# DBU Student Clearance Management System

DEBREBIRHAN UNIVERSITY

**School Of Computing**

**Department Of Information Technology**

**Web Based Clearance Managment System**

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### ABSTRACT

Online clearance system is a research work that will help build an effective information management for schools. It is aimed at developing a system for making clearance process to be fast and effective. The designed software will serve as a more reliable and effective means of undertaking students and employee clearance remove all forms of delay and stress as well as how to do your clearance online. This project work made use of data collected from the University, materials and journals from various authors and software was developed to effectively achieve the aims of this project. In this project, the implementation of the computer- based system will carried out using PHP, JAVASCRIPT, CSS and MYSQL for the database. In conclusion, the work met all the objectives intended

## CHAPTER ONE

**PROPOSAL**

## INTRODUCTION

Clearance is a status granted individuals, typically members of Military, University graduates and Employees of Government and their contractors, allowing them access to classified information, a clearance by itself is normally not sufficient to gain access. The organization must determine that the clearance individual has a “need to know” the information.

Part of that process include

* + - * Determining the owner(s) of the intellectual property.
      * Contacting the owners and negotiating on agreement.
      * Administering written contracts
      * Handling other issue related to the use and licensing of intellectual property.

## BACKGROUND OF THE STUDY

Debre Berhan University was established by ministry of education in 1997 E.C. Based on the above information the clearance system was also established in 2000 E.C. because of the member of the university lends a lot of materials from the university and finally they must be return the resource they lend to the university. The lack of clearance system in the university is serious of problem to manage the resources in the university.

One of the activities that are performed in Debre Berhan University is student clearance activity. Clearance is the process of approving students is cleared from any doubt. Based on our observation and Answers of different university’s societies now a day Debre Berhan University is in the process of modernizing its operations by automating and improving existing manual processes but they do not use an automated system for students clearance activity it is still now performed manually. As part of this, we would like to automate student Clearance system in order to manage data more effectively and provide faster and more efficient services.

The current Clearance process of the university requires the students to go around the university and staffs to sign clearance forms and to queue in line repeatedly to submit or get other forms. The process can take an hour or so. Therefore it is important to automate clearance system for the members of the university.

## Statement of the Problem

The current Debre Berhan University’s student Clarence process is performed manually. Due to this the following problems are faced:-

* There is no way to get clearance form in one office.
* Most of the activities are time consuming and stressful.
* Absence of some staff officers who sign Clearance form which leads to students repeatedly visiting a particular office in order to sign his/her clearance form.
* Students travelling one office to the other and queuing in line to sign clearance form.
* When the Clearance form is lost it causes delaying of readmission date
* Unauthorized body may sign Clearance form.

Generally the above problem led the overall Clearance process let and boring Due to this it becomes necessary for an automated clearance system to eradicate the bottle neck of the manual system in place.

## Objective of the Project

* + 1. **General Objective**

The main objective of this project is developing automated Student Clearance system for DBU when they leave the university.

## Specific Objective

Specific objective of the project is in order to:-

* + - * To study the existing system
      * To Know about the existing System work flow
      * To analysis the existing systems problem
      * Find the solution for the problem found in existing system
      * Develop design model to use in clearance system
      * Creating a user friendly environment for particular clients to react and use the system in good manner.
      * Preparing test plan and conduct acceptance test
      * Implement the proposed system
      * Deploy the system and test it till it fits to the needs of the organization

## Significant of the project

The project has a lot of significant to the university society. For student:-

* Avoids going around the school and staffs to sign clearance forms.
* Provide convenient away to use it right from the bedroom, office or anywhere in the campus.
* Information processing is very fast and delays can be avoided.
* Minimizes delaying registration date and pay fee due to loss of Clearance form.
* It saves a lot of time.
* It is inexpensive to student, employee and school management.

**For Officers** (who work in the office in which the student will clear their clearance):-

* + It helps to easily controls the resources which are borrow to student.
  + It proved more security mechanism (unauthorized person cannot approve the Clearance).
  + Information processing is very fast and delays can be avoided.

## Scope and Limitation of the project

* + 1. Scope of the project

The introducing system, Clearance management system, which is going to be implemented for Debre Berhan University will automate the operation of clearance system of the University. The material management system is to allow the officers to lend the material and return the material. The clearance management system is to approve or reject the clearance process both for the student. There are three end users in clearance management system. These are officers, student and Registrar. The officers upload the material lends student information to the central database. Registrar upload the material lend student information to the central database and control the technical problem of the system and fix the problem if exist. When the student request for clearance signing their information checked in the central database and approved or rejected by the system. When the student request for approval, the system display the cleared clearance form then the student save the approved clearance form. The students go to registrar. Registrar prints the approved clearance form and sign on it, and then the registrar officer put the sill of the university to the clearance paper. The students take the approved clearance form.

* 1. 2 Limitation of the project

This project is limited to automate Clearance system for Debre Berhan University students.

The system will work if the client computer is the same local area network with server computer. The system will not include the digital signature of the officers when approve the Students clearance.

## Methodologies

* + 1. **Data gathering methodology**

During requirement analysis, data needed for the project will be gathered from various sources. During gathering and collecting necessary data and information needed for system analysis, we will use two major fact-finding techniques those are primary source and secondary source. In primary source we will use empirical approach such as interview and observation. In secondary source we obtain data from different document.

## Analysis methodology

After gathering different information from stakeholders we will analyze requirements by using Unified Modeling Language models like use case diagram, sequence diagram and class diagram.

## Design methodology

We select object oriented approach to design the system because it has best feature than other approach.

## 1.7 Project Life time

**Table 1:-project life time table**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **November** | **December** | **January** | **February** | **March** | **April** | **May** | **June** |
| Preparation of the  proposal |  |  |  |  |  |  |  |  |
| Requirement analysis |  |  |  |  |  |  |  |  |
| Requirement analysis submission date |  |  |  |  |  |  |  |
| Designing |  |  |  |  |  |  |  |  |
| Implementat ion |  |  |  |  |  |  |  |  |

1.7.**5 Project Cost**

* + - 1. Software development cost

For this particular project we will be using different software but the software’s are getting from the university.

**Table 2Software cost**

|  |  |
| --- | --- |
| Software costs | |
| Software Description | Price |
| Microsoft office word 2007 | 100 |
| Microsoft power point 2007 | 90 |
| Microsoft SQL server | 100 |
| Avast !free antivirus | 100 |

|  |  |
| --- | --- |
| xampp | 100 |
| Total | 490 Birr |

* + - 1. Tangible cost

**Table 3Tangible cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Name | Quantity | Unit price in birr | Total |
| 1 | Purchase of flash disk  (4GB) | 1 | 150.00 | 150.00 birr |
| 2 | Purchase of CD RW | 2 | 20.00 | 40.00 birr |
| 3 | Purchase of stationary paper pen  pencil | 1.5 packet 20  5 | 100.00  3.00  1.50 | 150.00birr 60.00birr  7.50birr |
| 4 | Purchase of CD\_R | 4 | 5.00 | 20.00birr |
| 6 | Total estimate cost | - | - | 1027.50birr |

## Intangible cost

**Table 4*Intangable*cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Professionals | Participators | Unit cost(birr) | Total unit  cost(birr) |
| 1 | Programmer,  designer, data  collector, and coordinator | 6 persons | 1 person \* 30birr/hr\* 6hr/week\*  27weeks | 4860 birr |

Total professional cost=5(4860)

=24,300 birr

1.8. **Feasibility study**

To bring the successful completion of this project goals and objectives the feasibilities issues listed below has determined the project viability or the discipline of planning, organizing, and managing resources.

* + 1. Technical Feasibility

This involves questions such as whether the most of the technology needed for the system has exists in the Debre Berhan University DBU compound. Because the system is too customized according to DBU information transferring system there will be no difficulty to build the clearance system, and also the staff and other concerned bodies has or will have enough experience using this system.

* + 1. Operational feasibility

Currently there is no existing system in the case of clearance system so this system will be implemented in DBU as a pioneer of clearance system project. The system will provide adequate through put at desired time to the user and also give the needed information in a timely usefully formatted way. The system also has security to gives access privilege providing account for an authorized person. This system provides help description to the user about how to use the system. And other technical modification on the system is done by the developers.

* + 1. Economic feasibility

As cost/benefit analysis, show the new system is developed using a very minimum coast and it give a lot of benefits such as advancing the services of the system, decreasing the work load of the users.

## CHAPTER TWO

* + 1. **SYSTEM ANALYSIS**

## REQUIREMENTS DETERMINATION

Requirements determination involves studying the current existing system to determine how it works and where improvements should be made. The study results in an evaluation of how current methods are working and whether adjustments are necessary or possible. These studies consider both manual and computer methods and are not merely computer studies. A requirement is a feature which must be included in a new system. It may include a way of capturing or processing data, producing information, controlling a business activity or supporting management. The determination of requirements therefore entails studying the existing system and collecting details about it to find out what these requirements are.

## DETERMINING BASIC REQUIREMENTS OF STUDENTCLEARANCE SYSTEM

The team structures its investigation by seeking answers to major questions.

* What is the basic business process?
* What data are used or produced during that process?
* What are the limits imposed by time and the volume of work?
* What performance controls are used?

## FACT-FINDING & ANALYSIS

The specific methods analysts use for collecting data about requirements are called *fact-finding.* These include:

**interviews observation

Usually these techniques used in combination during a study to ensure an accurate and comprehensive study are undertaken.

* + - 1. ***INTERVIEWS***

The team use interviews to collect information from individuals or from groups. The respondents are generally current users of the existing system or potential users of the proposed system. These are:

* Instructors of DBU
* Students
* Student Service Center
* Sport master officer

Beginning with the basics, the team ask questions which describe and provide a background of fundamental details about the system.

For example:

* What is the purpose of this Clearance activity?
* What steps are performed?
* Where does it performed?
* When does it performing?
* Who performs that?
* How long does it take?
* How often is performed?
* Who uses the resulting information?

Based on the above questions some respondents give their own answer. From this we get some information about the system as the student of the university sign clearance at the end of each year and when they want to sing for ID card form and withdraw form. The clearance signing process takes place in the university officers at work time and they can sign in any office randomly and they must submit to the Registrar at the end of clearance signing.

Interviewer question with respective answers

**Question 1:-**One of the offices which sign in to the clearance form is sport master so what kinds of thing you cheek before sign in the clearance form?

**Answer: -**we have different sport materials like ball, sport close etc. that is borrowed to the students. If one student lend this materials he must return it so first we would cheek he/she return the materials then if he return the material we sign in to the clearance form otherwise until he/she return the material or he pay the fee for that material we did not sign in to the clearance form.

**Question 2:** - How do you handle student information during borrowing materials from this office?

**Answer:-**in order to control our resource which lends to the student we use a form which used to record student information that borrow property from the office and borrowed property information.

**Question 3:-**Is there any problem during this clearance process?

Answer:

1. In the earlier time we put only the signature and name of sport master so that some students was put its own sign in to the clearance. But at this time we uses titter.
2. It is difficult to handle students and borrowed material’s information.

**Question 4:** In which ways you like to be the system?

**Answer:** We would like if it is networked computerized system because it enable us to communicate with related office without the student coming to our office and to easily manage each resource.

Interviewee Students

Question1: What difficulties you faced during the clearance process?

Answer:

*Absence of some staff officers who sign Clearance form that leads us to repeatedly visiting particular offices.

*To sign a clearance form we goes around various office of the university like:-

* Chief of library circulation,
* University book store keeper,
* sport master,
* student service
* School head etc.

Because of these the clearance process is time consuming and stressful. Question2: In which ways you like to be the clearance process?

**Answer:** It is better for us to get only from one office or using online.

## OBSERVATION

Observation allows the team to gain information they cannot obtain by any other fact-finding method. Through observation, the team can obtain firsthand information about how activities are carried out. This method is most useful when the team need to actually observe how documents are handled, how processes are carried out and whether specified steps are actually followed. While the team has observed the existing system, there have been improper handling of files that are too difficult to access it, and these make the decisions invalid. The teams know the way of signing clearance form during the end of each year, at that time the team understands how much the process is tedious and require high human power to accomplish the process.

What the team understands from the observation analysis and summarized in the following manners:

|  |  |
| --- | --- |
| **What should happen. ?** | **What actually happens...?** |
| Standard Operating procedures | Delays in doing work |
| Properly completed documents | Missed steps, an authorized body may sign |
| Efficient and timely completion of work | * New controls needed * telephone calls needed when the officers absent * The Process not completed as   required |

## DBU Existing Clearance System Description

Based on our data gathering the current clearance system of the Debre Berhan University is a manual one. When the students of the university leaves the university the take clearance form from registrar and go to different office to sign clearance form. The students may sign clearance form when they want to fill withdrawal, to take ID card for the second time, during the end of each year and finally when they graduate and leave the university. This makes the system so tedious and time consuming. Here, students have to visit all the clearance offices with a form for them to sign. Once these forms are signed, it proves that the student have been cleared and validate as they return the materials they borrowed. This process takes a lot of time to be completed and possess a lot of stress for all staff and students involved.

Before sign in the clearance form each officer first check all the property borrowed by the student whether return or not. If that is return he/she signs in to the clearance otherwise he/she didn’t sign in to the clearance form. In order to control the list of students who borrow the property from the office they

use document paper which contain the information about borrower and borrowed material like name of borrower, identification number of borrower , types of borrow material etc.

In the manual system, the clearance forms are documented in a file cabinet. Each time the clearance form is needed, a search operation is conducted on the file cabinets to locate a particular student’s clearance form.

## Players of the existing system

Players represent external entities that interact with the system. Due to this we will deal only with persons involved on those services or persons who have responsible for this work.

Here are the players involved:

* Students:-people who are getting service from the system.
* Registrar:-are persons who cleared the students at the end and where the student submits the cleared clearance form.
* Officers:-are office workers who sign clearance form for the customers. These includes employee at sport master office, book store office, course coordinators, library, café, Dormitory Proctors and different officers where the student of the university sign clearance form. They may also be any employee who works in the university and who will sign clearance form.

## The Existing System Clearance form preparation

Clearance form is prepared to each program for the students of the university. Each Clearance form consists of the following thing.

* + - * The purpose of clearances with three option

1. Clearance Form:-it is seasonal for the students, because the process takes places at the end of academic year. At the end of academic year each student gets clearance from various office of the university.
2. Withdrawal Form:-it takes places at any time in the academic year. If one student wants to leave the university for different purpose before the end of academic year so he/she get clearance from various office of the university.
3. ID Form: - is takes places at any time when the student want to take ID card of the university.
   * Information of student include
4. Full name
5. Id number
6. School
7. level
8. Program
9. Class/year
10. Semester
11. Last date class attend
12. Reason for withdrawal it requires only if the purpose is for withdrawal

* List of signed office

In students’ clearance system based on program, the lists of offices are different. The following table shows some of program within respective list of sign office.

**Table 5: some program within respective list of sign office**

|  |  |
| --- | --- |
| **Program** | **List of sign office** |
| **Regular Students** | School head |
| Student service |
| Dormitory chief |
| Library , chief of circulation |
| University book store keeper |
| Sport master |
| Course Coordinator |
| Office of the student academic service |
| Dining Office |
| Student Council |
| Campus Security Officer |
| **Extension Students** | School head |
| Library , chief of circulation |
| University book store keeper |
| Program coordinator (for update payment) |

After the students sign in each office and cleared, they go to registrar and give one piece of signed paper and take the remaining one. Then they are cleared from any responsibilities and can go to their home.

During signing into the clearance form

The following condition must check before sign in to the clearance form

* Each officer check whether all property borrows by the student returns to the offices or not. While students signing the clearance form, the clearance process is

done by the hierarchy. For example they must sign in different libraries and book store office before they go to sign in to the main libraries.

* Based on hierarchy. Upper office must check whether the lower office sign or not.

## Business Rules of Existing System

###### A business rule is effectively an operating principle or polices that we try to specify for both the existing system and the new system must satisfy. The business rule is a principle or a policy in which the proposed system operates accordingly.

The main business rules or principles of the existing system are:-

BR1:- anyone who sign clearance form must be the member of the university BR2:-Registrar officers give clearance form only for the students of the university

BR3:- Officers of the university are not expected to give service on Saturday, Sunday, and Holiday. BR4:- when the students want to sign clearance form they take the clearance form from registrar officers.

BR5:- when the students want to sign clearance form they must fill the required field and they must have an ID car of the university to check the validity of the University

BR6:- very student of the university must sign clearance form at the end of each year BR7:- students must fulfill their responsibility before they go to sign clearance in officers BR8:- the officers of the university must put their signature and the date when they sign BR9:- the student of the university must submit the cleared clearance form to Registrar

BR10:- students should take one piece of approved clearance form from registrar for their validity.

## Problem of Existing System

Due to the manual means been used by the university, keeping information about student clearance, a lot problems are encountered which includes:

###### There is no way to get clearance form in one office.

* The processes of clearing require that the students be cleared in various office of the University from all the office it is time wasting, stressful.

###### Absence of some staff officers who sign Clearance form which leads to students repeatedly visiting a particular office in order to sign his/her clearance form.

* Less security (unauthorized person may approve the Clarence)

###### Difficult to easily manage students who don’t return the equipment that borrow from the office.

* Wastage of resource and consuming storage space and time.

###### Difficult to search, retrieve, update and delete the data about the borrower of the materials.

* The absence of electronic data storing mechanism it requires huge storage space.
* The current process requires high human-power.

## Alternative Solutions

###### In order to overcome the current system problems that exist in the functioning of clearance system, our project team members have put down alternative options. These are:-

* Changing the structure of manual system in to organized manner

###### Completely change manual system in to computerized and automated system without affecting the structure of clearance system

The new system is designed to solve problem affecting the manual system in use. It is design to be used online thereby relieving both student and staff from much stress as experienced from the manual system.

###### This will do the analysing and storing of information either automatically or interactively, it will make use of online access to internet. The new system gives full system functionality that is needed by system user to perform system functionality. Among that system functionality online signing clearance form for the students, taking withdrawal form online for the students, signing clearance form to retake ID card for the student and give complain to system*.*

The proposed system will also have some other features like.

###### Accuracy in handling of data

* Fast rate of operation and excellent response time

###### Flexibility (i.e.) it can be accessed at any time

* Better storage and faster retrieval system.
* Accessibility from anywhere in the campus.

## Over view of the proposed system

During our observation and interview of users we have observed certain problems from their manual based system. Because of this we are proposed to solve the problem of the existing clearance system by developing automated clearance system. That means our proposed system will minimize the current problem and weakness of existing system by providing centralized clearance system, the student can get their clearance from only one place without moving office to office. The proposed system will also provide easily resource controlling mechanism and create communication between selected offices. As generally the proposed system will able to minimize the existing problems and resource consumption because the university clearance activities are based on manual system.

## Functional requirements

Functional requirements describe the interactions between the system and its environment. The environment includes the user and any other external system with which the system interacts.

Students registered by Registrar when they are the member of the university. They get user name and password to access the system, and then logged in to the system by using the username and password they given. After the user logged in the user fill the clearance form and click the submit button and wait for

approving the clearance. After that the approved page is displayed to the students and then students save the approved clearance form. Then the students take saved clearance form and go to registrar to print and sign on the clearance form. The system will approve the clearance form by typing as approve on the specified field and the date that they take the clearance. But reject the user if there is an office which borrowed the material and do not return that material to the office by telling as they have a responsibilities that they must have to be complete. Registrar sign and put the seal of university. Students take the approved clearance and go.

###### Our project will perform the following activities.

* + The systems will have ID form page to allow the student to sign for ID card recovering.

###### Our system will also have withdrawal form page, that allow students to sing for withdrawal form

* + The system will also have clearance form page that allow to sing the clearance when the student leave the university

The proposed system should include the following functionality:-

###### Handle Material lend student information.

* Handle property information

###### Approve and reject clearance

* User Administration Module – this module will provide system wide administration functionality including security setting and user account management.

###### Disallowing unauthorized access

* Help option for better understanding.

###### Allow student to save approved clearance form

* Allow student to Print approved clearance form

## 2.3.2. Nonfunctional requirements

Non-Functional requirements describe user visible aspects of the system that are not designated to the functional behavior of the system. The requirement includes from user interface to resource issues. Generally, Non-Functional requirements of the system can be viewed as follows.

###### User interface and human factors

Since users of the system will interface with the software to be deployed on a personal computer. When we consider the user interface on the personal computer since there is going to be different type of users. Generally it will include the necessary features for each user with a user friendly and attractive interface.

###### Documentation

The System has well defined document which helps to easily maintain the system and we will also prepare short and precise help file on how to use the system for the system users. It will have a helping page to guide the user of the system and to show the process how they will have to use.

###### Hardware consideration

The Software product to be developed should run on existing standard computers. The system will be portable that can be run on any type of computer and it supports any type of browsers.

###### Performance characteristics

Since the system is going to be accessed by different users with different needs, it should be capable of handling and processing their queries quickly. Besides the software, Hardware will also be a great factor in the systems’ performance. Generally, the system should be able to handle many users and it will be responsive.

###### Error handling and extreme conditions

The system is expected to handle errors encountered during run time. Errors could rise from users and from the system. Errors that occurred from the wrong doing of users will be handled by appropriate exception handling mechanisms. Generally, if an error occurs, the system will identify the error and notify the user so that he/she can take the appropriate corrections rather than terminating the system.

###### Quality issues

Since the system is used for clearance process it is more related with resource control of the university so it should be accurate, robust and reliable.

###### System modifications

The System modification can be achieve easily because the system is going to be designed using an object oriented approach.

If there is change on the process of clearance the system can be modified based on change criteria by the developers or any trained person that knows the code behind the system.

###### Physical environment

The server must be put on a place that has high security room. And the client must put in the local area it must connect with server.

###### Security issues

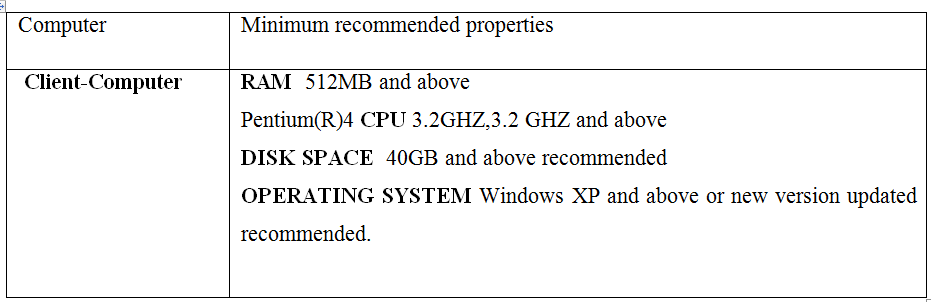
The system has login page it allow only the user who have privilege to access the system therefore the system can’t be accessed by unauthorized user. When the user want to access the clearance form they sign up to the system and sign in to the system. Each system users can access the system based on their access right.

**2.3.4** System Requirement of Proposed system

System requirement means the minimum required resource for the proposed system to meet the development goal or users functional requirement. This covers the material that will consume to accomplish the system.

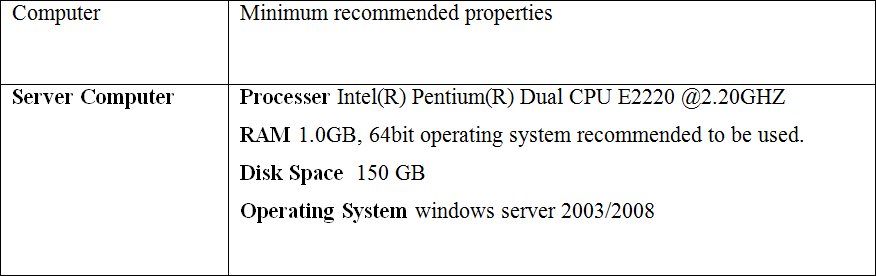
###### Client-Computer : in order to run the system the clients computer must have the following minimum requirement

**Table** 6Minimum requirement for client computer



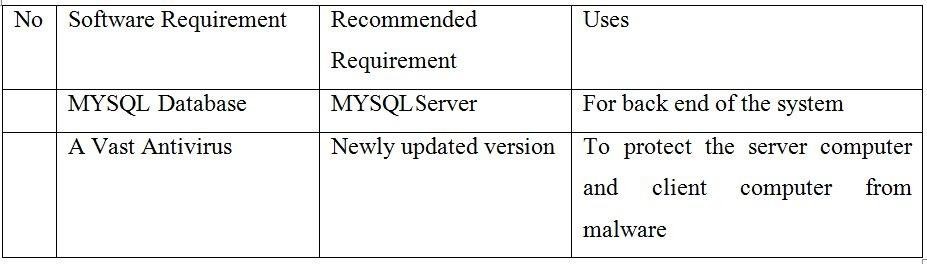
###### Server Computer:- in order to run the system the server must have the following minimum requirement

**Table** 7minimum requirements for server computer

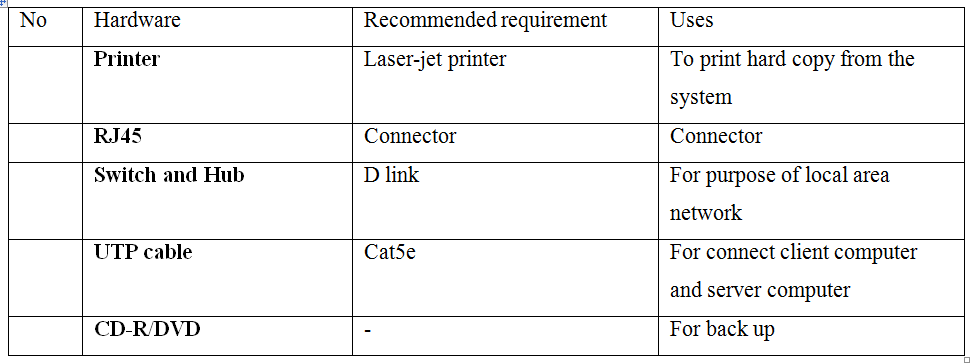


**Software Requirement: -**for maintenance purpose the following Software are needed

###### **Table** 8Software requirement for maintain the system



* External hard ware

**Table** 9External hard ware requirement

## 2.5. SYSTEM MODELING AND ARTIFACTS

## ESSENTIAL USE CASE [CURRENT SYSTEM MODELLING]

A use case is a set of scenarios tied together by a common user goal. A scenario is a sequence of steps describing an interaction between a user and a system. A use case describes a sequence of actions that provide a measurable value to an actor. A use case is particular purpose that a user actually uses a system to accomplish. A use case describes a function provided by the system that yields a visible result for an actor.

Use case is a coherent unit of externally visible functionality provided by the system unit and expressed by the sequence of message exchanged by the system unit and one or more actors of the system unit. The purpose of the use case is to identify pieces of the coherent unit behaviour without revealing the internal structure of the system.

An actor is an idealization of the external person, process or the thing interacting with the system and subsystem or a class. An actor characterizes the interaction that the outside user may have with the system. From the analysis of the document and the interview we undergo and as well with the group members discussion we have identified the current system’s actors as follows

* Student
* Officer: are different office employees who sign clearance form. Like School head, Dormitory chief , Student service, Library , chief of circulation, University book store keeper, Sport master, Office of the student academic service, Dining Office, Student Council, Campus Security Officer,
* Registrar: are officers who administer our system, manage student’s information and approve the student clearance at the end and take a backup to student clearance form.

Once we identify the system user [Actors], the next thing will be to specify the various types of functionality that the system will offer to this actors and the various functionality that they initiate from the system.

1. Student Actor
   * Fill form
   * Request a special need/ask for clearing
   * Submit to registrar
2. Officer
   * Borrow prosperities for the students and check whether they are return or not
   * After that they sign on the form and cleared the students
3. College Dean
   * Check whether the course coordinator sign to the clearance form and the sign to the clearance form if the course coordinator signs.
   * Check whether the students fill coast sharing form and complete their responsibilities
   * Sign and cleared the students

###### Course Coordinator:

* + Check whether the students fill coast sharing form and whether the instructors complete their responsibilities such as submitting grade report.

###### Sign and cleared the students and instructors

1. Registrar
   * Prepare and Distribute student clearance form
   * Cleared the student clearance and take backup

###### Students Services office

* + Include café and dormitory service officers

###### Check whether the students return the meal card and dormitory materials

* + Sign and cleared the Students

## USE CASE SELECTION

The following are the use cases that included in DBU Clearance system

###### Manage Property

* + Prepare Student Clearance Form

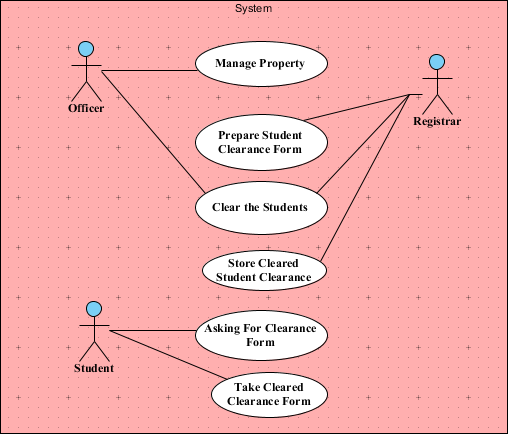
###### Clear the Students

* + Asking For Clearance Form

###### Take Cleared Clearance Form

* + Store Cleared Student Clearance

## ESSENTIAL USECASE DIAGRAM [CURRENT SYSTEM MODELLING]



**Figure** 1Essential Use Case Diagram

## ESSENTIAL USE CASE DESCRIPTIONS [CURRENT SYSTEM]

###### Table 10 Preparing student clearance form use case Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Preparing** | **Student Clearance** | **Form** I**D:** 1 |
| Participating Actor | Registrar | | |
| Description | The registrar Prepare student clearance form at any time. | | |
| Entry condition | The Registrar always should have printed Clearance form for the student in their office | | |
| Flow of event | 1. The Registrar have a soft copy of student clearance form 2. They print out and document in their Office | | |
| Exit condition | The Registrar document and Store a clearance Form | | |

Table 11Asking for clearance form use case Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Asking for** | **Clearance Form** | I**D:** 2 |
| Participating Actor | Students | | |
| Description | The Student ask clearance form from Registrar when they want to sign clearance. | | |
| Entry condition | Students must decide to signing clearance form | | |
| Flow of event | 1. The Registrar have a soft copy of student clearance form in their office 2. They print out and document in their Office 3. Students ask clearance form from Registrar 4. Registrar give a clearance form paper to the student | | |
| Exit condition | The Registrar give clearance form to students | | |

###### Table 12 Clearing Student use case Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Clearing** | **Students** | I**D:** 3 |
| Participating Actor | Officer & Registrar | | |

|  |  |
| --- | --- |
| Description | The above Actors Clear the Students by Signing on the Clearance Form if the student doesn’t have any Responsibility. |
| Entry condition | The Student Must be asking for signing clearance |
| Flow of event | 1. The Registrar have a soft copy of student clearance form 2. They print out and document in their Office 3. The Students ask a clearance form from Registrar when they want to sign clearance 4. By taking the clearance form they Travel into different office to sign clearance 5. The officers sign and clear the student if they do not have borrowed material that does not return. 6. The Students then cleared and submit to registrar |
| Exit condition | The Students get Cleared at the registrar |

Table 13 Manage Property use case Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Manage** | **Property** | I**D:** 6 |
| Participating Actor | Officers | | |
| Description | The officers manage the property of the university by borrowing and receiving the borrowed material | | |
| Entry condition | There student should be borrow the material from officers | | |
| Flow of event | 1. The officers lend the property to the student of the University who want to borrow the material 2. The officer must record the material they borrow with the full address of the borrower 3. The officer delete the record when the borrower return the material they borrow 4. Sign and clear the student | | |
| Exit condition | Validate students as they do not have any property they borrow | | |

###### Table 14Take Cleared Clearance Form use case Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Take** | **Cleared Clearance Form** | I**D:** 7 |
| Participating Actor | Student | | |
| Description | Student of DBU take a cleared Clearance form after they approved at registrar and submit to registrar. | | |
| Entry condition | The Students must sign in different officers, submit at registrar and must be cleared at Registrar | | |
| Flow of event | 1. Students wish to sign Clearance form 2. Student go to Registrar and ask for clearance form 3. Registrar give Clearance for to the Student 4. Students travel to different officers and sign clearance 5. Student go to registrar and submit cleared clearance form to the registrar officer 6. Registrar officers approved Student’s clearance form and   give to the student | | |
| Exit condition | Students take approved/cleared clearance form | | |

Table 15 Store Cleared Clearance Form

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name:** | **Take** | **Cleared Clearance Form** | I**D:** 8 |
| Participating Actor | Registrar | | |
| Description | Registrar Officers approve the student’s clearance and take a piece of cleared clearance paper as a backup. | | |
| Entry condition | The Students must sign in different officers, submit at registrar and must be cleared at Registrar | | |
| Flow of event | 1. Students wish to sign Clearance form 2. Student go to Registrar and ask for clearance form 3. Registrar give Clearance for to the Student 4. Students travel to different officers and sign clearance 5. Student go to registrar and submit cleared clearance form to the registrar officer 6. Registrar officers approved Student’s clearance form and take a piece of cleared clearance form paper and the give   the other piece of cleared clearance form to the student | | |

|  |  |
| --- | --- |
| Exit condition | Registrar officers store a backup of cleared clearance form of the student |

## PROPOSED SYSTEM ACTOR INDENTIFICATION

An Actor in the Unified Modeling Language (UML) "specifies a role played by a user or any other system that interacts with the subject. The followings are a list of Actors in the Proposed System.

###### Registrar: is someone who uploads material lends student information to the central database and print the approved clearance form and put the seal of the university.

* Officers: is someone who upload material lends student e information to the central database.
* Student: is someone who wishes to sign clearance form due to different reason and at the end of each year.

## USE CASE SELECTION

The following are the use cases that will include in DBU Clearance system

###### Manage student clearance

* Manage material lend student information

###### Manage User account

* Manage Property

###### Fill Clearance Form

* Request for Approval

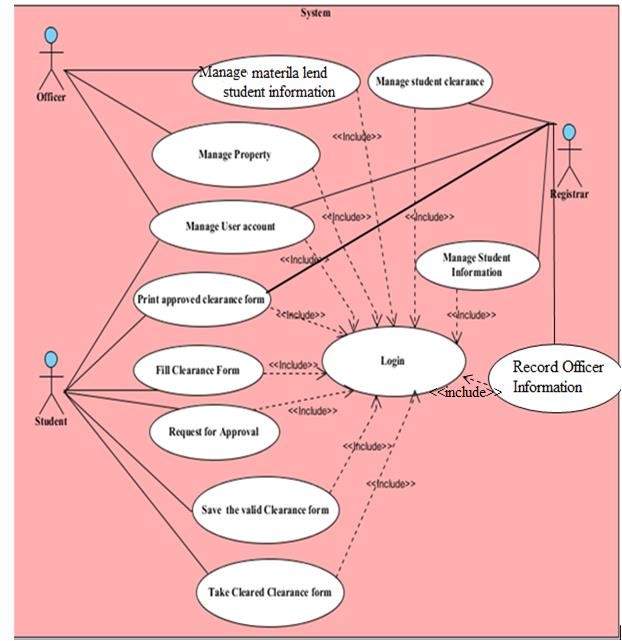
###### Save the valid Clearance form

* Manage Student Information

###### Print approved clearance form

* Take Cleared Clearance form

## ESSENTIAL USE CASE DIAGRAM [PROPOSED SYSTEM MODELLING]



**Figure 2** Essential Use Case Diagram for Proposed System

## NEW SYSTEM DESCRIPTIONS

In the beginning, the above actors will login in to the system based on the access privilege. The officers login into their page and record detail information about the materials and the name of the borrower when the students borrow material. They also upload the student information and the type of material they borrow to the central database. Registrar also login in to their page and manage Student information on their database. The registrar will have a database of student information and the material they borrow from different officers. The student login into their page and will fill the clearance form. The student will request to the central for approval. The system checks their information on the central database and if their information does not exist, the system clear the clearance but if there exist the system reject the request with a message as they have responsibility on that officer. The students save and print the cleared clearance form and sign out from the system. The students have a privilege to change their login password but they cannot change their login user name, also they can recover forget password.

## ESSENTIAL USE CASE DESCRIPTIONS [PROPOSED SYSTEM]

**Table** 16Login use case description

|  |  |
| --- | --- |
| Use case name | Login I**D:** 1 |
| Participating actor | All system user |
| description | Any user who wants to access the system’s functionality must be Authenticated and Authorized and login to the system. |
| Entry condition | The user must be already register (the user must have user name, password and account type) |
| Flow of event | 1. The user open the system 2. The user click login link 3. The system display the login page 4. The user enter his/her identification (user type user name and password) 5. The user click on login button 6. The system takes the user to his/her page. |
| Alternative Flow of event | Step 5, If the identification is not correct the system display incorrect user type, user name and password try again message and the system display the login page. The system give chance to try again. |
| Exit condition | The system user logged in to the system |

###### Description for property management use case it is general use case for

* + - Record property Information

###### update property Information

* + - Delete property Information

###### **Table** 17Record property Information use case description

|  |  |
| --- | --- |
| Use case name | Record property Information. I**D:** 2 |
| Participating actor | Officer |
| description | This use case helps for Officer, to record property. |
| Entry condition | Officer user login to the system. |
| Flow of event | 1. Officer select on upload material lend student information menu. 2. The system display record form. 3. Officer fills required information and click upload button. 4. The system displays an acknowledgement successfully record the information. |
| Alternative Flow of event | Step 3. If Officer enters wrong information the system display message in order to correct wrong information.  Step 4. If Officer enters duplicate property information the system display “information already exist” message. |
| Exit condition | Property information record on the system |

**Table 18** Edit property Information use case description

|  |  |
| --- | --- |
| Use case name | update property Information I**D:** 3 |
| Participating actor | Officer |
| description | This use case helps for Officer to modify previously recorded property. |

|  |  |
| --- | --- |
| Entry condition | Officer login to the system, the property already exist. |
| Flow of event | 1. Officer select on update record Menu. 2. The system display an acknowledgement successfully Edit the information. |
| Alternative Flow of event | Step 3. If the property is not found the system display “information not found” message.  Step 3.If Officer enter wrong information the system displays a message to correct. |
| Exit condition | Modification is recorded. |

###### **Table 19** Delete property Information use case description

|  |  |
| --- | --- |
| Use case name | Delete property Information I**D:** 4 |
| Participating actor | Officer |
| description | If the property that borrowed by the student are returned the Officer want to remove that property information. |
| Entry condition | Officer login to the system, the property must be returned to Officers. |
| Flow of event | 1. Officers click on Delete link 2. The system display an acknowledgement successfully Delete the information. |
| Alternative Flow of event | Step 3.If the Recorded information is not found the system display “information not found” message.  Step 3. If the Officers Click on cancel button the property do not remove. |
| Exit condition | Recorded Information is deleted. |

**Table 20** upload material lend student information use case description

|  |  |
| --- | --- |
| Use case name | upload material lend student information I**D:** 5 |
| Participating actor | Officer |
| description | This use case helps for Officer to upload material lend student information to the central database |
| Entry condition | Officer login to the system |
| Flow of event | 1. Officer select on upload student information Menu. 2. The system display material lend student information form. 3. Officer fills required information and click save button. 4. The system displays an acknowledgement successfully record the information. |
| Alternative Flow of event | Step 3. If Officer enters wrong information the system display message in order to correct wrong information.  Step 4. If Officer enters duplicate property information the system display “information already exist” message. |
| Exit condition | Materials lend student information uploaded to the central database. |

###### Use case description for account management use case this is general use case for

* + - Create user account

###### Update user account

* + - Delete user account

###### Recover forgotten password use cases

* + - Change Password

###### **Table 21** Create user account use case description

|  |  |
| --- | --- |
| Use case name | Create user account I**D:** 6 |

|  |  |
| --- | --- |
| Participating actor | Registrar |
| description | This use case helps the user when it is necessary to create new user account. |
| Entry condition | user login to the system |
| Flow of event | 1. User selects Record Student information from menu bar. 2. The system display Student Registration form. 3. User fills all information and click upload button. 4. The system crate new user account 5. The system save the new account 6. The system display an acknowledgement successfully crate the account |
| Alternative Flow of event | Step 3. If user enters wrong the system display message in order to correct wrong information.  Step 4. If users enters duplicate account the system display “information already exist” message. |
| Exit condition | A new user account is crated |

**Table** 22 Update user account use case description

|  |  |
| --- | --- |
| Use case name | Update user account I**D:** 7 |
| Participating actor | Registrar |
| description | This use case helps the users when he/she wants to update their account. |
| Entry condition | User login to the system |
| Flow of event | 1. User selects Manage account link from menu bar. 2. The system display user account form. 3. User search account that he/she want to update. |

|  |  |
| --- | --- |
|  | 1. The system display information of that account. 2. User makes necessary modification and click Update button. 3. The system asks for conformation. 4. User click ok button. 5. The system saves the change to that account. 6. The system displays an acknowledgement successfully updating the account. |
| Alternative Flow of event | Step 3.If the user account does not exist the system display “account not found” information. |
| Exit condition | Save the change to the account |

###### **Table 23** Change Password use case description

|  |  |
| --- | --- |
| Use case name | Change Password I**D:** 8 |
| Participating actor | All system user |
| description | This use case helps the user when it is necessary to change login password. |
| Entry condition | user login to the system |
| Flow of event | 1. user login to the system 2. User selects change password link. 3. The system display password change form. 4. User fills all information and click change button. 5. The system change the password and save the new password 6. The system display an acknowledgement of password change successfully |
| Alternative Flow of event | Step 3. If user enters wrong the system display |

|  |  |
| --- | --- |
|  | message in order to correct wrong information.  Step 4. If users input does not exist in the database the system display the password does not exist message |
| Exit condition | A new user account is crated |

**Table 24** Delete user account use case description

|  |  |
| --- | --- |
| Use case name | Delete user account I**D:** 9 |
| Participating actor | Registrar |
| description | This use case helps the user to delete user account if it is no more necessary. |
| Entry condition | The user login to the system, the account exists. |
| Flow of event | 1. Users select Manage account from menu bar 2. the system select Delete account link 3. Users search account who wants to delete. 4. The system display information of that account. 5. User click delete button. 6. The system deletes the account. 7. The system display an acknowledgement successfully deletes the account. |
| Alternative Flow of event | Step 3.If the user account does not exist the system display “account not found” information. |
| Exit condition | the account is deleted |

###### **Table 25** Recover forgotten password use case description

|  |  |
| --- | --- |
| Use case name | Recover forgotten password I**D:** 10 |
| Participating actor | Student |
| Description | The system users may forget their password so  this use case help to the system user to recover |

|  |  |
| --- | --- |
|  | the forget password . |
| Entry condition | The user must be previously register |
| Flow of event | 1. The user click on forgotten password button 2. The system display forget password recover form 3. The user will enter all required information and click on display button. 4. The system retrieves the password and display on their page and will display acknowledgment successfully retrieve the password. |
| Alternative Flow of event | Step 4.if the user miss required information the system display the message to fill all required information |
| Exit condition | The user knows their password |

**Table 26** Approving Student Clearance use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Approving | Student Clearance | ID: 11 |
| Participating Actor | System, Registrar | | |
| Description | The system checks the name and ID of the student on the registrar database and approve if not exist, Registrar take the approved clearance form from the student and approve the clearance form for the last time by putting the seal of the university and their signature. | | |
| Entry condition | The Student Must be Requesting for Approving clearance | | |
| Flow of event | 1. The Registrar have a database of Student and the material they borrow 2. The students login in to the system 3. Student click clearance form link 4. The system display student clearance Form 5. The students fill the required information in students clearance form 6. The student click the approve button 7. The system checks the student information on the registrar Database | | |

|  |  |
| --- | --- |
|  | 1. The system clears the student and displays the cleared clearance form. 2. The Student save and print the cleared clearance 3. Students go to Registrar and cleared at the end. |
| Exit condition | The Students get Cleared |

###### **Table 27** Rejecting Student Clearance use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Rejecting | Student Clearance | ID: 12 |
| Participating Actor | System, Registrar | | |
| Description | The system and registrar checks the ID of the student on the registrar database and reject if exist. | | |
| Entry condition | The Student Must be Requesting for Approving clearance | | |
| Flow of event | 1. The Registrar have a database of Student and the material they borrow 2. The students login in to the system 3. Student click clearance form link 4. The system display student clearance Form 5. The students fill the required information in students clearance form 6. The student click the submit button 7. The system checks the student information on the registrar Database 8. If the student information exists the system rejects the clearance request with a notification in which office the student have responsibility 9. The displays again on student clearance form page | | |
| Exit condition | The Students clearance request Rejected | | |

**Table 28** Requesting for Clearance approval use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Request for | Clearance approval | ID: 13 |
| Participating Actor | Students | | |

|  |  |
| --- | --- |
| Description | Students click the submit button after they fill the required information to request for clearance approval. |
| Entry condition | Student Must fill the required information on the clearance form and click the submit button |
| Flow of event | 1. Student login into their own page 2. Students fill the required information on the clearance form 3. Students click the submit button |
| Exit condition | Students waiting until the system say some thing |

###### **Table 29** Filing clearance form use case description use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Fill Clearance | Form | ID: 14 |
| Participating Actor | Students | | |
| Description | Students fill the clearance form on their own page | | |
| Entry condition | Students must be login in to the system | | |
| Flow of event | 1. Student login into their own page 2. Students click the clearance form link 3. The system display the clearance form 4. Students fill the required information on the clearance form | | |
| Exit condition | The required information on Clearance form Filled | | |

**Table 30** Mange student information use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Manage Student | Information | ID: 15 |
| Participating Actor | Registrar | | |
| Description | Registrar upload the student information and give user name, password and privilege to the student | | |
| Entry condition | Registrar users must be login to the system to their own page. | | |
| Flow of event | 1. Click record student information link 2. The system display the record student information form | | |

|  |  |
| --- | --- |
|  | 1. The user fill the required field and click add button 2. The system validated the user input and save the data into the database |
| Exit condition | Student information inserted to the student information table |

**Table 31** Take Cleared Clearance form use case description

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name: | Take | Cleared clearance Form | ID: 16 |
| Participating Actor | Student | | |
| Description | Students of DBU sing Clearance online and then they take the approved clearance form | | |
| Entry condition | Students must sign clearance and they must approved by the system and Registrar officer. | | |
| Flow of event | 1. Students wish to sign clearance 2. Students access our system 3. Student login to their page using user name and password 4. Students Click the clearance form link 5. The system display Clearance form 6. Students Fill the clearance form 7. The system check the students information in the central database 8. The system display the cleared clearance form 9. Student save the cleared clearance form 10. Student Go to Registrar 11. Registrar Print the cleared clearance form and approve the student clearance form | | |
| Exit condition | Student take the approved clearance form | | |

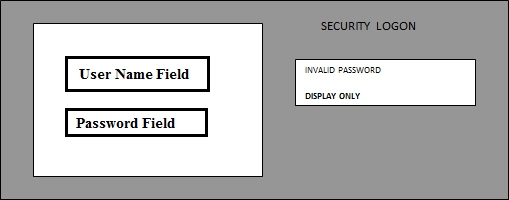
**BR 11**-The student must be approved by Registrar officers for the last approval

**BR 12** – The registrar officer should check whether the students are responsible or not on different officer before signing his/her signature and sill of DBU.

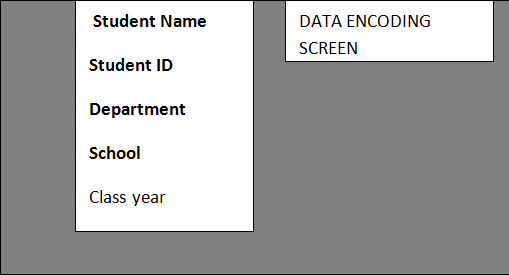
**BR 13**- The Registrar officer should first check whether the student approved by the system or not before putting his/her signature on the clearance form.

**BR 14-** The registrar officer should sign and put the sill of DBU on student clearance form which is approved by the system.

* + 1. **Essential User Interface**



**Figure 3 :** Essential Security Login

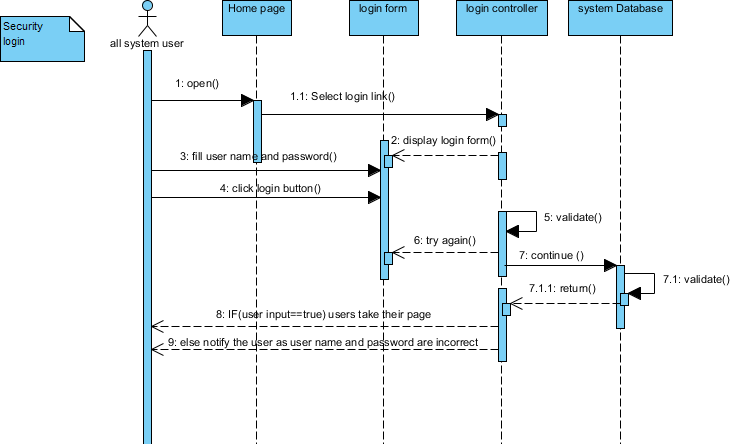


**Figure 4** : Data Entry Screen

##### DYNAMIC MODEL

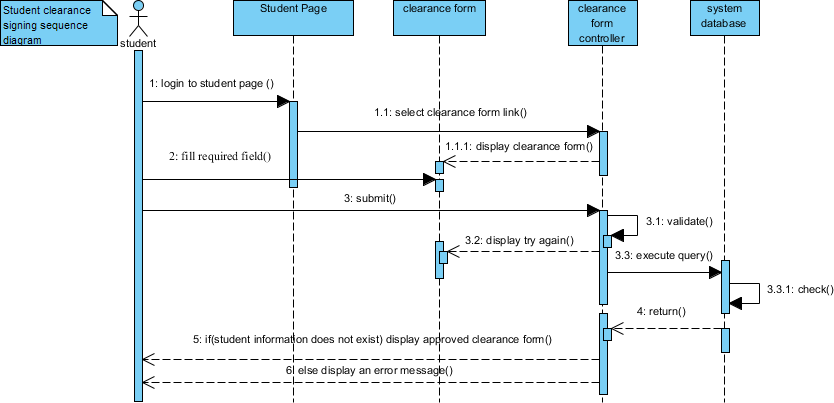
* + 1. Sequence Diagram

Sequence diagram describes interaction among classes of the DBU Student Clearance management system such as Students, officers and Registrar administrator’s terms of signing clearance form overtime. It models the behavior of these classes within a use case.



**Figure 5** Sequence Diagram for Login Use case

All the system users open the system and the system display the login page. Then the system user fill the login form fields and the system validate the users input, the user click the login button, the login form creates the login form controller which allow to execute the users input from the database, the systems database validate the users Identification and return the result to the login controller. Login controller validates the result and displays their page to the user. Then the system user work on their own page whatever they want to do.



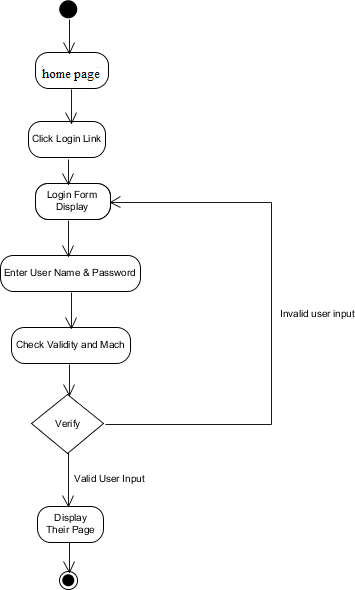
**Figure 6** Sequence Diagram for Signing Clearance Form Use case

This sequence diagram shows the steps how the students of DBU follow to sign clearance online. To sign clearance online the student of the university must be registered and later login based on the previous registration. The user open the system and fill the login form field , click login button, then the system display clearance form page. Students fill the required filed on their own page and click the submit button. The users input validated by the system and creates clearance form controller which allow executing the users input from the database. The systems database validates the query and returns the result to clearance form controller. Then if the users input are valid in systems database the system display the cleared and printable page and create print controller to execute the users command. The system user clicks the print button and takes the cleared clearance form. But if the user’s information

exists in the central database the system notify the user by telling they have responsibility that they must complete and where they have responsibility.

* + 1. Activity Diagram

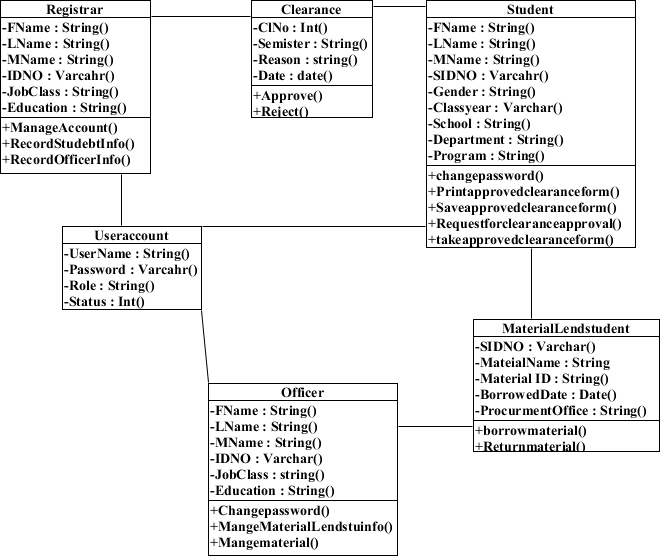
Activity diagram is another important diagram in UML to describe dynamic aspects of the system. Activity diagram is basically a flow chart to represent the flow from one activity to another activity. The activity can be described as an operation of the system.



**Figure 7** Activity diagram for login

The above diagram show the activities performed when the system user login into the system. The user opens the systems home page and clicks the login link. The system displays the login form page. Then they fill the user name and password to login and click the login button. The system validates the users input and display their page if the user input are correct or notify the error and display the login form page.

## Analysis Level Class Diagram

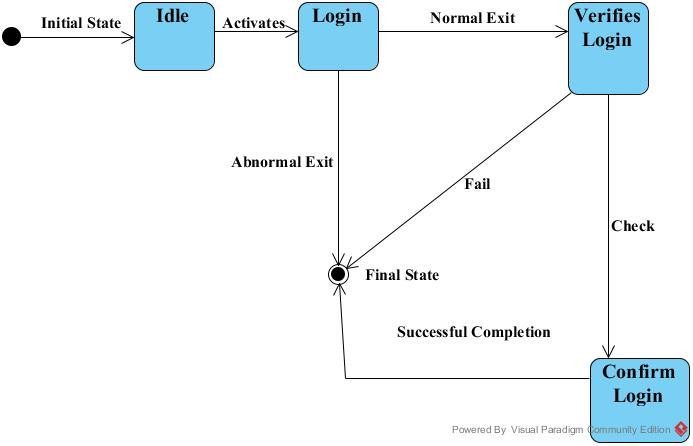


**Figure 8** Analysis Level Class Diagram

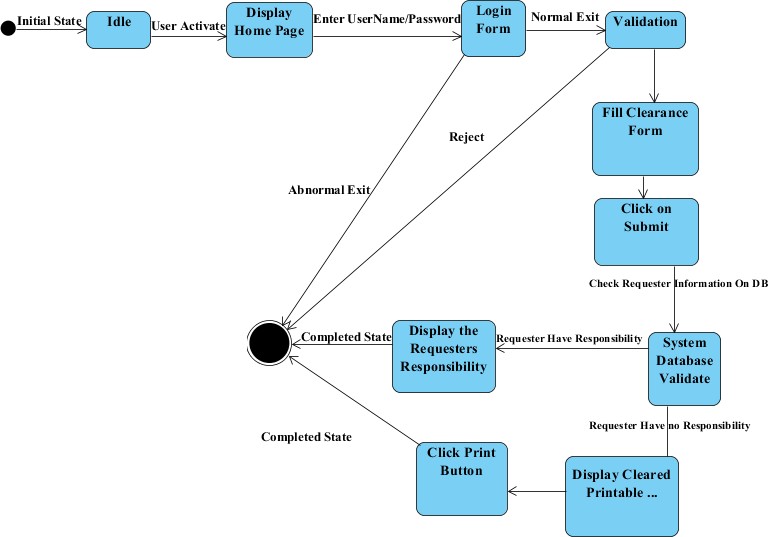
## State chart diagrams

UML state machine diagrams depict the various states that an object may be in and the transitions between those states. In fact, in other modeling languages, it is common for this type of a diagram to be called a state-transition diagram or even simply a state diagram. A state represents a stage in the behavior pattern of an object, and like UML activity diagrams it is possible to have initial states and final states. An initial state, also called a creation state, is the one that an object is in when it is first created, whereas a final state is one in which no transitions lead out of. A transition is a progression from one state to another and will be triggered by an event that is either internal or external to the object.

States are depicted as rounded rectangles. Transitions are arrows from one state to another. Events or conditions that trigger transitions are written next to the arrows.



**Figure 9** State chart diagram for login



**Figure 10** State-chart diagram for Clearance Form Signing

## STATIC MODEL

Static modeling is used to represent the static constituents of software such as class, objects, Interface and their relationship with each other.

## Class Diagram

Class diagram describe our system in terms of objects, attributes, operations and relationships.

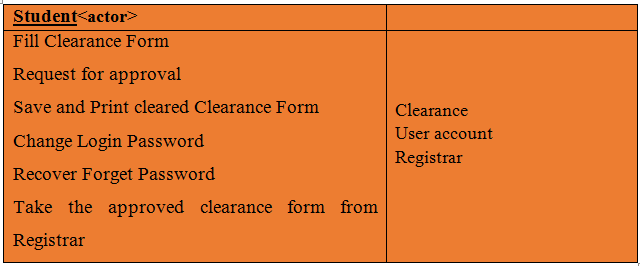
To draw the class diagram, we follow the following steps

1. describing the system functionality shortly, this helps us to identify the class
2. preparation of class responsibility collaborators[CRC]
3. identify the abstraction or class
4. identify the responsibility of each class
5. translating the responsibility of each class in to its attribute and operations needed to perform those responsibility
6. identify the relationship between class
7. finally draw the class diagram of the system based on the above information

###### System functionality description

In the beginning, the student will access the system. After that they login into their page and fill the clearance form. Students who fill the clearance form will send request to the system for approval the system check and cleared. The system displays the printable form and the requester will save and print the clearance form and go to registrar, the Registrar officers print the cleared clearance form paper and put their signature and the seal of the university. Then the students take the approved clearance form paper.

###### Class Responsibility Collaborators [CRC] Identification



Student class

-this message class is part of clearance package. It helps to manage student information’s Attribute in student class: **-**student class has 7 private attribute and 5 private methods

###### First name:-used to set and get student first name

* Last name:- used to set and get student Last name

###### Sex:-used set and get student sex

* Id number:-used to set and get student id number

###### School:-used to set and get student school

* Department:-used to set and student department

###### Program :-used to set and get student program

* Class/year:-used to set and get student class/year

###### Academic year:-used to set and get student academic year

Method in student class: - all method in student class is private

###### Save ():- used to insert student information in to the database.

* Show ():- used to show previously store student information
* Print ():- used to print the cleared clearance form
* Change Password ():- used to allow change the login password of the student
* Recover Forget Password ():- used to allow to recover forget password

User account class

-This user account class is part of clearance package. It helps for the Registrar administrator to manage user information.

Attributes in user account object: **-** all attribute in user account class visibility is private those are

###### First name: - used to set and get user first name

* Last name:- used to set and get user last name

###### User type :-used to set get user type

* User name :-used to set get user name

###### Password :-used to set get user password

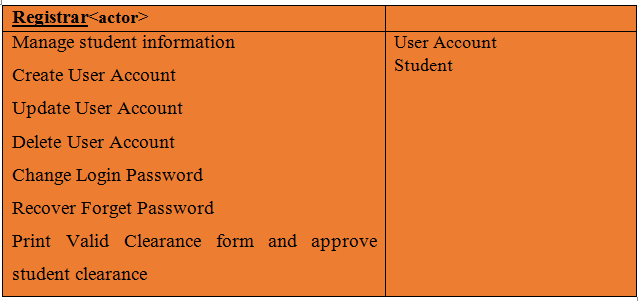
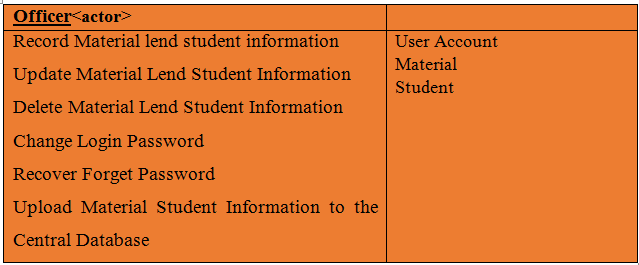
* ID No:-used to set get user id number

Methods in user account Class:-

###### Save ():- this method used to enter users information in to the database.

* Edit ():- this method used to modify user account information.

###### Delete ():-this method used to delete user information from the database.



* + - 1. Identify Classes from the Use Case and CRC

***Use cases classes***

###### Fill form, student classes

1. encode-data officer, Registrar and Property classes

###### Login account classes

1. Update, Delete property officer classes

###### Requesting for signing Student and Clearance classes

4. Identifying the responsibility of each class

1. **Student:-**

**Attributes: -** Used to keep information about the student (first name, last name middle name, faculty, department, year, student ID, and program)

**Operation:** Show Clearance (), Print Clearance ()

1. Registrar: -

**Attributes:** First name, last name, middle name, user name, user type, and password

**Operation:** Create user account (), Update user account (), Delete user account (), Change Password (), view Report (), record report (), delete Recorded report (), update recorded report ()

1. account

**Attributes:** username, password and user type

**Operation:** verify account ()

1. Clearance:-

**Attributes:** Reason, Semester, date

**Operation:** Approve (), Reject ()

###### Material:-

**Attributes:** Quantity, Borrow date, material name

**Operation:** lend (), return ()

###### Identifying The Relationship Between Classes

In our class diagram, the following types of relationship exist. Association relationship exists between the following classes:

o Many-to-many relationship: - Officer to Student.

In this case many Officer will have information about many students who borrow materials from officers and many officers may upload many material lend student information to the central Database.

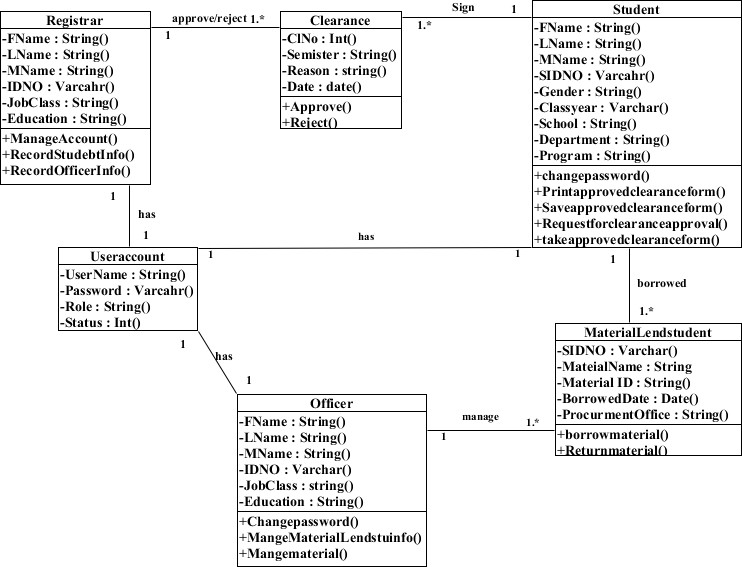
o one-to-one relationship:- Student to account, Registrar to Account, Officers to Account

Each student who is a member of DBU will have only one account and each Officer also will have only one account.

o One-to-many relationship: - Registrar to Student, Student to Material.

In this case one student can borrow many materials from officers and one material can be borrowed by many students. In this case Registrar will have information about many students.

###### Draw the class diagram of the system



**Figure 11** Design Level Class Diagram

## CHAPTER THREE

## SYSTEM DESIGN

## Introduction

System design is the process and focuses on decomposing the system into manageable parts. During requirements analysis, we concentrated on the purpose and the functionality of the system. During system design, we focus on the processes, data structures, and software and hardware components necessary to implement it. The challenge of system design is that many conflicting criteria and constraints need to be met when decomposing the system. The analysis model describes the system completely from the actors’ point of view and serves as the basis of communication between the client and the developers. The analysis model, however, does not contain information about the internal structure of the system, its hardware configuration, or, more generally, how the system should be realized. System design results in the following products:

###### List of design goals, describing the qualities of the system that developers should optimize.

* Webpage architecture, describing the subsystem decomposition in terms of subsystem responsibilities, dependencies among subsystems, subsystem mapping to hardware, and major policy decisions such as control flow, access control, and data storage.

## Purpose of system design

The Purpose of system design is in order to:-

###### Define what methods or mechanisms we use to achieve requirements of the system.

* Fill the gap between the system specification produced during requirements elicitation and analysis.
* Make the system easily manageable by individual team member.

## Design Goals

Design goals describe the qualities of the system that developers should optimize. The following are the qualities that our system should focus on.

###### Performance: DBU clearance system should respond fast with high throughput, i.e. it should perform the task of DBU Student clearance system quickly.

* Error Handling and Extreme conditions: The system should be robust enough to handle error conditions and continue with normal operations. If an error occurs, the system should identify the error and notify to the user.

###### Availability – DBU Student clearance system should be accessible from any computer if the computer is connected with a server computer by local area network and will be accessible anytime a user would want to use the program.

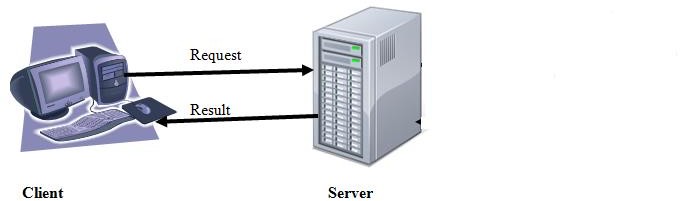
* Security: DBU Student clearance system should be secured, i.e., not allow other users or unauthorized users to access data that has no the right to access it.

###### Cost: The system should be developed with minimum cost possible

* Modifiability: DBU Student clearance system should be modifiable for further modification and enhancement of the application.

## Proposed System software architecture

* + - 1. **Overview**

Software architecture refers to the subsystem decomposition in terms of subsystem Responsibilities, dependencies among subsystems, subsystem mapping to hardware, and Major policy decisions such as control flow, access control, and data storage. The proposed system will have two tier client-server software architectures. The clients request to the server and the server response to the client, then the client can get the information whatever they request to the server.

**Figure 12**Software Architecture of the system

## Subsystem decomposition

###### The system will be built on a layered architecture. A layered architecture makes it easier to maintain or modify one part of the system without affecting the others. If for example the users need a modification on the User interface, they could get it without affecting the whole or the rest of the system. During decomposition of the system we decompose our system in to individual unit that can be perform by one team member and one subsystem modification do not affect the other subsystem and each subsystem class are related with each other. Our system has the following sub system

* + - * + Student Information management subsystem

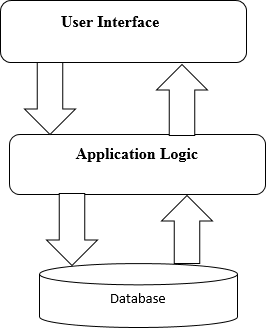
###### Property management subsystem

* + - * + Clearance management subsystem

###### User administration subsystem

* + - * + Communication management subsystem

The following diagram shows the layers that the system will be constructed on.



**Figure 13** layered architecture of the system

The above figure shows that the system will have three logical layers now let us describe each layer:-

###### User interface**:-**it is the first layer of the system in which the user interacts with the System.

* Application logic: **-**it is the second layer of the system in which all functional requirement of the system will implement. On application logic the system should have the following subsystems.

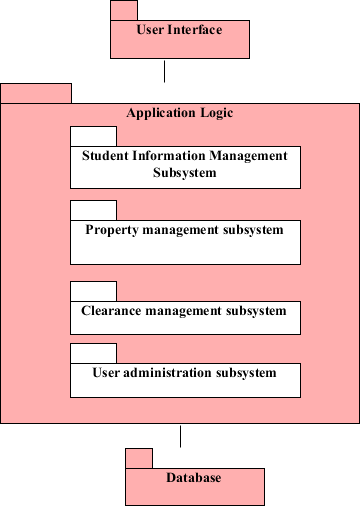
###### Student Information Management Subsystem

* + Property management subsystem

###### Clearance management subsystem

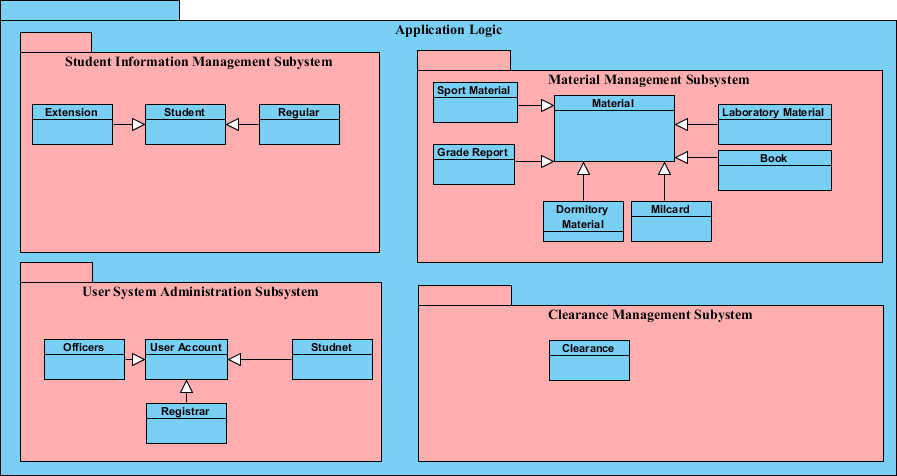
* + User administration subsystem

###### Database:**-**the layer at the bottom of the system architecture will be a database system that store Information about Student.



**Figure 14** sub system diagram of the system

Each subsystem of the system is decomposing in to class the following figure show subsystem of the system and the class in each subsystem



**Figure 15** sub system class

## Access control and security

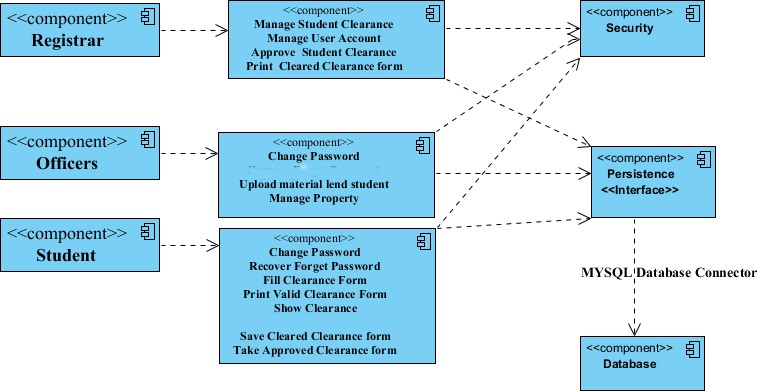
The access control shows who can access which class in the system and we describe it by using access control matrix.

**Table 32 Access Control and Security**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Actors** |  | | | |
| **Student information management** | **Property management** | **Clearance management** | **User System administration** |
| Registrar | Upload Student Information()  information() |  | Approve Clearance ()  Print Clearance() | Create\_user\_account() Update\_user\_account() Delete\_user\_account() Change\_password() |
| Officer | Upload material lend student() | Add-property information ()  Edit-property information ()  Delete-property information () |  | Change\_password() |
| Student |  |  | Show Clearance()  Print Clearance()  Save Cleared Clearance form ()  Take Approved Clearance form() | Change password()  Recover forget Password () |

## Component diagram

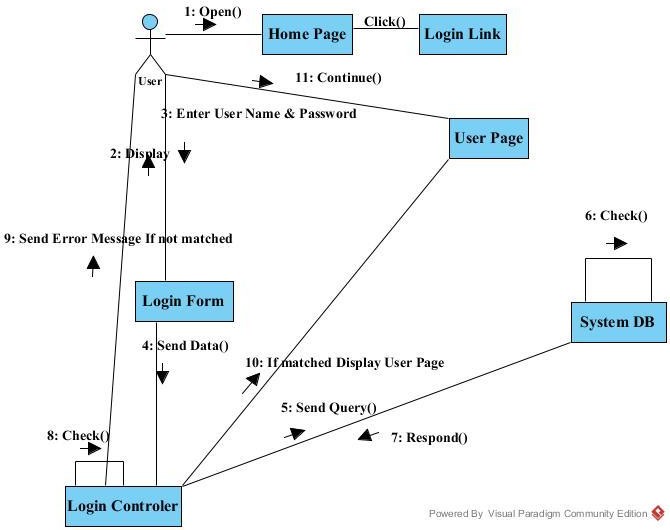
In this Diagram components of the system will be wired showing that there is relation among components, management of the system, database and operations performed on databases such security issue. This in some extent shows which component or objects will be accessed by whom and what type of security infrastructures it is using. The diagram is simulated below.



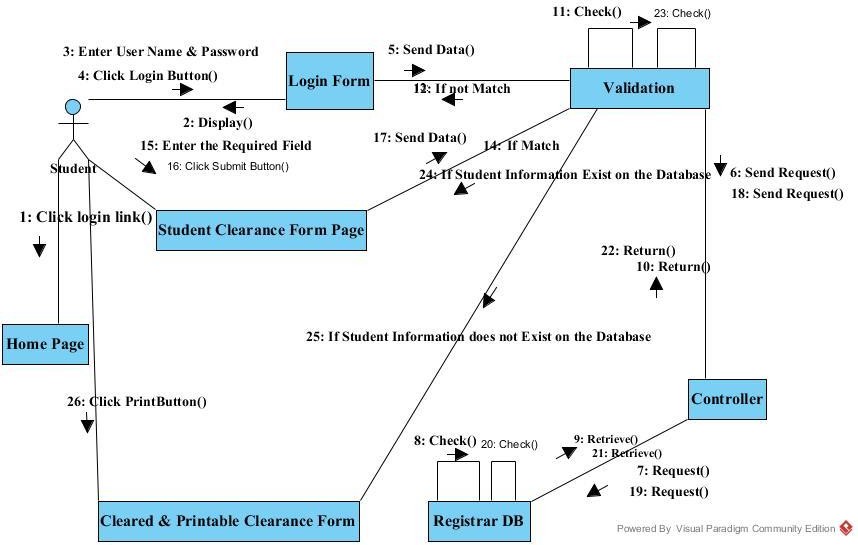
**Figure 16** component diagram

## 3.1.7 COLLABORATION DIAGRAM

Collaboration diagram is another form of interaction diagram. It represents the structural organization of a system and the messages sent/received. Structural organization consists of objects and links. The purpose of collaboration diagram is similar to sequence diagram. But the specific purpose of collaboration diagram is to visualize the organization of objects and their interaction. Collaboration diagrams aim at showing the communications that happen between objects, by defining messages that flow between each other.

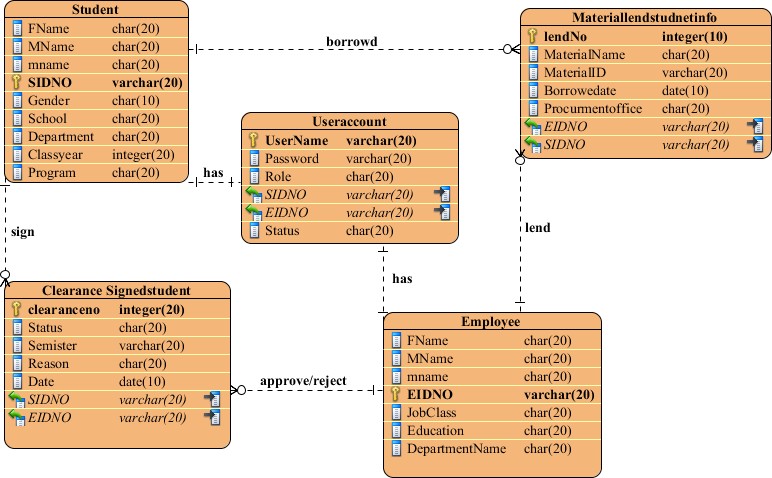


###### **Figure 17**Collaboration diagram for user login



**Figure 18**Collaboration diagram for Student Clearance signing

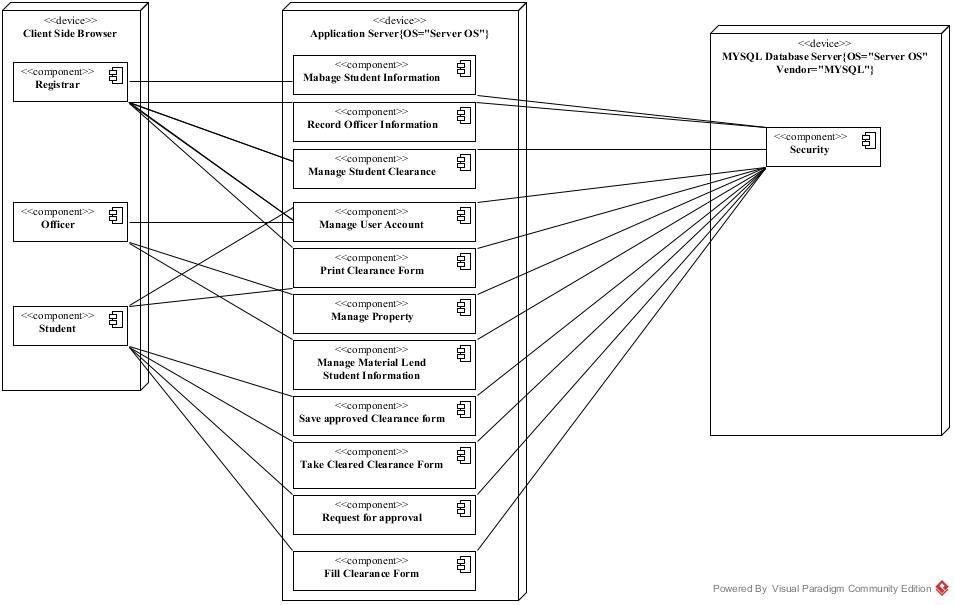
* 1. Database Design



**Figure 19** Database Design Diagram

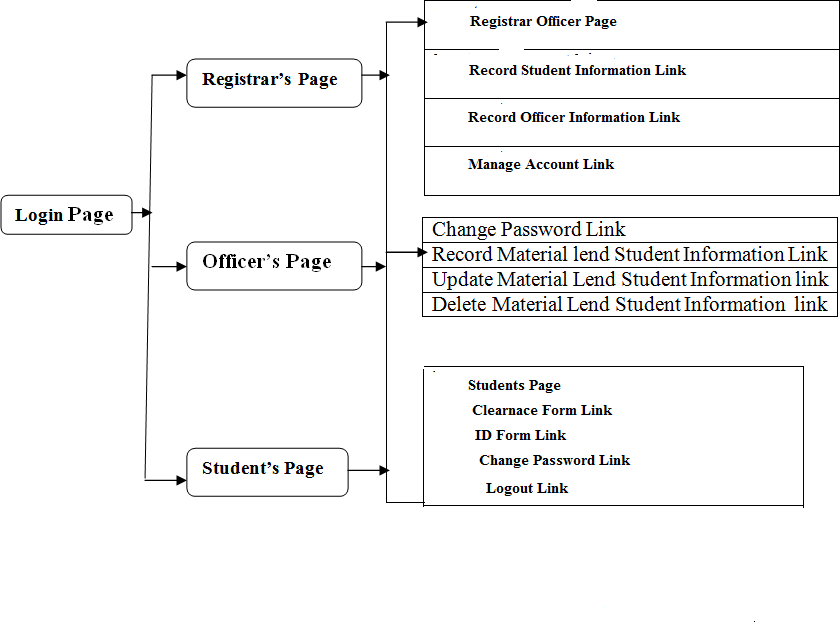
## 3.2.1. Deployment Diagram

Deployment Diagrams show the hardware for your system, the software that is installed on that hardware, and the middleware used to connect the disparate machines to one another.



**Figure 20** Deployment diagram

## USER INTERFACE PROTOTYPING DESIGN



**Figure 21** user interface prototype

### Sample user Interface

In this system users will communicate with it through the following user interfaces.

1. **Home Page:** This form 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 case for the students the system requires ID Number as user name.



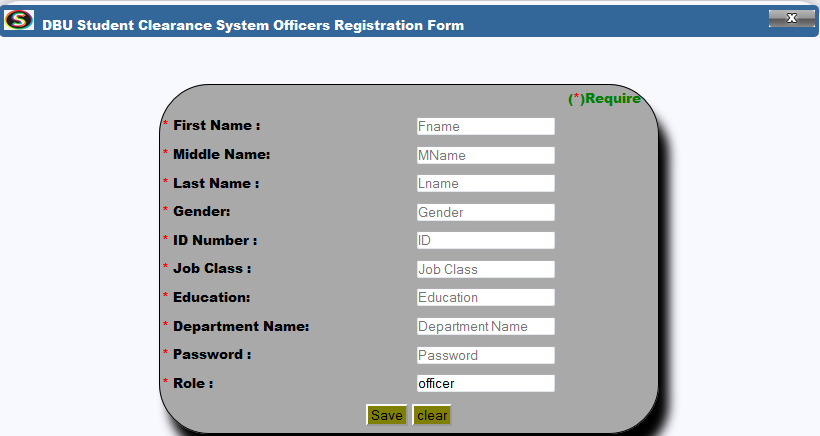
**Figure 22** Home page of DBU Student clearance System

1. **Log In form:-**this form found immediately following the home page. Home page appears as the site on which the system is deployed is opened. The user get the login link when they open the system as the same as the home page. Every user of the system use their ID Number as user name and their number as password for the first time.



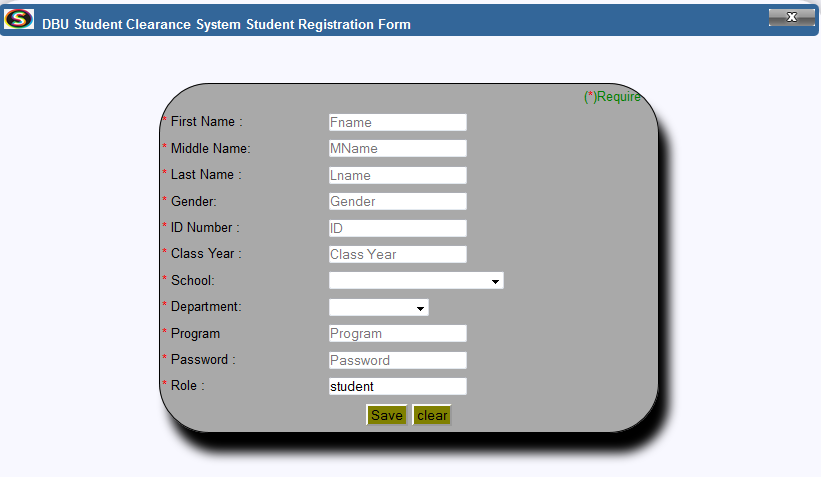
**Figure 23** DBU Student Clearance System Login Page

1. **Officer Registration:** the registrar officer gets to their page and registers the new officer to the central database by using this form.



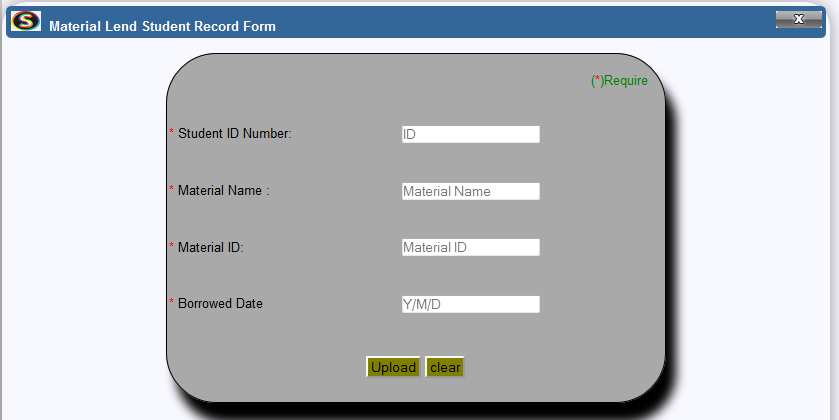
**Figure 24** Officer Information record form

1. **Student Registration:** the registrar officer gets to their page and registers the new studetn to the central database by using this form.



**Figure 25** student information record form

1. **Upload material lend student information:** the officer gets to their page and registers material lend student information and the material information to the central database when the student borrowed material from their office.



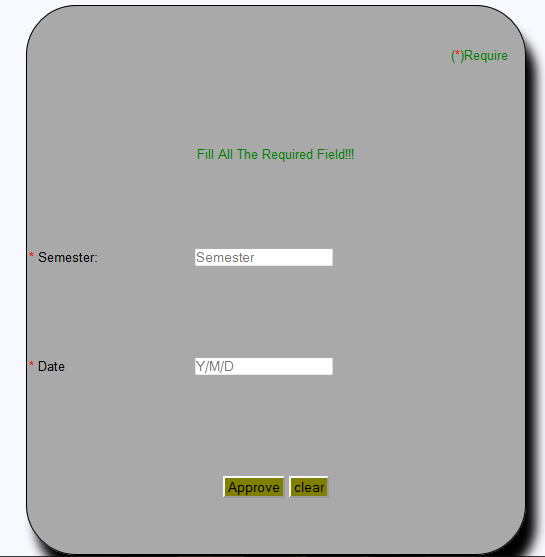
**Figure 26** material lend student information record form

1. **Change password:** every user of the system gets to their page and clicks the change password link when they want to change the password, and the change their password using the form bellow.



**Figure 27** change password form

1. **Fill the clearance form:** student login to their page and click the ID form then the system display the form below and students fill the ID form.



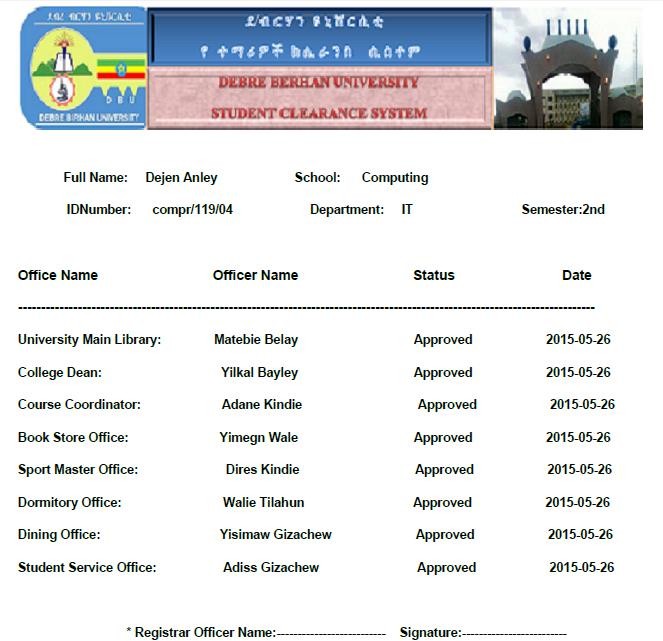
**Figure 28** Student ID clearance form

1. **Approved clearance form:** after the student fills the clearance form on the system, the clearance form which is approved by the system looks like this.



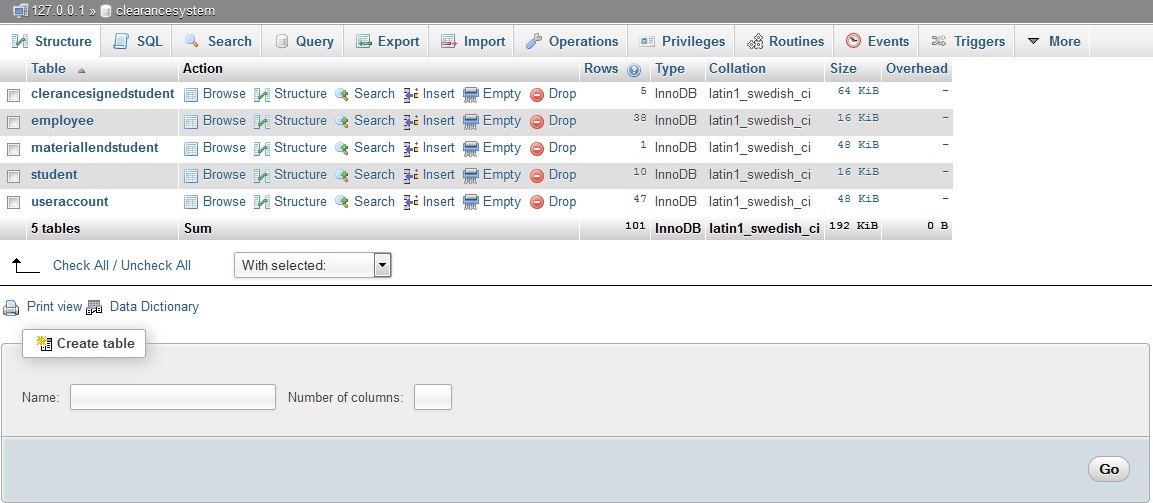
**Figure 29** clearance form approved by the system

1. **Saved clearance form:** after the approved clearance form displayed the student save the approved clearance form and the clearance form which is saved as PDF looks like this.

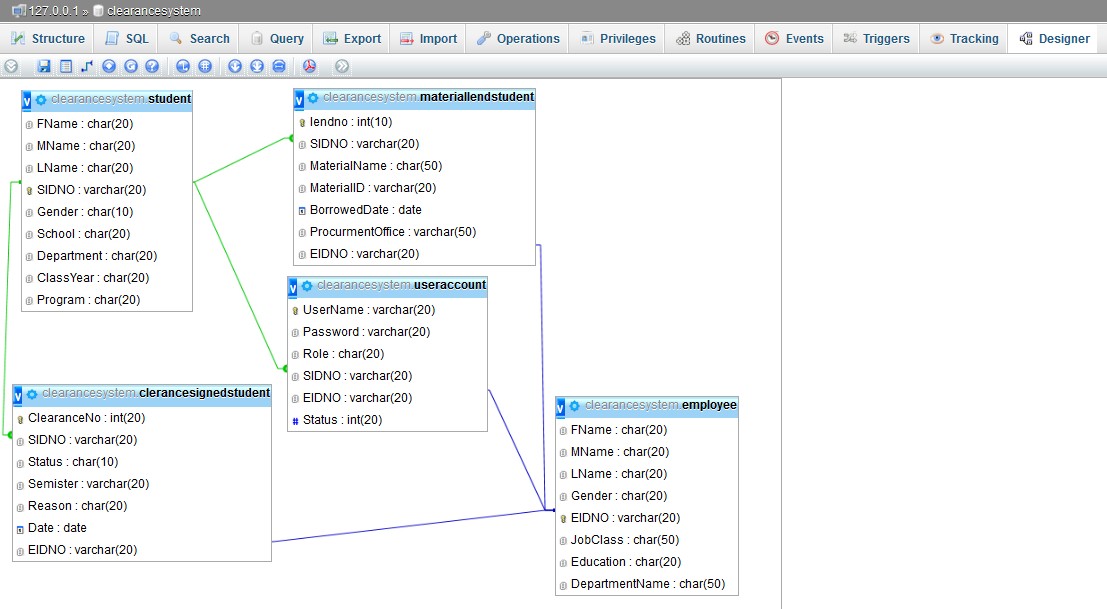


**Figure 30** saved clearance form

1. **List of tables and their relationship:** these include the list of tables for DBU clearance system database and their relationship.



**Figure 31** list of tables of clerancesystem database



**Figure 32 relation ship between tables of clerancesystem database**

## CHAPTER FOUR

##### IMPLEMENTATION AND TESTING

* + 1. **Implementation overview**

The Implementation Process takes the design model and produces an equivalent executable representation and the purpose of this part of the document is to provide short explanation how we implement the system. In this phase we show the tools and environment to implement the system.

##### Tools and environment

We used different hard ware and software tools to develop the system those are

Software

Front end

* + Dreamweaver to design users interface.

Back end

* + SQL SERVER 2005 Express Edition. Pictures editing
  + Adobe Photoshop CS4 Hard ware
  + Two desktop computer with 1 GB RAM and 150 GB hard disk one for server to design data base and one client to write the code.
  + CD/DVD and flash disk to take back up & store file Language
  + HTML (Hypertext Markup Language): in order to design front end of the system and to design help file for the user.
  + CSS (Cascading Style Sheets): in order to make format the displayed HTML.
    1. Testing methodology

We will use the following fault detection technique In order to identify the possible faults that may occur during and after developing the system it help us to assure the quality of our product.

* + Unit testing

We will use this testing technique in order to test smallest individually executable code units.

* + Integration Testing

We will apply integration testing in order to test Interactions between two or more units or Components.

* + System testing - we will test all the components together to cheek whether the systems meet all requirements or not.

## CHAPTER FIVE PROTOTYPE DEVELOPMENT

###### The physical design specification created by the designers is turned in to working computer code by the programmer using Php, HTML and Css.

* 1. **Sample code for login:**

<?php if(isset($\_POST['submitlogin']))

{

$user =$\_POST['username'];

$password=$\_POST['password'];

$passdec=base64\_encode($password);

$query1 = "SELECT \* FROM useraccount WHERE UserName = '{$user}' AND Password = '{$passdec}'AND Status='1' ;";

$result=mysql\_query($query1); if(!$result){

die("Login Failed".mysql\_error());

}

$rowCheck = mysql\_num\_rows($result);

$row=mysql\_fetch\_array($result);

$role=$row['Role'];

//if($row['level']==1){

if($role=='student')

{

$\_SESSION['validuser']=$user; echo "<script>window.location='student.php';</script>";

}

if($role=='RegistrarOfficer')

{

$\_SESSION['validuser']=$user;

echo "<script>window.location='Registrar.php';</script>";

}

if ($role=='officer')

{

$\_SESSION['validuser']=$user;

echo "<script>window.location='officer.php';</script>";

}

if ($role=='employee')

{

$\_SESSION['validuser']=$user;

echo "<script>window.location='employee.php';</script>";

}

else {

echo '<div align="center"><strong><font color="#FF0000"> Incorrect Login Trial!!!

Try Again Latter. !!</font></Strong></div>';

echo'<meta content="2;login.php" http-equiv="refresh"/>';

}

}

mysql\_close($conn);

?>

* 1. **Sample code for Student Registration:**

<?php if(isset($\_POST['submitMain']) )

{

$fname=$\_POST['fname'];

$lname=$\_POST['lname'];

$mname=$\_POST['mn'];

$sex=$\_POST['sex'];

$year=$\_POST['cyear'];

$id=$\_POST['id'];

$school=$\_POST['sch'];

$dept=$\_POST['dep'];

$pro=$\_POST['pro'];

$pass=$\_POST['pass'];

$role=$\_POST['role'];

$pasmd5=base64\_encode($pass);

$get= mysql\_query("SELECT \* FROM student where SIDNO='$id' ")or die(mysql\_error());

$num = mysql\_num\_rows($get); if($num==0 && $id!=""){

$query="INSERT INTO student(FName,MName,LName,SIDNO,Gender,School,Department,ClassYear,Program)";

$query.="VALUES ('{$fname}','{$mname}','{$lname}','{$id}','{$sex}','{$school}','{$dept}','{$year}','{$pro}');";

$result=mysql\_query($query); if(!$result){

die("Query is Failed".mysql\_error());

}

else{

echo"<p class='success'> Student Information Uploaded Successfully!!! </p>"; echo'<meta content="2;studregist.php" http-equiv="refresh"/>';

}

$get1= mysql\_query("SELECT \* FROM useraccount where SIDNO='$id' ")or die(mysql\_error());

$num1 = mysql\_num\_rows($get1); if($num1==0 && $id!=""){

$query1="INSERT INTO useraccount(UserName,Password,Role,SIDNO,Status)";

$query1.="VALUES ('{$id}','{$pasmd5}','{$role}','{$id}','1');";

$result1=mysql\_query($query1); if(!$result1){

die("Query is Failed".mysql\_error());

echo'<meta content="2;studregist.php" http-equiv="refresh"/>';

}

}

}

else{

echo "This Student Registered Before This Time!!!"; echo'<meta content="2;studregist.php" http-equiv="refresh"/>';

}

mysql\_close($conn);

}

?>

## CONCLUSION

As project come up to the end. We pass all software development life cycles. Start from system specification up to system testing and at each stage system development we understand clearly what to be done and what need to be done each tasks. For example, in analysis, we tried to model the new and proposed system using UML diagrams: - use case diagrams, sequence diagrams, class diagrams and Activity Diagram. And from this we understand how to model the system.

In general the project (system) that the team developed will benefit the enterprise in by changing its business range from manual to online level.

The overall benefits of the system to the enterprise are:

###### provide sufficient security

* Minimize the time required to perform task.

###### Reducing human power and cost that are spent on the manual system.

As a system developing team the group member have acquired more knowledge and experience about the different phases of the software development life-cycle. As software developers, the team has worked together and assessed risks, and minimizes them.

Table 33Appendix

APPENDIX

#### List of Symbols

|  |  |
| --- | --- |
| **Symbol** | **Description** |
| Description: C:\Users\JIT\Desktop\diagram\acr.PNG | Actor |
| Description: C:\Users\JIT\Desktop\diagram\bon.PNG | System boundary |
| Description: C:\Users\JIT\Desktop\diagram\desion.PNG | Decision |
| Description: C:\Users\JIT\Desktop\diagram\usecase.PNG | Use case |
| Description: C:\Users\JIT\Desktop\diagram\class.PNG | class |
| Description: C:\Users\JIT\Desktop\diagram\object.PNG | Object life line |
| Description: C:\Users\JIT\Desktop\diagram\dep.PNG | Deployment diagram |
| Description: C:\Users\JIT\Desktop\diagram\missage.PNG | Message line extends from the lifeline of one object to the  lifeline of another object. |

|  |  |
| --- | --- |
|  | Include, relates to the include use case to indicate inserted behavior |
|  | Create Return Message |
| Description: C:\Users\JIT\Desktop\sdfghfdg.PNG | Starting point of activity/state diagram |
| Description: C:\Users\JIT\Desktop\dfhgxdfgh.PNG | Ending point of activity/state diagram |

List of Acronyms

|  |  |
| --- | --- |
| **Abrivation** | **Description** |
| BR | Business rule |
| DBU | Debre Berhan University |
| PHP | PHP: Hypertext Preprocessor |
| CSS | Cascading style sheet |

###### REFERENCE

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###### *Alain Abran*, École de technologiesupérieure*James W. Moore*, The MITRE Corp. (2004 Version) Guide to software engineering body of knowledge 2004 Version