software structure of the proposed system. We are going to use three tire architecture of the system. It consists of the front end, middle layer (connector) and back end of the system layers. In the front end it consists of the user interface of the system, the connector consists of the web server, and back end consists of database system (the backup server and server computers).

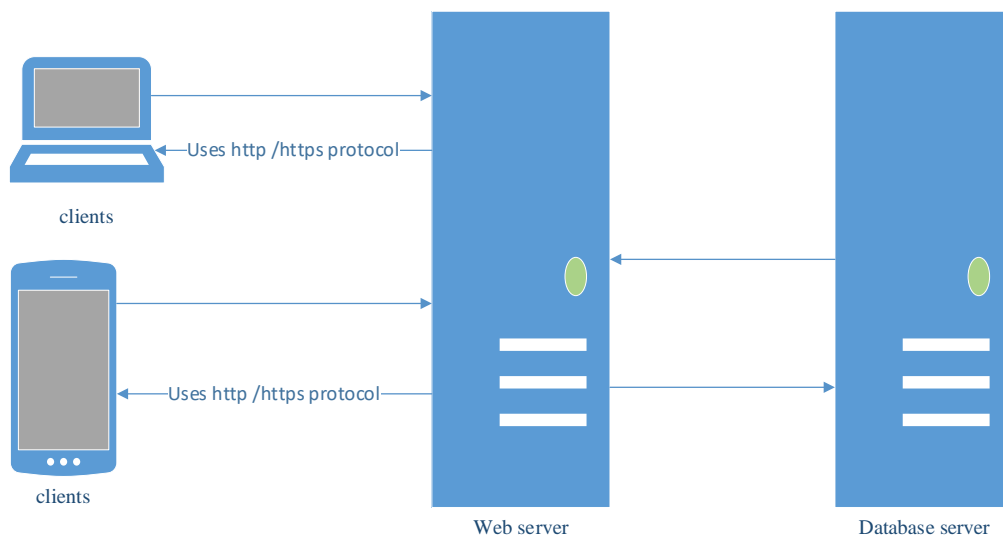


Figure 5. 1 : proposed system architecture

5.2.1. Subsystem Decomposition and Description

To reduce the complexity of the solution domain, we decompose a system into simpler parts, called subsystems. The main need of this portion is to design the external part of the system. Sub-System Decomposition is the way that helps us to distinguish the part of the operations that takes place under the system.

In this project there are four main sub systems those are:-

1. Register sub system

Register student information ()

Register collage and department information ()

Update information ()

View information ()

2. Department selection sub system

Select stream ()

Select department ()

Edit selection ()

View selection ()

3. Student sub system

View account information ()

Select department ()

Complain ()

4. Admin sub system

Create account ()

Department description ()

Add collage and department ()

Delete account ()

5. Database sub system

Connect ()

This are the sub systems of the student placement system.

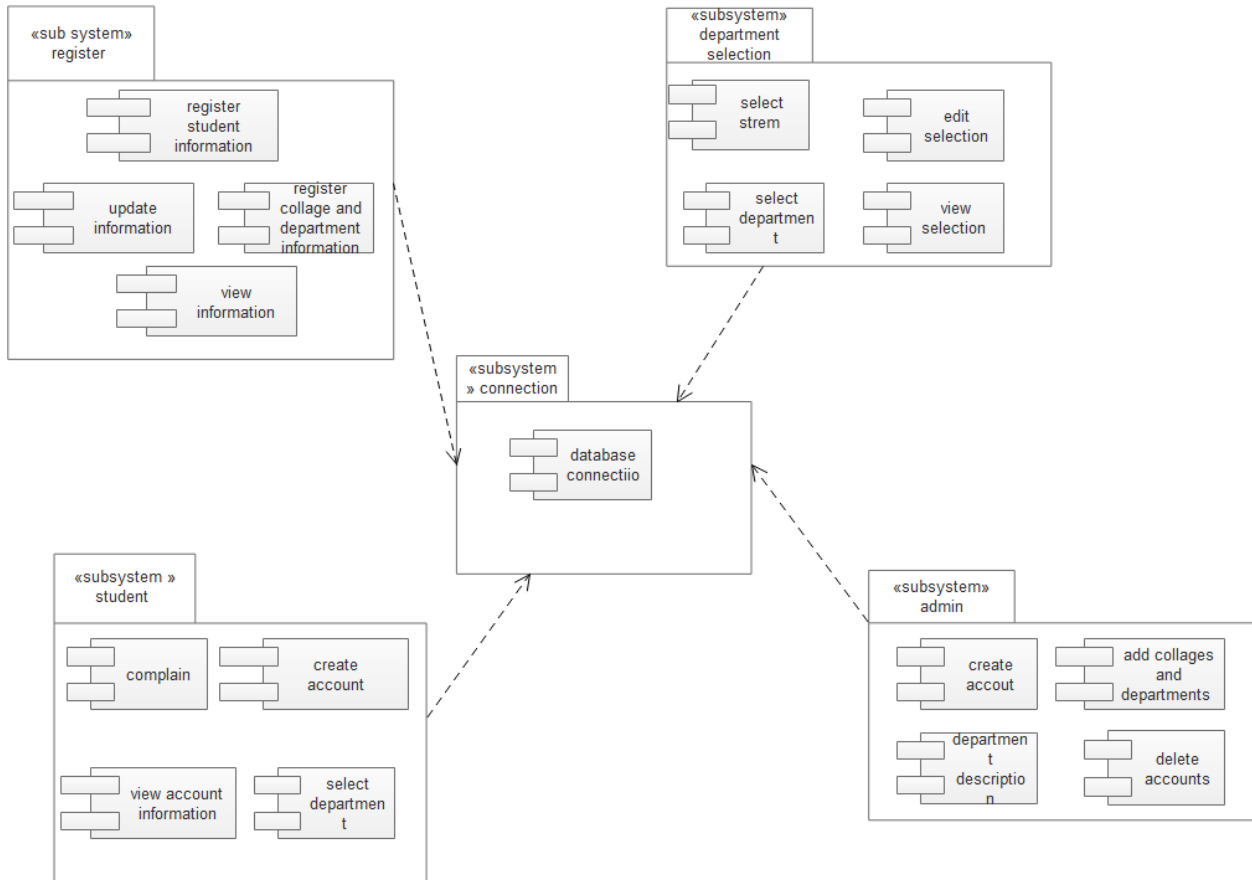


Figure 5. 2 : subsystem of placement student

5.2.2. Hardware/Software Mapping

Hardware software mapping shows that what hard-wares are used and what software s are installed on them. It also show how the hardware and software are connected with each other. And also middleware are needed for connection hard wares with the software. The software hardware mapping of our system is shown below.

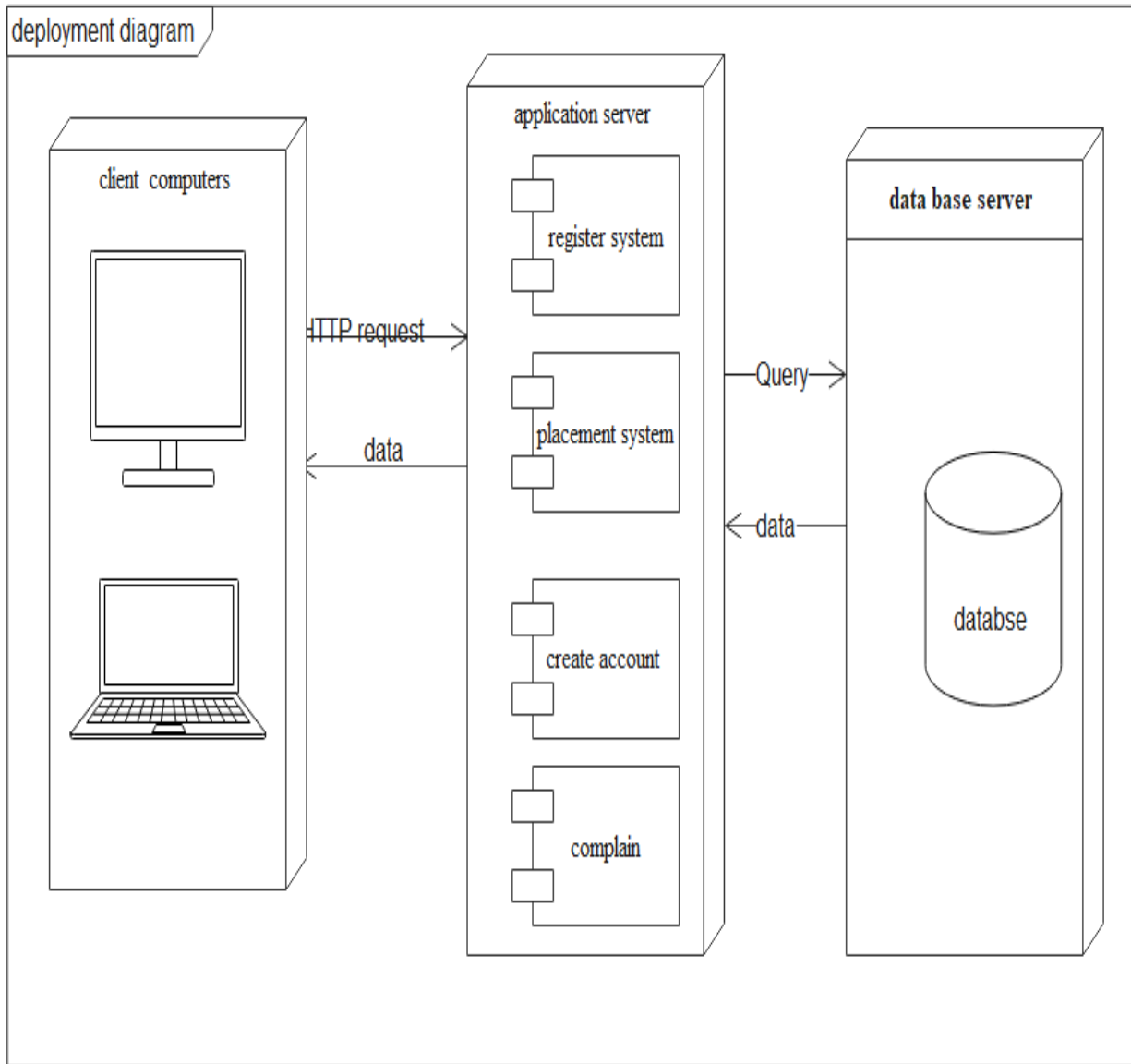


Figure 5. 3 : deployment diagram

5.2.3. Detailed Class Diagram

Class diagram describes the system by visualizing different types of objects in the system and the static relation between them. We this in this in the below class diagram.

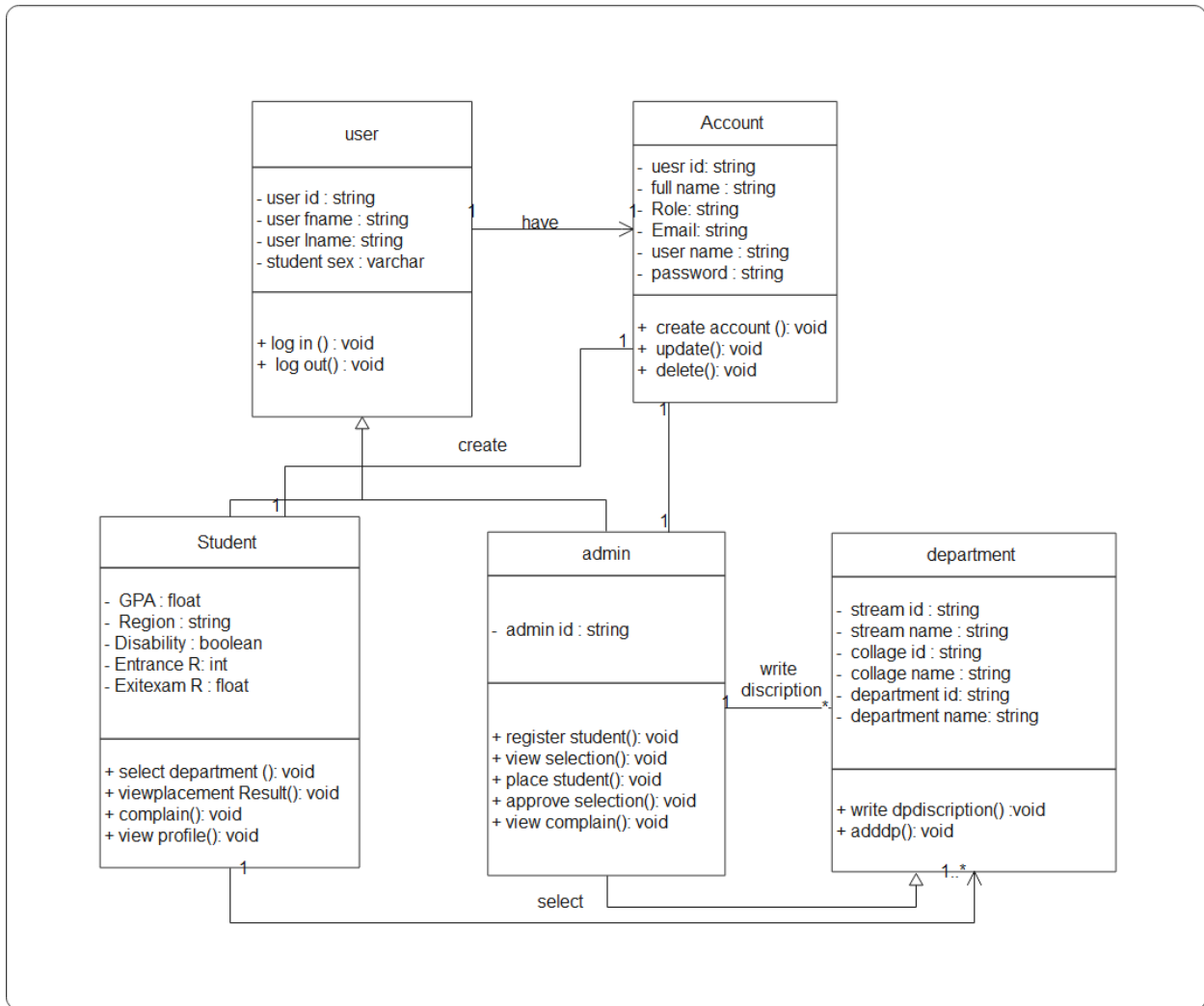


Figure 5. 4 : detailed class diagram

5.2.4. Persistent Data Management

Persistent data management shows that how the class are mapped into to database table .To design the database, we will use the table to indicate what the database looks like and we define appropriate field name, data types and length of the input, primary key, and foreign key.

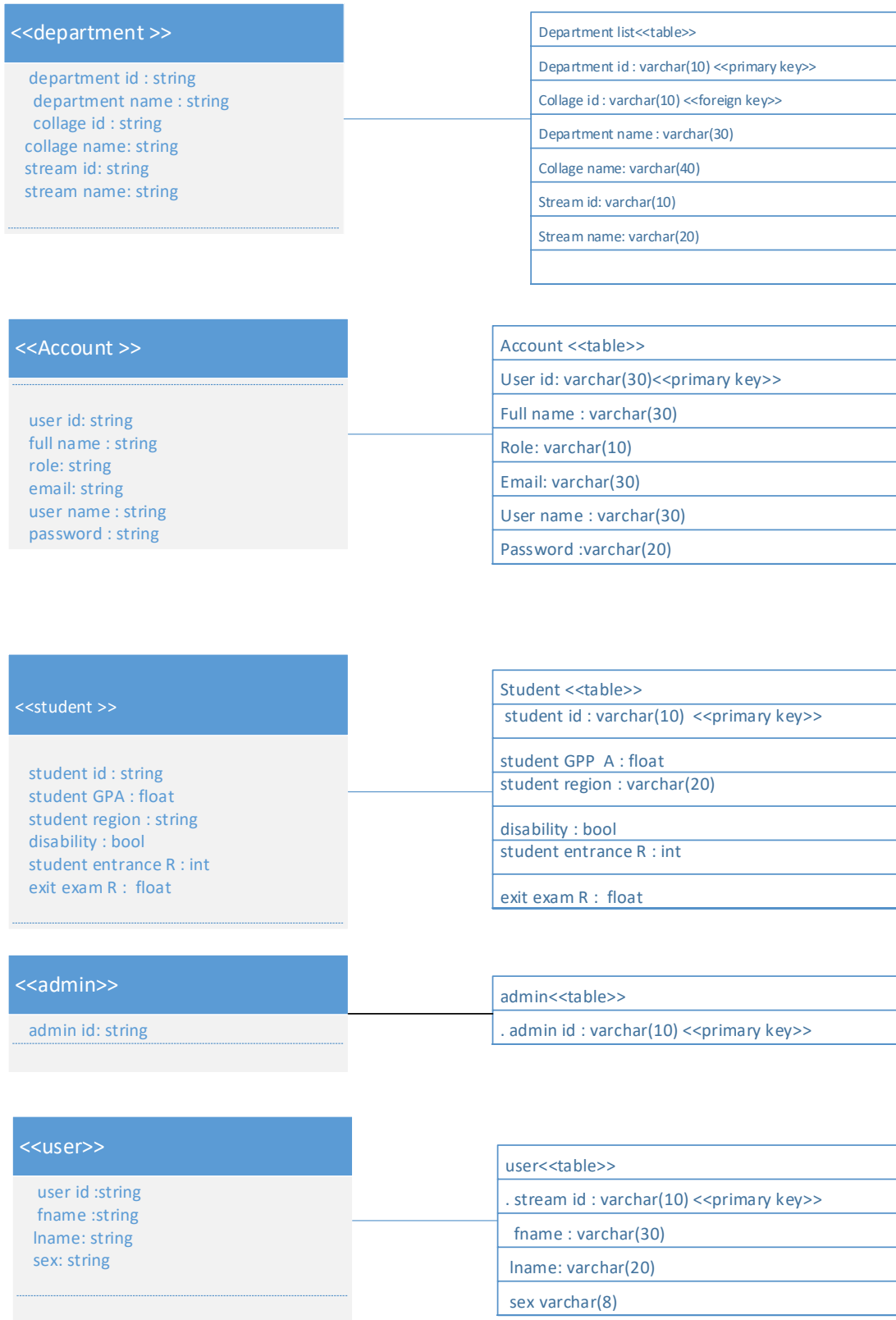


Figure 5. 5: persistence data

5.2.5. Access Control and Security

In this system, different actors have access privileges to different information and data. Access control and security specify what the user can access or what cannot perform by some users. This access control is verified by a username and password. The system admin grant a privilege for users. The proposed system follows multi-user system. In multi-user system, different actors have access to different functionality and data. Then it must be having: -

Privateness: - Only authorized persons can access the information. Private data is kept private.

actors	Operations				
	Register student	Account	Placement	Selection(choice)	complain
Admin	Register	Create, delete, update	place	View, approve	view
student	update	Choose, edit	write

Table 5. 1: access control

5.3. Package

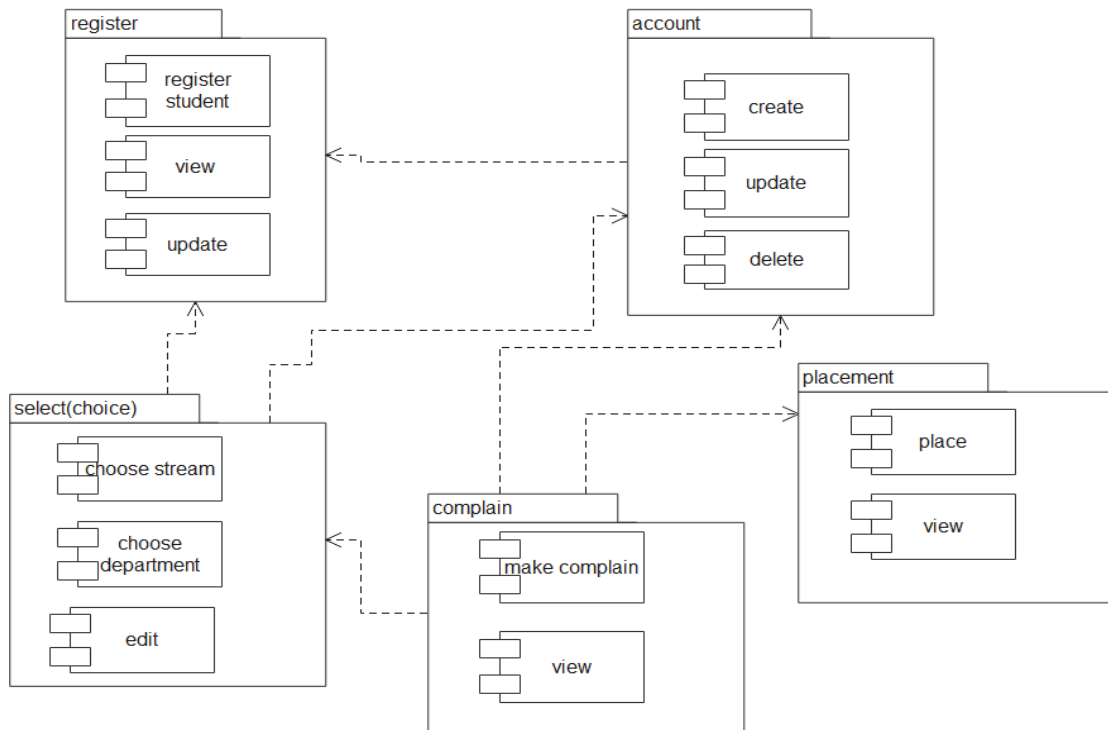


Figure 5. 6:package diagram

5.4. Algorithm Design

Algorithm for log in

begin

If user click log in button

Log in page

Enter credentials

 If (correct format)

 Check from the database

 If(correct)

 Go to user page

 Else

 Display error message

 End if

End if

End if

End

Algorithm for register

Start

If admin click register button

Display register form

Fill data

If(valid)

Register to database

Else

Display error message

End if

End if

End

Algorithm for select department

Start

If student click select department

Stream list

If select stream

Department list

Select department

If(correct)

Success message

Else

Error message

End if

End if

End if

End

5.5. User Interface Design

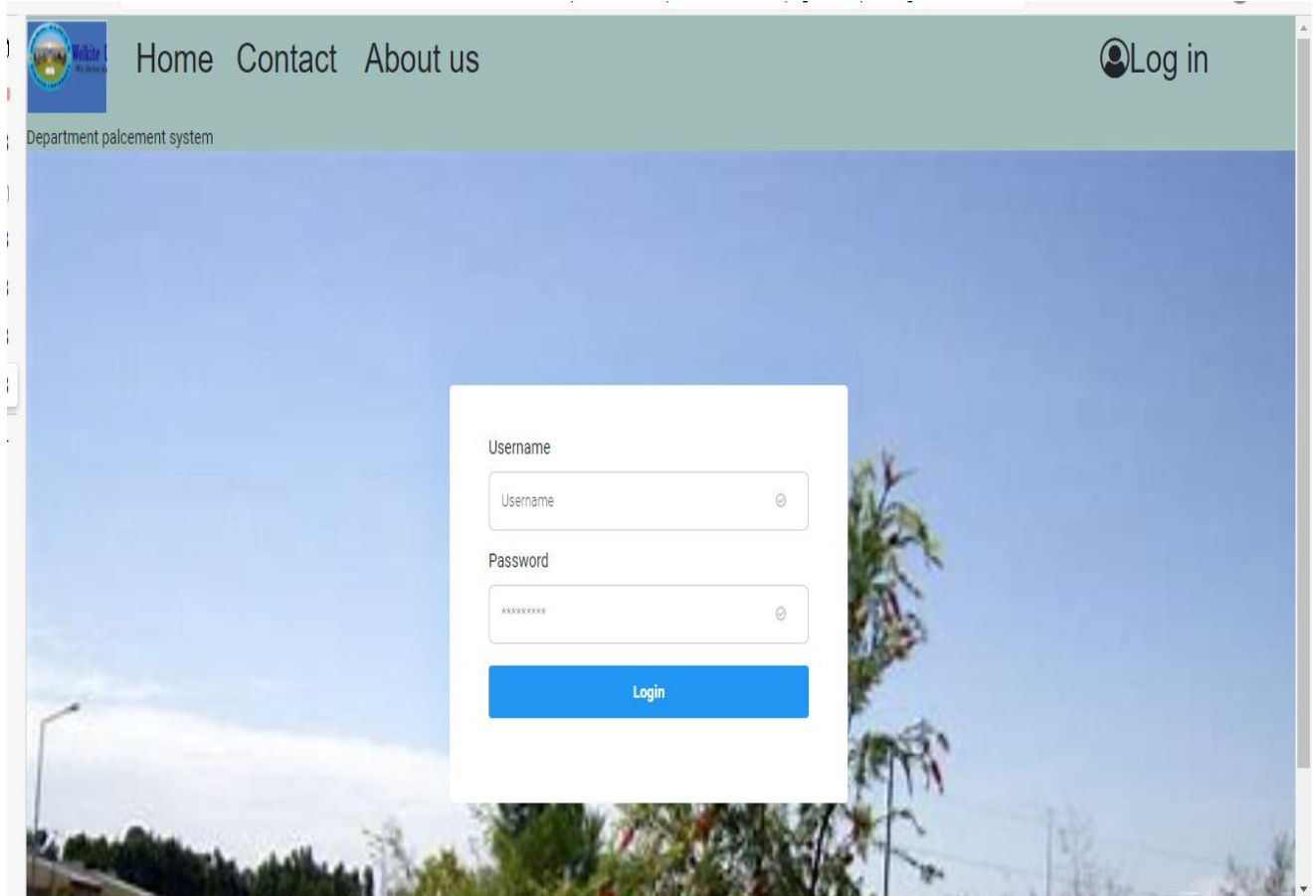


Figure 5. 7 : user login page



Department placement system

choice department from

- department of computer science
- department of software engineering
- department of information technology
- department of information system
- department of mechanical engineering
- department of chemical engineering
- department of food engineering
- department of electrical engineering
- department of construction management engineering

you
can
edit
you
choice
if
you
need
to
edit

edit

Figure 5. 8 : selection page

References:

- [1] “How does the placement system work?”[Online].Available.
<https://www.reading.ac.uk/english-literature/Undergraduate/ell-academic-placements-how-does-the-system-work.aspx>. [Accessed: 3-april-2021]
- [2] “How to Make UML Diagrams.” [Online]. Available:
<https://www.smartdraw.com/uml-diagram/how-to-make-uml-diagrams.htm>. [Accessed: 7-may-2021].

Appendix

Department selection

Students will select their department preference using the following form and submit to college or central registrar.

Wolkite university
First year students department selection form

Student ID _____
(Sample department list and code)

Department name	Code
Computer science	CCI101
Information technology	CET102
Software engineering	NCS103
*****	*****

Rank your references on the following table (sample)

Code	Rank
CCI101	2
CET102	1
NCS103	3
*****	*****

Signature _____




Figure A: department selection form

College selection

Students will select their college preference using the following form and submit to college or central registrar.

Wolkite university
First year students college selection form

Student ID _____
(Sample college list and code)

Collage name	Code
Computing and informatics	CCI
Engi and technology	CET
Natural and comp science	NCS
.....

Rank your references on the following table (sample)

Code	Rank
CCI	2
CET	1
NCS	3
.....

Signature _____




Figure B: collage selection form