

**WEB BASED DISTANCE EDUCATION MANAGEMENT
SYSTEM FOR DEBRE MARKOS UNIVERSTY**

Submitted by

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Under the guidance of Matebie H. (MSC)

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ABSTRACT

Distance education process is one of the basic sub systems of teaching and learning system. Currently in DebreMarkos University, the distance education is going on manually. Because of this manual system have so many difficulties on its progress in terms of effectiveness. Some of those difficulties are students do not get updated information, students cannot get fast access of reading materials, submission of assignment is not secure it may be lost before reaching to the office. The proposed system stands for avoiding the difficulties and side effects of the existing system. So the project we are going to develop will try to recommend those problems and providing prototype of the system to be developed by the program. Because the system to be developed is online, it includes online registration of the students, uploading modules and assignment, posting new information etc.. This project is not valuable only for students but also for the University. Because it minimizes burden of the employees to distribute modules and the registration process.

APPROVAL OF ADVISOR AND EXAMINERS

This project has been submitted for examination with our approval as the project advisor.

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DECLARATION

We,undersigned,declere that thesis our original work, has not been presented for a degree in this or any other university, and all the source of material used for the thesis/project have been acknowledged.

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List of Acronym and Abbreviations

BR-----	Business Rule
HTML-----	Hyper Text Markup Language
CSS-----	Cascading Style Sheet
PHP-----	Hyper Text Pre Processor
ID-----	Identification
UML-----	Unified Modeling Language
SUC-----	Use Case
WAMP-----	Windows, Apache, MySQL, PHP
MYSQL-----	My Structured Query Language.
ACA-----	Alternative course of action
DVD-----	Digital versatile Disc
CD-----	Compact Disc

CHAPTER ONE

1.1 INTRODUCTION

It is well known that technology have gained world-wide attention in different applications areas, particularly with proliferation in Information System. Specifically the profit of technology has foreseen solution paradigm in academic application. Technology can change the way teacher teaches and learner learns. Currently obtaining education service at higher institutes in difficulty for reasons: Possible limitation of capabilities with an education environment and disabilities that limit to enjoy higher educational institutions. Moreover, the need to travel becomes hindrance to achieving higher educational because a large number of people live a greatest distance from the educational institutions. Also the competition for the market of jobs are requiring the higher education qualification for further employment success. Particularly, nobody willing to surrender their income due to their current lifestyle or the need to support their family. Some paradigm of education at higher institution must reformulate to address aforementioned problems. Distance education programs are key solution to the above-mentioned problems. With Distance education learning programs, one can gain study at higher institutional education wherever i.e. without having to leave home or a job to obtain higher education. The programs enable it possible for students qualified to higher education without having to lost their career and time. [6]

1.2 Motivation

We are very interested to develop web based system for Debre Markos University Continuing and Distance Education because of the following reasons:-

- Until this day computerized system wasn't developed
- To solve complexity of the office by develop web-based system
- To improve our knowledge regards to how to develop systems related to teaching and learning process
- To provide alternative solutions with some prototype to Continuing and distance education.

1.3 Background of the project

There were many departments in DMU that give services to the university's students when it was started teaching and learning process. After a time, it developed and Continuing Distance Education program. Debre Markos University of continuing and distance education (CCDE) was established 10 years ago with continuing education program (CEP). It started with Certificate and

Degree Programs in the fields of Accounting, business, Economics, Biology etc...delivering education at DebreMarkos University.

The distance education program was initiated in 2010E.C to deliver education (to the level of Degree) in several fields of education (like Economics, Management, Accounting, and Law) under the Faculty of Education. Distance education centers were opened in DebreMarkos University and Burie campus and Bechena campus city Administration.

The role of this program is to give educational service for the students who cannot learn in regular program by working in other places further apart from the university. But, the system of distance education is manually and paper based. Still no one has been tried to automate it. Still is working different activities through this manual system. Because of this, facing a lot of problems such as loss of data or paper; wastage of time in data processing, lack of manageable tasks, burden of work on workers, etc. As the DebreMarkos University Distance Education becomes growing its service providing also becomes complex and it is difficult to accomplish in efficient way because the system is manual system. So, needs to be automated. [5]

1.4 Statement of the problem

Since Debre Markos University Distance Education existing system performed all the activities manually, it leads to many problems. During requirement gathering we have notice that the college has done everything manually. They also manage student files manually. It is highly error prone and tedious work for the employees to handle the data recording process manually. And it's also time consuming. Sometimes there is also a situation that the data or file may be lost. Some of the main problems of the manually operating Distance Education system are:-

- The basic problem of manually distance education is lack of student's Satisfaction.
- Students don't have opportunity to get updated information on time. I.e. since the system is manual based the information that were distributed for students may be modified, deleted, or changed. Example, the registration date, exam date and receiving materials were make confusion.
- It takes high cost to duplicate learning material and distribution
- Loss of data or paper; wastage of time in data processing, lack of manageable tasks.
- Employees also facing a lot of problems with the existing system (such as, Overburden work for employees).
- Overburden work for the departments and colleges during providing the service to the Students like distributing materials for students is another problem.

1.5 Overview of the proposed system

The proposed web based Distance Education management system solves the existing system problems, which was carried out manually. Mainly focuses on solving the problem of managing student file and student registration by developing a web based application for distance education program. This system enable the distance education program to manage the student file management handled easily and also it makes the retrieval of those file super easy. Even if the main aim of this project is to develop a computerized system that manage student file and record, it also perform related work like Distributing modules, allocating assignments, announcing registration and examination dates , applying for registration, registration and different user account management activities are performed in automated way. So, it reduces the time and task required to perform the operation within the office and for students, better satisfaction of the speed provided by the office in module distributing and submitting assignment.

1.6 Objective of the project

1.6.1 General objectives

The general objective of this project is to develop interactive web-based system in order to overcome the problems some subsystems with the existing system.

1.6.2 Specific objectives

In order to achieve the main objective, the team has considered the following specific objectives have to be take account during developing of new system. These specific objectives are:

- Understanding the existing continuing and distance education system
- Developing an intuitive user interface for the students, instructors and privileged body.
- Develop a system provides application interface for uploading, downloading, submitting assignment and modules; and provide online assessment.
- Find out the requirement required to design the prototype
- Design the proposed prototype for the existing system, based on the business rule.
- Implementing the desired system
- Testing and validating the developed system
- Organize the document so as to submit for evaluation purpose

1.7 Scope of the project

Currently, Debre Markos University may run many approaches to innovate educational philosophy. The scope of this project is restricted to the developing of online distance education system using web-based technologies in order improve quality of education and minimize manual operation burden.

In DebreMarkos University online Distance education system has the following sub systems will require to be automated.

- Distributing module via the internet
- Distributing assignments for distance learners
- Receiving those submitted assignments from distance learners
- Posting information
- Adding, updating and searching student information
- Generating necessary information

1.8 Limitation of the project

Due to the shortage of time and security problem (e.g. at the time of examination it is difficult to secure) the following activities are not included to be automated in our system. It is better to inform others who are interested to do on this project.

- Providing tutorial online
- Online examination
- Online video learning
- Online payment

1.9 Significance of the project

After completion of this project it provide the following significant for DebreMarkos University distance education;-

- To minimize work complexity of the existing system
- To minimize cost of copying or duplicating materials
- To reduce wastage of time to submit assignments
- It saves money and times to student.
- It will provide updated information to distance learners such as announcing the registration date, new curriculum and etc.
- The learner can schedule learning around other aspects.
- It allows the learners to study wherever they have access.
- It provides extra knowledge of using computer to students.
- For the office of CDE; it will reduce cost of learning materials to duplicate and distribute.
- The students can download learning materials (module) and assignments.

1.10 System Requirement

System requirements are the hardware and software components of a computer system that are required to do the proposed system and simply identify tools and methodology. There are different System requirements:-

1.10.1 Hardware requirement

Hardware requirements are the touchable and visible components that are necessary to develop a system.

- **Computers:** To do different activity or applications.
- **Flash disk (8GB):** To store data. The data in the computer may be lost because of different cases and to take available data from different sources.
- **CD (700MB):**-To store data and take back up.
- **Pen and Paper:-**To design the system before typing on the computer
- **Mobile:-**for idea exchanging

1.10.2 Software requirement

The software requirements are the instructional components used to develop a system. Software requirement to develop system are as follows:

- **Wamp server:-**includes MYSQL, apache, PHP and Windows.
- **Editor:-**Notepad++, notepad
- **Edraw Max and Visual paradigm editor:-**For drawing different UML diagrams.
- **Browser:** -chrome, Firefox, opera, UC browser, Internet explorer used to run the program.
- **Microsoft office word 2010:-**For writing documentation
- **Microsoft PowerPoint 2010:-**For presentation
- **Window 7:-**An operating system

1.10.3 Programming language & database tools

Programming language is important to complete the system in the best way and to make it good, easy and interactive with the customer. The project includes both front-end programming language and back-end programming languages.

- **Front –end programming:** -refers to the part of the web users interact with which are all controlled by the browser [1]
 - **Web based (PHP):**-a server is scripting language, and a powerful tool for making dynamic and interactive Web pages. It is a programming language that allows web developers to create dynamic content that interacts with databases.
 - **HTML and CSS:-**used to design the system(to apply sets of style characteristics and to create web pages for a website)
 - **JAVASCRIPT**(for form validation)
- **Back-end programming:** -An application responsible for calculations, business logic, database interactions, and performance. It runs on the server.
 - **SQL and Wamp server:** -are used to store data

1.11 Data Collection Methodology

1.11.1 Data gathering techniques

The methods we used for data collection are:

- **Interviewing:** to find which problems are available in the current system, important questions raised while interviewing.
- **Document analysis:** we have read the document available in DebreMarkos University.
- **Observation:** we used in order to analyze the conditions to which the current system is acting. It is useful to observe how jobs are done, how information flows.
- We use different reference books and internet

1.11.2 System Development Tool

Object oriented system analysis and design: -The team plan to use the OOSAD Development Methodology for the development of the system among the different methodologies. Because it is better way to construct, manage and assemble objects that are implemented in the system. Typically OOSAD uses Unified Modeling Language (UML) to represent and visualize the interacting objects and models in the system. This may include the following:

- Use Cases
- Use case diagram
- Class Diagrams
- Activity Diagrams
- Sequence Diagrams

1.11.3 System analysis and design Methodology

- Among the different methodologies available we are using object oriented methodology for the analysis and design of the system. Object oriented methodology enables us to represent complex relations among different objects and represent data and process with consistent notation throughout the system

1.12 Feasibility study (Technical, Operational, Economical and Legal)

1.12.1 Feasibility study

Our system is feasibly in beneficial and practical to the development of Distance Education in an information system. Given enough time, money, and personnel, almost all our system project is feasible. Feasibility of our system study provides the information that allows management to:

1.12.2 Economic feasibility

The system which we have developed is economically feasible. It is financially affordable. And have economic benefit. The costs that we used to develop this project are lower than the cost that

will reduce to the user after it developed. This project reduces costs in terms of stationary and transportation cost.

Stationary costs: after this project develop, reduces the cost that distance learners pay to copy and to buy paper and pen.

Transportation costs: reduce the costs of transport to come to the university from long distance.

1.12.3 Operational feasibility

The system which we developed is operationally feasible. It works well all the solution in the Distance Education system. This system is web based system for distance education system in Debre Markos University. So it attains its desired objectives. It will solve the problems in distributing module and assignment; therefore it will minimize the amount of effort to do all through manually. And it performs the basic functionalities that planned to use.

1.13.4 Technical Feasibility

The system which we developed will be technically feasible. The system is technically feasible since the teams developed it easily by using simple programming languages and software's like: html, JavaScript, MySQL, pup. These languages are simple, open source and already known, so the team developed the system easily. We expect that, the system can be operated in simple way and all users can access easily by giving simple training for them. It doesn't require any technical expertise and can be integrated with the existing system.

1.14.4 Legal feasibility

The system provides web based distance education for Debre Markos University without traveling far from their home. The system doesn't contradict the law of the country.

CHAPTER TWO

SYSTEM ANALYSIS

Introduction

The process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way

2.1 Overview of Existing System

The existing system of Debre Markos University Distance Education is manually operated. Different activities are performed as follow:

The department gives education service for the students at these sectors. First the students apply to register by coming personally to one of the specified sectors. Then the department has its own criteria to approve the student's application. The center employee/supervisor checks the registration form filled by the student whether it satisfies the criteria or not. If the student satisfies these criteria's he/she will be approved to be registered. Then after the approval, the student will pay the payment for the courses that he/she will take. Then the student will be registered and start the class by the schedule posted by the department. The department handles this information manually. And the file management system is paper based. So, the information recording or filling and retrieval system is too tedious, error prone, and also time taking.

Distributing modules, allocating assignments, announcing registration and examination dates and some other activities are performed by distance education office.

2.1.1 Users of the Existing System

Users are external entities that interact with the system. Users which have involved in the existing system were:

Student: In the existing system, takes tutorial, exam, learning materials and assignments distributed by **Logistic and module distributor** and also payee learning fee, submit assignment.

Applicant: In the current system apply to register.

Logistic and module distributor: In the current system distribute learning materials.

Instructor: In the existing system prepare module, exam, give tutorial and collect assignment.

Registrar officer: In the current system prepare grade report, transcript and register student, prepare tempo, prepare academic schedule and, manage schedule.

Department: In the current system assign instructor, accept and reply question raised by student approved grade.

Academic vice president: In the existing system verify academic schedule that prepared by registrar.

The current system we observed is face a lot of problems, due to this reason we analysis those problems to provide some alternative solutions in the new system.

2.2 System Requirement Specification

A Requirement is any function, constraint, or property that the system must provide, meet, or satisfy in order to fulfill its purpose. It is focus on business user needs during analysis phase. Requirements change over time as project moves from analysis to design and implementation. [2]

2.2.1 Functional Requirements

A functional requirement describes a particular behavior of function of the system when certain conditions are met. [8]

Functional requirement is a function or feature that must be included in an information system to satisfy the system need and be acceptable to the user. In short it is an action of the system.

Functional requirements that must be included in the system are:

- **Login to the system:** authorized user can login to the system using his/her username and password.
- **Manage user's account:** administrator, registrar officer, instructor, DEP officer, Director Academic vice president and students must create their account update if it is necessary.
- **Uploading modules and assignments:** enable a CDEofficer upload module and assignment questions as well as download assignment answers submitted by students.
- **Downloading modules and assignments:** enable student to download module and download assignment questions.
- **Post updated information:** DEP officer must post information for students such information is, registration date and changed policies in the distance education etc.
- **Payment and load calculation for employee worked time:** The employee worked time must be calculated and pay
- **Online application to the Examination:** the examination date must be also posted on the page

2.2.2 Non-functional Requirements

Non-functional requirements a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. They are contrasted with functional requirements that define specific behavior or functions. [6]. Non-functional requirements describe user-invisible aspects of the system that are not directly related with the functional behavior of the system that are listed above. A non-functional requirement is a statement of how a system must behave; it is a constraint upon the systems behavior. They specify criteria that judge the operation of a system, rather than specific behavior.

The proposed system is feasible in terms of:

Performance: there is no ambiguous data fetched on the system and no wastage of time to organize and integrate file. Due to this the our system is good in performance

Security: The system doesn't allow unauthorized users to log into it and modify records. Additionally, one user can't access other's user profile. Those security mechanisms play a great role for the system.

Availability: The system is available at any time in the presence of intranet connection. So, the users of system can access the system successfully.

Reliability: The system should handle invalid inputs and displays error message to users. Reliability is one feature of the system significantly validates user inputs.

Maintainability: The user interface is user friendly and interactive so it is easy to fix while errors occur. The failure of the system causes many problems repairing the system must not be difficult since it undermines users to easily fix the system.

Portability: This system is portable, since it runs on different platforms. Running on different platforms makes the system accessible by users

Error Handling: When a user interacts with the system errors may occur. To control this kind of inaccuracies the application will generate different user friendly messages.

2.2.3 Business Rules

This part specifies and gives understanding of activities which are being done in the existing system in terms of business rule.

BR1: Applicant who have Ethiopian school leaving certificate examination (ESLCE). It must be qualified ministry of education university entrance result of higher education institute. Applicant who have successfully completed 10+2 (preparatory) education and qualified by ministry of education(MOE) higher educational institute university entrance result .

BR2: Applicants who have successfully complete ten-plus-two (10+2) preparatory school education can apply to the distance and continuing education program.

BR3: Students must pay 50 birr for application to the finance office in its internal bank account

BR4: Applicants must provide original documents and their required number of photo copies which the office may require.

BR5: The University determines registration date and clarifies required criteria.

BR6: Applicants who want to join Debre Markos University must have full of documents and qualification of Ministry of education certificates.

BR7: Student should be registered on the specified registration date.

BR8: Each student should have unique identification card to be identified.

BR9: Student should have to pay education fee to get access in this program.

BR10: Choice of field study is based on the applicant's interest.

BR11: The grading system in the DE is the same as DMU regular students

BR12: To be accepted by natural science fields, the student must be natural science student

2.2.4. Constraints

At higher education institute, Distance education system is an important method of delivery of many education services. The program provides many benefits for universities as well as for students. However, some constraints that could face the new system are:

- **Resource Constraints:** Distance learners have access to university's resources for many academic reasonable purposes. However, unexpectedly the system does not provide this provision or limited bandwidth from home to access the university resources.

- **Student Interaction Constraints:** Distance education learning is non-competitive environment community where it is not about who has score best grade, but it's about to succeed. This implies the interaction of student is very important.
- **Technological Constraints:** This system is developed to be software platform independent. But, there may be little performance differences using some OSs and some output distortions using different types of browsers. Additionally, the system introduces the computer as the technology in delivering education service, which may load and perform slowly.
- **Skill Constraints:** Instructor and learner may suffer to uploading and access to the system(It needs some computer skill to operate on the system).And also
- It's not suitable for disable person, like blind people.
- Lack of Internet connection.

2.2.5 Risk Assessment & Management

The project can't be completed as it is initially planned. This is due to the fact that a problem may happen in the process of project development. We assumed the following risks can be encountered:

- The unavailability of data source (information gathering) on time may extend the project completion time. We will manage this problem by searching information from website of Debre Markos University
- Damaging the computers that we work on, it will be managed by using backup.
- Unavailability of internet also another problem we will use other reference materials
- Shortage of Time. We managed such problem by using additional time from our rest time.
- Virus can attack our project. We used updated antivirus to manage this problem. Power fluctuation problem. It is using laptop that have high power pack ups are used.

2.3 System Requirement Analysis

2.3.1 Actor and use case Identification

Actors: An actor represents a type of users of the system that the system interacts with.

Use cases: A use case describes the sequence of events of some types of users, called Actors, using some part of the system functionality to complete a process.

The purpose of actor analysis is to identify all of the actors that interact with the system. An actor is a user of the system playing a particular role.

The actors that interact with the new system are:-

- | | |
|-----------------|---------------------------|
| ➤ Administrator | ➤ Registrar officer |
| ➤ Instructor | ➤ CDE officer |
| ➤ Student | ➤ Academic vice president |

- Finance Staff
- Department head
- Collage Dean

The following use cases have been identified from the system specification that each actor performs its activities.

Administrator:-

- Login
- Register user
- Restore Backup
- Create account
- Update account
- Take Backup
- Change password

Registrar officer:-

- Login
- Import Student Data
- Prepare grade report
- Prepare academic schedule
- Generate ID card
- View Grade report
- Update grade
- Change password

CDE officer:-

- Login
- Post Announcement
- Upload module
- Prepare module schedule
- Prepare payment load
- Add Programs
- view academic schedule
- View uploaded Module
- Change password

Academic vice president:-

- Login
- View generate report
- View academic schedule
- Change password

Instructor:-

- Login
- Upload prepared module
- Upload assignment
- Downloads submitted assignment
- Record course result
- View course result
- Post course result
- View assigned course
- View uploaded assignment
- Change password

Student:-

- Login
- Download module
- Download assignment
- Submit assignment
- View Grade report
- View course result
- View entered result
- Send feedback

- See news

- Change password

Finance Staff:-

- Login
- Control Payment
- Change password

Collage Dean:-

- Login
- Submit employee load time
- View academic schedule
- Change password

Department head:-

- Login
- Assign instructor
- View academic schedule
- Prepare employee worked time
- Register course
- Approve grade report
- Approve course result
- Post notice
- Update notice
- View grade report
- View course result
- Change password

2.3.1.1 Use case Description

Table 1 Use case Description

Use case name	Use case ID	Uses/includes
Manage user account	Suc01	Login
Upload module	Suc02	Login
Upload assignment	Suc03	Login
Download module	Suc04	Login
Download assignment	Suc05	Login
submit assignment	Suc06	Login
Post updated information	Suc07	Login
Prepare grade report	Suc08	Login
View Grade report	Suc09	Login
Prepare tempo	Suc10	Login
Control Payment	Suc11	Login
Change password	Suc12	Login
Assign instructor	Suc13	Login
Approve grade	Suc14	Login
Post notice	Suc15	Login
Assign instructor	Suc16	Login
Give feedback	Suc17	Login
See news	Suc18	Login

Generate ID card	Suc19	Login
View Generate report	Suc20	Login
Prepare module schedule	Suc21	Login
Update notice	Suc22	Login
Add course	Suc23	Login
Prepare academic schedule	Suc24	Login
View academic schedule	Suc25	Login

2.3.1.2 Use-case Diagram

Identifying the activities that mainly performed on the proposed system is the basic thing in modeling a new system. Use case diagrams graphically describe system behavior (use cases). These diagrams present a high level view of how the system is used as viewed from an outsider's (actor's) perspective. From the identified use cases and actors the use case diagram of the system is shown below. [1]&& [4]

A use case diagram contains four components.

- **Boundary:-**which defines the system of interest in relation to the world around it.
- **Actors:** -usually individuals involved with the system defined according to their roles.
- **Use cases:** -which the specific roles are played by the actors within and around the system.
- The **relationships** between the actors and the Use cases

Table 2 Use-case description for Manage user account

Use case name	Manage user account
Identifier	SUC01
includes	login
Description	1. Administrator creates new account for users. 2. Administrator can delete user account such as student's account for example, during termination or leaving the distance education program.
Actor	Administrator
Pre-condition	1. An administrator should have to enter a valid user name and password in order to create and delete user account.
Post-condition	If an administrator entered valid user name and password then he/she can create and delete user account successfully. Finally logout the system.
Basic course of action	
Actor	System
Step 1: Administrator enters username and password. Step 3: The administrator search the user's account to be modified. Step 5: The administrator modify the account.	Step 2: Then the system should verify the user name and password. Step 4: User's account will be displayed. Step 5: The system display successful message Step 6: The use case end
Alternative course of action	A1. Confirmation message will be displayed And A2. The system returns to step 1.

Table 3 Use-case description for upload module and assignment

Use-case name	Upload module and assignment
Identifier	SUC02
includes	login
Description	The instructor will upload the module and assignment prepare the uploaded material
Actor	Instructor
Per-condition	The instructor prepare the module to be uploaded
Post-condition	The instructor will upload the modules and assignments for the course he/she instructing

Basic course of action	
Actor	System
Step 1.The instructor want to upload module and assignment Step 2.The instructor enter into the system Step 4.The instructor select login link Step6.The instructor enters correct username and password Step 9.The instructor select upload module and assignment link Step12.The instructor select the department, year, semester, course(the course he/she is instructing) Step13.The instructor browse and upload module and assignment	Step 3.The system display home page Step 5.The system display login form Step7.The system verify user name and password Step 8.The system display instructor main screen Step 10.The system displays module and assignment upload page Step 11.System display department, year, semester, course Step14.The system display successful message Step15.The use case end
Alternative course of action	A6: The instructor enters incorrect username or password A7. The system determines the instructor enters incorrect username and password. A8. The system display failure message to the department A9. The system returns to step 5. A10. The use case ends

Table 4 Use-case description for download module and assignment

Use-case name	download module and assignment
Identifier	Suc03
includes	login
Description	The student downloads the module and assignments provided for him
Actor	Student
Pre-condition	The student login to the system
Post-condition	student will download the material provided
Basic course of action	
Actor	System
Step 1. The student wants to collect module and assignments Step 2. The student enter into the system Step 4. The student select login link	Step 3. The system display home page Step 5. The system display login form Step 7. The system verify user name and password Step 8. The system display student's screen

<p>Step 6. The student enters his correct username and password</p> <p>Step 9. The student selects collect module and assignments link.</p> <p>Step 11. The students select his/her department.</p> <p>Step 13. The student select the course</p> <p>Step 15. The user selects the assignment and module</p> <p>Step16.The student download module and assignment he/she has required</p>	<p>Step 10. The system displays module and assignment collection screen</p> <p>Step 12. The system display the course</p> <p>Step14.The system display the assignment and modules</p> <p>Step 17.The system display successful message</p> <p>Step 18.Use case end</p>
Alternative course of action	<p>A6: The student enters incorrect username or password</p> <p>A7. The system determines the student enters incorrect username and password.</p> <p>A8. The system display failure message to the student</p> <p>A9. The system returns to step 5.</p> <p>A10. The use case ends</p>

Table 5 Use-case description for Submit assignment

Use-case name	Submit assignment
Identifier	Suc04
includes	login
Description	Submit assignment
Actor1	Instructor
Pre-condition	The student login into the system
Post-condition	The student will submit the assignment.
Basic course of action	
Actor	System
<p>Step1.The student wants to submit assignments</p> <p>Step2.The student enter into the system</p> <p>Step4. The student select login link</p> <p>Step6. The student enters his correct username and password</p> <p>Step8. The student select submit assignment link</p> <p>Step10. The student fills the form correctly.</p>	<p>Step3. The system display home page</p> <p>Step5. The system display login form</p> <p>Step7. The system verify user name and password</p> <p>Step9. The system display assignment submission form.</p> <p>Step11. The system determines the student has filled correct information</p> <p>Step12. The system display success message</p> <p>Step13.The use case end</p>
Alternative course of action	<p>A6: The student enters incorrect username or password</p> <p>A7. The system determines the student enters incorrect</p>

	<p>username and password.</p> <p>A8. The system display failure message to the student</p> <p>A9. The system returns to step 5.</p> <p>A10. The use case ends</p> <p>B11: the student did not fill the correct information</p> <p>B12.The system determine the students didn't fill correct information</p> <p>B13.The system display failed message to the student</p> <p>B14. The use case returns to step 5</p> <p>B15.the use case end</p>
--	--

Table 6 Use-case description for post updated information

Use-case name	post updated information
Identifier	Suc06
includes	login
Description	1.The administrator posts updated information such as registration date, examination date and some changed policies in the distance education program
Actor	Administrator
Pre-condition	1. An administrator should have to enter a valid user name and password in order to post information.
Post-condition	2. Ifan administrator enters valid user name and password then he/she can post information for those users including the student. Finally logout the system.
Basic course of action	
Actor	System
<p>Step 1: Administrator should have to enter his/her username and password</p> <p>Step 3.The Administrator select posting information link</p> <p>Step 5.The Administrator click posting information</p>	<p>Step 2: Then the system verifies the validity. If user name and password are correct the posting information page will be displayed.</p> <p>Step 4.The system display posting information</p> <p>Step 6.The system display success message</p> <p>Step7.The use case end</p>
Alternative course of action	A 1: If Administrator inserts wrong user name and password can't post information.

2.3.2 Sequence Diagram

A UML Sequence diagram showing the sequence of interactions among objects and used to represent or model the flow of messages, events and actions between the objects or components of Distance Education Management system. Sequence Diagrams are also used primarily to design, document and validate the architecture and interfaces of the system by describing the sequence of actions that need to be performed to complete a task or scenario [7]. The elements we used on sequence diagrams are:

Message (call): A simple message between header elements



Return Message: A return message between header elements

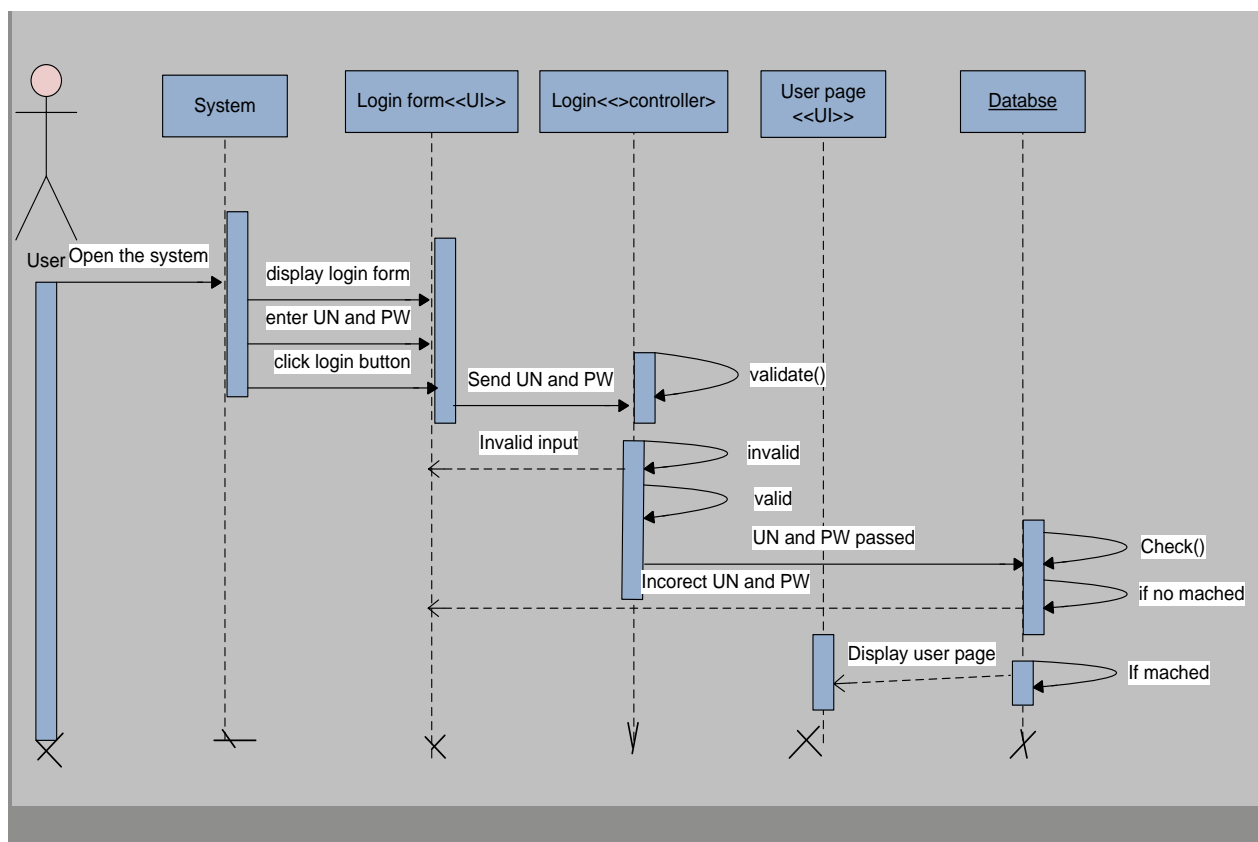


Figure 2 Sequence Diagram for Login

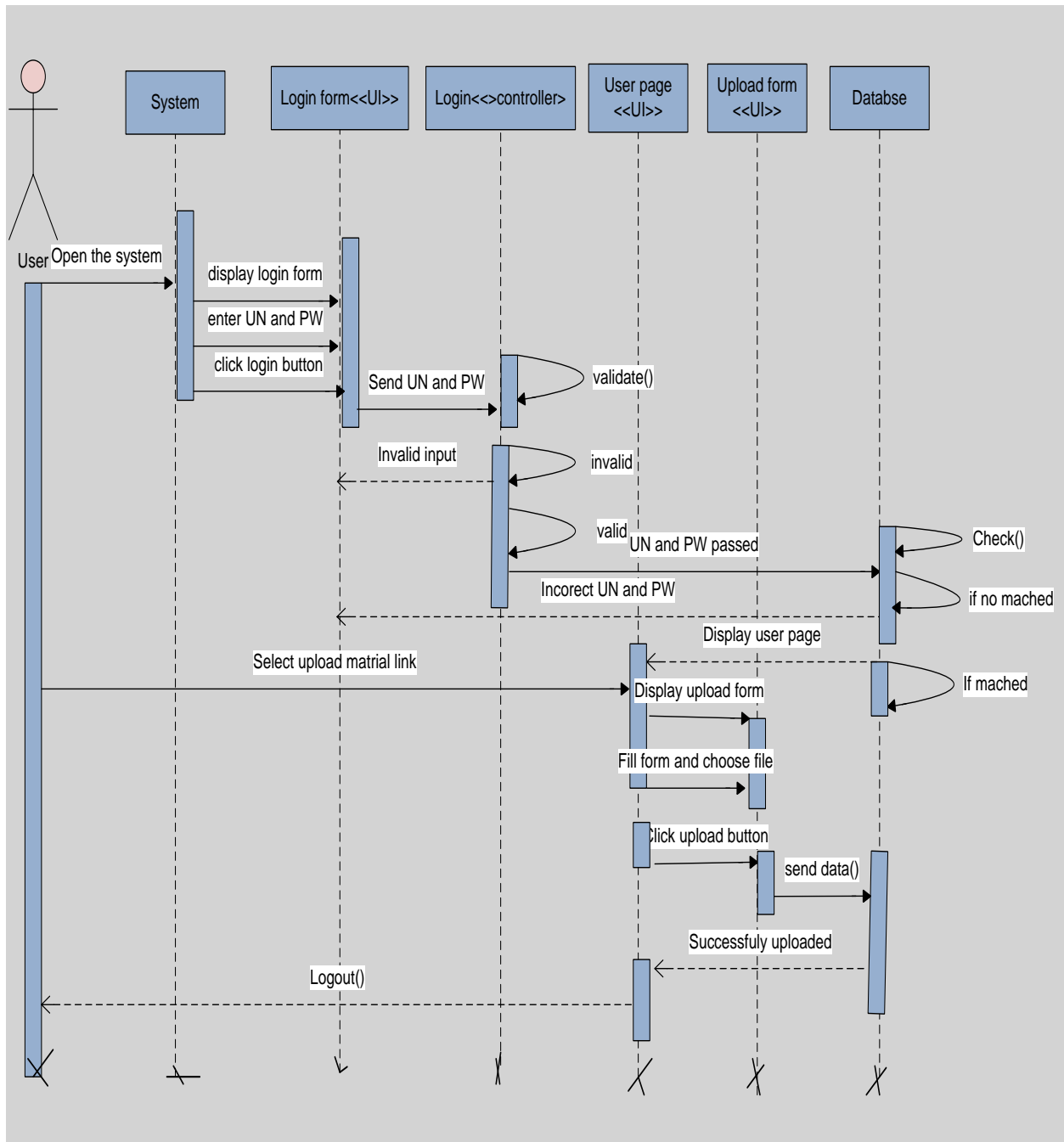


Figure 3 Sequence diagram for upload material

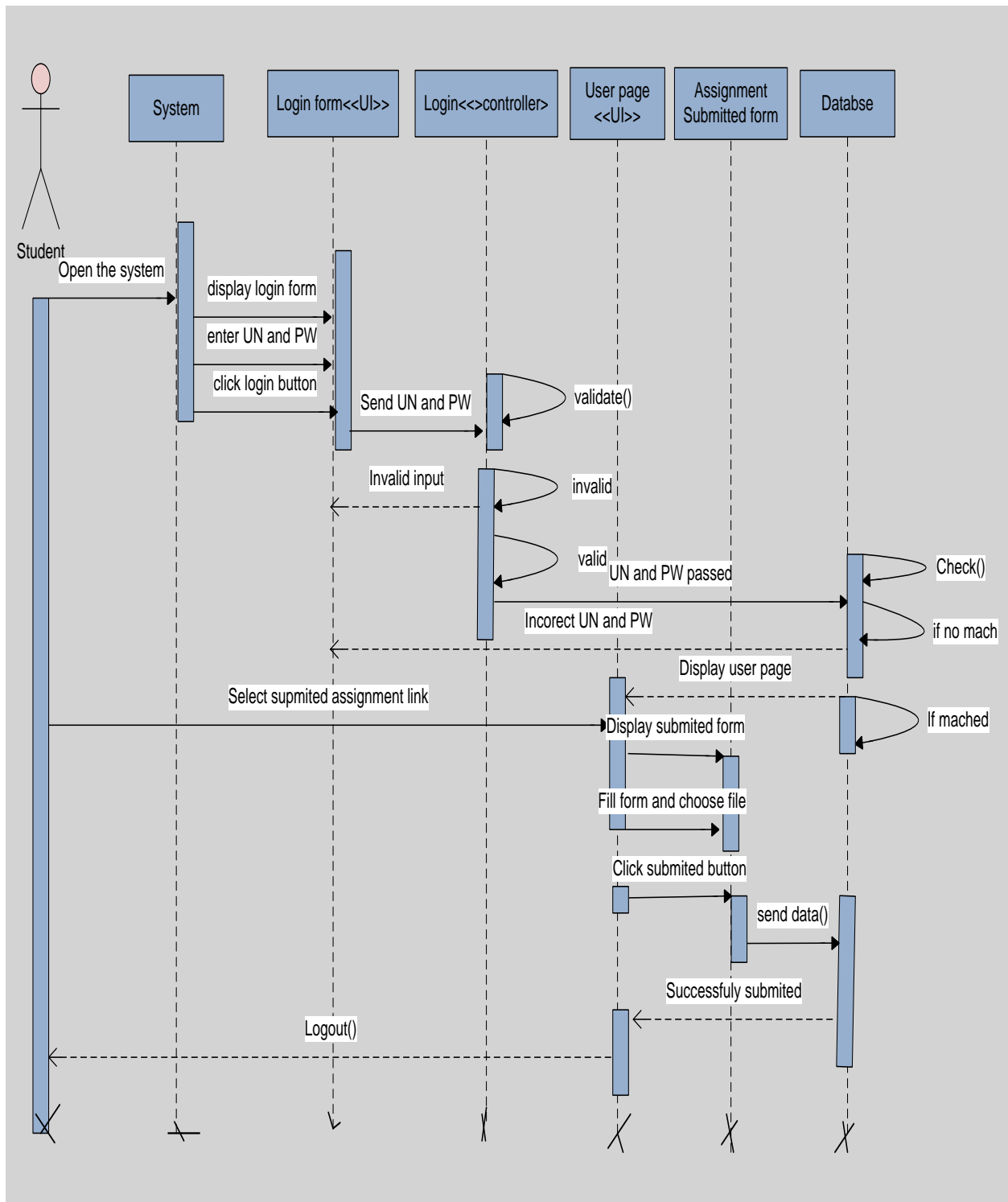


Figure 4 Sequence diagram for submitted assignment

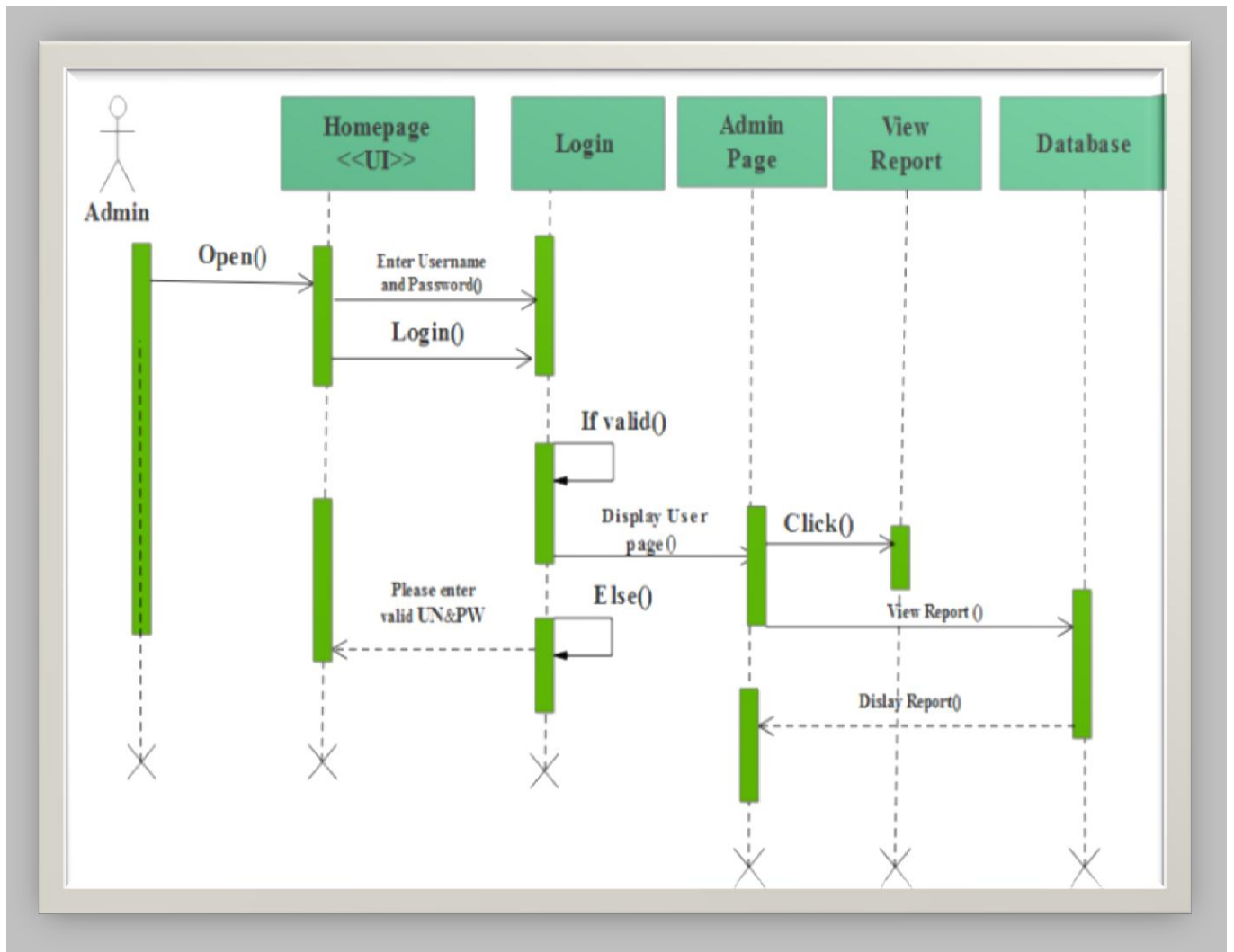


Figure 5 Sequence Diagram for View Report

2.3.3 Analysis class diagram

A class diagram is diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods) and the relationships among objects. Class diagrams can also be used for data modeling. Class diagram has three components. The top component contains the name of the class. The middle components contain the attributes of the class. The bottom component contains the operations the class can execute. That means It capture the logical structure of a system as a series of classes, their features and the relationships between them or in other way class diagram shows the existence of classes and their relationships in the logical view of a system. Class itself represented as a box with name, attributes, and methods.[4]

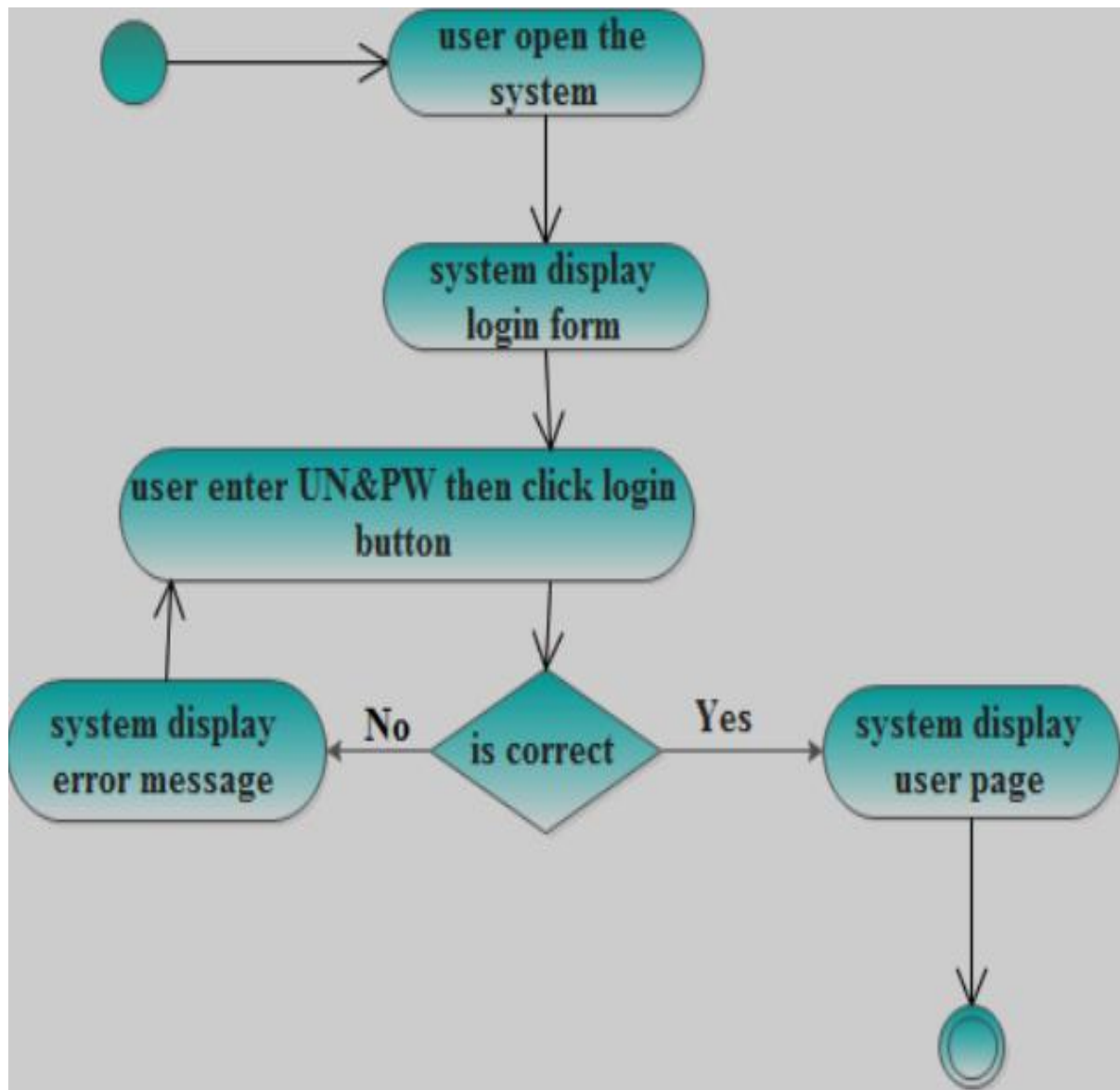


Figure 6 Activity Diagram for Login

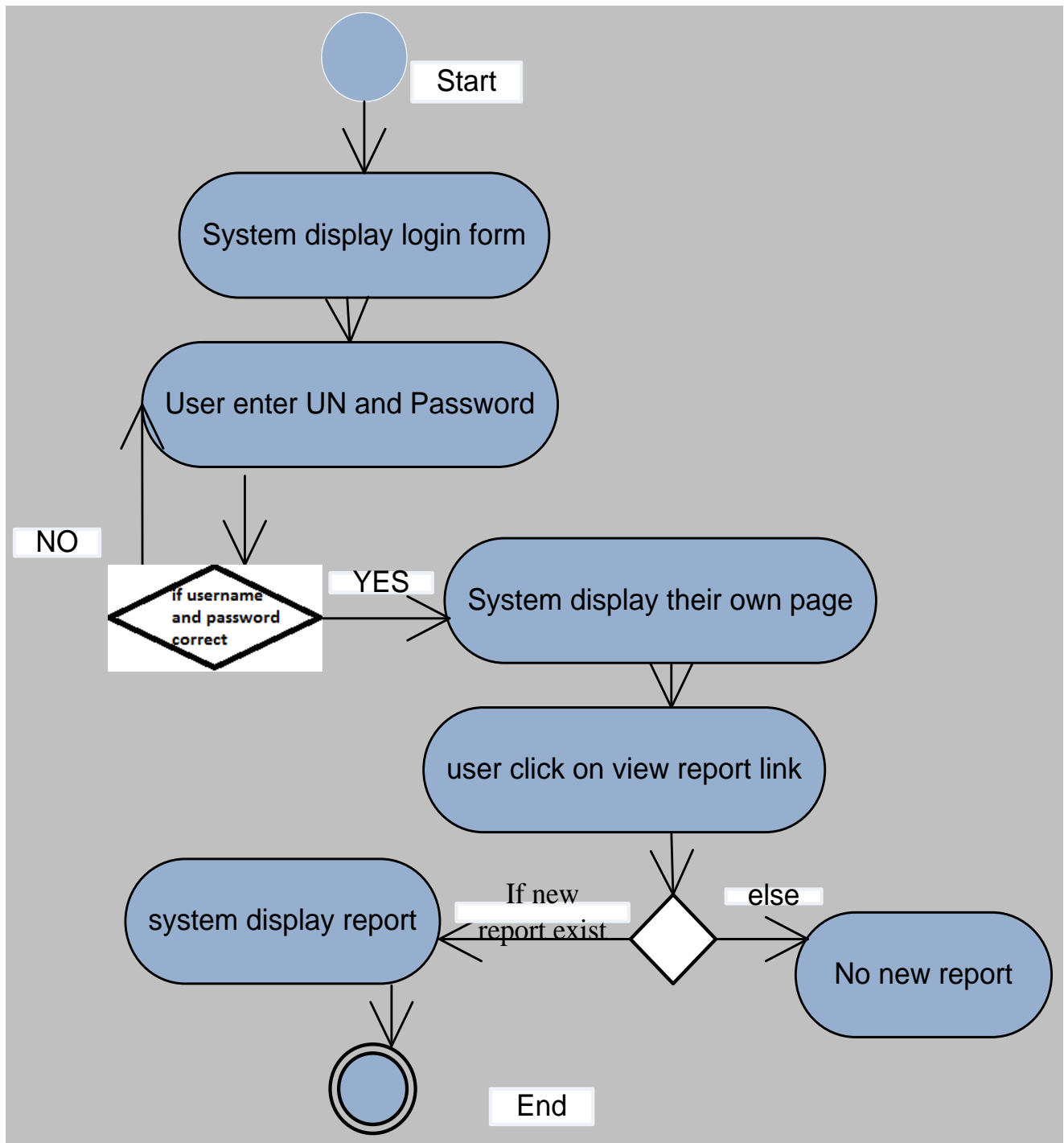


Figure 7 Activity Diagram for view report

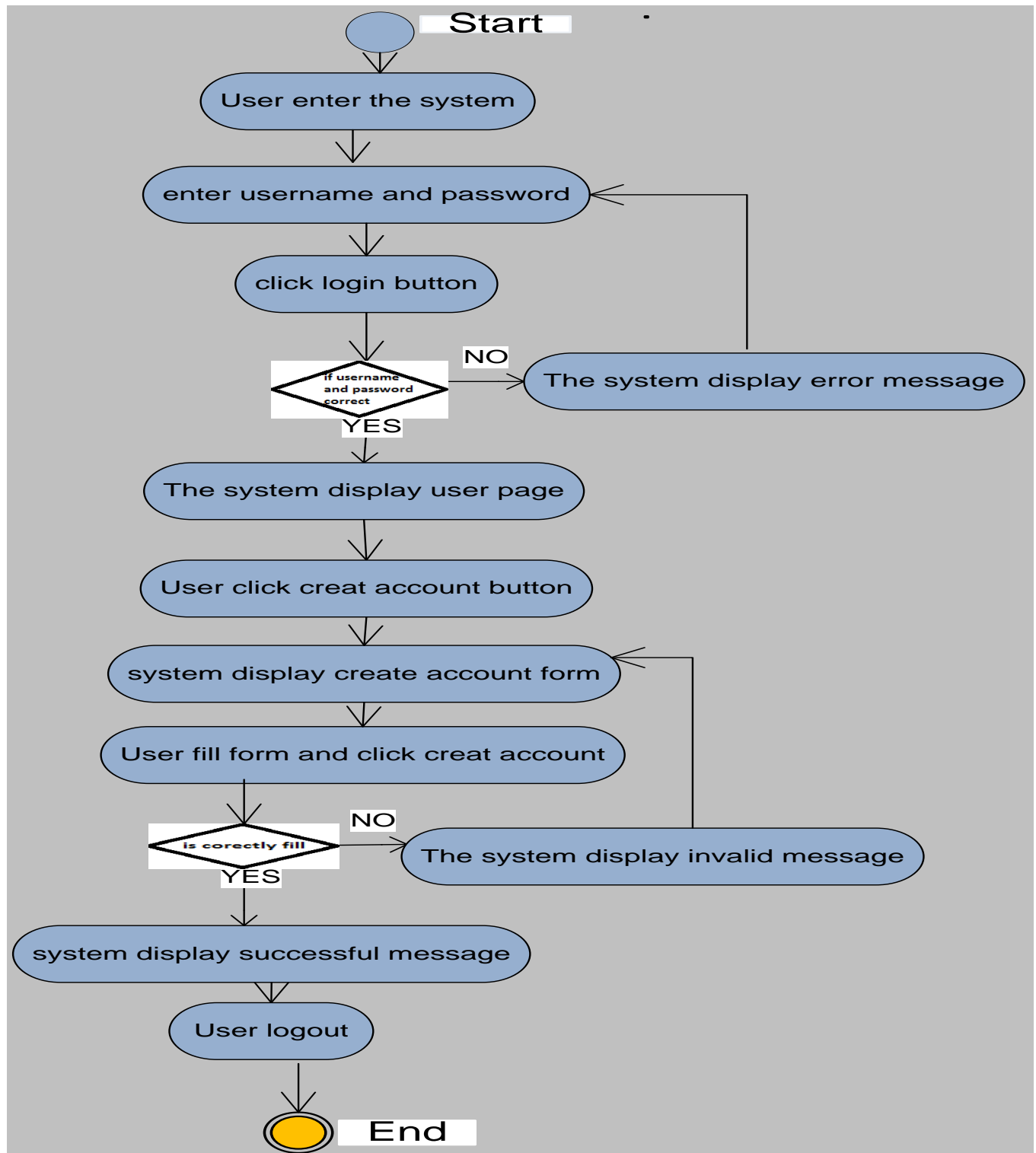


Figure 8 activity diagrams for create account

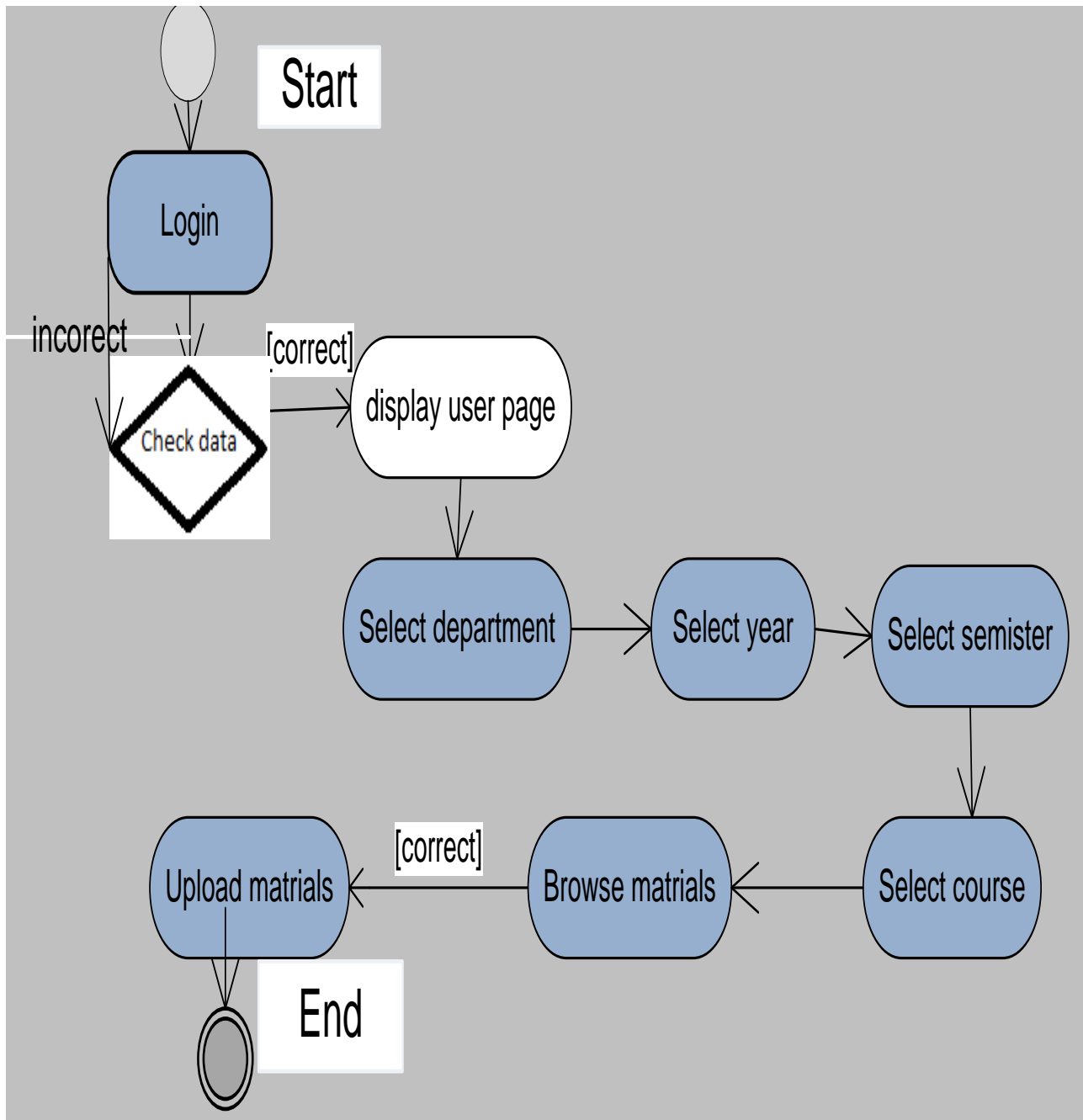


Figure 9 activity diagram for upload material

CHAPTER THREE

3 SYSTEM DESIGN

The purpose of design is to determine how the system is going to build and to obtain the information needed to drive the actual implementation of the system. It focuses on understanding the model how the software built. System design is the detail investigation of system elements from logical view. After the determination of the requirements, it is the design that follows. The design is all about stating the design goals of the system and subdividing the system into smaller parts to improve the problem in a modular approach. The output of this phase includes description of each subsystems and the deployment of the subsystems. To give right service for the right user at the right time on subject of his/her need make the design properly. The design goals are derive from the non-functional requirement, which is the part of the analysis document, and they describe the quality of the system.

3.1Design class diagram

The class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing and documenting different aspects of a system but also for constructing executable code of the software application. The class diagram describes the attributes and operations of a class and the constraints imposed on the system. The classes diagrams are widely used in the modeling of object oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages. The class diagram shows a collection of classes, interfaces, associations, collaborations and constraints. It is also known as a structural diagram. [1]

3.1.1 Description of design class diagram

3.2.1. Description of design class diagram

Attribute	Purpose	Data type
CDE officer_ID	Represent as CDE officer unique identifier	varchar
Position	Represent as the location of system admin	String
full name	Represent the user name of system CDE officer	string
Phone	Represent the phone number of system CDE officer	int

Table 7 CDE officer class

Methods	Functions
Post update Info	Used to post update information
Prepare module schedule	Used to prepare schedule for distributed module
Upload module	Used to upload module to the student

Table 8 method of CDE officer class

Attribute	Purpose	Data type
SId	Represent as unique identifier of Student	string
Name	Represent as the name of the Student	String
Sex	Represent the sex of the Student	Char
Program	Represent the program that the student apply in the system	string
Document	Represent the document of student	string
Email	Represent the email address of student in the system	string
Department code	Used to Represent the department uniquely identify	string
photo	Used to represent the students physically	file

Table 9 Student class

Methods	Functions
Download module	Used to download module
Submit assignment	Used to Submit assignment after its done

Table 10 method of Student class

Ro_ID	Represent as registrar unique identifier	string
Name	Represent as the name of registrar	String
Position	Represent the location of registrar	string
Phone	Represent the phone number of registrar	string
Department code	Used to identify the department uniquely	Varchar(15)

Table 11 registrar officer class

Methods	Functions
Prepare grade report	Used to prepare students grade
Import student data	Used to register the student
Update grade	Used to update the student grade when error occur
Prepare academic schedule	Used to prepare schedules

Table 12 method of registrar officer class

Department name	Represent as the name of Department	string
Department number	Represent as Department unique identifier	string
Location	Represent as the place or direction of Department	int

Table 13 department head class

Methods	Functions
Assign instructor	Used to assign instructor that teaches student
Add course	Used to add new course
Accept and replay question	Used to accept and replay question raise by user

Table 14 method of Department head class

3.2 Physical data model/Database design

A physical database model shows all table structures, including column name, column data type, column constraints, primary key, foreign key, and relationships between tables. Features of a physical data model include: Specification all tables and columns. Foreign keys are used to identify relationships between tables.

3.2.1 Account table

In this physical data model the attributes of the account needed are listed and the constraints (primary key) attributes are described. User id (userid) is uniquely identifies the table.

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	<u>UID</u>	varchar(20)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial Fulltext Distinct values
<input type="checkbox"/> 2	UserName	varchar(50)	latin1_swedish_ci		Yes	NULL		Change Drop Primary Unique Index Spatial Fulltext Distinct values
<input type="checkbox"/> 3	Password	varchar(2000)	latin1_swedish_ci		Yes	NULL		Change Drop Primary Unique Index Spatial Fulltext Distinct values
<input type="checkbox"/> 4	Role	varchar(20)	latin1_swedish_ci		Yes	NULL		Change Drop Primary Unique Index Spatial Fulltext Distinct values
<input type="checkbox"/> 5	status	varchar(20)	latin1_swedish_ci		Yes	NULL		Change Drop Primary Unique Index Spatial Fulltext Distinct values
<input type="checkbox"/> Check All With selected: Browse Change Drop Primary Unique Index								

Figure 11 account database design diagram

3.2.2 Employee work time payment table

In this physical data model the attributes of the employee needed are listed and the constraints (foreign key/primary key) attributes are described. User (UID) is uniquely identifies the employee.

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	<u>no</u>	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary Unique More
<input type="checkbox"/> 2	UID	varchar(20)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 3	c_code	varchar(20)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 4	Instructors_Name	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 5	Course_Code	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 6	No_of_Sections	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 7	No_of_Assignment_Marked	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 8	No_of_Exams_Marked	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 9	Rank	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 10	CrHr	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 11	Department	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 12	Year	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 13	Section	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 14	No_of_hours_she_he_gave_tutorial	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 15	No_of_Exams_prepared	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 16	No_of_pages_prepared	int(50)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 17	Payment_per	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 18	Payment_Per_Assignment	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 19	Total_Payment_for_Exams	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 20	Total_Payment_for_Assignments	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 21	Total_Payment	int(11)			No	None		Change Drop Primary Unique More
<input type="checkbox"/> 22	unread	varchar(20)	latin1_swedish_ci		No	None		Change Drop Primary Unique More
<input type="checkbox"/> 23	status	varchar(20)	latin1_swedish_ci		No	None		Change Drop Primary Unique More

Figure 12 Employee work time payment table

3.2.3 Assign instructor table

In this physical data model the attributes of the assign instructor needed are listed and the constraints (foreign key/primary key) attributes are described. instructor id is uniquely identifies the table and cours_code is referred from course table as foreign key.

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> 1	<u>no</u>	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 2	corse_code	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 3	cname	varchar(100)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 4	chour	int(11)			No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 5	uid	varchar(23)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 6	lname	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 7	department	varchar(100)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 8	section	varchar(10)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 9	Student_class_year	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 10	semister	varchar(50)	latin1_swedish_ci		No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> 11	ayear	int(11)			No	None		Change Drop Primary Unique Index Spatial More
<input type="checkbox"/> Check All With selected: Browse Change Drop Primary Unique Index								

Figure 13 Assign instructor table

3.3 User Interface Design

User interface design is the design of system with the focus on the user's experience and interaction. The interface has elements that are easy to access, understand, and use to facilitate those actions.

The following interface design pictures describe the logical characteristics of some Interfaces between the system and the users. So the sample interfaces are shown as follows:

3.3.1 Home page interface

This page contains some links, which lead it to the concerned page, and if the user has an account, he/she will directly go to concerned page by entering their username and password. In this interface the users enter username and password to log in and it has many additional elements: to successfully login to this system enter your username and password correctly. to know the general information about the system visit the navigation menus listed next to header.

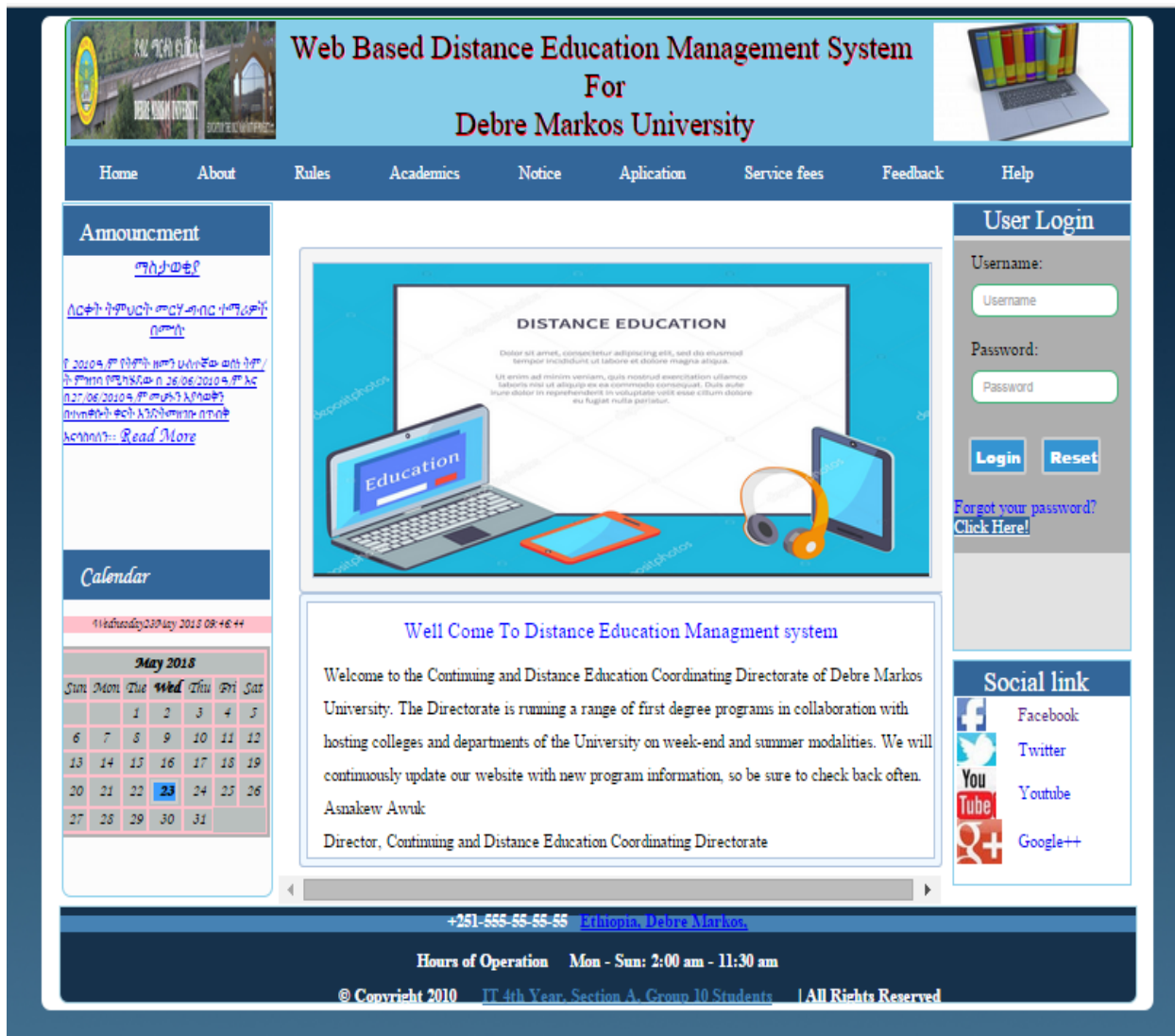


Figure 14 Interface Home page

3.3.2 Employee work time load calculation interface

In this interface the CDEofficer calculates employee works done time and prepare module schedule as well as add programs if it is necessary.

**Web Based Distance Education Management System
For
Debre Markos University**

Prepare Payment Work Time Prepare module schedule Notification[0] Log out

Side Link

- Add Programs
- View Uploaded Module[0]
- Post Announcement
- View academic schedule

Calendar

Wednesday 23 May 2018 21:35:17

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

User Profile

Welcome: (melikamu teshager)

Change Photo

Change password

Another link

- Facebook
- Twitter
- Youtube
- Google++

+251-555-55-55 Ethiopia, Debre Markos.

Hours of Operation Mon - Sun: 2:00 am - 11:30 am

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Figure 15 Employee work time load calculation page

3.3.3 Upload materials page interface

In this interface the user fill all the necessary information correctly in the appropriate space in order to upload materials.

Web Based Distance Education Management System For Debre Markos University

Prepare Payment Work Time Prepare module schedule Notification[0] Log out

Side Link

- Add Programs
- View Uploadd Module[4]
- Post Announcement
- View academic schedule

Calendar

Wednesday 23 May 2018 21:46:57

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Download module and upload to student [View All Module](#)

Sender Name	Module Code	Module Name	Credit Hour	Year	Department	File Name	Download/Upload	
worku addis	law001	programming	3	2010	law	Chapter 7.docx		Fell
worku addis	law002	networking	3	2010	law	Chapter 6.docx		Fell
abebe bazezew	mangt001	managment	3	2010	Managament	Chapter-1 pptx		Fell
abebe bazezew	mangt002	oosad	3	2010	Managament	Chapter 7.docx		Fell

User Profile

Welcome: (melikamu teshager)

[Change Photo](#)

[Change password](#)

Another link

- Facebook
- Twitter
- Youtube
- Google++

+251-555-55-55-55 [Ethiopia, Debre Markos,](#)

Hours of Operation Mon - Sun: 2:00 am - 11:30 am

© Copyright 2010 [IT 4th Year, Section A, Group 10 Students](#) All Rights Reserved

Figure 16 Interface Upload material page

3.4 System Architecture (Deployment)

3.4.1 Deployment Diagram

A UML deployment diagram shows static view of the run time configuration of processing system user and the components that run on system. In other words, deployment diagram shows the hardware of our system, the software that to be installing in that hardware. It also shows how hard ware and software components work together.

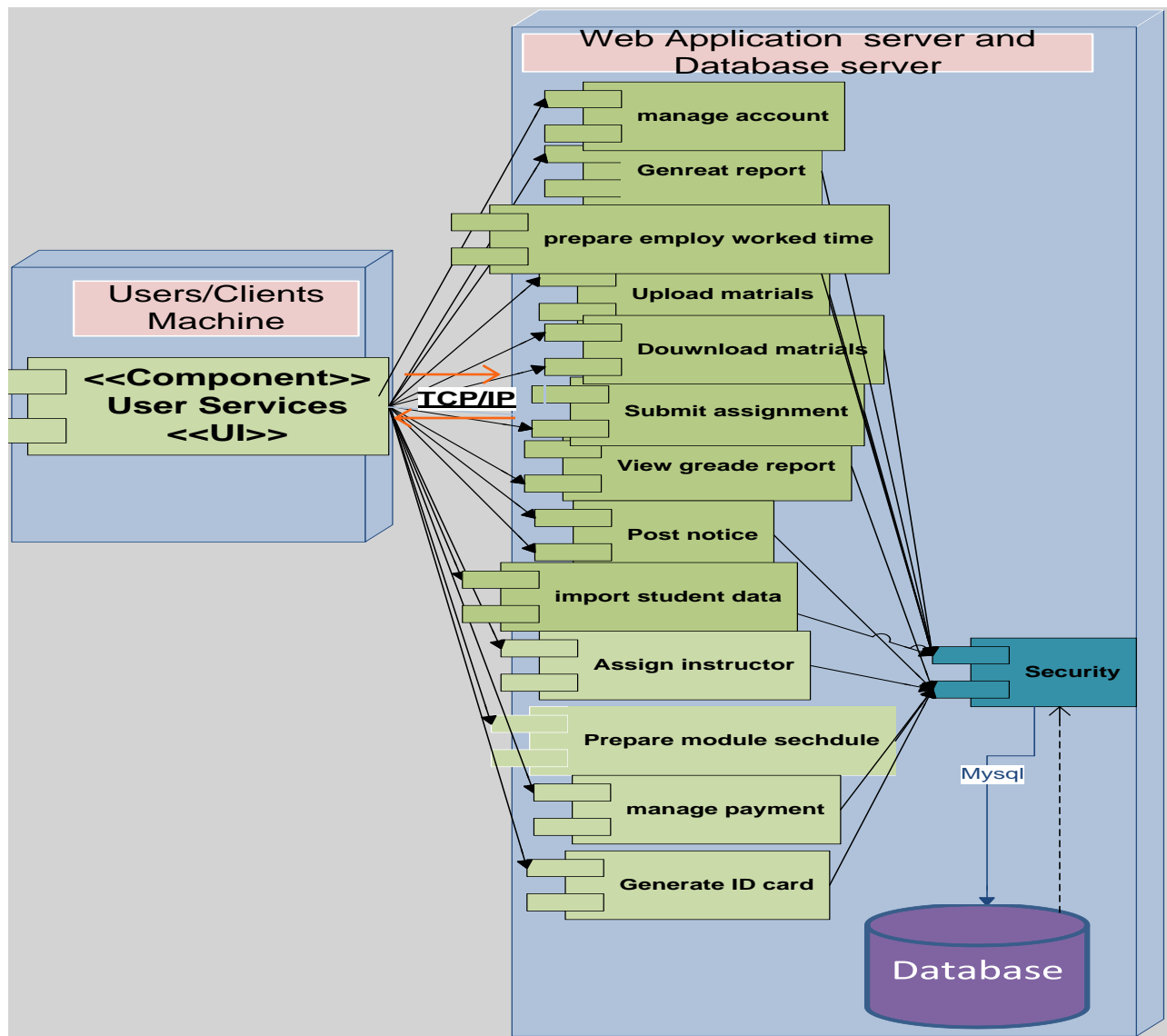


Figure 17 Deployment Diagram

CHAPTER FOUR

4. IMPLEMENTATION

System implementation is the final stage in software development stage in which the design is Putting in to coding or real application.

4.1. Over view of the programming language used

This project used PHP server side programming technology integrated MySQL database with a programming language. Because:

- The code and its syntax is simple to understand
- PHP It's quick to develop in PHP
- PHP is flexible. It's available for free
- It runs on many different operating system
- easy to access other web-based tools through PHP (i.e. Google)

In general PHP is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.

4.2. Algorithms used

Pseudo code: is a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally-styled natural language rather than in a programming language. Pseudo code is sometimes used as a detailed step in the process of developing a program. It allows designers or lead programmers to express the design in great detail and provides programmers a detailed template for the next step of writing code in a specific programming language.

The purpose of using pseudo code is that it is easier for people to understand than conventional programming language code, and that it is an efficient and environment-independent description of the key principles of an algorithm.

The project also used **random algorithm**. When the Department assign student class and also we use **sorting algorithm** to give ID for student's i.e. we use first name and section

We use md5 with crypt key encryption algorithm. MD5 (technically called MD5 Message-Digest Algorithm) is a cryptographic hash function

Whose main purpose is to verify that a file has been unaltered?

The MD5 function is a cryptographic algorithm that takes an input of arbitrary length and produces a message digest that is 128 bits long. The digest is sometimes also called the "hash" or "Fingerprint" of the input. MD5 is used in many situations where a potentially long message needs to be processed and/or compared quickly.

Pseud code for login

```
Fill the Login Form
    Click the Login button
        If (Form is filled)
            If (valid)
                Generate SQL select queries
            Connect to database
            Pass queries to database
        If (any query fails)
            Display error message
        Else
            Read session
            If session exists on database, user is already logged in, Display the page
        Else
            If they're correct
                Create session ID
            Store session ID on database
            Display the page
        End if
    End if
Else
    Display error message
Ask the user to refill the form
```

4.3 Prototype developments

Prototype development can be defined it is the sample code of the given project. These are some of the sample codes that we have done it.

Sample Code of the system

Sample code for login

```
<div id="container1">

    <form action="" method="post" class="form">

        <label class="label1" for="username">Username:</label>

        <input type="text" id="username" name="un" placeholder="Username" required
class="input">

        <label for="password" class="label1">Password:</label>

        <input type="password" id="password" name="pass" placeholder="Password" required
class="input">

        <input type="submit" id="submit" class="btn" name="login" value="Login" style="height:
34px; margin-left: 15px; width: 60px; padding: 5px; border: 3px double rgb(204, 204, 204);"/>

        <input type="reset" id="reset" class="btn" name="reset" value="Reset" style="height: 34px;
margin-left: 15px; width: 60px; padding: 5px; border: 3px double rgb(204, 204, 204);" />

    </form><p style="color: blue">Forgot your password? <u style="color:#fff;background-color:
#336699;"><a style="color:#fff;" href="forgot.php">Click Here!</a></u></p>

<?php

if(isset($_POST["login"]))

{

    $un=$_POST["un"];

    $pass=$_POST["pass"];

    function encryptIt( $q )

    {
```

```

$cryptKey='qJB0rGtIn5UB1xG03efyCp';

$qEncoded= base64_encode( mcrypt_encrypt( MCRYPT_RIJNDAEL_256, md5( $cryptKey ),
$q, MCRYPT_MODE_CBC, md5( md5( $cryptKey ) ) ) );

return( $qEncoded );

}

$encrypted = encryptIt($pass);

$sql="select * from account where UserName='$un' and Password='$encrypted' and
status='yes'";

    $matchfound=mysql_query($sql);

    $row=mysql_fetch_assoc($matchfound);

    $uid=$row["UID"];

    $username=$row['UserName'];

    $password=$row['Password'];

    $role=$row["Role"];

    $sql1="select * from user where UID='$uid'";

    $matchfound1=mysql_query($sql1);

    $row1=mysql_fetch_assoc($matchfound1);

    $fname=$row1["fname"];

    $lname=$row1["lname"];

    $photo=$row1["photo"];

    $ccode=$row1["c_code"];

    $dcode=$row1["d_code"];

    $sql2="select * from department where Dcode='$dcode'";

    $matchfound2=mysql_query($sql2);

    $row2=mysql_fetch_assoc($matchfound2);

```

```

$dcod=$row2["DName"];

$sql3="select * from student where S_ID='$uid'";

$matchfound3=mysql_query($sql3);

$row3=mysql_fetch_assoc($matchfound3);

$sem=$row3["semester"];

$sec=$row3["section"];

$yea=$row3["year"];

$dpt=$row3["Department"];

$_SESSION['sdpt']=$dpt;

$_SESSION['ssemester']=$sem;

$_SESSION['ssection']=$sec;

$_SESSION['syear']=$yea;

$_SESSION['scc']=$ccode;

$_SESSION['sdc']=$dcode;

$_SESSION['suid']=$uid;

$_SESSION['sun']=$username;

$_SESSION['spw']=$password;

$_SESSION['sfn']=$fname;

$_SESSION['sln']=$lname;

$_SESSION['srole']=$role;

$_SESSION['sphoto']=$photo;

$_SESSION['sdcode']=$dcod;

$login_time = date("h:i:s");

$_SESSION['login_time']=$login_time;

if($role=="registrar")

```

```

        header("location:registrar/registrarpage.php");
    else if($role=="administrator")
        header("location:admin/adminhomepage.php");
    else if($role=="department_head")
        header("location:department/deptheadpage.php");
    else if($role=="instructor")
        header("location:instructor/instructorpage.php");
    else if($role=="student")
        header("location:student/studentpage.php");
    else if($role=="cdeofficer")
        header("location:cdeofficer/cdeofficerpage.php");
    else if($role=="financestaff")
        header("location:finance/financestafpage.php");
    else if($role=="collage_dean")
        header("location:collage/financestafpage.php");
    else if($role=="acadamic_vice_presid")
        header("location:vice_presidant/vicepage.php");
    else if($role=="directorat")
        header("location:directorat/directormapage.php");
    else
    {
        $sql=mysql_query("select*from attempt");
        $total=mysql_num_rows($sql);
        $total++;
        if($total>3)

```



```

{
header("location:index1.php");
}
else
{
echo "<font color=red><font size=3px>Invalid username/password";
echo "<br>you are tries $total times,but allowed 4 times<h1></font></font>";
$insert=mysql_query("insert into attempt values(' ')");
}
}
}
?></div>

```

Sample code for Upload module

```

<?php
require('../connection.php');

?>

<?php
include('../connection.php');

$id=$_GET['id'];

$result = mysql_query("SELECT * FROM course where course_code='$id'");
while($row = mysql_fetch_array($result))
{
$ccode=$row['course_code'];

$name=$row['cname'];

$dept=$row['department'];

```

```

$ch=$row['chour'];
$ayear=$row['ayear'];
$file=$row['FileName'];
}
?>
<style type="text/css">
<!--
{
border-style:solid;
border-width:thin;
border-color:#00CCFF;
padding:5px;
margin-bottom: 4px;
}
#button1 {
text-align:center;
font-family:Arial, Helvetica, sans-serif;
border-style:solid;
border-width:thin;
border-color:#00CCFF;
padding:5px;
background-color:#00CCFF;
height: 34px;
}
--></style>

```

```

<form action="editexec.php" method="post">

<table><tr>

<td colspan="2" align="center">Upload Module To Students</td>

</tr>

<tr><td>Module Code:</td><td><input type="text" class="ed" id="brnu" name="cc" readonly
style="height:30px; width:180px; color:red;"required value="<?php echo $ccode ?>" />

</td></tr>

<tr><td>Module name:</td><td><input type="text" class="ed" id="brnu" name="cn" readonly
style="height:30px; width:180px;color:red;" required value="<?php echo $cname ?>" />

</td></tr>

<tr><td>department:</td><td><input type="text" name="dc" class="ed" id="brnu" readonly
style="height:30px; width:180px;color:red;" required value="<?php echo $dept ?>" />

</td></tr><tr><td>Student Class Year:</td>

<td>

<select name="scy" style="height:30px; width:180px;" required class="ed" id="brnu" >

<option selected="selected" value="">Select Student Class Year</option>

<option value="1st">1st</option>

<option value="2nd">2nd</option>

<option value="3rd">3rd</option>

<option value="4th">4th</option>

</select></td></tr><tr><td>Semister:</td>

<td >

<select name="sem" class="ed" id="brnu" style="height:30px; width:180px;" required >

<option selected="selected" value="">Select Semester</option>

<option value="I">I</option>

<option value="II">II</option>

```


CHAPTER FIVE

5 TESTING

Testing is a process of analyzing a system or system component to detect the deference between specified (required) and observed behavior. The procedures that we used are described below.

5.1 Unit testing

Unit testing is a validation method in which a programmer tests if individual units of source code are fit for use. The system units are tested one by one by inserting invalid data.

5.2 Integration testing

Combining modules and testing them is called integration testing. Integration testing is gradual. First we test the highest level, or coordinating module, and only one of its subordinate modules. After unit testing, the system is also tested whether every unit is integrated to each other.

5.3. System testing

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. It is a testing process in which the aim is to ensure that the overall system works as defined by the requirements. The System is functionally tested based on the use case model developed during the analysis phase. The system is also operationally tested based on requirements.

The requirements that are tested by the project team during the implementation are correctness, accuracy, security and others.

Testing the correctness:-correctness determines how users can interact with the software and how the software should behave when it is used correctly. Users can easily interact with the a application since it has easily understandable interface and the application responds correctly.

Testing the Accuracy: The system give only valid result, if no data is found with the specified criteria the system should not give invalid response. Since, our application fulfills these characteristic it is accurate.

Testing the security: -To insure the security of our application user must login to the system with user name and password. The system allows only authorized users to login i.e. users that have previously created account through user name and password.

CHAPTER SIX

6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This project which has different phases; the first phase concerned with the analysis phase of the life cycle, the design phase and the next phase is about implementation. As the end of the first phase, we need to review that we have covered in accordance with what we have planned at the beginning. We began our work by identifying the significance of automated system for the store and the overall techniques to be used in the development process. This involved defining the system development methodology, identifying process. This involved defining the system development methodology, identifying resource and cost requirements, and setting the deliverable and scheduled for the project.

The analysis helps the team to well understand the major functional areas and processes of the system. Through this method we evaluate the existing system weakness and strength.

After that, we performed requirements elicitation to discover user and system requirements. This phase consisted of drawing the functional as well as non-functional requirements of the system. Then we have undertaken a major phase in system development process: object oriented Analysis. Here, we tried to model the new system we proposed using UML diagrams such as Use case, sequence, and class diagrams Also, we designed the new system user interface prototype.

6.2 Recommendation and Future Enhancement

6.2.1 Recommendation

According to scope of our project the team develops web based application. Because of the time and security problem constraint we may have limitation which should be consideration in, but in the feature the team believes that this system should be fully operationally by adding some functionality that are not included in the proposed system. We also want to recommend this project can be expanded and more automated with additional functionalities by integrating with many new technologies. We recommend also to the user use this system properly.

The system that we have tried to automate is not the whole system of the distance education. Because of time limitation and security problem we can't develop all parts of the system, but we tried to automate some sub systems and functionalities.

The system we have developed is a automate web based Distance education management system for DMU and it needs a skilled person to work with the system. So, we recommend the system should be required the responsible and skilled person. We highly recommend the system should be kept in highly safe and favorable condition.

6.2.2 Future Enhancement

- The system will be developed by using android in a way to support mobile users.
- By the future, technology students can view their result on their mobile phones in notification form.
- The following functionalities can't be automated because of the limitations that we have discussed above so, Therefore using this project as an input, if there is any interested body to develop a system on this title need to add the following features.
 - ✓ Providing tutorial online
 - ✓ Online examination
 - ✓ Online video learning
 - ✓ Online payment
- The system will be support different language like Amharic.

Appendix

Questions asked during requirement gathering using interview

Q1. What are the objectives of your organization?

Q2. What is the mission of your organization?

Q3. How many employees do you have?

Q4. How does your current system work?

A. Is it manual?

B. is it computerized?

Q5. If your answer for question number 4 is choice “b” what computer applications do you use?

Q6. How you make relationship with the customer?

Q7. What is the procedures or steps when customers get service of the organization?

Q8. What qualifications are expected from a customer who wants to register to the system?

Q9. How does you store customers and other information's?

Q10. What are the problem that you get when the organization use the existed system?

Q11. How you prepare monthly or annually report?

References

- (1). "What is uml diagram" <http://www.uml-diagrams.org/examples>. [Accessed 10 December2010 2:45:05].
- (2). "What is system requirement," Google, 08 December2010. [Online]. Available: www.google.com.et/. [Accessed 15 December2010 3:09:21].
- (3). The object primer 3rd edition agile model driven development with uml 2.[_Accessed 14 December2010 4:23:07].
- (4). Modern system analysis and design third edition by JEFFERY A.HOFFER, JOEY F.GEORGE, and JOSEPH S.VALACLCH read to do how to design the use case diagram and identify use case; actor and symbol. [Accessed 03 December2010 10:27:35].
- (5). "Introduction about dmu" www.debrmarkose.edu.com. [_Accessed 10 December2010 4:50:10].
- (6). "Introduction about eLearning" www.elearning.edu.[_Accessed 07 December2010 2:13:45].
- (7). "Requirements," 03 April 2015. [Online]. Available: <http://www.google.co.uk/>. [Accessed 9 December 2017 8:37:22].
- (8). "Non-functional requirement," 02 December 2017. [Online]. Available: www.projectRequerment.com. [Accessed 08 December 2017 9:57:29].