WOLKITE UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

A Project Web Based Wolkite University Property Management System

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Advisor: Mr. Kolana K.

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SUBMITED TO DEPARTMENT OF COMPUTER SCIENCEIN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF BACHLER OF SCIENCE IN COMPUTER SCIENCE

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Acknowledgment

First of all, we would like to give a great thanks to the Almighty God who helped us, gives us love, patience, healthy, wisdom and ability to walk through all the problems and obstacles during the period of our study. Next, we take this opportunity to express our sincere thanks to our principal Advisor Mr. Kolana K for the guidance and support us by giving comments and ideas throughout this project and correcting various error of proposal with attention and care.

Approval Sheet

This Independent Project entitled as “Web based Property Management System for Wolkite University” has been read and approved as meeting the preliminary requirements of the Computer Science Department in partial fulfillment for the award of the Bachelor Science degree in Computer Science, Wolkite University, Wolkite, Ethiopia.

Advisor Name	Signature	Date
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Department Head Name	Signature	Date
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Examiner 1: Name	Signature	Date
_____	_____	_____
Examiner 2: Name	Signature	Date
_____	_____	_____
Examiner 3: Name	Signature	Date
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Acronyms and Abbreviations

CSS	Cascading Style sheet
HTML	Hyper Text Markup Language.
JSP	Java Server Pages
OOP	Object Oriented Programming
OS	Operating System
PMS	Property Management System
SQL	Structural Query Language
UML	Unified Modeling Language
WKU	Wolkite University
UC	Use case
UI	user interface

Abstract

This property management project will be intended to develop a system which is a type of property management system model where a community of property management will create and customers use with it. The main objective of this project will develop a web-based property administration system in order to facilitate and help to improve the quality of property management of WKU. This project will consist of drawing out functional and nonfunctional requirements of the system. And then we will perform object-oriented analysis and object-oriented design. In analysis, we will try to model the new and develop property Management system using UML diagrams: use case diagrams, sequence diagrams, Class diagrams. In design phase, we will extend our work in analysis with more models. The class type architecture, Class diagrams in analysis would extend in design, while deployment and component diagrams will also be drawn.

Keywords: - Property Management, web-based system, object-oriented analysis, object-oriented design, UML,

Chapter One

1. Introduction

Property management system deals primarily with determining the amount and recording of the property within a facility or within multiple locations of a store. One way of managing this system is to have a web-based system in place that can instantly track and update the information about the properties. The current system represents material or property by card to know whether the property is present in the store or not. If any property is entered to the store write the codes of the card that represent the property in excel or table in MS-word. The communication between the workers is by phone or letters.

This system requirement specification project was prepared for Wolkite University the property management system developed computerized system named property management system.

A property management system managed the entire acquisition process, from request purchase, to approve and generate report and other additional functionality that is performed by this system. Currently the university used manual property management systems to distribute the properties and exchange information.

1.1 Background of the organization

Wolkite University is one of the new established universities in Ethiopia. It was organized in the year of November 14, 2004 E.C .in south region in particular area of Gurage zone at wolkite town. Wolkite University in its acronym (WKU) was established as a result of Ethiopian government s endeavor towards realizing the countries renaissance through educating the generation. It is one of the nine newly established public higher learning institutes. During this time, it includes three colleges. These are: -collage of Computing and Informatics, Natural and computational science and College of Engineering and Technology. At this time the university runs undergraduate programs. It is expected that include expansion of number of Colleges and programs will be open and the enrolment capacity will be increase.

Property management system was established during this time and it is developed from time to time with development of university. The numbers of workers increase time to time and need of

material too; therefore, property management system is a mandatory to managing all the activities related to materials in the university in organized way.

Currently, the number of colleges has reached eight with one additional school in which a total of 32 academic programs are running. It is the intention of the University to gradually increase the number of students to a target of 15,000 total enrollment at the end of the first 5 years and 30000 to 40000 total enrollments by the end of the third 5 years. Wolkite University board is the University ‘s governing body whose broad responsibilities are supervising, coordinating, managing and regulating the university as provided by ministry of education.

Mission of the of Wolkite University

The university, as indicated in the proclamation No. 650/2009, has the following missions

- To produce graduates who are knowledge, attitudinally mature and practically innovative,
- To supply relevant and demanded technology and knowledge that address national and community level development problem to help make operations of the government and non-government organizations efficient, effective and competitive and
- To provide training and consulting services to the community and the government

Vision of the WKU

Wolkite University envisions being one of the best ten Universities in East Africa by 2027 E.C

1.2. Background of project

The main goal of property management system is to save time and address the property for the university community by allowing easily keep track of information, manage listing and with specified identification of items. One way of managing system is to have a Web-based system in place that can instantly track and update the information about the item. The important of implementing a Web-based property management is becoming vital as most of the time the information are accessible directly for the university community.

The current information in the property management system was arrangement property officer, data and communication process between the property officer and clerk. The system currently uses

file-based record system to accomplish its task. This system uses MS_EXCEL to record the information

1.3. Statement of the Problem

Identifying statement of the problem is a clear study of the problem with existing system and putting them in the precise statement. The property management system currently uses manual system. The property management has the following major problems.

- **Wastage of time (in efficient use of time):** during the exchange of information between workers they use letters and phone numbers. So, the time is waste until reach to the need task. Also, to generate a report from manual system requires much effort and its time consuming.
- **Data inconsistency and redundancy:** Registering property is the file-based recording and not well organized. This will result in poor techniques handling in arrangement related data.
- **Loss of documents:** since all records kept physically on shelves and file cabinets the store man record keeping system is poor and subjects to number of problems such as files can be destroyed.
- **Difficult to check data and search property:** since the information is record in manual paper so searching, updating, using and other activity on the information is difficult.
- **Wastage of property:** the system needs pen; paper printed the documents for permanent record file. This is one reason for the wastage of economy for the office, and the other for searching files that are stored before is difficult to access due to the file-based recording system. So, to search the file additional human labor is needed (that means additional budget is needed for searching).
- **Needs more labor (human power):** in the current property management system any person may gain information by going to the person who performs the action' Due to the movement of person or group of people the labor of human is not necessary now a day due to the technology.

  Since Wolkite University has manual property management system for recording items, complexity to offering materials for University users and generate report periodically.

Based on the above listed problems of the University we want to develop automated system for Wolkite University property management system which will solve that problem. At the end of this project will remedy the problem that has faced property management system by increasing the time of searching and fast delivery for users

1.4. Objectives of the project

1.4.1. General Objective

The main of goal of this project is to develop Web based Wolkite University Property management system.

1.4.2. Specific Objectives

The specific objectives of property management system are:

- requirement identification the problem of the current system
- To analysis the previous manual systems problem.
- To create database that keep recording of property.
- To develop and design model to use in store management system.
- To Implementing the designed system.
- To Test the system.
- To Deploy the system.

1.5. Feasibility study of the project

Feasibility study aims to objectively and rationally uncover (make visible) the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. Time, scope, and cost have an important relationship between them, for example, when the project scope increase, then the project would use more time to complete and the cost may be also increase. Feasibility study outline is provided to give you guidance on how to proceed with the study and what to include. Therefore; we must consider these issues in feasibility study.

1.5.1 Technical Feasibility

Technical feasibility midpoint on the current manual system property management system process and what extent it can support the existing system. This system is technical feasible, due to the

whole system is designed into the latest technology to develop web-based system and design database it can support currently different equipment and hardware they will compatible with the system.

Since the system uses easy hardware and software specifications for deployment processes it can be feasible in technical issues. So, that the required person to operate and use the system is not expected to be professional. Anyone who has basic computer knowledge can use the system easily. The system must be versatile when technology developed and that support project management techniques.

1.5.2. Operational Feasibility

Operational feasibility is satisfying the central administrator that anybody accesses the system anywhere with authorize way for the system. The system offers great processing speed therefore; the cost of maintenance can be reduced. Due to processing speed, high and work is reduced in maintenance point of view the system is operation feasible. It provides how the proposed system will fulfill the organization need and additional gives safe, precise and competence system to the organization.

1.5.3. Economic Feasibility

The existing system is manual and all is done in a paper and pen by hand, so it is much costly and difficult to use, to operate and it is also time consuming. Therefore, this automated property management system is much feasible in costing time and effort too as compare with manual system. Economic feasibility addresses the following things: -

Tangible benefit: -

- Cost reduction
- Increase system efficiency
- Proper use of time and resource

Intangible benefit: -

- Moral satisfaction
- Work initiation

1.5.4. Schedule Feasibility

The project is always given with deadlines. Every project is completed specific duration. We have to complete the project in time and if it is not possible to complete time then we should try to fulfill requirements.

1.5.5. Political Feasibility

The developed system is politically feasible and cannot cause any harm in the environment. The project proposal would be beneficial because it satisfies the office's need. The system would be developed to be user friendly, needless training and improves the working environment.

1.5.6. Legal and Contractual Feasibility

This is the process of assessing potential legal and contractual ramification due to the contraction. When we first think to planned and select a system, we have to consider law, financial reporting, standard, as well as the current contractual obligation.

1.6. Scope and Limitation of the Project

1.6.1 Scope of the project

The data used by the system is stored in the database that will easily generated through the report of all information held about items and this enables things to be simplified and considerably quickly or fast processing.

The system that we trying to target on property management system will cover only for our University and will provide many services and function among this: -

- Classifying and coding items to store in the stock.
- The University able to distribute materials to the users easily
- The system Register the Items in database for users to use it.
- The stock keeper control and accept the taken material from users and check when they return.
- The Users can take the material only at the given time appointed by store keeper.
- The system can send a notification to remind the user when they couldn't return the material at a given time.

- The system will generate the report about property according to its affair.

1.6.2. Limitation of the project

Limitation of the project defined what the newly developed system is not going to perform and not cover. The newly developed system cannot cover any relationship of property administration link out of Wolkite University and also does not perform finance activity such as:

- ✓ Bid and selling property and purchasing.

1.7. Significance of the Project

This project brings some significance such as: -

- This system provides full and fast organized service for the user
- Helps to the user to save their time.
- Helps to University properties from wastage.
- The result of the project may initiate other officials to carry out large scale investigation in this area.
- The system enables to control and manage for properties of the University in good ways.

1.8. Beneficiaries of the Project

Computerized property management system is developed to facilitate the general administration system to manage various information of the property. The newly proposed system has a benefit for the manager of property and customer. This means:

For organization:

- to save time for organization
- reduce over load
- to solve problems those are associated with manual system
- easily data reporting and accessing

For manager:

- To save time when checking the item

- Speed up their working system
- Can easily manage the item

For staff

- the system speeds up and efficient their work
- to eliminate human error because it relies on predefined rules and polices designed during configuration
- it helps to effective control and management over property stock

For customer

- To check the items easily
- To save time for them too
- Interact in a good interface

1.9. Methodology of the project

1.9.1 Data Collection Techniques

During information gathering the teams have used a number of techniques that helps us to get full information about the current system.

These techniques are:

Interview

The team member asked the property management system manager and employers and get the most important and critical information about the general view of the property management system.

Observation

The team members have observed physically by going to property manager office and property store place. It was no any well-developed computerized system in the property center and also information about the property and the service that the property provides were not available easily.

Document Analysis

Document analysis: we used document analysis to get the information about background of the system.

1.9.2. System Analysis and Design

In this project, our team selected to use object-oriented system development methodology for the design

1.9.3. System Development Model

Iterative model: From the difference development model, we can choose iterative model to develop our project. Because it is very useful model in order to develop our system. It increases our motivation to develop reliable system because it gives chance in all iteration to add a new feature and Modification to our system. We can test our system in every phase and modify the mistake that Can be made in the previous phase and clearly pass to the next phase.

1.9.4. Testing Methodology

Software tasting is evaluation of the software against requirement gather from users and system specification. So, our team will use to test the system by using types of testing like unit testing, system testing and integration testing.

- **Unit testing:** unit testing is done at the source code level for language specific programming error such as bad syntax, logic errors, or to test particular function or code error.

  Sample test

  - ✓ Check whether the return type of function is correct.
  - ✓ Check the correct output is produce for different inputs.
  - ✓ Check efficiency of the code.
- **System testing**: The goals of system testing are to detect fault that can only be exposed by testing the entire integrated system or some major part of it.

  Sample test

  - ✓ Verify system completeness-based user's requirement.
  - ✓ Evaluating the functionality of the subsystem after a combination of individual subsystem whether it works correctly or not.

- ✓ Check the coherence and coupling of each sub system.

- **Integration testing:** in this level of testing, we will examine how the different procedure works together to achieve the goal of the sub system.

  Sample test

  - ✓ Check the interaction between individual functionality which performs the specific task.
  - ✓ Identify the independence of each subsystem with other subsystem.

1.9.5. Development Tools and Technologies

- PHP is a server-side scripting technology that enables scripts (embedded in web pages) to be executed by a XAMP server.
- PHP is a program that runs inside XAMP server in all OS.
- Database Environment: MYSQL is a typical environment for constructing relational databases.

1.9.5.1. Frontend Technologies

The user interface is developed using frontend technology is: -

- **CSS** stands for cascading style sheets, it describes how HTML elements are to be displayed on screen, paper, or in other media.
- **HTML** stands for Hyper Text Markup Language; it describes the standard markup language for creating web pages.
- **JAVASCRIPT** is the programming language of the Web.
- **XML**

1.9.5.2. Backend Technologies

We will use the system Php and Xampp database to develop and manage the backer of the system.

1.9.5.3. Documentation and Modeling Tools

This project will use the following system development tools and environments for Different activities.

Table1. 1.1Software tools

Activities	**Software** tools

Platform	MS Window
Presentation	MS office power point 2016
Design proposed system	Microsoft Visio 2003
For Browser	Mozilla fire fox, Internet explorer, chrome, opera min

Tool's hardware activities

- Desktop
- Laptop
- 500 MB RAM and above
- Printer
- Flash drive
- CD drive
- Paper

1.13. Budget and Time Schedule of the Project

1.13.1 Budget of the Project

Resources like time and equipment are needed for any system development. Some of resources needed for project team are listed below with their estimated cost: -

Table1. 2 Cost Breakdowns

NO.	Item Description	Quantity	Unit	Unit Price	Total Price
1	Removable flash disk	2	Birr	150.00	300.00

2	Blank CD	3	Birr	30.00	90.00
3	Binding	2	Birr	25.00	50.00
4	Pen	5	Birr	10.00	50.00
5	Paper	Half pack	Birr	50.00	50.00
6	Laptop	1	Birr	15000.00	15000.00
7	Printing	2	Birr	160.00	320.00
Total					15,860.00

1.13.2 Time schedule of the project

The project is always given with deadlines. Every project is completed duration.

Table1. 3 Gant Chart

ID	Task name	Start	Finish	Duration	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021		
1	**Project proposal**	03/11/2021	03/23/2021	12d								
2	**description of existing system**	04/01/2021	04/17/2021	16d								
3	**system analysis**	04/18/2021	04/30/2021	12d								
4	**System Design**	05/02/2021	05/28/2021	26d								
5	**Implementation and Testing**	06/12/2021	07/25/2021	43d								
6	**Conclusion and Recommendation!**	08/01/2021	08/20/2021	19d								

1.14. Team Organization

The team that develops the project consists of three persons. The team members meeting in daily bases to discuss about the project, and to assess where each member was on his prospective task.

1.14.1 Team Composition and Management

The Team that develops the project consists of three persons. The team members meet in daily bases to discuss about the project. To develop this project team is organized.

Table1. 4 Team Composition and Management

Title Name	**Web Based Property Management System for Wolkite University**				
Prepared by	**Name**	**ID_NO**	**Email**	**Phone Number**	**Responsibility**
1	**Negeso Girma**	**CIR/218/10**	**hinse0263@gmail.com**	**0916614107**	**Programmer and manager**
2	**Aman Ababiya**	**CIR/010/10**	**Amanaba480@gmail.com**	**0939415244**	**Designer and secretary**
3	**Teysir Kelifa**	**CIR/067/10**	**Kelifateysir74@gmail.com**	**0917554755**	**Data collector and designer**

1.14.2 Communication Plan

For the achievement of our proposed project all of the group members fully participate on each activities of the project. To insure this, we tried to work corporately by sharing idea with each other and present on time at the time of meeting. As a team member, we communicate each other by group discussing on the issues in general, for example we design on paper before writing on the system. And sometimes we divide and do a separate task to facilitate the project to proceed based on the schedule.

CHAPTER TWO

2. DESCRIPTION OF THE EXISTING SYSTEM

2.1. Introduction of Existing System

This chapter deals with analyzing the general work flow of the existing system, players in the existing system.

Currently the existing system or the manual system has worked different task primitively, some of the activity which is done by the manual system. Item is supplied from companies they are received and recorded by Model-19 and Model-22 is a form that is usually used when an item is issued for different offices and users. In the existing system, all the information of a property or client proceed manually and it has to maintain the record of the entire activity involved in manual system. Property registration process also involves lot of paper work.

For every property, separate file has needed to be preserve according to name of user property details. It is so worth full to keep each users of file permanently. Searching the Property was done by the person's own self from the store. It is very difficult to the store related to security issue. In these cases, the time was very essential. So, to solving this problem stock of problems can be listed in the existing system. If any person wants to take or return a property, then he has to come to the Stock and wasted his or her precious time.

Currently, the store office does not use any kind of integrated software. So, it almost manipulates its work manually with paper to record system for any information's that are related to inventories and report generating process. The system is labor intensive. In addition to this, in the current system there are numerous paper flows between higher officials, store and users to perform even simple tasks. There is long transaction process to take property for users. Therefore, it is a primitive and every task is performed manually.

2.2. Users of Existing System

Users of Existing System Start from when the University was established, there are different users who have gotten a service from the store in different staff of the University. Currently, users of the existing system are: -

- Store Administrator
- Store Clerk
- Teachers
- HRMS users
- Collage Dean
- Department Head
- Student Dean
- Library
- Students' cafeteria
- Student Union
- Proctor head
- Proctors

2.3. Major Function of the Existing System

The major activities of the existing system are registering property (i.e., incoming and outgoing, fixed asset count, registering tangible and non-tangible property depending on date, type, functions). Consequently, for those activity there are people who acts with the store property manual approach, store manager, store keeper and users. This manual system needs a man power to perform its all activities i.e., for searching material, available materials. The forms that the current manual system uses include the following forms.

- Property request form
- Fixed Assets control Card Form
- All the forms share almost the same attributes.

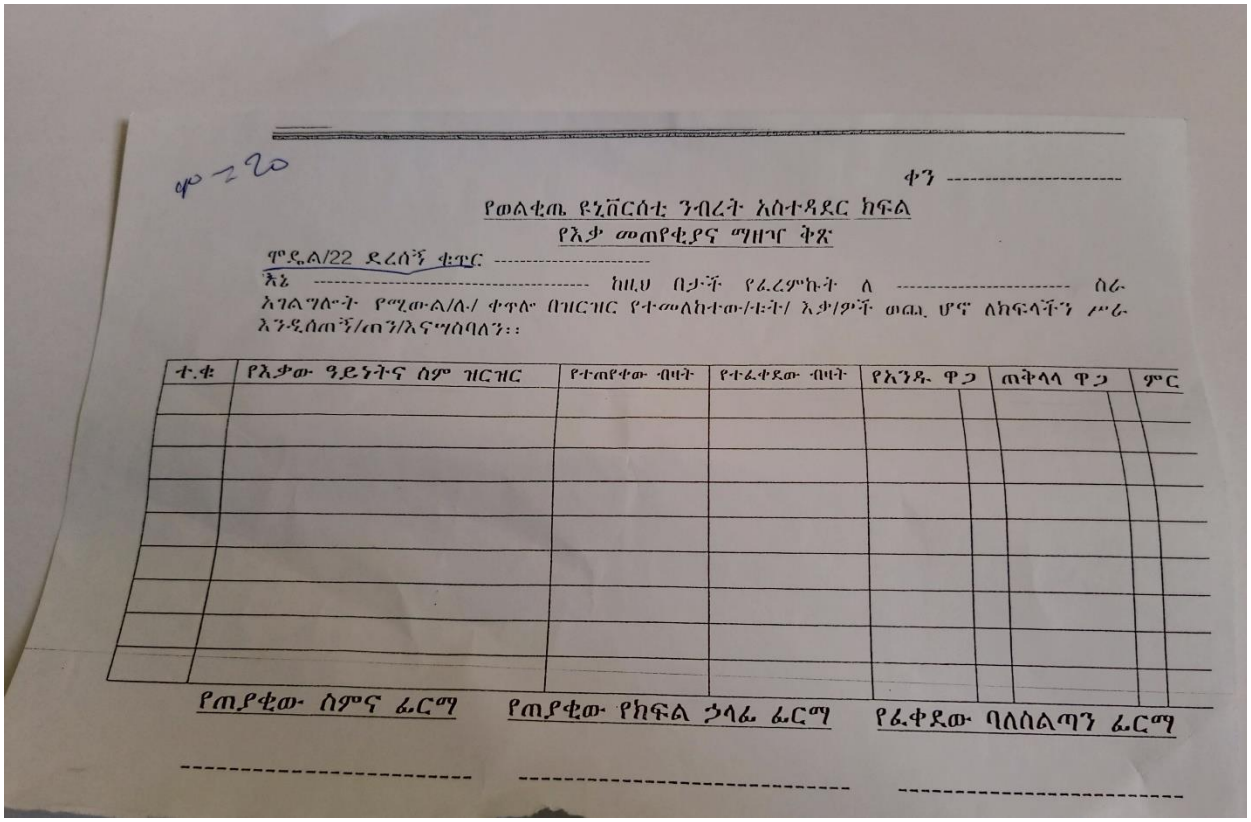
- These attributes include, item name, item code, quantity, and item description, requested item quantity, permitted item quantity.

2.4. Forms and Other Documents of the Existing Systems

Currently the manual system has its own report generating form end of each year that will submit to higher property management. The generating report that we have seen in the place of store management looks like this:

Requesting an item: - any staff members request items from store and get response from store manager and department manager.

- Request items form



ቀን ----------

የወልቂጤ ዩኒቨርሲቲ ንብረት አስተዳደር ክፍል

የእቃ መጠየቂያና ማዘገር ቅጽ

ሞዴል/22 ደረሰኝ ቁጥር ----------

እኔ ---------- ከዚህ በታች የፈረምኩት ለ ---------- ስራ አገልግሎት የሚውል/ለ/ ቁጥሮ በዝርዝር የተመለከተው/ቱት/ እቃ/ዎች ወጪ ሆኖ ለክፍላችን ሥራ እንዲሰጠኝ/ጠንን/እናሳስባለን፡፡

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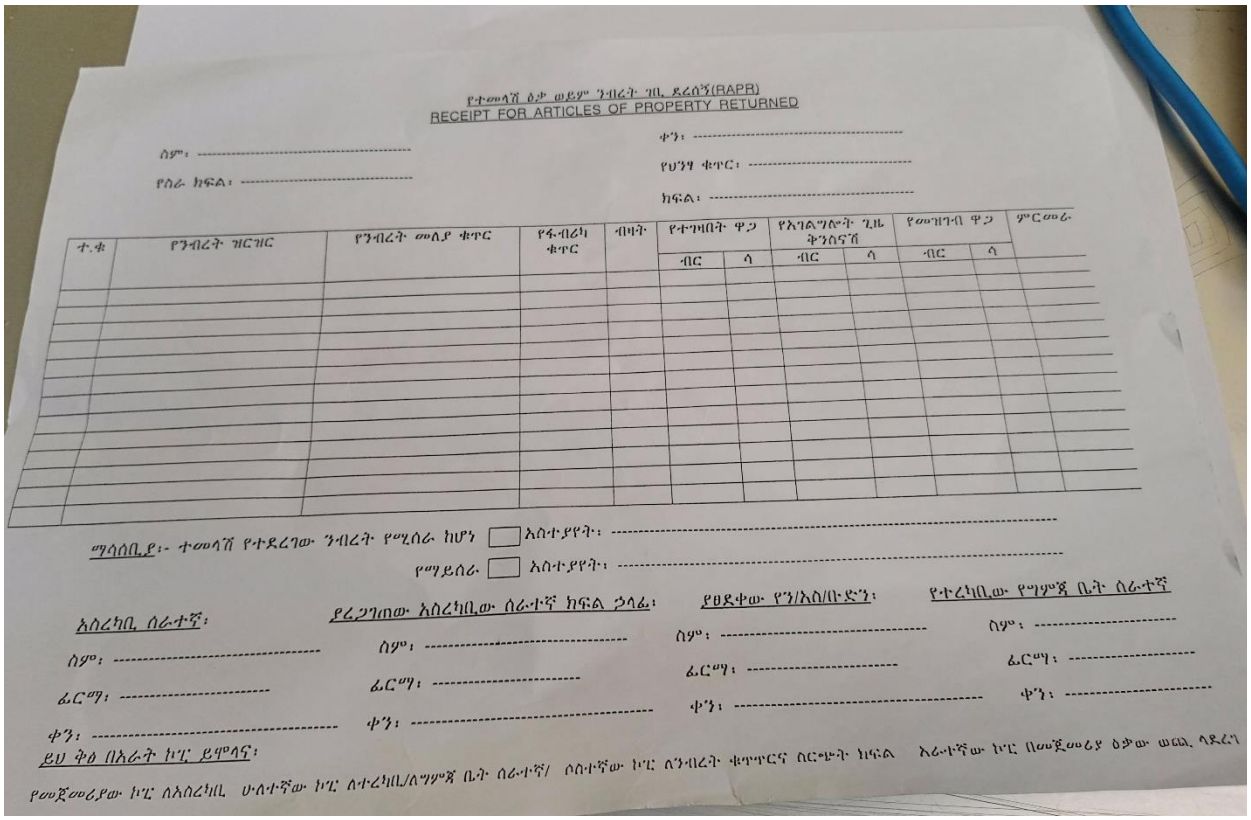
የጠያቂው ሰምና ፊርማ ---------- የጠያቂው የክፍል ኃላፊ ፊርማ ---------- የፈቀደው ባለስልጣን ፊርማ ----------

Figure 2. 1 Requesting an items registration form

- **Return an item: -** users (staff member) exit from the university by any case he/she must return items for the store and receive clearance from store.



የተመላሽ ዕቃ ወይም ንብረት ገቢ ደረሰኝ(RAPR)
RECEIPT FOR ARTICLES OF PROPERTY RETURNED

ስም፡ ----------
የሰራ ክፍል፡ ----------
ቀን፡ ----------
የሀንዛ ቁጥር፡ ----------
ክፍል፡ ----------

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ማሳሰቢያ፡- ተመላሽ የተደረገው ንብረት የሚሰራ ከሆነ ☐ አስተያየት፡ ----------
የማይሰራ ☐ አስተያየት፡ ----------

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ፊርማ፡ ----------
ቀን፡ ----------

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Figure 2. 2 Receipt for articles of property returned

Transferring an item: - Users transfer items from one staff member to another that means one staff member exit from university he/she must transfer or return items.

- Transferring items form

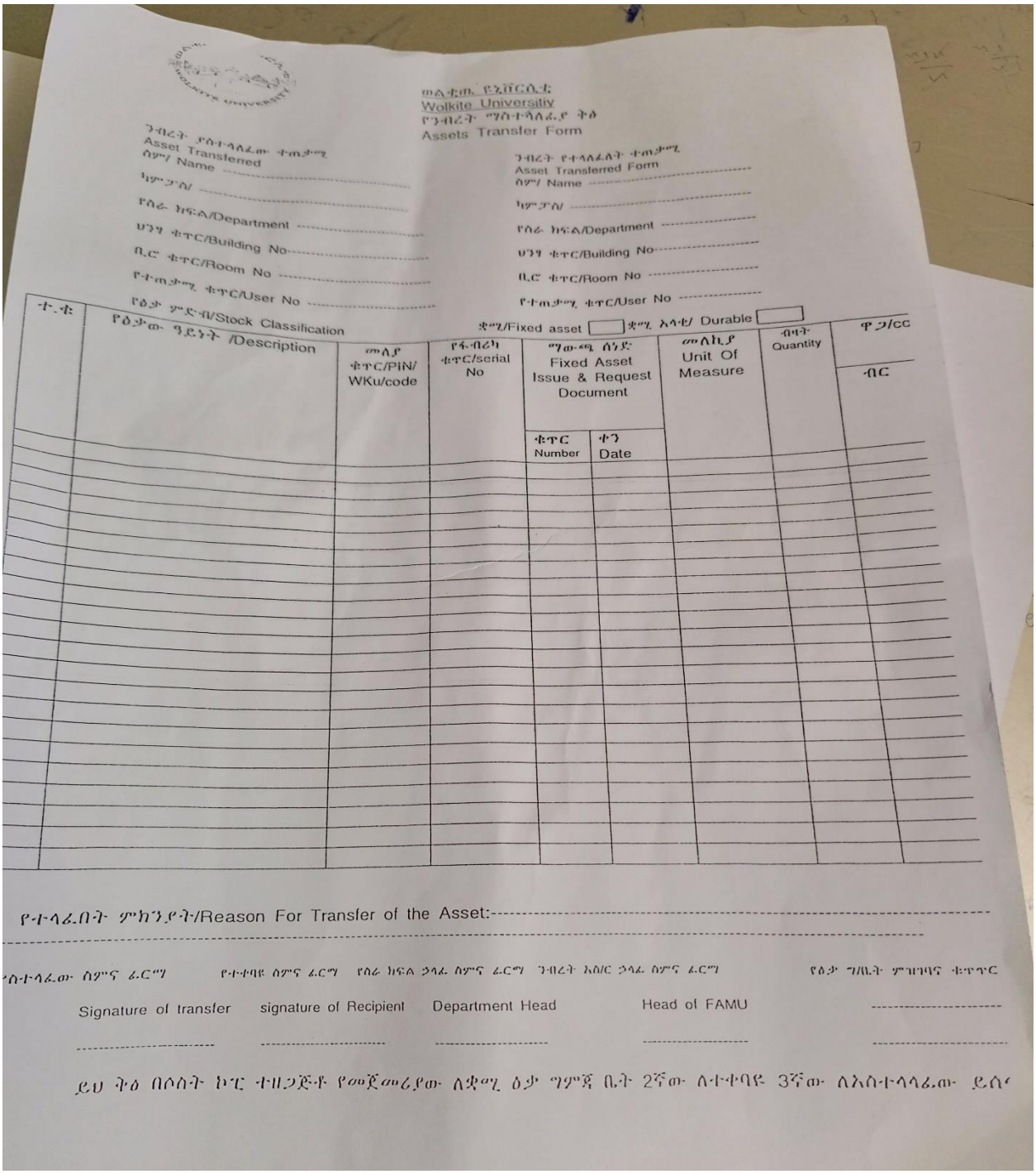
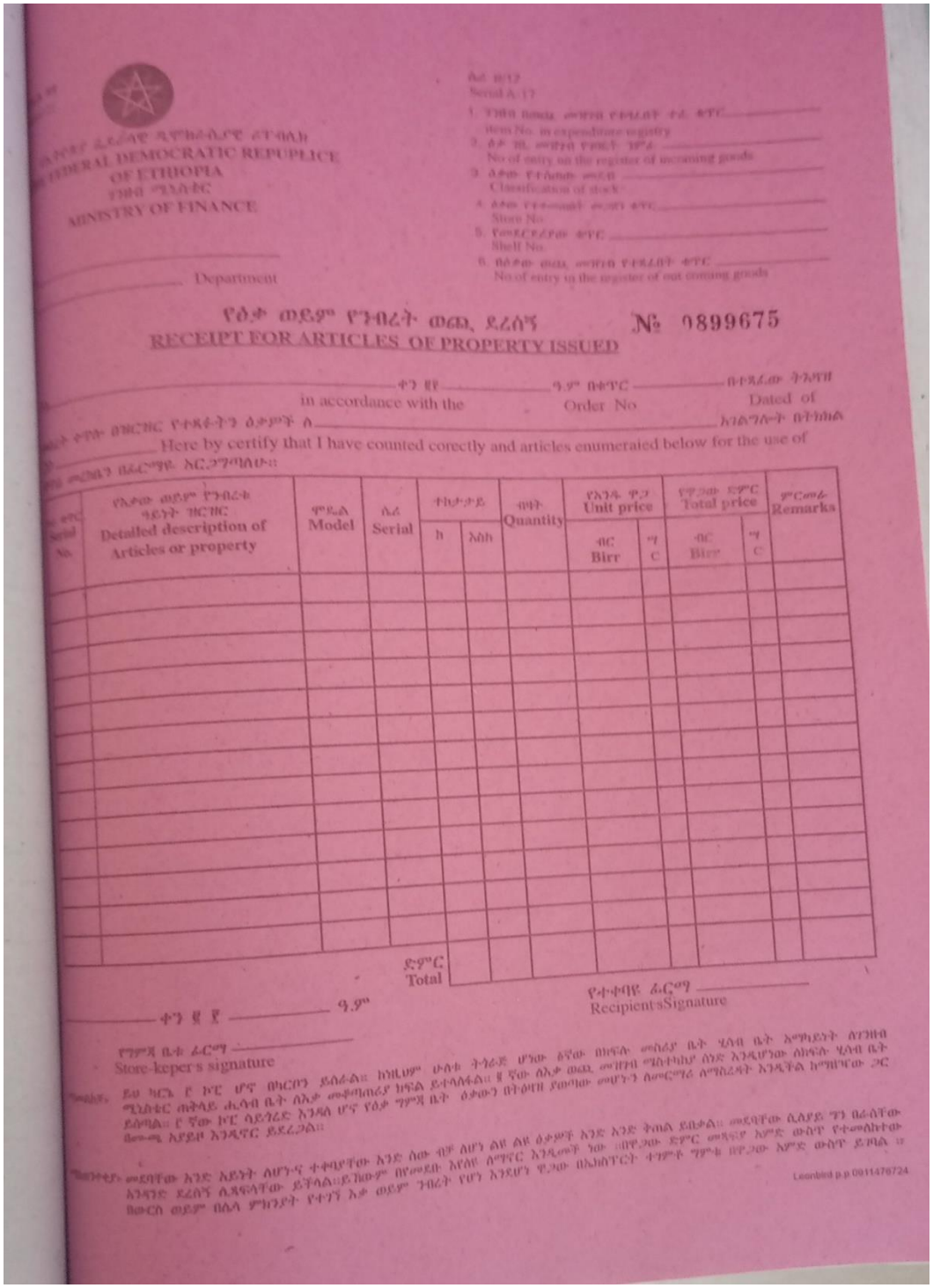


Figure 2. 3 Assets transfer form

- This form is **Bin card** to know how much property is left in the store in terms of money



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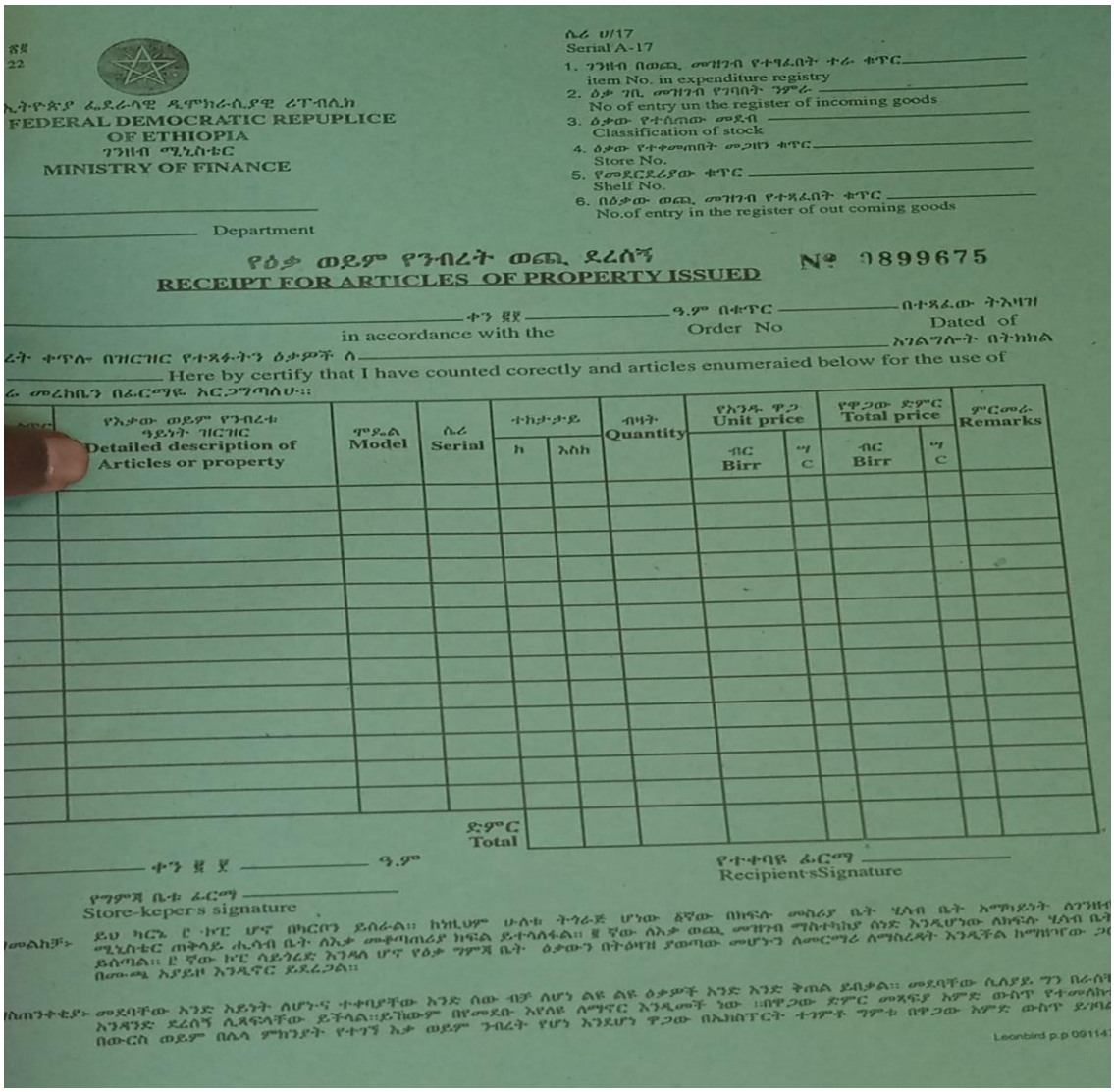
RECEIPT FOR ARTICLES OF PROPERTY ISSUED

Figure 2. 4 Receipt for articles for property issued (bin card)

- This form is **stock a card** which has record of the cost price and value of stock received, issued and remaining balance in the storage.



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FEDERAL DEMOCRATIC REPUPLICE
OF ETHIOPIA
ገንዘብ ሚኒስቴር
MINISTRY OF FINANCE

Department

ሴሪ ሀ/17
Serial A-17

1. ገንዘብ በወጪ መዝገብ የተፃፈበት ተራ ቁጥር
item No. in expenditure registry
2. ዕቃ ገቢ መዝገብ የገባበት ገጽ ተራ
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3. ዕቃው የተሰጠው መደብ
Classification of stock
4. ዕቃው የተቀመጠበት መጋዘን ቁጥር
Store No.
5. የመደርደሪያው ቁጥር
Shelf No.
6. በዕቃው ወጪ መዝገብ የተጻፈበት ቁጥር
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የዕቃ ወይም የንብረት ወጪ ደረሰኝ
RECEIPT FOR ARTICLES OF PROPERTY ISSUED

№ 0899675

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ራ መረከቤን በፊርማዬ አርጋግጣለሁ።

የእቃው ወይም የንብረቱ ዓይነት ዝርዝር Detailed description of Articles or property	ሞዴል Model	ሴሪ Serial	ተከታታይ ከ	ተከታታይ እስከ	ብዛት Quantity	የአንዱ ዋጋ Unit price ብር Birr	ሳ C	የዋጋው ድምር Total price ብር Birr	ሳ C	ምርመራ Remarks
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Recipient-sSignature

የግምጃ ቤቱ ፊርማ
Store-keper-s signature

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Figure 2. 5 Receipt for articles for property issued (stock card)

2.5. Drawbacks of the Existing System

The major Drawbacks of the existing system is that it uses the manual system. In this case the following problems occur in the existing system: -

- **Time Consuming:** - Due to the manual data processing all activity are performed in the paper this is time consuming that means like search data, generate report, view data, update data and delete data is very time consuming.
- **Boring: -** As long as the manual system invokes much documentation in which the system users need to copy the necessary information from paper to paper, which is even more boring for the system users
- **Data management: -** That means record, delete, update and search items and user's data is very difficult in the existing system.
- **Security issue: -** in the existing system all data process performs in the paper this paper put on the cabinets and shelf this leads less security issue.
- **Inaccurate: -**Manual data transfer has no guarantee that the person in charge may make mistakes that can even cause a major crisis for the users or university.

2.6. Business Rules of the Existing System

A business rule is successfully an operating standard or polices that we have try to specify for both the existing system and the proposed system of the store management must satisfy. We mainly focus on the existing system business rules.

The existing system has many business rules or principles some of them are:

BR1: The manager manages each workers and business center.

BR2: The manager or office members must have prepared forms or sheets.

BR3: The users fill the forms of their requirement and requested their requirement.

BR4: The office members or workers must check the forms for valid information.

BR5: when the users/staffs want to borrow any material he/she must register his id, full name, email, status and other user details properly.

BR6: in order to get the item, he /she must get permission from the stock manager and the store officers have to put their signature.

BR7: the staff member has to put his/her signature while taking the item.

BR8: staff member transfer item from one person to another he/she must announce for the stock office members.

BR9: When the staff member or user send request to manager, the manager must approve or Disapprove the request.

BR10: the staff member should not damage the item.

BR11: if the staff member has loss or damage the item, he/she has to replace that item or pay the cost with additional percent.

CHAPTER THREE

3. PROPOSED SYSTEM

3.1 Functional Requirements

There are several functions that are included in the system to satisfy the needs of the university. Some of these are as follows:

A Functional Requirement is a requirement that satisfied the users to perform some kind of function. It directly related to the system, means it answer the question what the system can do and how the system perform each activity or describe the interaction between the system and the environment, the environment includes the system user and any other external system with which the system interacts.

In addition to this functional requirement is a statement that specifies functions or services that a software system is able to perform. Functional requirement of the new system related to user or actor of the system are

The functional requirements that we are going to analyze as below:

- ✓ **Manage account: t**o manage the system allows system administrator shall manage account.
- ✓ **Register property:** the system allows registering all the property those existed in the store and new property.

- ✓ **Create user account**: the system administrator shall create users account due to Security of the system.
- ✓ **Request property**: this system allows the user requesting property online from manager of property.
- ✓ **Generate report**: the system allows for store man to generate report to the manager.
- ✓ **Change Password:** stock clerk, users, manager and administrator change password.
- ✓ **View comment**: the system allows view comment for those comment sent from users or store man.
- ✓ **Receive Response:** users receive a response which is approved or disapproved items.
- ✓ **View request**: the system allows to the system actor to view the sending request.
- ✓ **Manage Personal Information:** administrator manage personal information that means register new employer and create account for new employ and delete, update and view existing employer information
- ✓ **Transfer items:** any staff member (users) transfer an item to the other users by using proposed system.
- ✓ **Return items:** staff member return item lives from the university and the item fail in the same case. Generally, the items return from the user to store.

3.2. Non-functional Requirements

A Non-Functional Requirement is usually some form of constraint or restriction that must be considered when designing the solution. It describes user-visible aspects of the new system that have not directly related to the real functional behavior of the system.

Property management system includes the following non-functional requirement:

3.2.1 User Interface and Human Factors

The system interface should develop by bootstrap because of easily understandable by the user.

The developed system provides a web-based application user interface and is compatible with Browsers like Google chrome, Mozilla Firefox, internet explorer.

3.2.2 Hardware Consideration

The system is compatible with the specified hardware and software requirement and the system should computer compatible so that it can be accessed by computer going through our website.

3.2.3 Security Issues

Security: A complex combination of factors that describe the integrity of a system and its users. Security includes authentication and authorization of users as well as secures compliant information.

To protect users' data and system misuse, the system should provide a restriction in using system functionality and information access by its user, i.e., the system uses a Role-based authorization technique. The external security can be provided by giving the login authentication and data that are stored in the database is private. The system should enable to task a backup at any time and able to restore from backups. The users are allowed to do task only after the login process Based on their privileges.

3.2.4 Performance Consideration

The systems have high performance and error-free and the measurement of response time and latency concerning user load conditions. The system should search the given thing quickly and responds on time on minimum space. We would increase the performance of the system by increasing the space of the server and the desktop computer hard disk

3.2.5. Error Handling and Validation

- **Error handling:** The System shall output a correct message correspond to the action taken. If the taken action is not correct the system should respond the action is incorrect message. When the user makes some mistakes, the system responds that error has occurred using easily understandable messages and allows the user to recover from the error.
- **Validation**: It validates when the user fills passwords or any other information that needs to be validated and give notification.

3.4.6. Quality Issues

The proposed system is expected to have:

Reliability: the system should be reliable in retrieving and displaying only the requested data for the user. Users can rely on the information be gotten would be true and dependable. The system is assumed to be reliable by available all required information and increases the performance of the system.

Robustness: the inventory management system should be capable of trapping errors and promoting the user to take appropriate action.

The system will be available to users for 7 days of the week for 24hours unless there is power loss. And a measure of how often a system's resources and services are accessible to end-users often expressed as the uptime of a system.

3.4.7. Backup and Recovery

The processes of backing up refer to making copies of data so that these additional copies may be used to restore the original after a data loss event. These additional copies are typically called "backups." Backups are useful primarily for two purposes. The first is to restore a state following a disaster (called disaster recovery). The second is to restore small numbers of files after they have been accidentally deleted or corrupted. Data loss is also very common.

3.4.8. Physical Environment

The system must be deployed on the server that supports windows operating system only. Besides this the server must be put on a place that has high security and little access physically. The system will be developed on any computer runs on windows operating system.

3.4.9. Resource Issues

Proposed property management system needs the resource to deploy the system the system needs different hardware and software required to deploy the system on the origination like servers, computers and other software setups.

3.4.10. 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.

CHAPTER FOUR

4. SYSTEM ANALYSIS

This chapter focuses on developing the system analysis models for the new system using the use case model, sequence diagram, activity diagram and class diagram, state chart diagram and dynamic model!

4.1 System Model

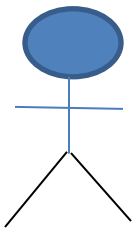
This section focuses on modeling the proposed system. The project development team used an object-oriented system development methodology. Because the Object system development approach gives an easier to produce a model of the system which is correct, complete and consistent we need to construct the analysis model which focuses on structuring and formalizing the requirements of the system.

4.1.1. Use Case Model

A use case is a set of scenarios that describing an interaction between a user and a system. A use case diagram displays the relationship among actors and use cases.

Actor: is a person, or external system that plays a role in one or more interaction with the system.

And represented with:



In our system the following actors are involved: -

- **Actor of the system**
  - ✓ System Admin
  - ✓ Manager
  - ✓ Vise/president
  - ✓ Finance directory
  - ✓ Clerk
  - ✓ Staff Member
  - ✓ Department and
  - ✓ Faculty

Use case: describes a sequence of actions that provides something of measurable value to an actor and is drawn as a horizontal ellipse

In our system the following use case is involved: -

- ✓ Login
- ✓ Create Account
- ✓ Manage Account
- ✓ Add Property
- ✓ View Report
- ✓ Request Property
- ✓ Register Property
- ✓ View Request
- ✓ View Property
- ✓ View Response
- ✓ View Property
- ✓ Give Response

- ✓ Send Request

System boundary: indicates the scope of the system project. Anything within the box represent functionalist in side in scope

4.1.1.1. Use Case Diagram

Use Case Diagram

Use case diagram shows use cases, actors, and their interrelationships. A use case diagram is a graphic depiction of the interactions among the elements of a system. Use case diagrams are used for capturing functional requirements of the system. It is the functionality of the system or the service provided by the system

A use case is a methodology used in system analysis to identify, clarify, and organize system requirements. A use case model describes the proposed functionality of our system.

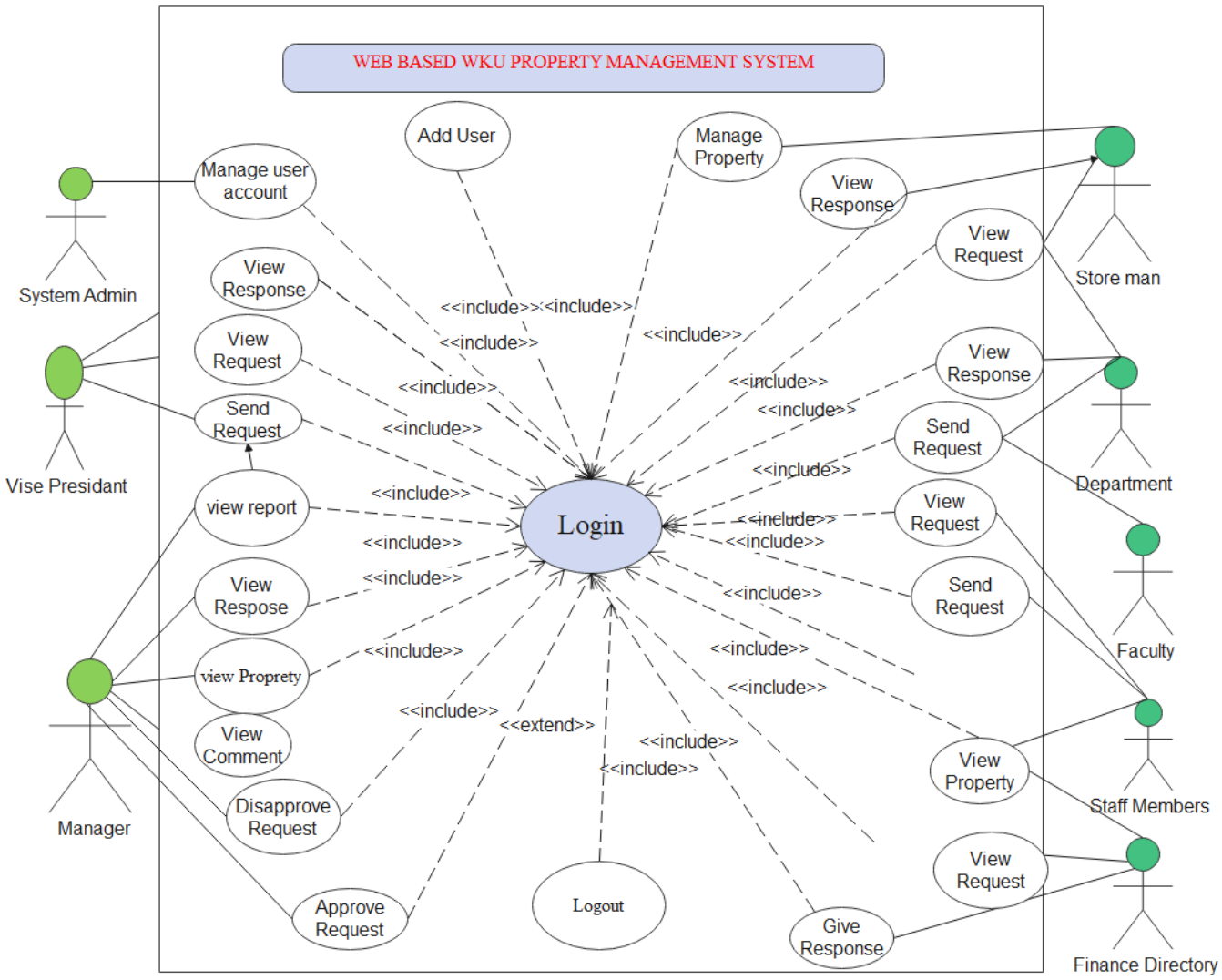


Figure 4. 1 use case diagram of the system

4.1.1.2. Use Case Description

Table 4. 1 Use Case Description for Login

Use case name	Login
Identifier	UC#01

Description	validate the users to access in to the system	
Actors	System admin, manager, Vise/president, finance directory, store man, and staff member or user	
Precondition	the system user must have username and password	
post condition	The user get access to the system according to their predefined system privilege and finally he/she logout or turn off the page	
Basic course of action	Actor action	System response
	1. Launch the user opens the main home page by writing the URL of the website 3. Users fill the form (user name and Password) and Login.	2. The system displays the Main Home page 4.The system checks for the validity of the username and Password from the database. 5.The system display (enter) to The homepage. 6. Use case end.
Alternate course of Actions	If the user forget password or user name, reset password link appear and User can reset password.	

Table 4. 2 Use Case Description for Create account

Use case name	**Create Account**	
Identifier	UC#02	
Description	The system admin creates an account for Vise/president, store man, manager, finance directory and other staff member.	
Actor	System admin	
Precondition	Get the list of system user members	
Post condition	The system admin creates user account successfully.	
Basic course of action	Actor action	System response
	1. The system admin click the create account link. 3. System administrator fills the required fields and click submit button.	2.The system display create account form 4. The system checks for the validity of the username and password. 5. The system display message for successfulness.
Alternative course of action	If the entered value is invalid The system display error massage.	

Table 4. 3 Use Case Description of Request Property

Use case name	Request Property	
Identifier	UC#03	
Description	the user requests the property from manager	
Actors	Users	
Precondition	Uc1	
Post condition	the user request registered to the system	
Basic course of action	Actor action	System response
	1.The users browse the home page 2. The users select the request form. 4.The users fill the form 5. The user click send button.	3. The system displays the request form. 6. The system validates the filled information of request form. 7. The system show message request is sent.
Alternative course of action	If invalid information filled with the form	

	The action restarts from step4

Table 4. 4 Use Case Descriptions for Register Property

Use case name	Register Property	
Identifier	UC#04	
Description	The store man registers property.	
Actors	store man	
Precondition	UC1.	
Post condition	The system display property registered successfully	
Basic course of action	Actor action	System response
	1. Actors click on the register property link. **3**. Actors fill all necessary details and click register property.	**2**. The system displays the form of registration property. 4. The system checks the validity/correctness of the entered information. 5. The system

		registered the property.
Alternative course of action	If the system informs invalidity from the system. The system restarts from to step3.	

Table 4. 5 Use Case Descriptions for View Request

Use case name	View Request	
Identifier	UC#05	
Description	Any actor needs to get the sending request.	
Actors	Vise/president, manager	
Precondition	UC-0 3, UC-04, UC-11	
Post condition		
Basic course of action	Actor action	System response
	1. The actor clicks on view request link. **3.** The actor read request.	**2**. The system display the request.
Alternative course of action	If there is no request the system display no request is posted	

Table 4. 6 Use Case Description for Manage Account

Use case name	Manage Account	
Identifier	UC#6	
Description	Allows the actors to manage account.	
Actors	System Admin	
Precondition	UC-01	
Post condition	The account is manage successes fully	
Basic course of action	Actor action	System response
	1. The actors click on manage account link. **3**. The actors select the account and click on. **4**.Actors make manage	**2.** Account participants interface displayed. **5.** The system checks the availability of the manage account on the system. **6**.The system display account manage successfully message to the actors

Alternative course of action	If the incorrect manage account The use case continues from step 3.

4.1.1.3. Use case Scenario

Scenario tells who is using the system and what they are trying to accomplish. Provides a realistic, fictional account of a user's constraints, when and where they are working, why they are using the system, and what they need the system to do for them. Describes any relevant aspects of the context in which the user is working with the system, including what information the user has on hand when beginning to use the system. The following are WKU property Management System describing scenario of how the users use the systems of the institution.

Scenario name: login

Participant actor: Clerk/Manager/Administrator/Staff (users).

Flow of Event: When Clerk/Manager/Administrator/Staff want to use the system, they first open any browser and browse the system using system address (URL) then the system display the login page. He/she open their private page; he/she must first log into the system. After this he/she inters or fills exact (correct) user name, password and select their own role then he/she clicks" login" button if the user name, password and role is not correct the system displays error message like your password is incorrect try again, but if the user name, password and role is correct display user account so he/she inters his/her own full page then he/she works his/her work in the system perfectly.

Scenario Name: Change Password and Username

Participant actor: Clerk/Manager/Administrator/Staff (users)

Flow of Event: When Clerk/Manager/Administrator/Staff Administrator first open the browser and browse the system using system address (URL) then the system display the login page, then he/she inters their own page, he/she must fill the exact user name, password and select the role

then click login button. If the user name, password and role is correct the system open the administrator page otherwise the system display error message. The system open their own page is now displayed from the different categories he/she should select on the link ‘change username and passwords ‘pressing this link, then the system is display the form and change button. The system users fill necessary information on the form and click change button. The system checks whether the input is valid or not and also if unfilled input box exists or not, and if it has error the system displays error message and if not, then the system change username and passwords and displays a message like “You are successfully change username and passwords”.

Scenario Name: Create account

Actor: Administrator

Flow of Event: At first the administrator will open the browser. He/she browses so that a login page will be displayed. He/she fill user name, password and select the role. Administrator fills the valid user name, password, select the role and then click on the button ‘login’. An admin page which consists the different task of the administrator including a manage account link will be displayed now the admin can create account for the authorized users by pressing the manage account link then the admin open the manage account page and click create account button. Next a form saying create account will be shown the form is to make fill the admin; first name, last name, employee id, email, phone number, block number, office number, registration date, status, username, and password of the user who is going to be created an account. In this way he/she can fill the form according to the required information and then click the button create. If the user information is valid the system will save the information into the database and display a message saying “a user account is successfully created”. Otherwise the system display error message saying “Invalid user information”.

4.2. Object Model

An object model is a logical interface, software or system that is modeled through the use of object-oriented techniques. It enables the creation of an architectural software or system model before development or programming. In our system, we use object models like the data dictionary and class diagram

4.2.1. Class Diagram

A class is a description a set of objects that share the same attributes, operations, relationships, and semantics (Stellman A. G., 2005). Graphically, a class diagram is drawn as a rectangle with three compartments holding the class name, attributes, and operation.

Class Diagrams are used to represent the structure of the system in terms of objects, their notes and nature of relationship between classes. We use class diagrams to model the objects that make up the system, to display the relationships between the objects, and to describe what those objects do and the services that they provide.

The developed system has the following classes:

- **Manager:** was the representation of the real-world class of manager which interacts with system to accomplish the managerial activity such as view report, approve request.
- **Staff members:** is the representation of the real-world class of user which interacts with the system to request property from manager.
- **Administrator:** was an administrator which uses the automated system to manage user's account.
- **Property:** it is the representation of the real-world class of materials which is requested by the user.
- **Stock clerk:** the representation of the real-world class which interacts with system to accomplish the activity such as managing property, manage and view Response from the database.
- **Finance Directory:** -are members of senior executive team with responsibility of View request, Give response from vise president to users
- **Vise president:** View Request, Send Request, View Response from faculty, to finance, View response from finance respectively

- **Department: -** Department have the responsibility to View Request, Send Request, View Response from staff, to faculty, from faculty Finance Response Respectively.
- **Faculty:** - faculties have the responsibility to View Request, Send Request, and View Response from department, to vice president, From finance response Respectively.

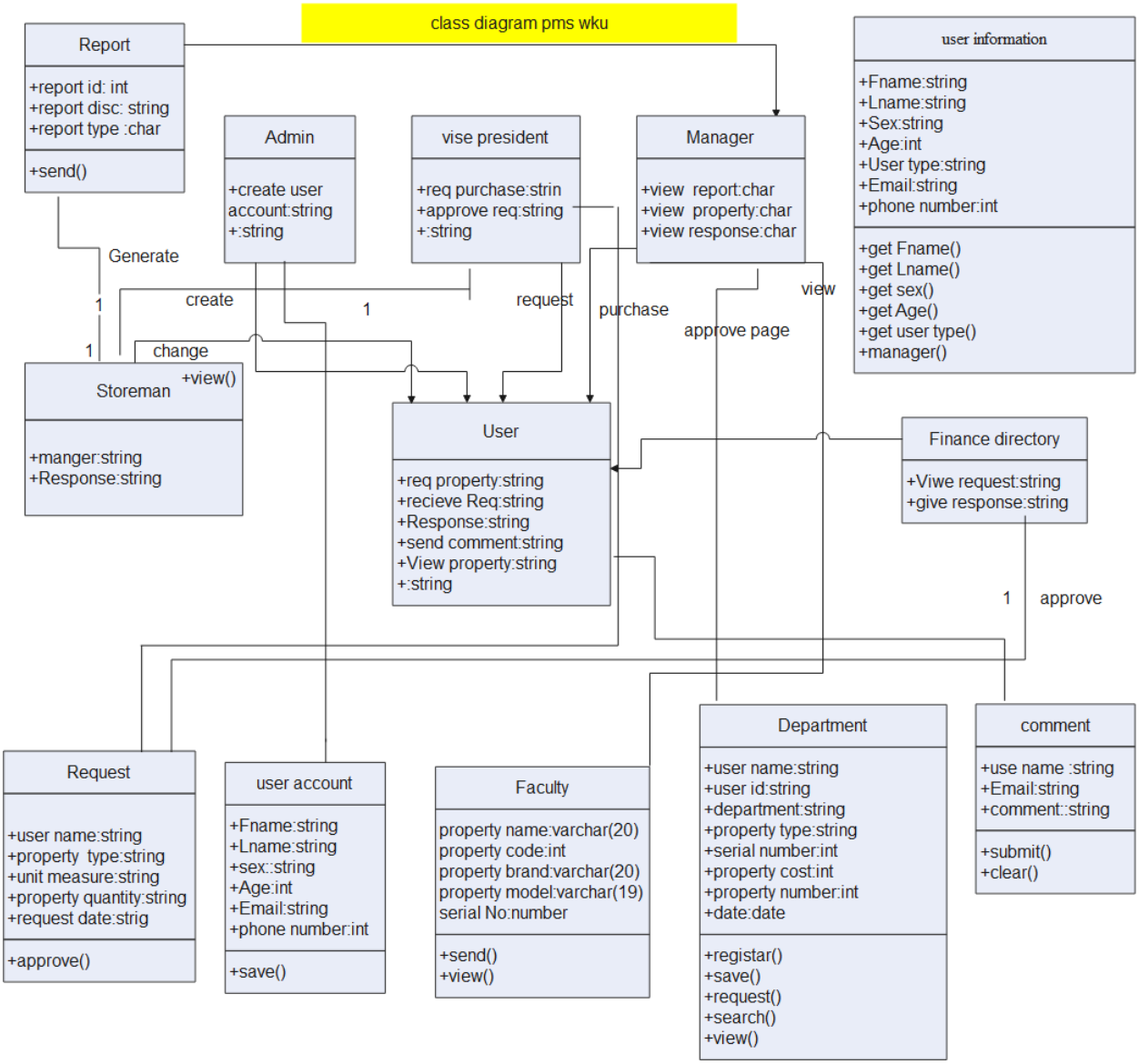


Figure 4. 2 Class diagram of the system

1.1.1 4.2.2 Data Dictionary

A data dictionary is a file or a set of files that contains a database's metadata. The data dictionary contains records about other objects in the database, such as data ownership, data relationships to other objects, and other data. The following table describes a data dictionary of our system.

Table 4. 7 user accounts of users

Table name:-user account Description:- User Account of Users to Access the System						
NO	Field Name	Data type	Visibility	Constraint		Description
1	User name	Varchar(20)	…..	Primary key		User Name for users
2	User ID	Varchar(18)	….	Foreign key		User Id of users
3	Password	number	……	Not NUll		Password for users

Table 4. 8 Register property

Table name:- Register Property Description:- register property by store man						
NO	Field Name	Data type	Visibility	Constraint	Null able	Description
1	Act type	Varchar(30)	+	Not null	NO	Account type
2	User ID	Varchar(20)	+	Foreign key	NO	
3	ConfPass	number	+	Not Null	NO	Confirm Password
4	F Name	Varchar(30)	+	NOT Null	NO	First Name
5	LName	Varchar(30)	+	Not Null	NO	Last Name
7	Email	Varchar(30)	+	NOT NULL	NO	Email
8	Phone- No	int	+	Not Null	NO	Phone Number
9	Block No	number	+	Not Null	NO	Block Number
10	Office No	number	+	Not Null	NO	Office Number

Table 4. 9 departments of users to access item

Table name: Department Description: -Department of users to access Item						
NO	Field Name	Data type	Visibility	Constraint	Null able	Description
1	Depr name	Varchar(20)		Not Null	NO	Department Name
2	DeprID	Varchar(18)		Foreign key		Department ID
3	Deprpassword	number		Primary key		Department Password

4.3. Dynamic Model

Dynamic models are generally model that contain or depend up on an element of time, specially allowing for interactions between variables over time.

4.3.1. Sequence Diagram

A Sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario of the proposed system (Douglas Baldwin, 2004). Sequence diagrams typically are associated with use case realization in the logical view of the proposed system under development. The main sequence diagrams of the new system of property administration system are listed below.

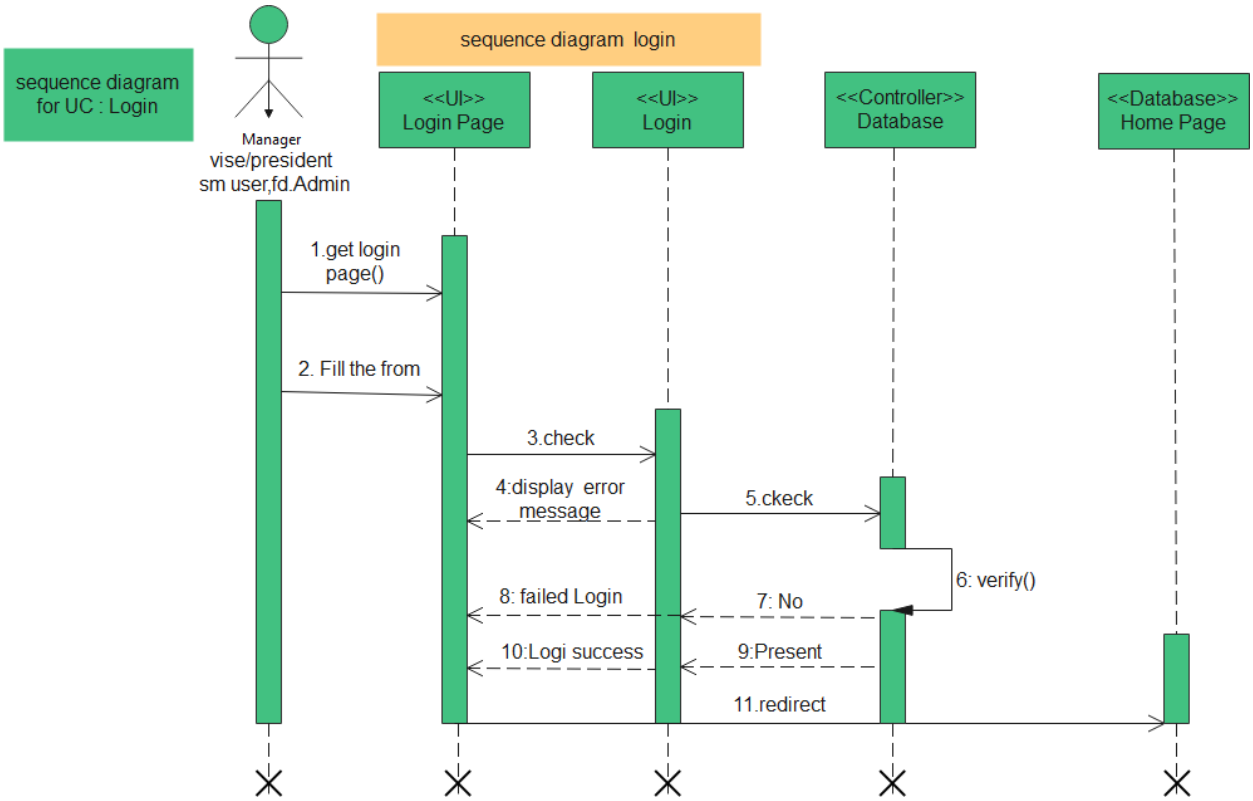


Figure 4. 3 Sequence diagram for a login page

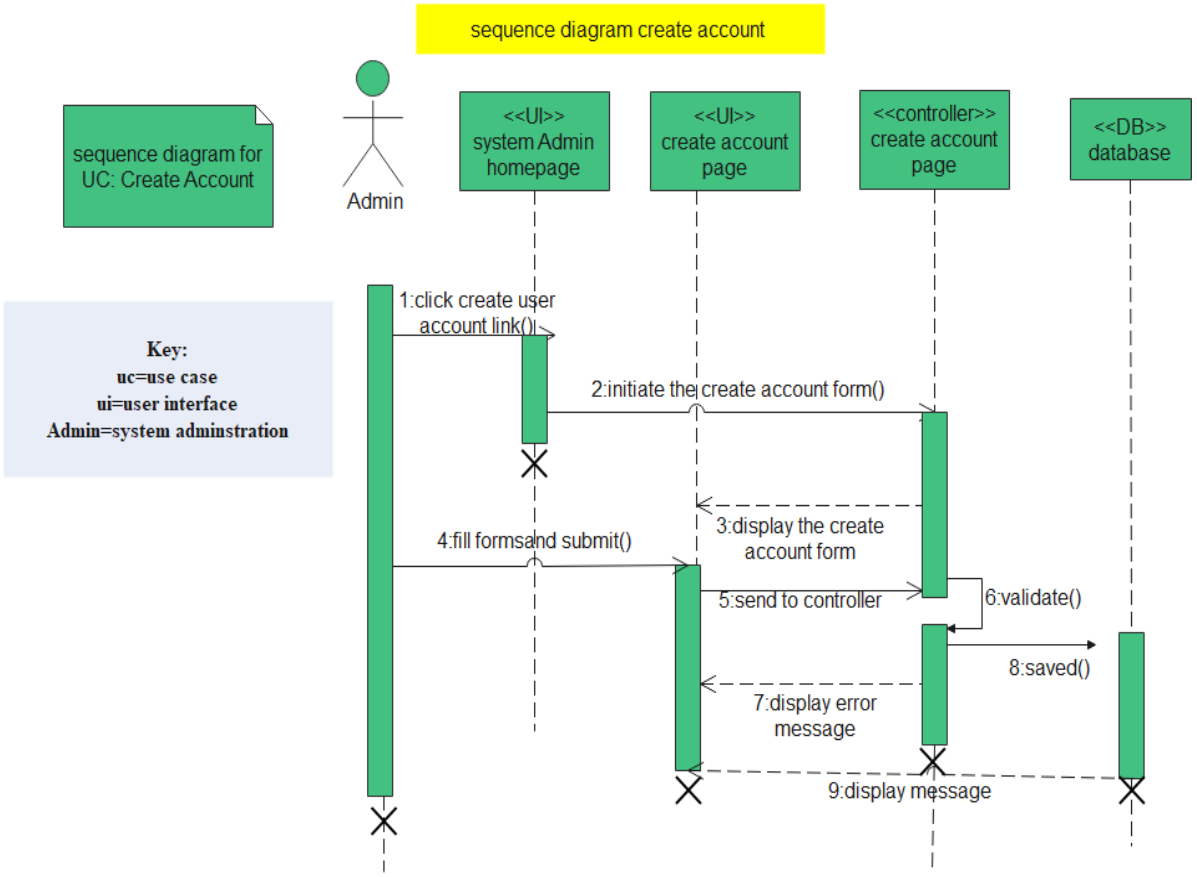


Figure 4. 4 Sequence diagram for a create account page

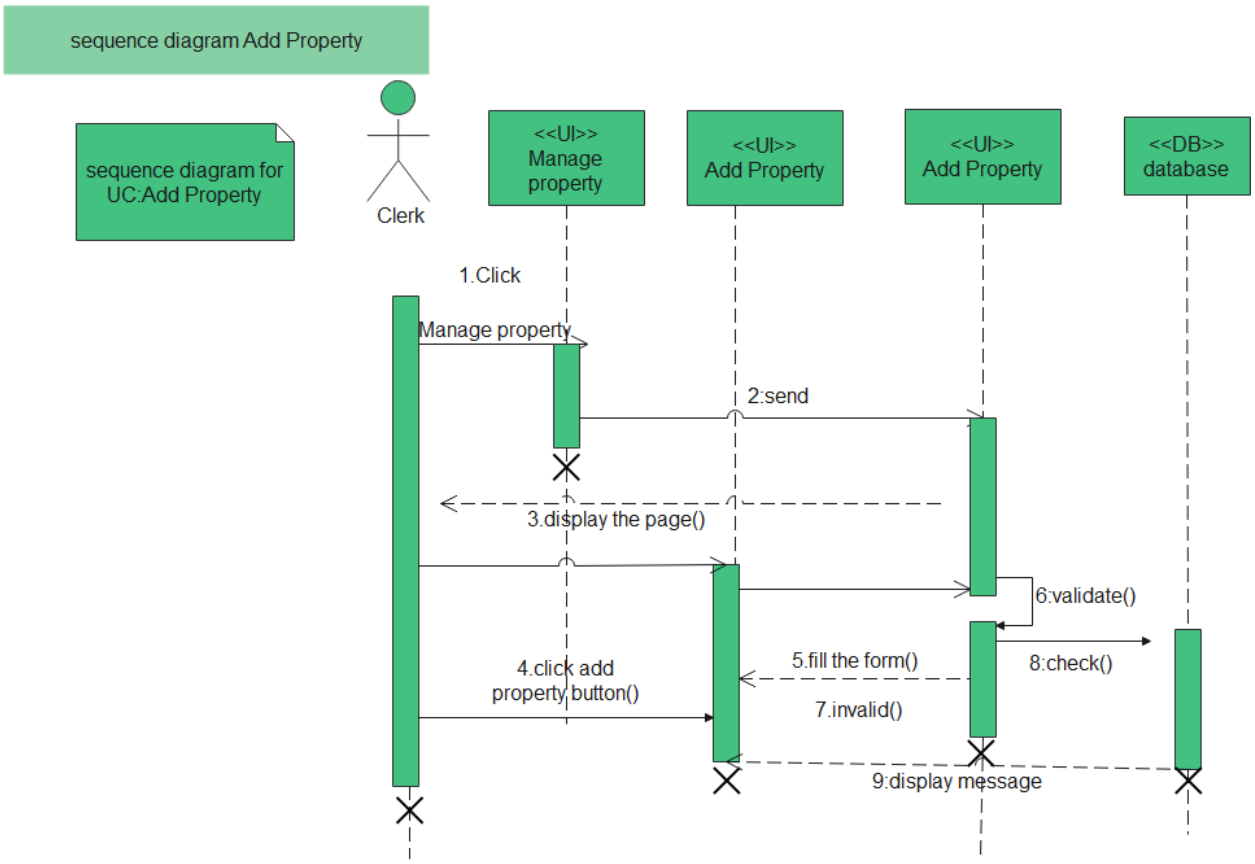


Figure 4. 5 Sequence Diagram Add property page

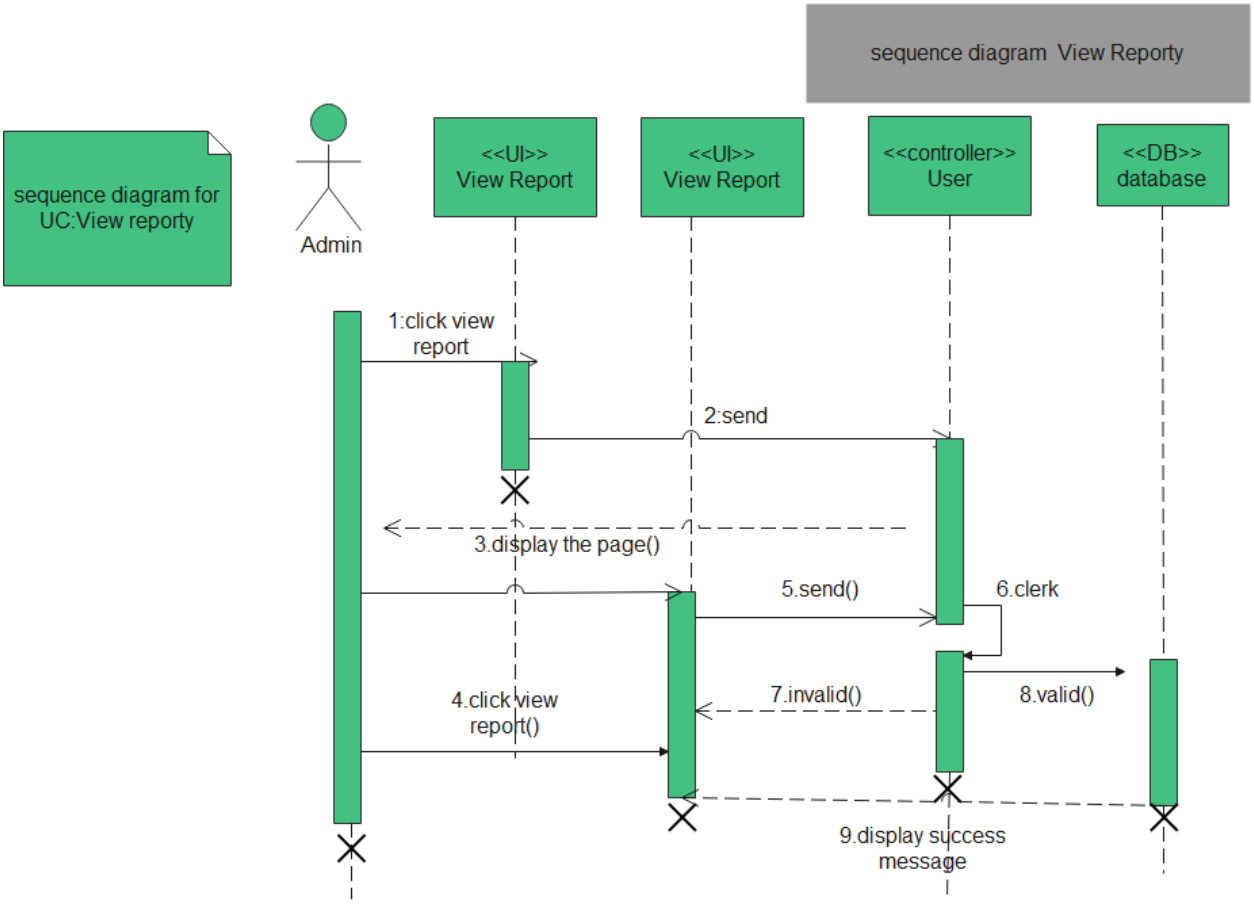


Figure 4. 6 Sequence diagram View property Page

4.3.2. Activity Diagram

Activity diagram shows how objects interact over time to accomplish specific system functions or activity of property Management system. Activity diagram shows also the conditional logic for the sequence of system activities needed to accomplish a business process of developed system in a good way.

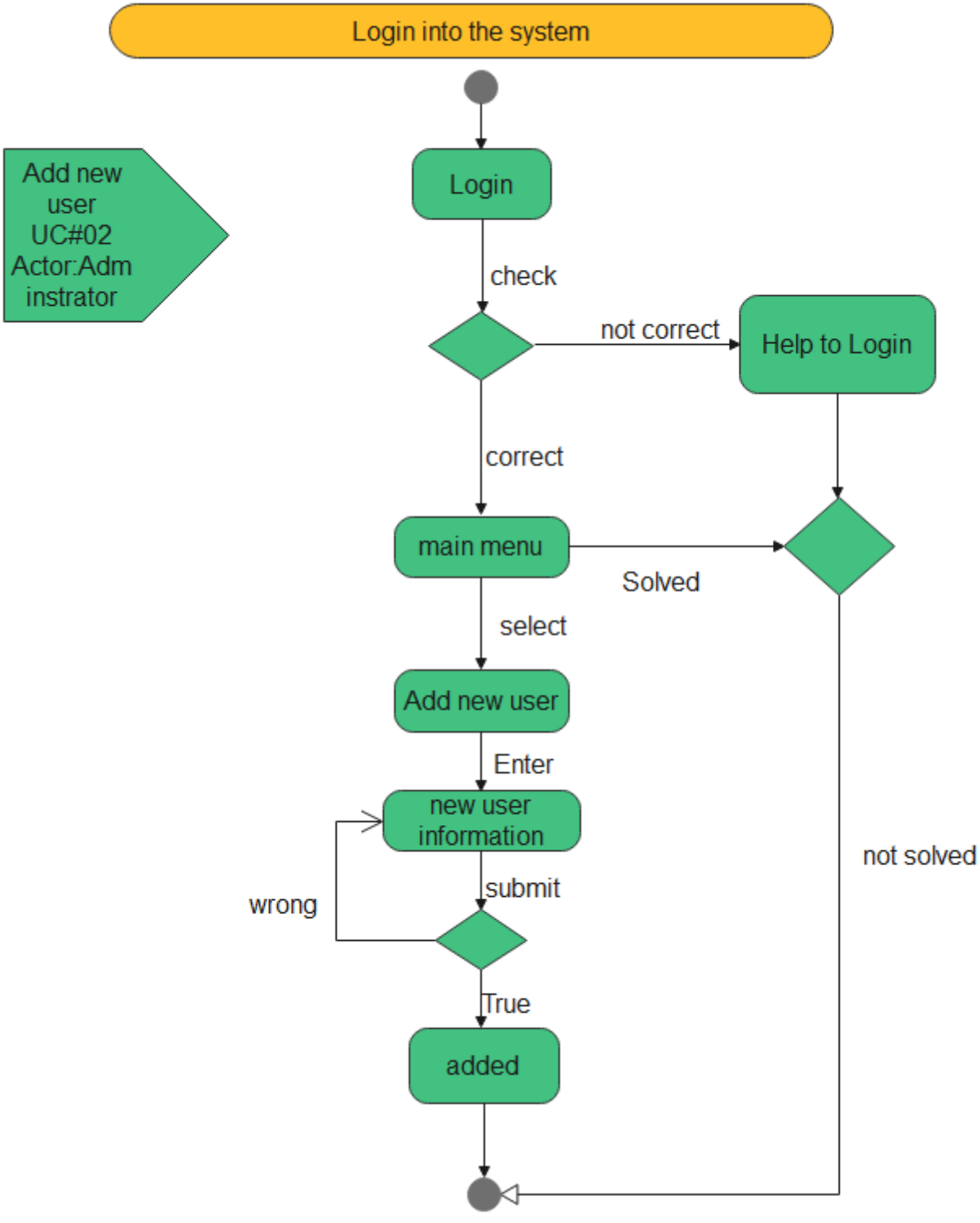


Figure 4. 7 Activity Diagram for a Login page

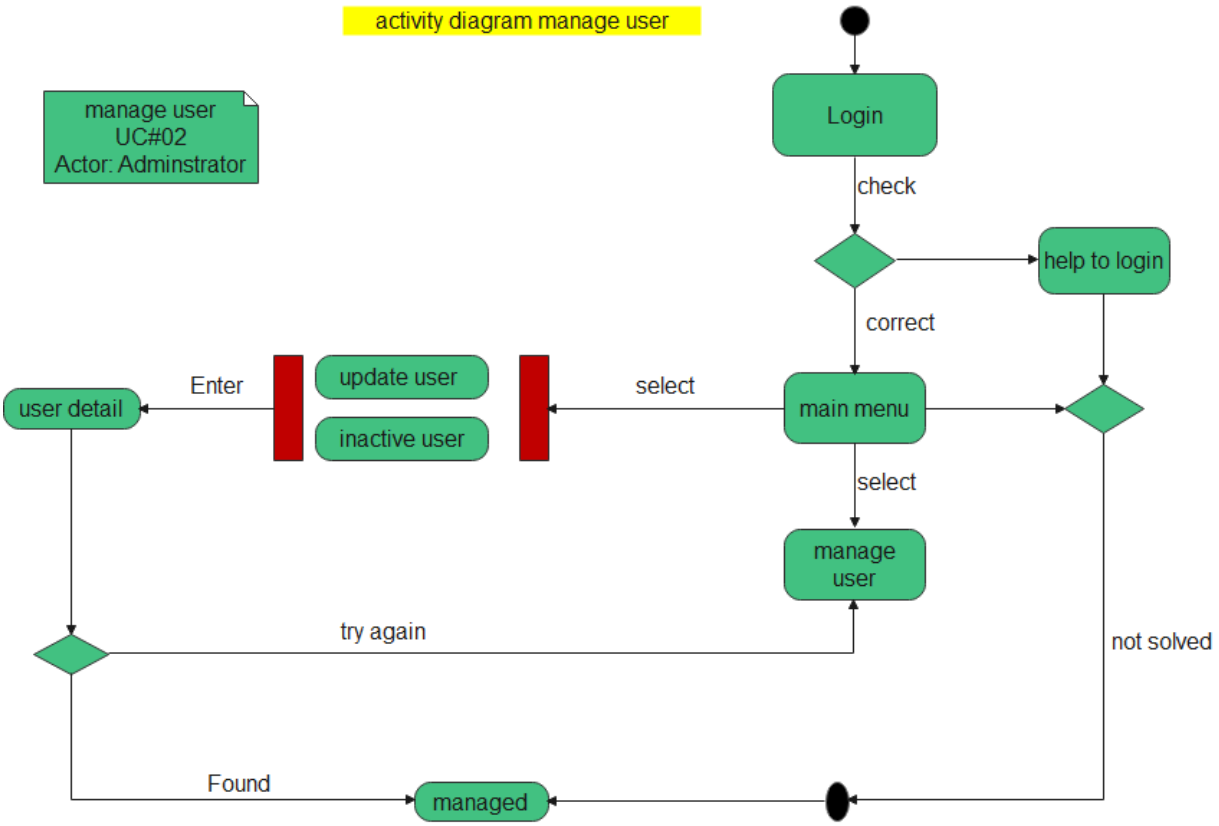


Figure 4. 8 Activity Diagram for a manage user

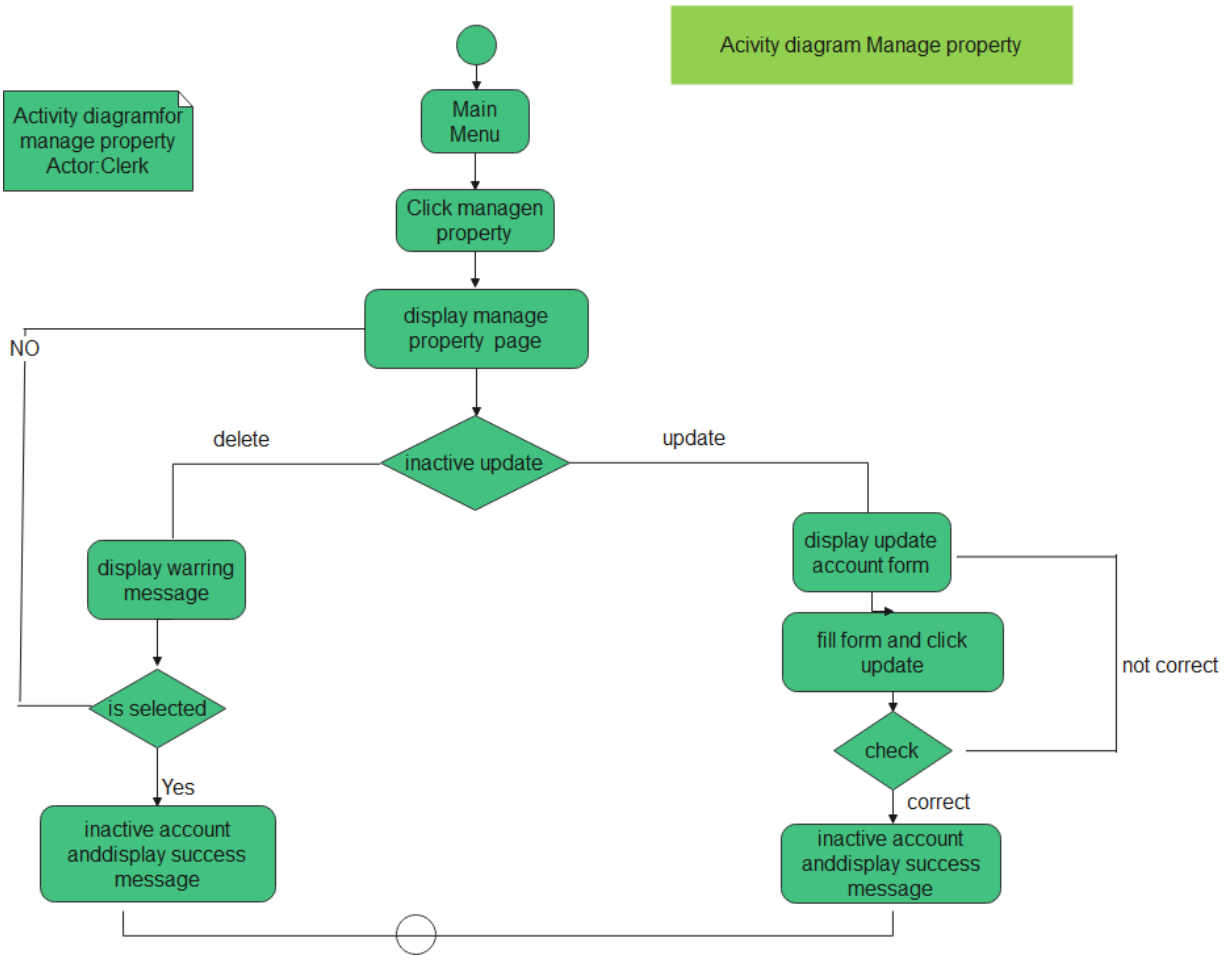


Figure 4. 9 Activity Diagram for a manage property

4.3.3. State Chart Diagram

State chart diagram describes the flow of control of the property Management developed system from one state to another state to describe the system dynamically. State chart diagram is a diagram that shows the state change of object which occur when the event appears or happens.

The state chart diagram is used to show the class with a dynamic attribute. States are defined as a condition in which an object exists and it changes when some event is triggered. So, the most important purpose of State chart diagram is to model life time of an object from creation to termination (Hawryszkiewycz, 1994).

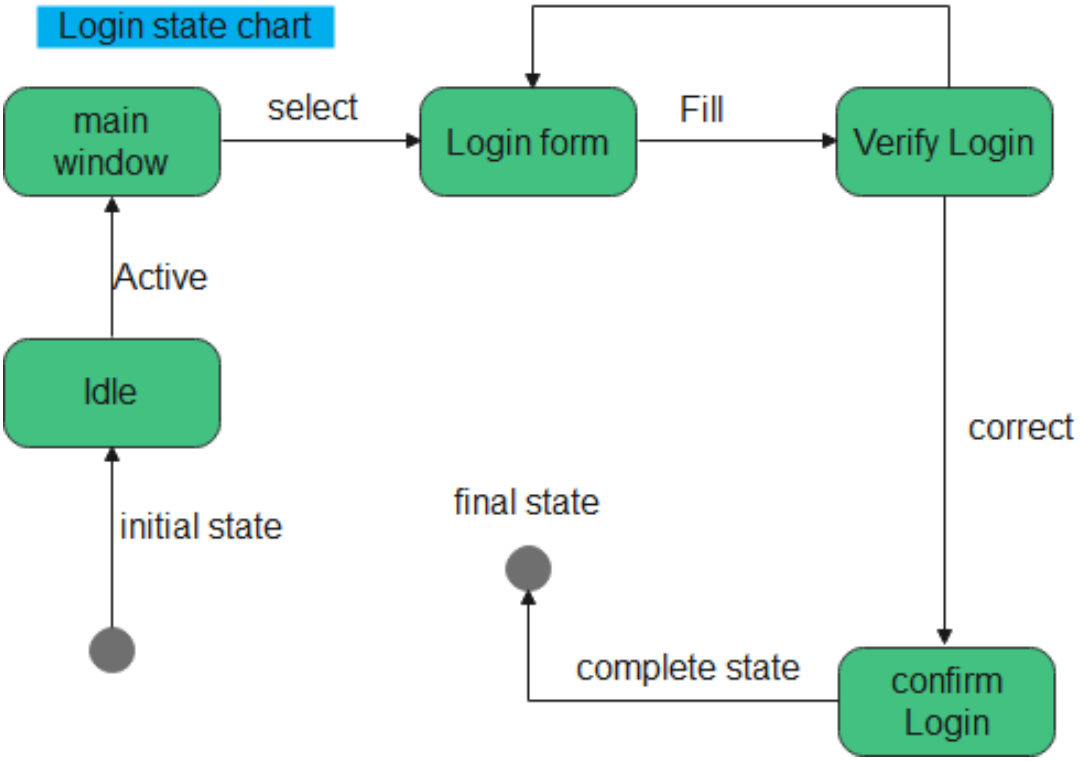


Figure 4. 10 State chart diagram for a login page

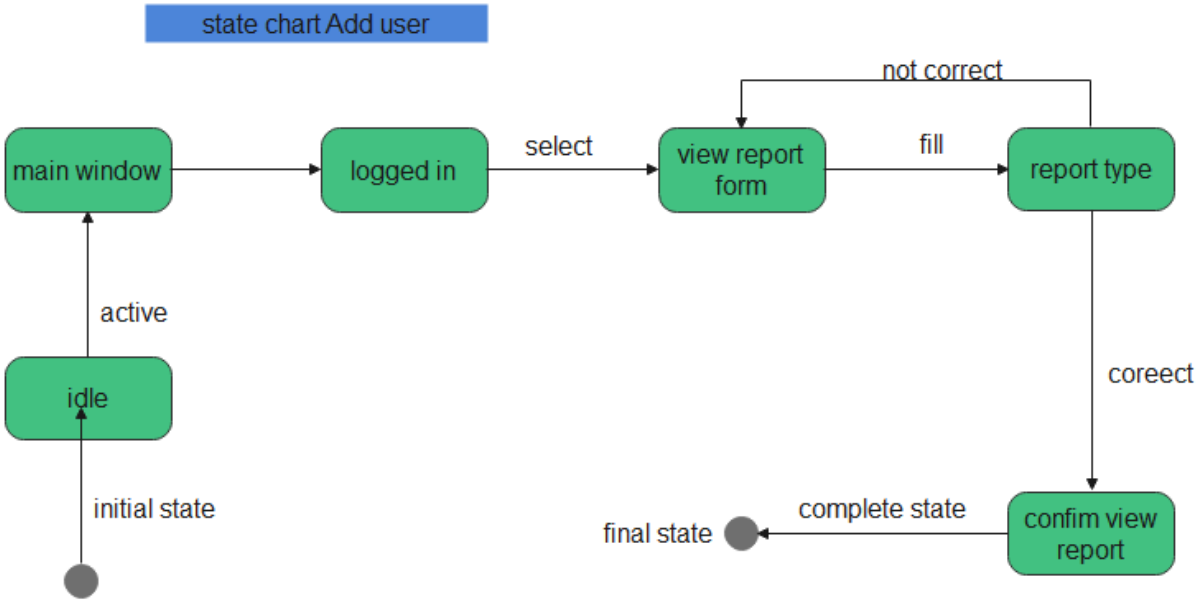


Figure 4. 11 State chart diagram for a add user

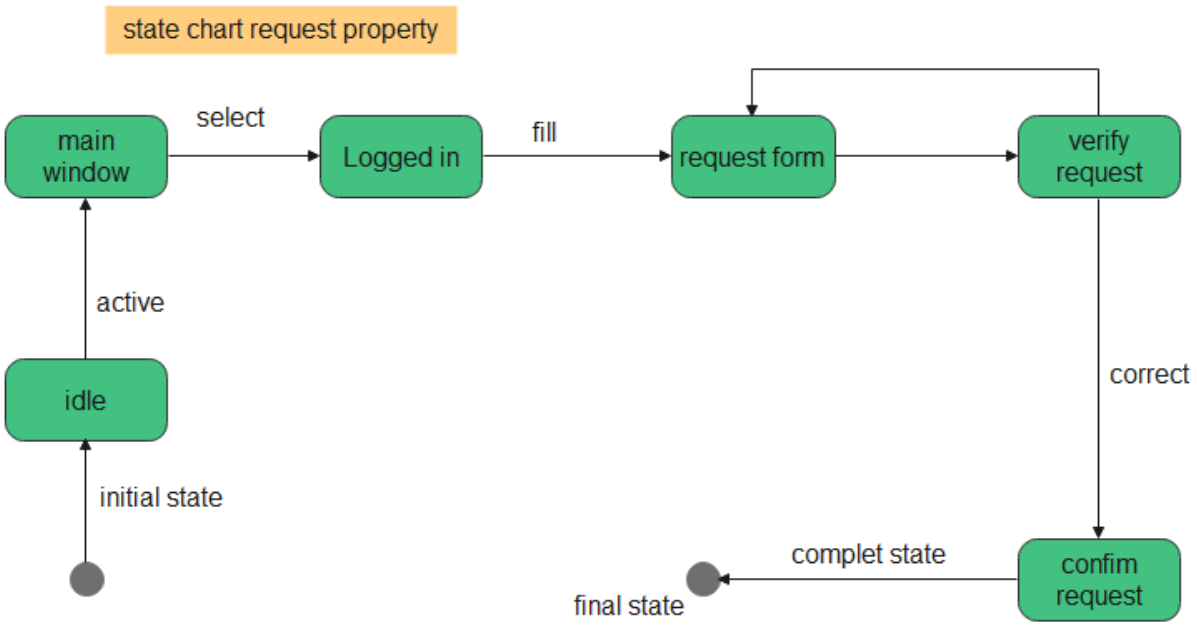


Figure 4. 12 State chart diagrams for a login page

CHAPTER FIVE

5. SYSTEM DESIGN

As previously mentioned in statement of the problem, there are a lot of problems associated with the current system of the organization. The main aim of the proposed system is to implement in wolkite university web based property management system which allows users to accesses the store easily and overcome to those problems**.**

Generally, this chapter is describing how the project is designed, what tasks done under this project And will cover proposed software architecture subsystem decomposition, system class diagram, collaboration, persistent data management, component diagram, deployment diagram, graphical user inter face design of the system.

5.1. Design Goals

The goal of system design according to proposed system is to increase efficiency, security and accessibility of the system. Design goals describe the qualities of the system that developers should optimize. Such goals are normally derived from the non-functional requirements of the system. The design goals are derived from the non-functional requirements of the system, which were stated in chapter two of this document. Those were described what the system should focus on. This includes:

5.2. Current System Architecture

The existing system of the property management system for WKU is manual system and hence there is no Existing software architecture that will be considered. As a result, we only describe the software architecture of the newly proposed system.

5.3. Proposed System Architecture

The System Architecture describes how the different components and nodes are arranged within the system. When closely looking at how the system works.

We use 3-tier for our project because 3- tier architecture provides scalability, performance, availability for the project.

User (Presentation) Tier: End-users operate on this tier and they know nothing about any existence of the database beyond this layer.

Application (Middle) Tier: At this tier reside the application server and the programs that access the database. For a user, this application tier presents an abstracted view of the database. End-users are unaware of any existence of the database beyond the application. At the other end, the database tier is not aware of any other user beyond the application tier. Hence, the application layer sits in the middle and acts as a mediator between the end-user and the database.

Database (Data) Tier: At this tier, the database resides along with its query processing languages. We also have the relations that define the data and their constraints at this level

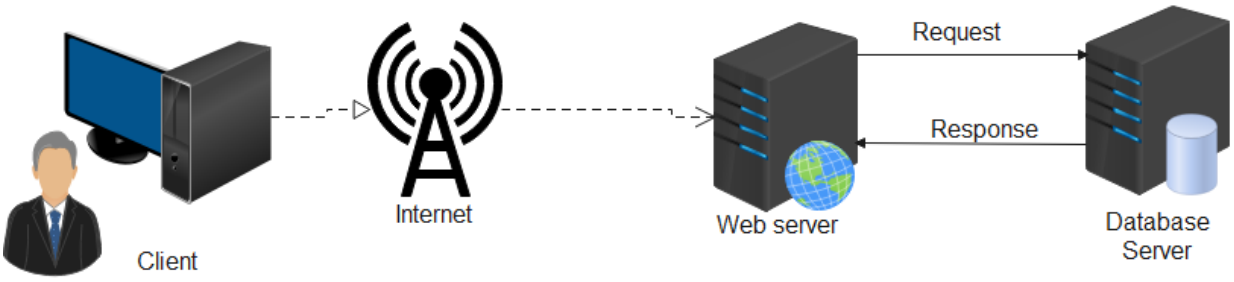


Figure 5. 1 Proposed system architecture

5.3.1. Subsystem Decomposition and Description

In order to reduce the complexity of the application domain, we identified smaller parts called "classes" and organized them into packages. Similarly, to reduce the complexity of the solution domain, we decompose a system into similar parts, called "subsystem", which are made of number of solution domain classes.

- **Manage Account subsystem:** these subsystems managing of information regard to account and perform.
  - Create account
  - Update account
  - Activate account
  - Deactivate account

- **Property information management subsystem**: this subsystem handles records of material and it includes operations of:
  - Register new material
  - Update material information
- **Report management sub system:** This subsystem allows for managing information and performs this operation.
  - Generate report
  - View report

- **Request subsystem**: in this subsystem managing of information regard to requestand perform.
    - Send request
    - View request
    - Approve request
    - Disapprove request
- **Comment subsystem:** in this sub system manage information of comment and perform.
    - Give comment
    - View comment

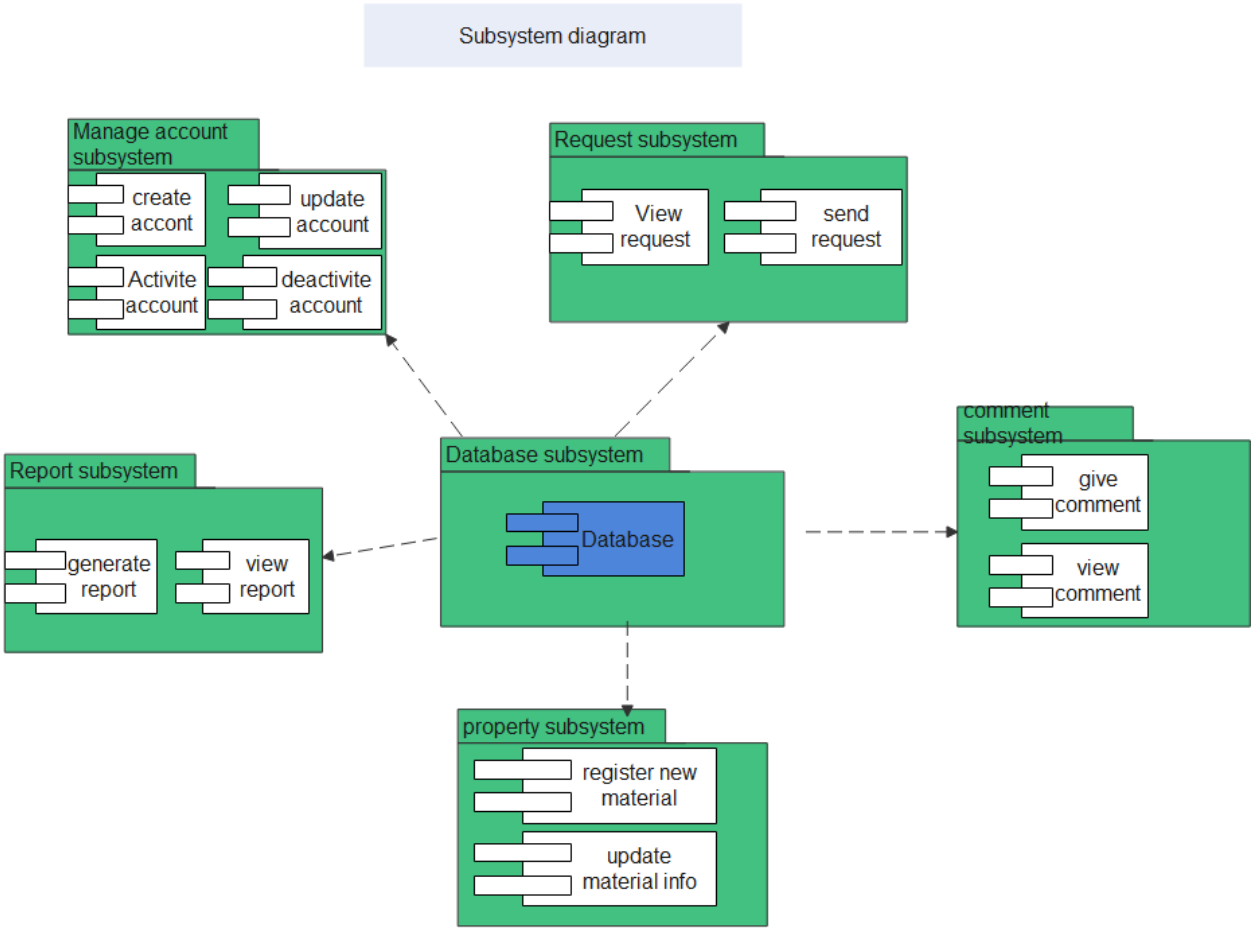


Figure 5. 2 Subsystem diagram

5.3.2. Hardware/Software Mapping

Hardware/Software mapping: - used to show the hardware of the system, the software that is installed in the hardware and also the middleware that is used to connect the different machines to one and other. It also shows how the software and the hardware components work together. The architecture used for the system is a 3 tier Client/Server Architecture where a client can use Internet browsers to access the online report provided by the system using the Internet. Three tier architectures consist of three components distributed in 3 layers: client (requester of services) the business logic (data handler) and server (provider of services).

The three components are: -

- ✓ User System Interface (such as session, text input, dialog, and display management services)
- ✓ Processing Management (such as process development, process presentation, process monitoring, and process resource services).
- ✓ Database Management (such as data and file services) The three-tier design allocates the user system interface exclusively to the client. It places the application logic on the second layer and places database management on the third layer. The reason of why we choose 3-tier architecture is:
- ✓ The system works on homogeneous environments with processing rules (business rules) that do not change very often.

Separation of business logic from application logic minimizes the work load of server and enhances the security of data. The figure is shown below.

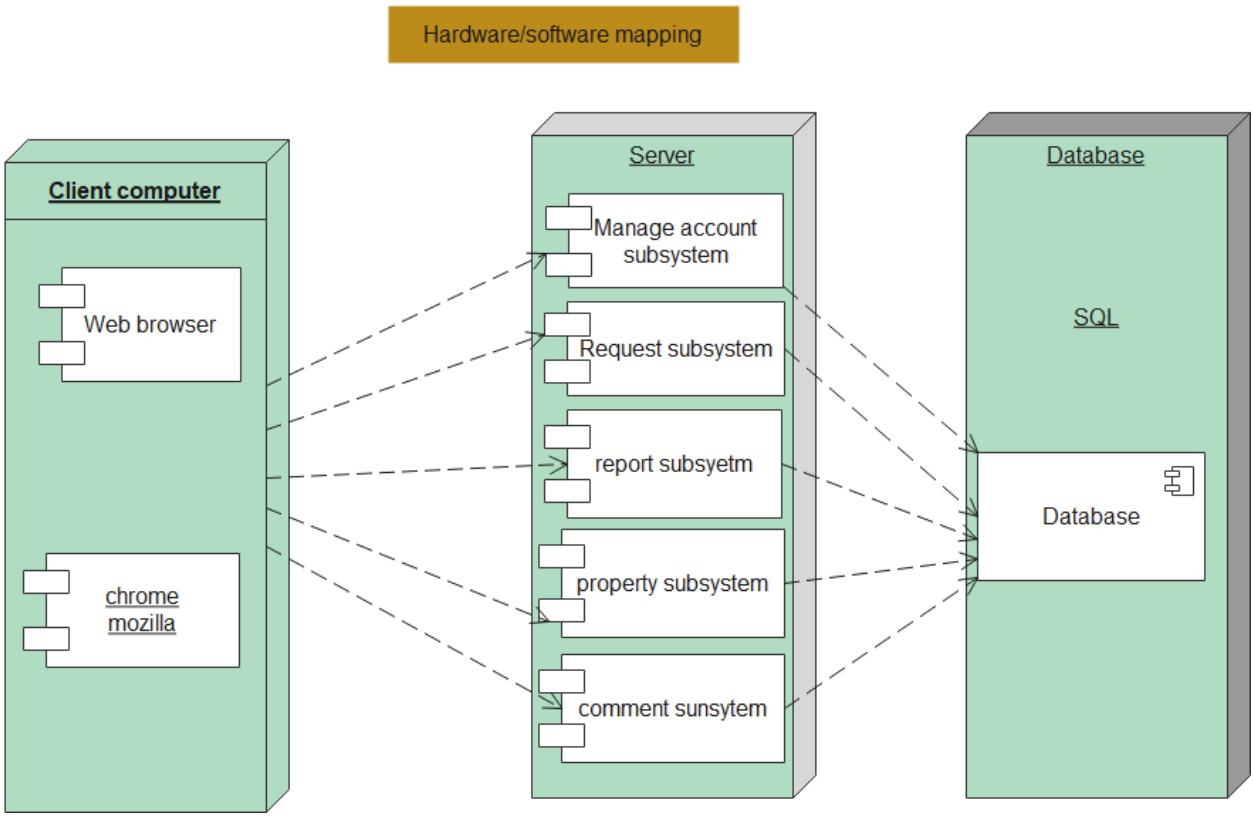


Figure 5. 3 Deployment Diagram

5.3.3. Detailed Class Diagram

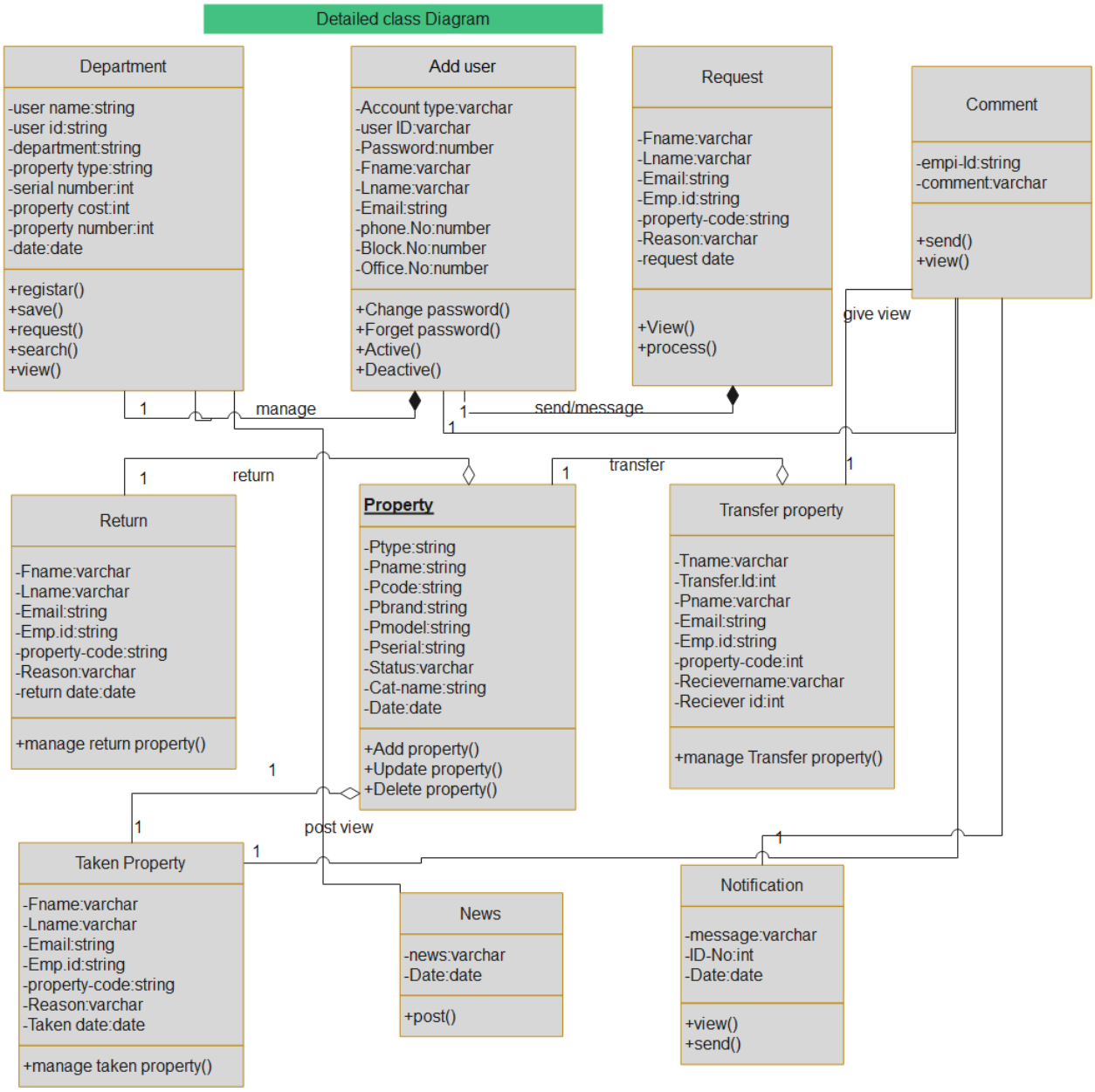
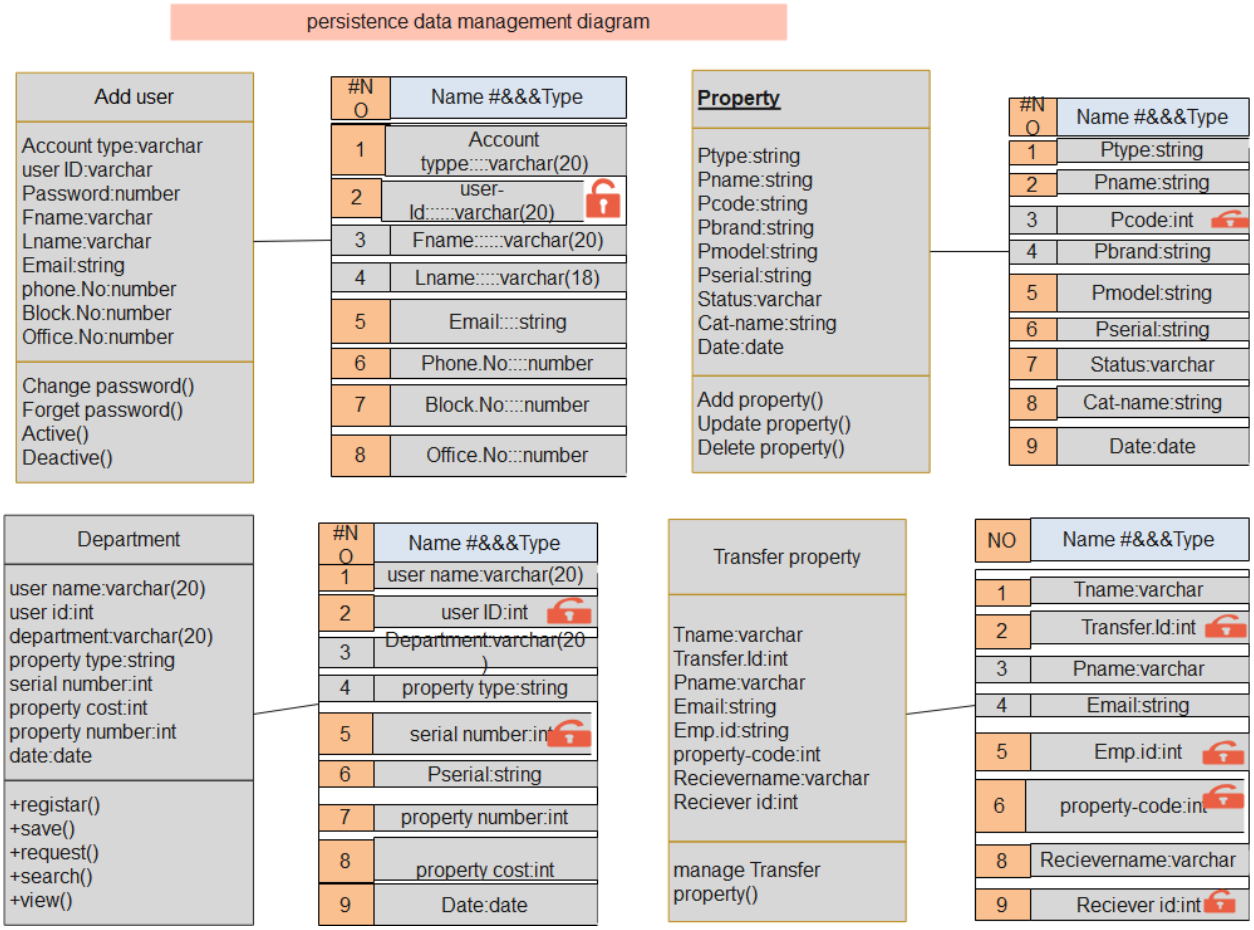


Figure 5. 4 Detailed Class Diagram

5.3.4. Persistent Data Management

When user interact with the system persistent data management is needed .during this activity persistent object is identified, storage management strategy is selected, and description of database encapsulation is described, in order to store information persistently we map objects into tables and

the attributes into fields to the specific table based on the objects found on the system. This part is to describe and show the necessary relationships among the tables, which are selected to store the data persistently in the system.



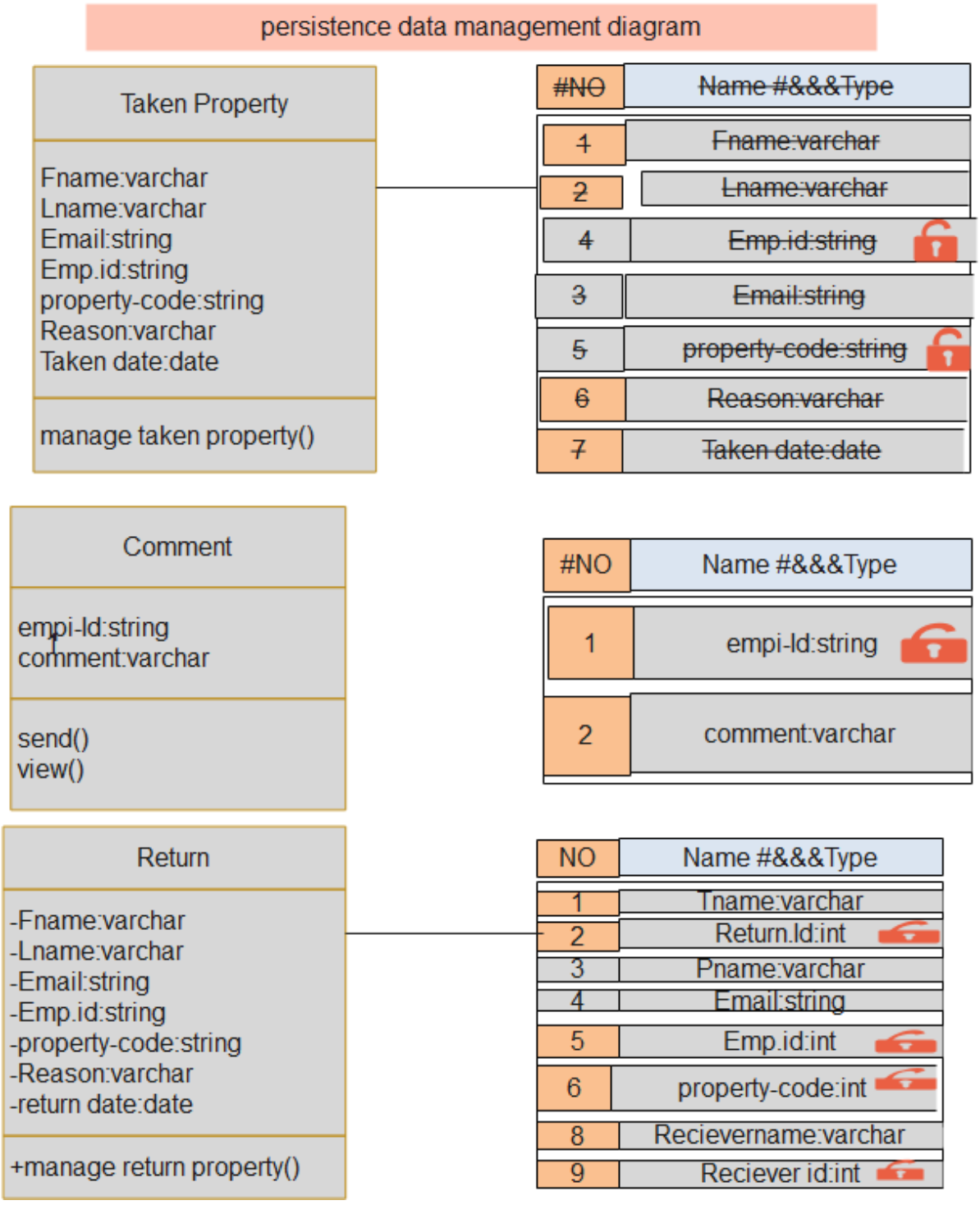


Figure 5. 5.Persistent diagram

5.3.5. Access Control and Security

Access control and security describes the user model of the system in terms of access matrix. Upon start up, the system will display the user a login screen. Then the user will enter username and password. After the user entered the username and password, the system verifies whether the username and password entered are valid or not. If it is valid, the system will allow access to the application based on the privilege to which the user belongs. Accordingly to the following access control list is given for the system.

Table 5. 1 Access privilege

	Admin	Manager	Clerk	Staff	F:directory	Vice president	Department	Faculty
Login	yes	yes	yes	yes	yes	yes	yes	yes
Manage property	No	No	yes	No	No	No	No	No
Change password	yes	yes	yes	yes	yes	yes	yes	yes
Manage activity	yes	No	No	No	No	No	No	No
View comment	No	yes	No	No	No	No	No	No
Transfers property	No	No	yes	No	No	No	No	No
Return Property	No	No		No	No	No	No	No
View report	No	yes	No	No	No	No	No	No
Receive response	No	yes	yes	yes	yes	yes	yes	yes
View		yes	yes		yes	yes	yes	yes

property								
Manage account	yes	No	No	No	No	No	No	No
Approve request	No	yes	No	yes	No	No	No	No
Disapprove request	No	yes	No	yes	No	No	No	No
Give comment	No	yes	No	yes	No	yes	yes	yes

5.4. Packages

The package diagram describes the decomposition of subsystems into packages and the file organization of the code. This includes an overview of each package, its dependencies with other packages, and its expected usage. In the previous section, we were trying to define the subsystems of our system, in this part we are going to describe the dependency of each subsystem to another subsystem which is found in the same package.

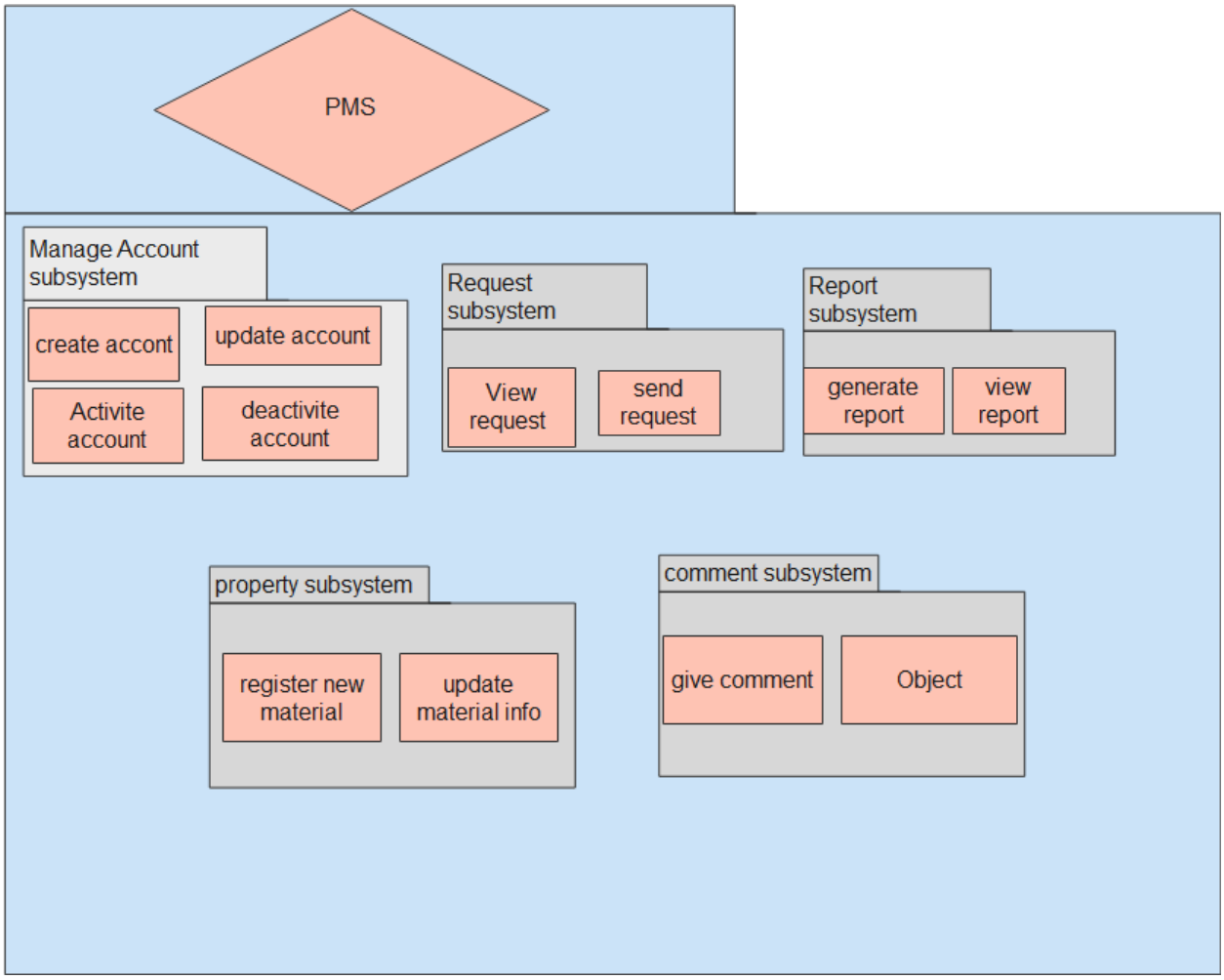


Figure 5. 6 package Diagram

5.5. Algorithm Design

It defines the algorithm required for each element of the architectural design to accomplish its tasks.

Algorithm we used in the MCCRMS:

Login

Inputs: User name and Password

Description: used to access any CCRS page

Begin

Connect to database

Access account table

Select username, password from account table

IF username and password are equivalent to select a given user account

Display home page of user with user Id selected

End if

End if

Else if

Display Error message: wrong user name and password. Please fill the correct one.

End else if

END

5.6. User Interface Design

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

5.6.1. User Interface for Login

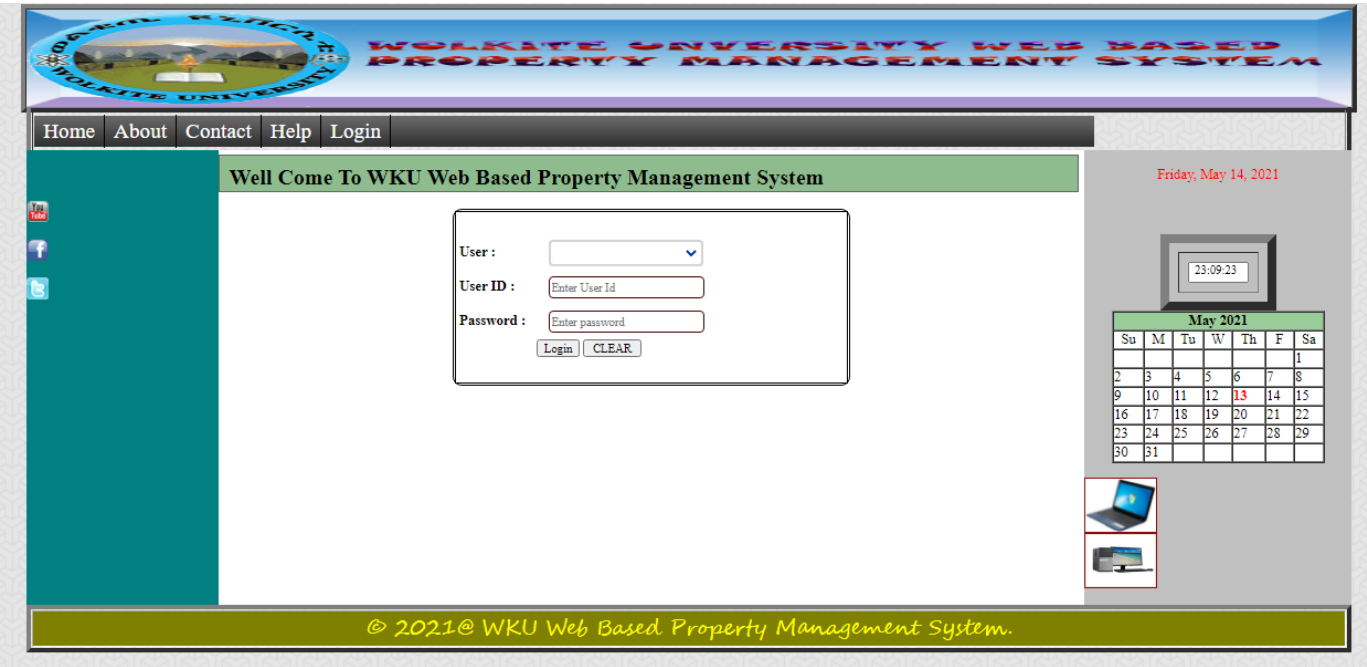


Figure 5. 7 Login Interface page

5.6.2.user interface for home page

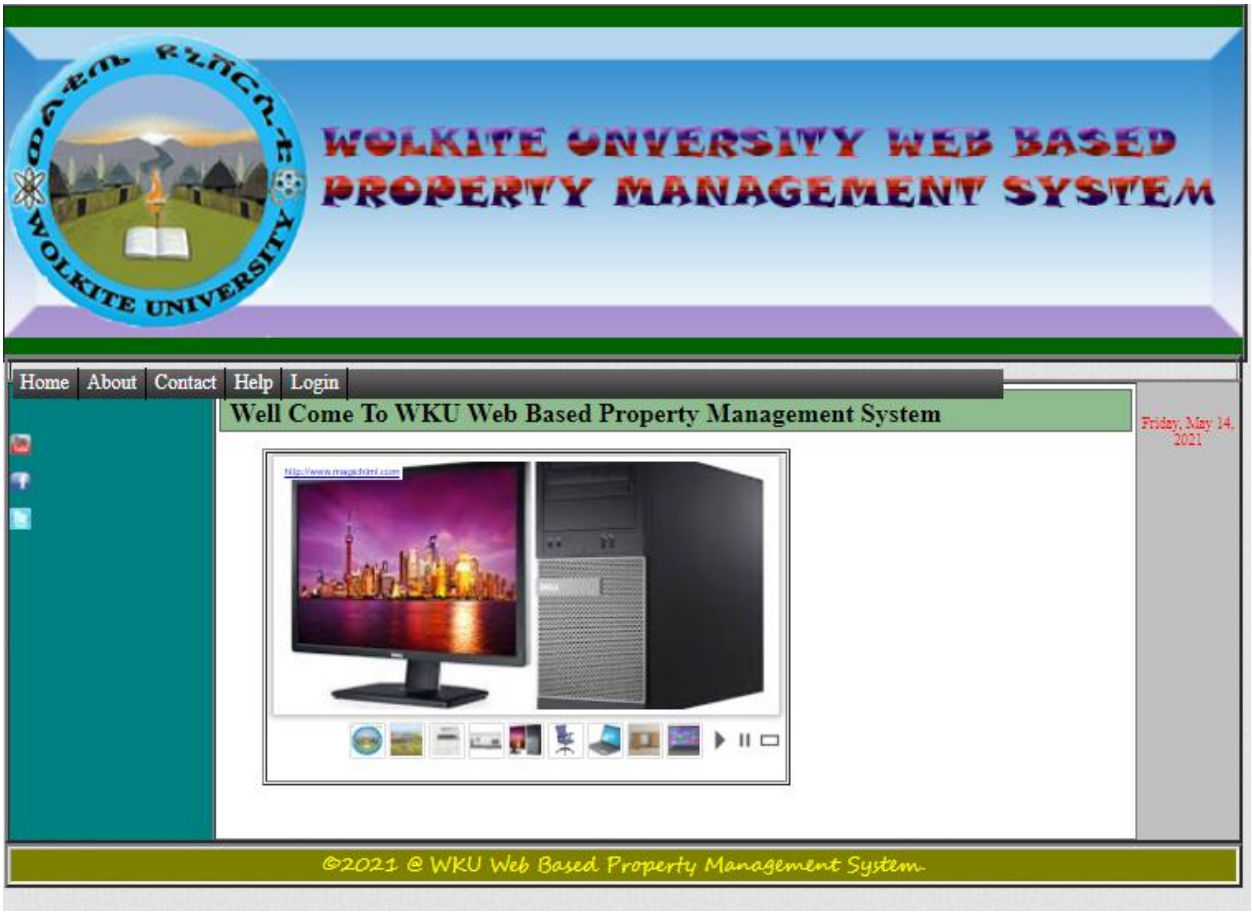


Figure 5. 8 home user interface page

5.6.3. User interface for about us

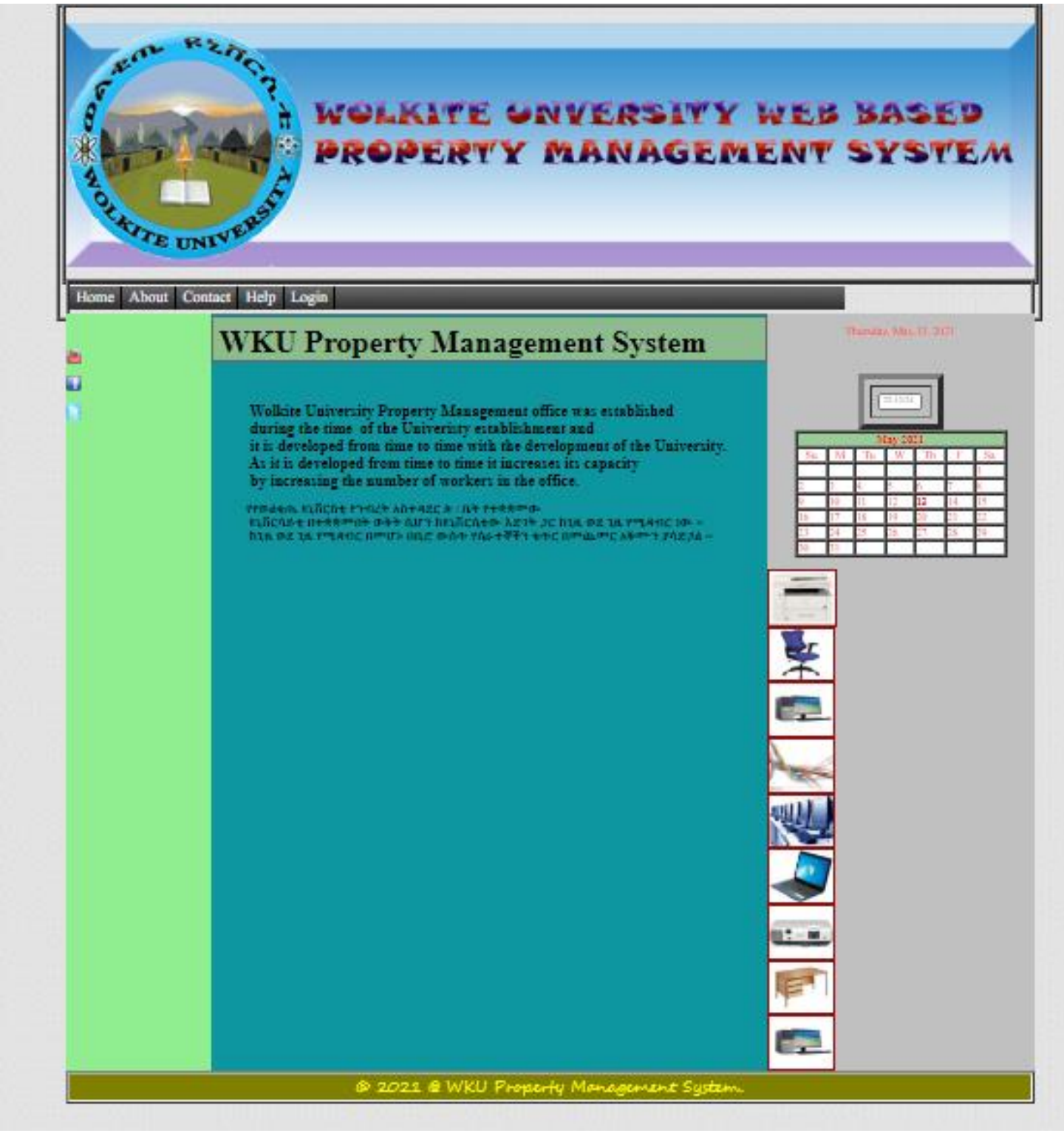


Figure 5. 9 user interface About us page