Wachemo University Durame Campus

College of Engineering and Technology

Department of Information Technology

Project Title: Web Based Residence Management System for Durame City

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Submitted to: IT Department head

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DECLARATION

This is to declare that the project work which is done under the supervision of **Mr. Merihun** and having the title Web Based Residence Management System for Durame City by the sole contribution of me.

No part of the project work has been reproduced illegally or copy and paste which can be Considered as Plagiarism. All referenced parts have been used to argue the idea and cited properly. I will be responsible and liable for any consequence if violation of this declaration occurs.

Student Name:

Name:	**Signature**
Sara Girma	_____

This project has been submitted with my approval as an advisor.

Mr. Merihun

Signature ----------

Date----------

Examiner Name	**Signature**
1. _____	_____
2. _____	_____
3. _____	_____

Acknowledgment

First and foremost, we would like to thanks for GOD; and then after we would like to give thanks to our advisor of this project, **Mr. Merihun** for the valuable guidance and advice for this continues and whole hearted an encouragement and support.

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Acronyms

Acronym	**meaning**
Admin	Administrator
BR	Business Rule
CD	Compact Disk
CSS	Cascading Style Sheet
GUI	Graphical User Interface
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transport Protocol
ID	Identification Card
MYSQL	My Structured Query Language
OOSAD	Object Oriented System Analysis and Design
PHP	Hyper Text Preprocessor
RAM	Random Access Memory
UML	Unified Modeling Language
WAMP	Windows Apache MySQL and PHP

Operational Definitions

Actor: are users of a system that plays a role to one or more use cases.

Apache: is a freely available Web server that is distribute under an "open source" license.

Automation: the replacement of human workers by technology; a system in which a work place or Processes has been converted to one that replaced human labor with electronic or mechanical equipment.

Database: refers to an organized collection of data for one or more purposes, it is usually in digital form.

Notification: is a message you can display to the user outside of your applications normalUI.

Use case: describes the sequence of action that provides a measurable value to an actor and draw as horizontal ellipse and contains use case name inside the ellipse.

Abstract

This Web Based Residence Management System for Durame City will enable the users to have a simple and efficient way of maintaining resident information. Achieving this objective is difficult using a manual system since the information is scattered, redundant and collecting relevant information may be time consuming. All these problems will be solved using this project.

Due to its flexible nature towards change and capability of early delivery of a system, iterative development methodology will be followed to realize this project. A wide range of tools, such as PHP, JavaScript, html, CSS, sublime text editor will be used in the project's lifetime.

Fact finding techniques like interview and documents analysis will be used to collect information about the system. A new system will be proposed and analyzed using object-oriented method like use case diagram, activity diagram and sequence diagram. A specification of the new system is to be designed using deployment diagram, collaboration diagram and class diagram.

Chapter one

Introduction

1.1 Introduction

Now days it is better to perform every activity using new technology in order to fulfill the need of human being, Organization, Enterprise etc. As today's world there are many organizations and each organizations needs to be preferable, competitive and work on fastest way in order to satisfy users interest etc. i.e. they should have facilitated their activities in computerized way. Technology is spreading its wing in almost every walks of human life activities. Many developing countries are in a good position to exploit the opportunity of technology revolution and advance human development.

Today computer and other electronic device increasingly communicate and interact directly with other devices over a variety of network such as internet. The internet provides individuals and small business centers for the ability to communicate inexpensively. Hence, developing the system using technology has great advantages for organizations; which is in our case Web Based Residence Management System for Durame City. Currently, the system is manual based; due to this the residents, and managing staffs faces some problems. Because of this, we are initiating to develop our project on Resident system in order to minimize the problem by using computerized system. Web Based Resident Management is management system which performs all activities (i.e. Registration New Residents, give identification card to residents of the Kebele, Renewed identification card to residents and others related activities) online.

1.2 Detail study of the existing system

Existing system refers to the system that is being followed till now. The current system of resident management has no automated system so they are working through manual file handling system and data is stored in written document. If a resident wants to get Id, different access etc., he/she should directly contact the corresponding office. The system does not use any office automation infrastructures to provide services for the resident. Working with such system is time consuming, tedious and it also consumes several resources. This is because upto now there is no automated system developed for the Durame city residence management.

1.3 Statement of the problem

The number of populations in the Durame city is increasing due to both natural increase and rural to urban migration. And there are a lot of problems happen around the existing system. Some of which are problem of data collection, Poor registration and documentation, improper management, difficult to preservation resident information and removal of record of resident, Data storage integrity, the existing system does not create smooth work flow between staff of the Durame city. The system is costly; the system takes a lot of hard copies and other instruments because of this there is high space coverage of data.

Personal file of the Durame city residence are lost or misplaced; Because of data movement throughout the process, Poor record keeping, the data handling and manipulation mechanism is not secured or exposed to damage. And the other thing is that customer is not satisfied with the service Because of keeping long time to get service (queue). Therefore, in order to solve those problems, we are going to develop the new automated system. The problems are described as follows:

Let's define some of the problem as we have been understood.

- Unorganized flow of information mean's that there is no confidentiality on the customer's data to keep, distribute, and rotate around the office.
- Problem of data collection: the employee of the Durame city has to be communicating with the resident physically and observe the environment carefully.
- Poor registration and documentation: there so many tiresome activities to perform registration of house and resident means that resident must communicate with concerning Durame city employee physically the register and the employee should lose much energy and time to register house.
- Improper management: the system is difficult to manage since it operates manually mean that residents and employees of the Durame city have not their account and profile to be managed.
- Difficult to preservation resident information and Removal of record of resident: Some customer's lost their identification card which makes it difficult to search out the customer's data.

- Data storage problem: As we have observed in the office records storage of customer's takes a huge amount of place around one room is reserved to keep customer's record this also creates a problem to the Durame city.

1.4 Objective of the project

1.4.1 General objective

The general objective of this project is to design and develop web based residence management system for Durame city.

1.4.2 Specific objective

In order to achieve the general (main) objective, we have the following specific objectives:

- To review the existing system
- To specify the requirements of resident Information Recording System
- To design centralized data base
- To design model of the proposed system with appropriate modeling language.
- To design interactive user interfaces.
- To implement /code/ the system
- To test the system.

1.5 Methodology

Our work runs from the starting point up to the end of the project within a systemically and a methodological journey through problems to eradicate them or as much as possible to reduce them and to get better things by exploring or formulating new modernism which will be employed in the real world to solve that specific problem. This section describes the steps and procedures that we should be followed when we perform the project activities.

1.5.1 Data collection methodology

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes [2]. The data collection process to conduct project is the qualitative data. I have focused on the qualitative data since I perform specific applications. This is will be performed through the use of instruments such as personal observation, interview group discussion, brain storming. I will use different data collection methods for

gathering information/Data from different levels of the organization. The methods will be used to use to collect qualitative data are described as the following.

1.5.1.1 Interview

It is the direct communication with the respondents. A meeting of people faces to face, especially for consultation. To get the basic information about the existing management system, I will should interview the administrator and other office employees of the Durame city about the activities they perform, and the problems associated with that environment. We have used an interview to ask different bodies about the process of Durame city in Kembata zone resident record management system. Some of the questions that interviewed are like:

- How the Durame city management system works currently?
- What rules and regulations are applied?
- How the organization is structured?
- How to serve customers?
- What is the responsibility of each employee? And so on.

1.5.1.2 Document analysis

To get more information about the project I have used earlier documents that help us to develop the project. For example, to know about the background of the City I have read many written documents beneficial to our work given from the administrator of the kebeles.

1.5.1.3 Observation

Even if interview is very important to gather information, direct observation is simple and help full to protect involuntary interviewee from lying and hiding important information. Proposed project have physically observe information that cannot maintain from the interview. This is one method of gathering information which is done by directly observing the works of the Durame city. Even if this method is the most reliable ways of gathering information most of the employees were not voluntary as a result of place limitation as well as time to guide us at the time. I observed the structure of the Durame city, the relationship with other Durame city and its own employees, and its staff members to know the work flow of the organization.

1.5.2 System development approach

The proposed project used the object-oriented methodology to develop this system. Here for the deployment of project I use unstructured system development (object-oriented system

analysis) and design method (OOSAD) specifically UML (Unified Modeling Language) model and iterative method. I select this because of the following advantages:-

- To simplify the design and implementation of complex program.
- To make it easier for designers and programmers to work in a single software project.
- To enable a high degree of reusability of designs and software codes. Increased consistency among analysis, design and programming activities.

1.6 Development tools

In system development

- **PHP**: will be used this server-side scripting language to create dynamic content that interacts with databases.
- **HTML: -**We use this Language to create Webpages and define the page layout and elements within the page [2].
- **MYSQL:** MYSQL is an open-source relational database management system. It is based on the structure query language; it is consistent fast performance, high reliability and uses it as back end [2].
- **WAMP SERVER:** The Apache is a freely available Web server that is distributed under an "open source" license.
- **JAVASCRIPT:** used in the form of client-side JavaScript for the development of dynamic website.
- **Micro soft word** 2007, Microsoft word 2013 and Microsoft office power point 2007 all of these are used to write the documentation and the power point presentation of the project throughout the project lifecycle.
- N**otepad, notepad++** I use this software to write the code of our project.
- **Microsoft office Visio 2007**and**Edraw max 7.9.0** to draw the gnat chart and all the UML diagram of the project respectively.

1.7 Scope of the project

This project of web based resident record management system is limited geographically only to the Durame city in Kembata zone. The Durame city resident record management system requires a web based system to perform most tasks efficiently. The Durame city resident record management system has many tasks that is solved through web based system. Our project

concentrates on solving problems of the existing manual resident record management system of Durame city in Kembata zone.

The web based resident record management system can give many services for residents such as: Giving ID card for citizens, register house, population, and count house, register new candidate and create account for them after accepting, provide clearances when someone wants to move to another place by physically appeared and remotely by sending requests, residents can give feedback (comment) and other actors can view each feedback(comment), updating and deleting residents file, easily manage users, residents able to give requests and view there solution quickly, generate in a systematic way daily, weekly, monthly and annual reports. Search and retrieve resident's information, easily post information efficiently; generally, the main activities handled by this system will be:

- Registration of New Residents.
- User account management
- Give identification card to residents of the Durame city.
- Renewed identification card to residents.
- Prepare Clearance for anyone who needs to transfer from one place to another place or Give Withdrawal.
- Generate report.
- Post news.
- Register houses.

1.8 Constraints

Though the existing residence management system performs various activities; there are many difficulties that I faced when doing this project. These difficulties are the limitation time and budget allotted to this project, Failure of electric power and network connection; managing staffs are not willing to give the required information.

- **Limitation of budget**: required materials are cost to complete within the team members capacity of income.
- **Failure of electric power and network connection**: there are failure of power and connections and it is due to accidental failure and purposive failures.

- **Data gathering problem:** the employee or the interviewee are not willing and dishonest to give the proper information about their City; and these is due to their time limit and doubtfulness of that the forwarded interview is none academic purpose.

1.9 Limitation of the project

There are many activities or tasks of existing system that have not be include in project. these activities which will have not done are like register the vital events, The system does not work payment issue, The system does not work activities that has interlinked with other organizations such as policing service, land administration, small enterprise, and building managers, The developed system does not use languages other than English and geographically limited only to Durame City.

1.10 Feasibility study

Feasibility study is essential to evaluate the benefits of the new system. On the basis of the feasibility study decision is taken whether to proceed or to cancel the project**.**

1.10.1 Operational feasibility

The project will be developed in such a way that it becomes very easy even for a person with little computer knowledge to operate it. This system is very user friendly and does not require any technical person to operate. Thus, the project is even operationally feasible.

1.10.2 Economic feasibility

The system to be developed is economically feasible and the benefit is outweigh (reduce) the cost. Since this project already computerizes the existing system, by now the reduction of cost for materials used in manual operation becomes beneficiary to the Durame city.

Generally the system that we will develop, Durame city Resident Management System will bring a number of tangible and intangible benefits.

Tangible benefits:

- Cost Reduction
- Error Reduction
- Increase Speed of activity

Intangible benefits:

- Reduce Resource Consumption: like human labor
- Increase security
- Increase Management flexibility

1.10.3 Technical feasibility

The system will be developed by using technologically system development techniques such as PHP, Java script, CSS and MySQL database. We have enough capability to use those technologies to develop the project. In addition, the new system will be easy to maintain when it faces some problems; so, the project is technically feasible.

1.10.4 Organizational feasibility

The system can be organizationally feasible because the system we will develop is based on the policies of the city administration and it will be developed according to the interest of them.

1.11 Alternative solution

In order to overcome the current system problems that exist in the functioning of Durame city Residence Management System, the project team members have put down alternative solutions. These are:

- **Web based applications:** This is for application that is usable only with an active internet connection and that uses HTTP as its primary communication protocol and also called web application. This method includes that can be accessed over the internet.
- **Desktop application:** This is for applications that run stands alone in a desktop or laptop computer
- **Mobile Application:** A mobile app is a software application developed specifically for use on small, wireless computing devices, such as smart phones and tablets, rather than desktop or laptop computers.

1.12 Proposed solution

The system going too developed can give effective and efficient service for those who use the system, and also for new applicants that wants registration requests. The system going to developed is efficient in facilitating the different tasks, like register resident, accept new applicants, create account for the new applicants, give ID card for residents, registration of new applicants, generate and give certificate, clearance for residents. It takes feedback or comments, request service from the resident. The major thing in the system to be developed is authenticated users. Authorized users only access the system. Unauthorized person is not allowed to access the system; they are prevented by user name and password mechanism.

Even if the new system can prevent the user by deactivating their password if they use the system in unauthorized way. The proposed system can facilitate the following activity: -

- The system registers populations which are resident and new person in the kebele and after registration gives ID card for residents.
- To provide collecting of all resident documents and files in one complete system which is accurate and precise and to make searching or retrieving the residential information and data from the new registration and recording file system in short time. This holds data base in organized manner.
- This system limits multiple registration of a resident and user can only enter into the system by login, therefore it is secure.

The system allows each resident will have profile: In the system, every resident has its own profile having detail information including name, ID, house number etc. When a resident has any question to the City to get data or associated resource the system help easy access to the profile associated to the requested and also it helps employees of the City to access the information or resources requested by the resident.

- The system helps the resident by giving up to date information and rules about their City. It also helps to announce meeting, meeting of employees with chairman, meeting employee with resident.

1.13 Significance of the project

The project is aimed at improving the management and service in Durame City and Kebele. The new system is highly reliable, easy, fast and consistent and play a crucial role for reliable service for residents, administrator, and for the management and create job satisfaction to the staff and user. The system is user friendly to the staff members and resident. The significance of the system includes:

- It used to avoid wastage of resident's time, materials, and human power.
- Make tasks simple and efficient in every aspect.
- It avoids redundancy of files.
- To provide accurate output, and facilitates delivery of resident request and solution.
- It provides a well-organized and guaranteed record keeping system with minimum space.
- It avoids data loss because of improper data storage.

- It makes the performance of the work more efficient and faster than the current manual system.
- It provides fast response for the request of residents.
- It helps for new applicants to register with in their home without losing their power and time.
- Protect unauthorized access (Secure) and with wise use of information resources available.
- Technological advancement of the Kebele residence management system.

1.14 Beneficiary of the project

The proposed web based resident record management system has all the following beneficiaries.

- Residents: can save their time and energy, and can get the solution of their request quickly. The residents can see the notices equally.
- Administrator: can easily manage the user accounts i.e. can prevent unauthorized access, and allow for the authorized one. She/he can prevent unauthorized access by deleting and deactivating user account.
- Record officer: can save his/her time when he/she lose at generating the annual and monthly reports .can save human power The record officer loses many times to record resident file in the manual system because done by writing on paper but when we will automate the existing system done by computer easily such as registration of the resident and house, generate report, and give ID card.
- Chairman: can avoid redundancy in the systematic way. The chairperson view report written by computer and approve request by computer.
- New applicants can register simply with in their home by uploading his clearance from other kebele or sub city.
-

1.15 Hardware and software tools

1.15.1 Hardware requirement

Hardware has to be used many hardware requirement tools when to develop the system.

No	Types of hardware	Purpose
1	Desktop computer and laptop	To perform all activities concerning to the project such as writing the documentation, power point, code, design interface, saving files and as a storage of all the file.
2	Flash	To transfer files and save as a backup.
3	Compact disk(CD)	For backup purpose
4	Mobile phone	Used as a camera to Capture different images.
5	Printer	To print the document

Table 1 Hardware Requirement

1.15.2 Software requirement

No.	Types of software	Purpose
1	WAMPP server	To serve as local server
2	Microsoft word 2013, Microsoft word 2007 and PowerPoint	To write the document, and to prepare presentation slide respectively.
3	Notepad++	To write the code
4	Microsoft office Visio 2007	To design UML diagrams and Gantt chart
5	MYSQL	For database
6	PHP	To make dynamic and interactive web pages quickly
7	CSS	For increase the attractiveness of the interface
8	HTML	To describe web page
9	JAVA SCRIPT	To do validation of each form of a web page

Table 2 software requirements

1.16 Overall cost estimation

1.16.1 Cost cash for materials

The budget that we have been allotted for the flow of the project by the team members are:

Item	Quantity	Unit cost per Item(in birr)	Total cost in birr
Paper	250	0.50	125.00
Pen	5	6.00	30.00
Flash	1	230.00	230.00
CD	2	8.00	16.00
Laptop	2	16,000	32,000
Print	100 paper	1.50	150.00
Mobile Card	10	10.00	100.00
Total			32,651 birr

Table 3: cost cash for materials

1.16.2 Time

The project is supposed to undergo in a well-planned and organized manner. For the time scheduling purpose; The Gantt chart below is being used in order to show the project's progress in each and every phase.

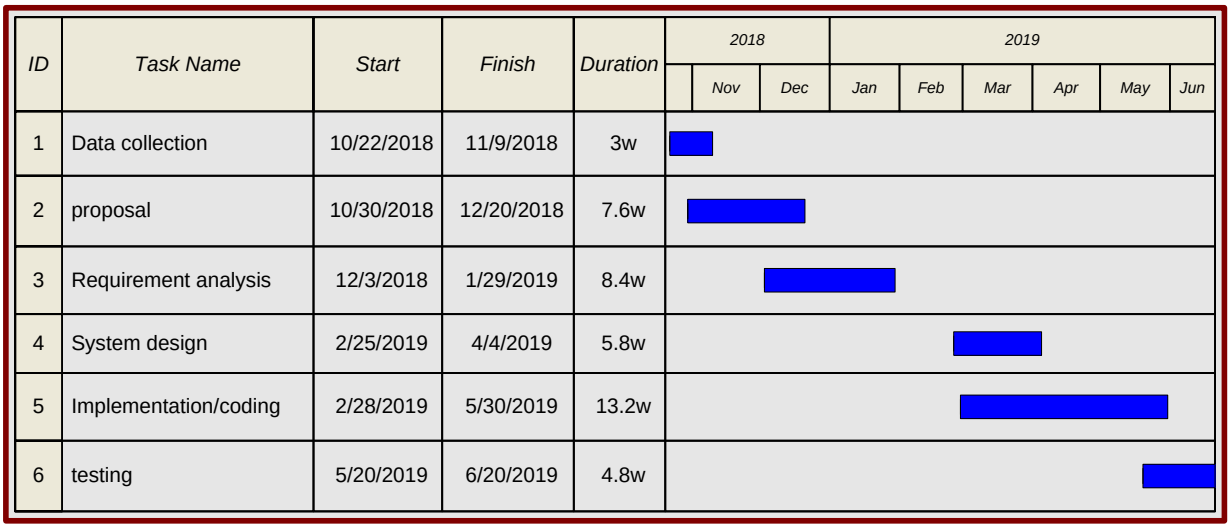

Figure 1 Time scheduling Gantt chart

Chapter two

Description of Existing System

2 Introduction

This chapter presents analysis of the existing system and define its problem, its business rule and major function of existing system and propose new system as well.

2.1 Introduction to existing System

Existing system refers to the system that is being followed till now. The current system of Durame City has no automated system so they are working through manual file handling system and data is stored in written document. If a resident wants to get ID, different access etc. he/she should directly contact the corresponding office. It is the process of managing the academic and administration records for all residents. Use the system to access letters of offer, update your contact information, review your academic records, and self-report any statutory holidays you've worked as residents.

It also known as Records information management, is the professional practice or discipline of controlling and governing what are considered to be the most important records of an organization throughout the records life-cycle, which includes from the time such records are conceived through to their eventual disposal. This work includes identifying, classifying, prioritizing, storing, securing, archiving, preserving, retrieving, tracking and destroying of records. Records management is the systematic control of an organization's records, throughout their life cycle, in order to meet operational business needs, legal and financial requirements, and community expectations the benefits of records management. Know what records they have, and locate them, control administration process and costs, support decision making.

2.3 Problems of existing system

There are many problems that the existing system faces when circulating and performing activities of the City. The system does not use any office automation infrastructures to provide services for the resident. Working with such system is time consuming, tedious and it also

consumes several resources. This is because upto now there is no automated system developed for the Durame City management and registration system. Most of the problems are as follows.

- Time consuming.
- High space required to store data
- Work overload for Officers
- Lack of data integrity.
- Difficult to handle record and retrieve customer data.
- Difficult to get personal information of resident.
- Data is not well protected and organized
- Data is not accurate

2.4 Major Functions of the Existing System

Even if the existing system performs its activities manually, it has different major functions.

- Registers new residents in a paper form-filling.
- Property listing and management.
- Maintenance request submission and tracking
- Registers residents who leaves residency.
- Gives clearance for resident who withdraws.
- Registers privateor Kebele house and the generation or assignment of house-numbers
- Provides land ownership authorization and transfer of properties.
- Organizes peoples in small enterprise.
- Solves conflicts easily with lower court.
- Collects rent price for Kebele houses.

2.5 Business rules of existing system

Business rules are principles and polices that must be fulfilled and obligated in order to well function, to be properly and effectively. Durame City has its own businesses rule to inform the residents how it facilitates the service and the type of services which are functionally used by the kebele and its resident. This rule must govern all the residents in the city. These rules are:

TO REGISTER RESIDENT

Description**:** Those customers who fulfill the required qualification to register for resident of the kebele.

Related rules:

BR1.1: Applicant should bring their clearance from their home town.

BR1.2: the Applicant should come on time.

TO PREPARE CLEARANCE

Description: The resident can ask for clearance to leave there kebele.

Related rules:

BR2.1. Validate clearance information of the resident

PREPARATION OF IDENTIFICATION CARD

Description: Residents ask identification card to get service from the kebele and other organization.

Related rules:

BR 3.1. When Residents ask identification card; customers should bring their photograph and fee.

BR 3.1. Resident gets ID in the following ways:-

- If either his/her father or mother have kebele ID.
- If either his wife or her husband have kebele ID
- People who come from other places in legal way.

2.6 Work flows of existing system

Workflow of the existing system means the work that already takes place in an organization. Work flow is the task that is followed from the person who is in a position of authority to other who has the same position of authority and to other persons who has the authority below them.

We have the following two examples of work flows in the existing system.

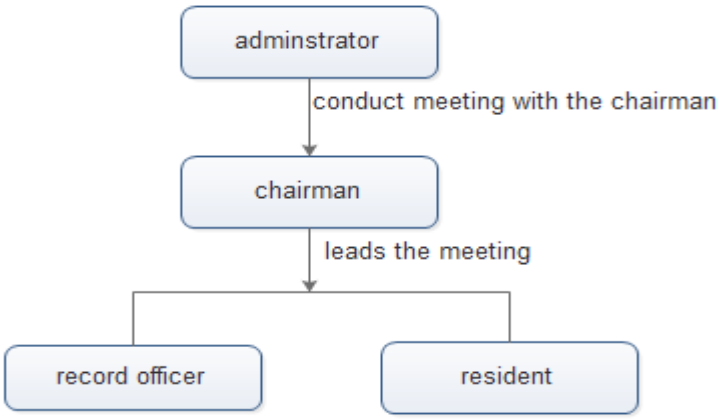

Figure 2 conduct meeting work flow diagram

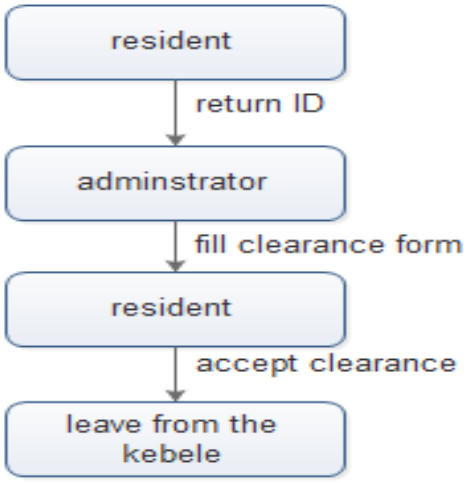

Figure 3 clearance request work flow diagram

2.7 Over view of the new system

The system going too developed can give effective and efficient service for those who use the system, and also for new applicants that can want registration requests. The developing system is efficient in facilitating the different tasks, like register resident, accept new applicants, create account for the new applicants, give ID card for residents, registration of new applicants, generate and give certificate, clearance for residents. It takes feedback or comments, request service from the resident. The major thing in the developing system is authenticated users.

Authorized users only access the system. Unauthorized person is not allowed to access the system; they are prevented by user name and password mechanism. Even if the new system can prevent the user by deactivating their password if they use the system in unauthorized way;

The proposed system can facilitate the following activity:

- The system registers populations which are resident and new person in the kebele and after registration gives ID card for residents.
- To provide collecting of all resident documents and files in one complete system which is accurate and precise and to make searching or retrieving the residential information and data from the new registration and recording file system in short time. This holds data base in organized manner.
- This system limits multiple registration of a resident and user can only enter into the system by login, therefore it is secure.
- The system allows each resident to have profile: In the system, every resident has their own profile having detail information including name, ID, house number etc. When a resident has any question to the City and kebele to get data or associated resource the system help easy access to the profile associated to the requested and also it helps employees of the kebele to access the information or resources requested by the resident.
- The system helps the resident by giving up to date information and rules about their kebele. It also helps to announce meeting.

2.7.1 Business Rule of Proposed System

Business rule refer to the set of policies, procedures or definitions that peoples follow in order to use the system. Business rules are specific rules or business policies that govern behavior of our system or the organization. These rules are;

BR1: Users must have a valid user name and password (i.e. administrator, chairman, record officer and residents).

BR2: The Resident should fill the correct personal information during registration.

BR3: Authorized user can visit the system anytime.

BR4: The entire resident must have profile or user account to survive in that City.

BR5: The residents have a right to access the system equally.

BR6: administrator has the responsibility of managing the resident's account.

2.7.2 Inputs and outputs of the system

The system requirement specifies what the information system must do or what properly or quality the system must have to reach user need of the project. This requirement analysis works for the residents and kebele needs of the new system.

2.7.3 Input

- The system should allow Record officer to register population and house.
- The system should allow the administrator to create username and password for users.
- The system should allow the administrator to add new employee.
- The system should allow residents to insert username and password.
- The system should allow chairman to insert username and password

2.7.4 Output

- The system should have a login GUI for users.
- Generate and view report; such as population report, house report.
- View applicant comment and request.
- System will display full information of residents.
- Confirmation alert after creating account.
- Display appropriate pages after login into system.

2.7.5 Requirement analysis of the new system

2.7.5.1 Functional requirement

The functional requirement is functioning or features that the system must include to satisfy the system need and to be acceptable by the user. The functional requirements for the new system that will replace the existing system include:

- The system should allow the Residents file record information's to keep properly in a well-organized database so that retrieving these files will easily and faster.
- The system should register population and house.
- The system should be able to prepare and renew ID card.
- The system also provides give clearance for the residents.
- The system should be able to generate reports.
- The system shall allow Searching, inserting, updating and deleting records of resident.

- The system should be flexible to get statistical data of population and house whenever required.
- The system shall allow resident to view information regarding ID card in the kebele.
- The system should post news.

2.7.5.2 Nonfunctional requirement

Nonfunctional requirement is a requirement that specifies criteria that can be used to judge the operation of the system rather than specific behaviors. System must exhibit software quality attributes, such as:-

- User interface**:** The system provides web-based application user interfaces that are compatible with any platforms.
- Hardware Requirements**:** The kebele should have desktop computers having typical storage capacity and processing speed.
- Security issue: The system provides an access to privilege to an authorized user by giving account for each and every special function.
- Performance**:** We improve performance by using computers or laptops that have high processor speed and RAM.
- Error handling**:** The system shall display error message that guide users to handle it. This system handles error done by the user giving error message when the user enters wrong inputs. In addition, the system provides error handling mechanism on system interacts with data base and on input accepter fields.
- Quality issue**:** Information in the database should be accurate and update.
- Modifiability**:** The system should be easily modify or change the given information.
- Availability**:** The system will be available for 24 hours to users unless it's under maintenance.
- Portability**:** The system runs on different platform.
- Maintainability**:** The system easily can be maintained.

Chapter three

System Analysis

3. Introduction

Analysis is the separation and splitting of complex system into its different subsystem. The purpose of analysis in system development process is to understand the problem that an existing system currently faces, to understand the properties of the problem and the system itself, to decide what the existing system should does or does not, to determine that the system satisfies the needs and requirements of users etc. This chapter presents analysis of the new system using use case diagram, class diagram, sequence diagram and activity diagram.

3.2 System Requirements Specifications

3.2.1 Use Case Diagrams

Shows use cases, actors, and their inter-relationships. A use case diagram is a graphic depiction of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify and organize system requirements. Use Case Model describes the proposed functionality of a new system. A Use Case represents a discrete unit of interaction between a user and the system

A use case diagram contains four components.

Boundary:-which defines the system of interest in relation to the world around it.

Actors: -usually individuals involved with the system defined according to their roles.

Use cases: -which the specific roles are played by the actors within and around the system.

The relationships between the actors and the use cases

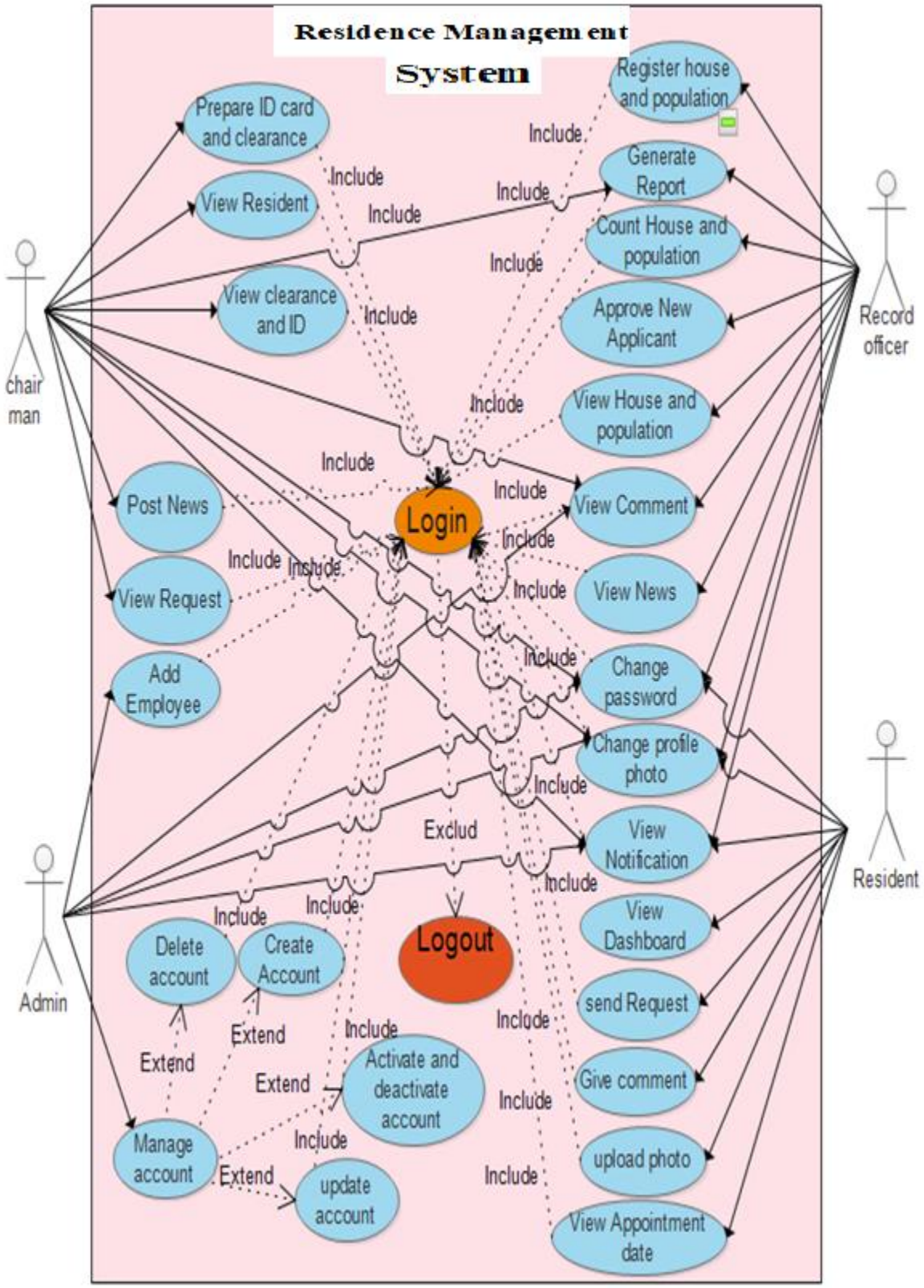

Figure 4 use case diagram

3.2.2 Use case documentation

Use case name	Login
Actor	Administrator, Chairman, Record officer, and Resident.
Precondition	All actors must have username and password.
Description	Validates the user to enter the system
Basic course of action	1. The actor Display home page 2. The actor fills user name and password by selecting his or her role 3. The system verifies user name and password is correct or not 4. The system displays user page. 5. End
Post condition	The user log in to the system
Alternative course of action	1. If the entered username and password is invalid. 2. The system displays error message. 3. The system tells the user to re-enter username and password. 4. Ends.

Table 4 login use case description

Use case name	Prepare ID card
Actor	Chairman
Precondition	The main menu form currently displayed on screen. The chairman has logged on the system and has an authorization for giving an ID card
Basic course of action	1. The Chairman clicks on prepare and select ID card menu form. 2. The system display search house number 3. The chairman search house number and if he/she is resident display name and prepare button form. 4. The system display resident information from database 5. Click on save button 6. System checks the age is greater or equal 18 7. If age is valid, the system generates ID number and save data to the database. 8. The system displays success message. 9. The chairman click on view ID card 10. The chairman writes the ID number to search ID card, then click print button. 11. Then the ID card is printed out. 12. Then the Chairman gives the person the signed and stamped to the ID card. 13. Ends.

Table 5 Prepare ID use case description

Use case name	View comment
Actor	Admin, Chairman and Record officer
Precondition	All actors display their page or They must open the web page. Take measurement in possible situation.
Basic action processes	1. The user login to the system. 2. The system displays the user account page. 3. Click on view comment. 4. The system display all comment. 5.End

Table 5 View comment use case description

Use case name	View comment
Actor	Admin, Chairman and Record officer
Precondition	All actors display their page or They must open the web page. Take measurement in possible situation.
Basic action processes	1. The user login to the system. 2. The system displays the user account page. 3. Click on view comment. 4. The system display all comment. 5.End

Table 6: view comment use case description

Use case name	Add employee
Actor	Admin
Precondition	Admin displays his or her page.
Basic action processes	1. The admin login to the system. 2. The system displays the account page. 3. Click on add employee. 4. The system display the registered form 5.fill the form and submit it 6.the system verifies the filled file 7.try again 8. The system displays successful message 9. End

Table 7 Add employee use case description

Use case name	Create user account
Actor	Admin
Description	The admin creates to users and all other employee in order to control the system and user.
Precondition	The system admin login to system and know all users to create account
Post condition	The user can get password and username or authorized access to the system.
Basic course of action	1. The Administrator login in to the system. 2. The admin select create account link. 3. The system displays create account page. 4. The administrator fills the required information and submits it. 5. The system verifies validation of inputs. 6. The system registers the users into the database 7. Display user account successfully created. 8. Use case end.
Alternative course of action	If the information admin filled is invalid information 1. The system display error entry of user name, go to step 2 If the name is not in data base 1. The system displays please fill the correct input, go to step 2

Table 8 create user account description

Use case name	Register house
Actor	Record Officer
Precondition	The main menu form currently displayed. The Record officer has logged on the system and has an authorization for registering house.
Basic course of action	1. The Record officer clicks on register and select house from the menu then click 2. The system displays register house form 3. The Record officer enters necessary inputs. 4. The system validates the input. 5. The system displays successfully saved message 6. Ends
	7.
Post condition	House already registered
Alternative course of action	If the input is invalid 1. The system display “invalid information”. 2. Record officer go to step 4.

Table 9 Register house use case description

3.2.3 Sequence diagram

A sequence diagram is an interaction diagram. From the name it is clear that the diagram deals with some sequences, which are the sequence of messages flowing from one object to another. Interaction among the components of a system is very important from implementation and execution perspective. So Sequence diagram is used to visualize the sequence of calls in a system to perform a specific functionality. The Sequence diagram models the collaboration of objects based on a time sequence. It shows how the objects interact with others in a particular scenario of a use case. UML can generate sequence diagram from the flow of events which we have defined in the use Case description.

It is a diagram that shows, a particular scenario of a use case, the events that external actors generate their order, and possible inter-system events. A system sequence diagram should be done for the main success scenario of the use case, and frequent or complex alternative scenarios. A system sequence diagram should specify and show the following:

- External actors
- Messages (methods) invoked by these actors
- Return values (if any) associated with previous messages
- Indication of any loops or iteration area

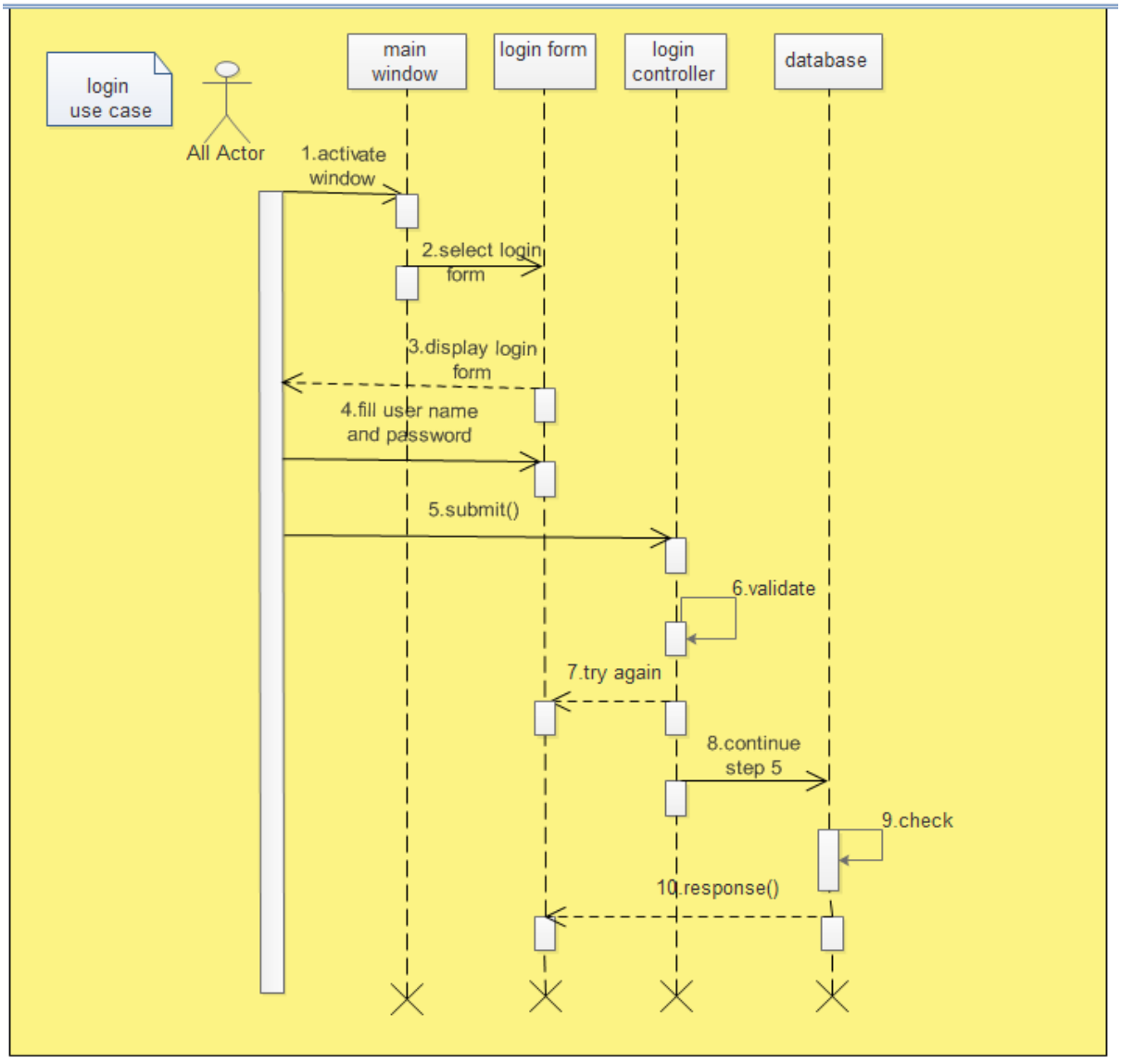

Figure 5 sequence diagram for login use case

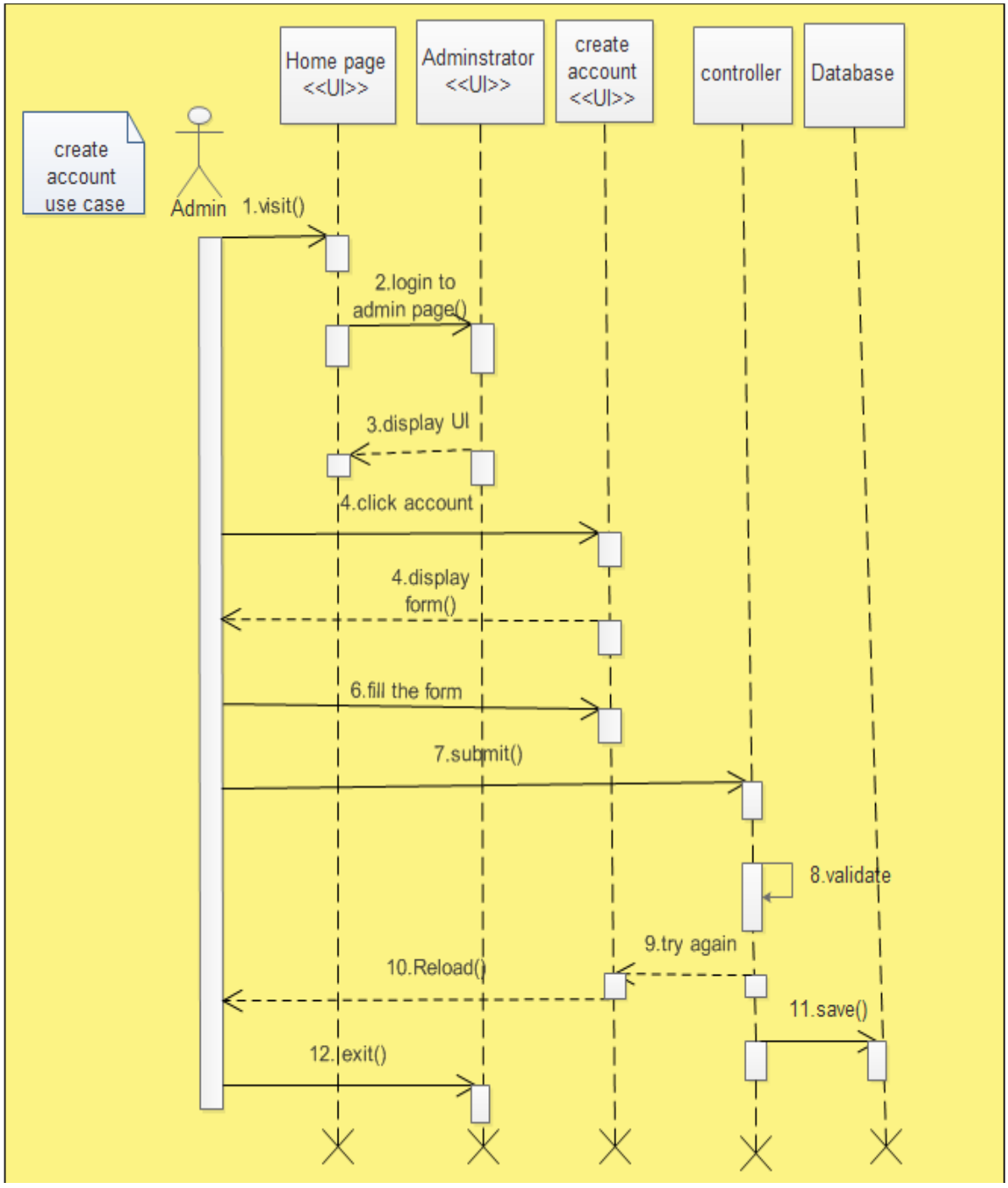

Figure 6 create account sequence diagram

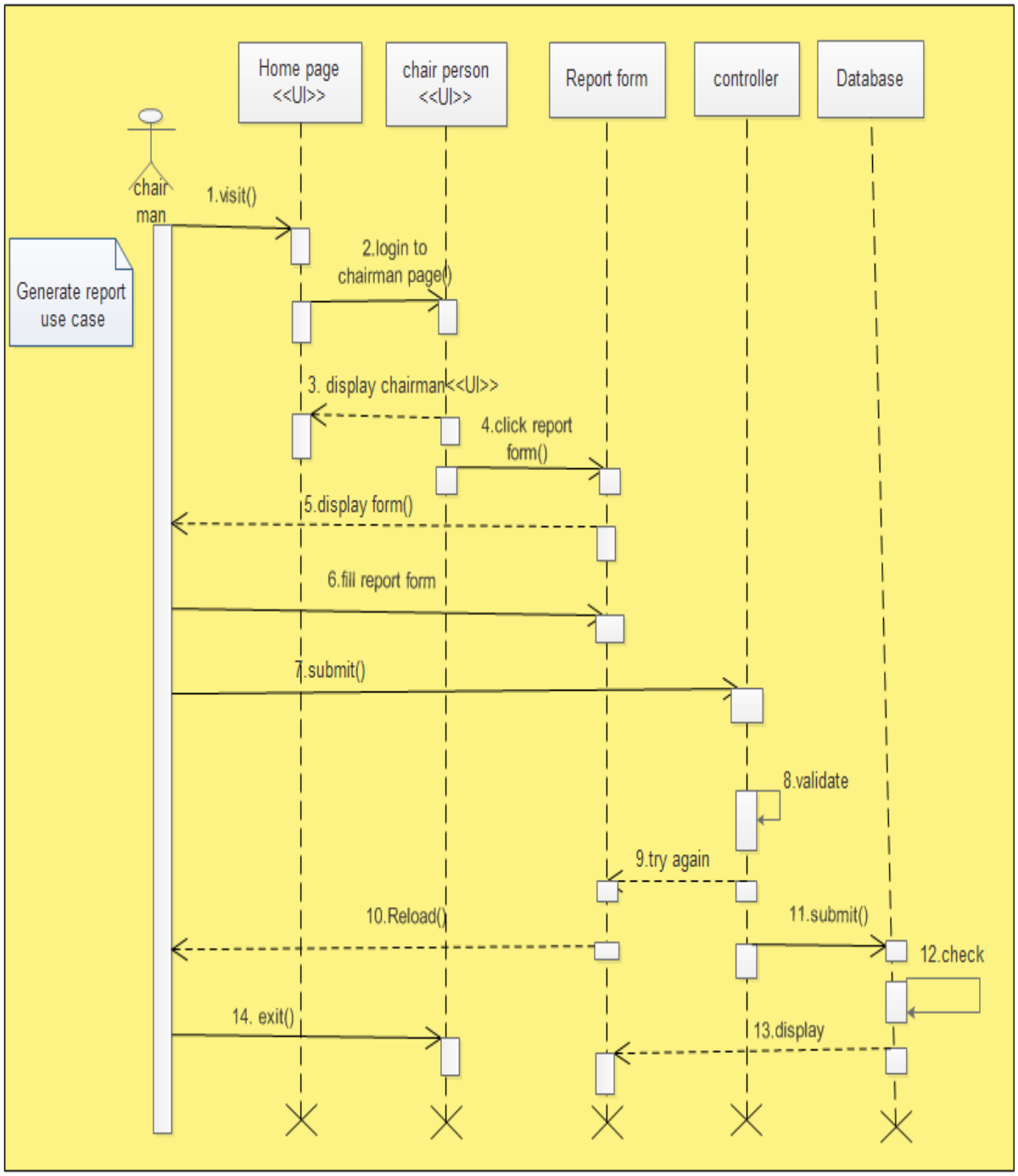

Figure 7 sequence diagram of report generates

3.2.4 Activity diagram

Activity diagram describes the flow control in a system. So, it consists of activities and links. Activity diagrams are used to visualize the flow of controls in a system. This is prepared to have an idea of how the system will work when executed. Activity diagram is basically a flow chart to represent the flow from one activity to another activity.

Basically it is a flow chart to represent the flow of forms from one activity to another activity. The activity can be described as an operation of the system; it can be sequential, branched or concurrent. It deals with all type of flow control by using different elements like split, join etc. It is also a particular operation of the system, but it is not only used for visualizing dynamic nature of a system but they are also used to construct the executable system by using forward and reverse engineering techniques.

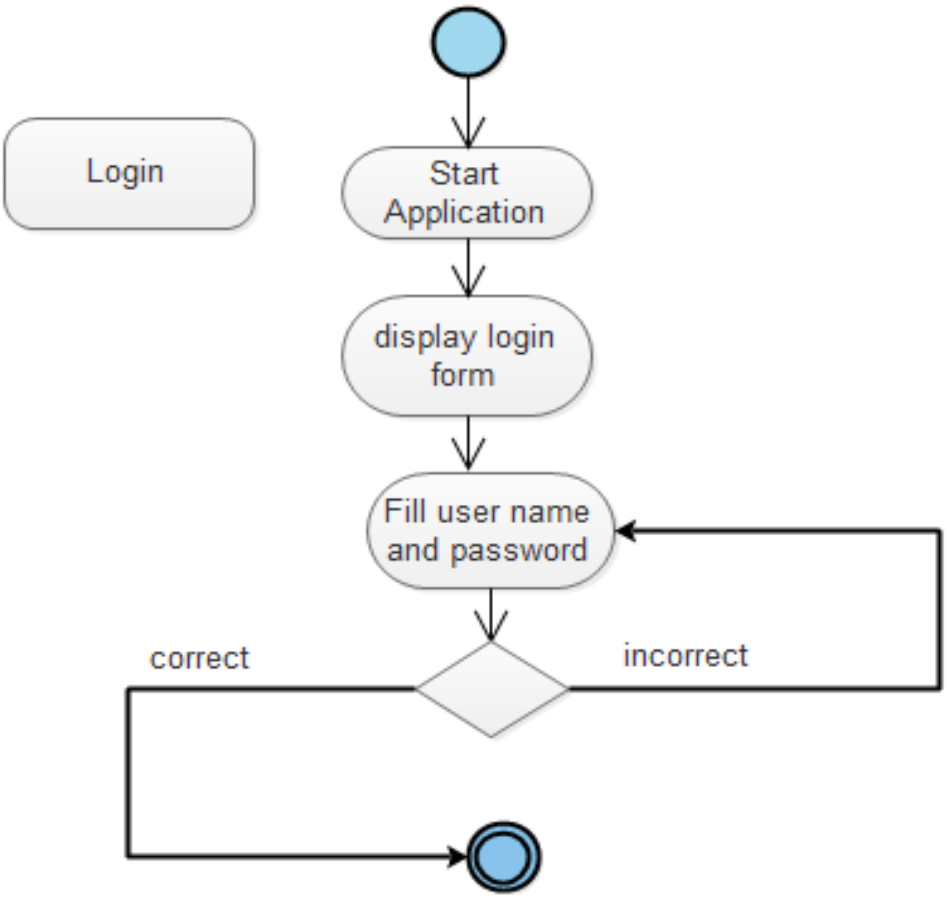

Figure 8 sequence diagram of report generates

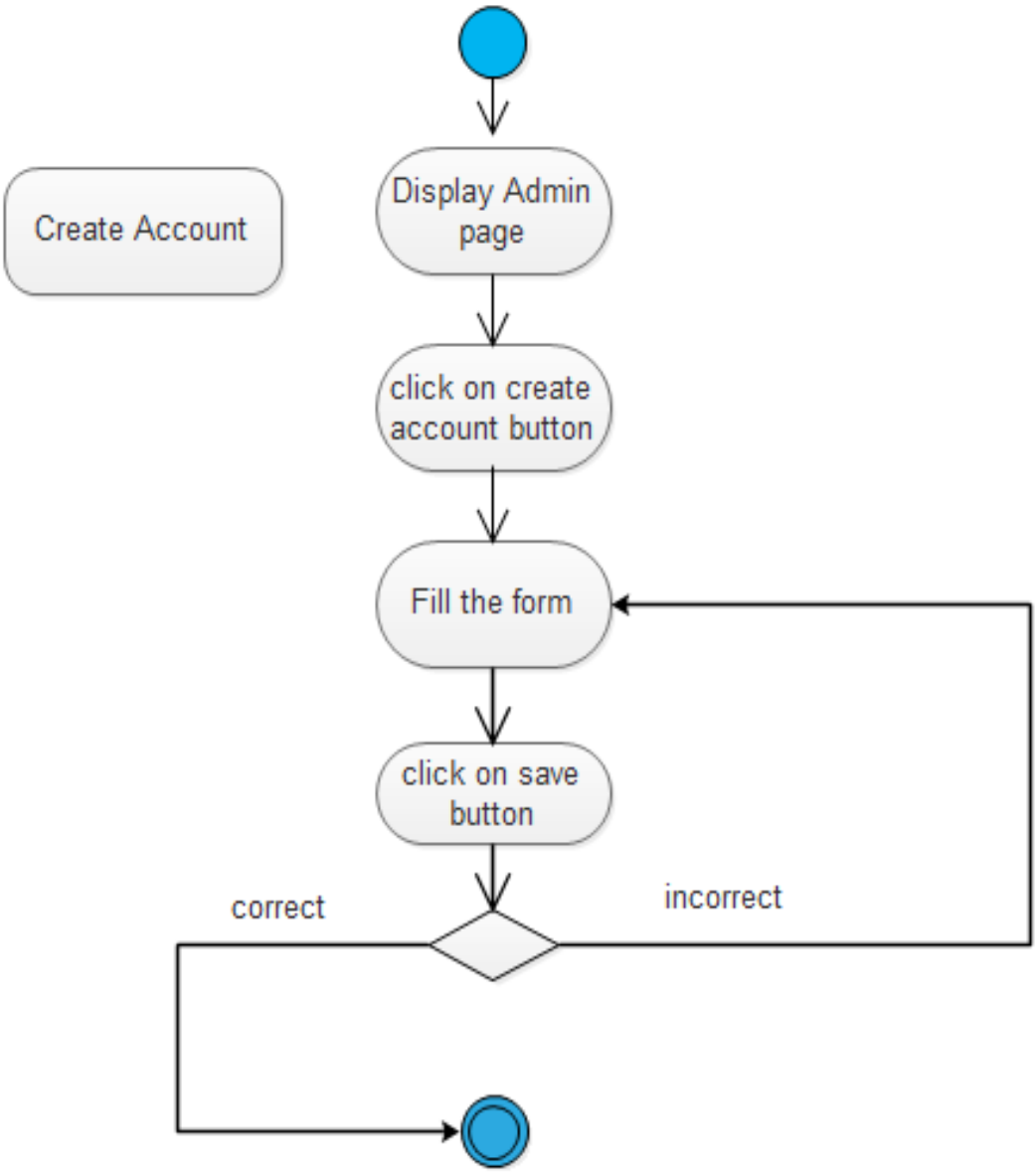

Figure 9: Create account Activity diagram

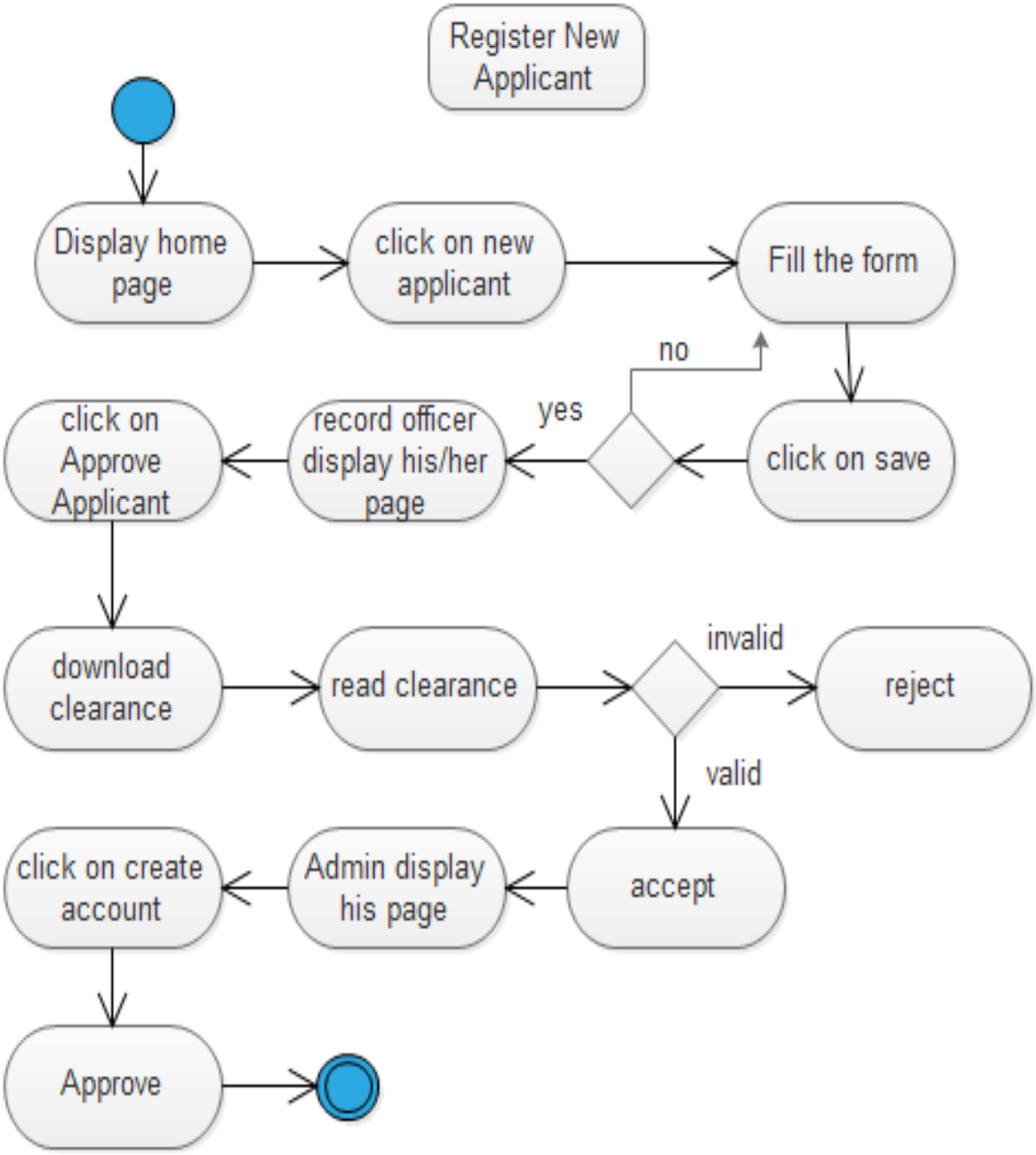

Figure 10: Register new applicant activity diagram

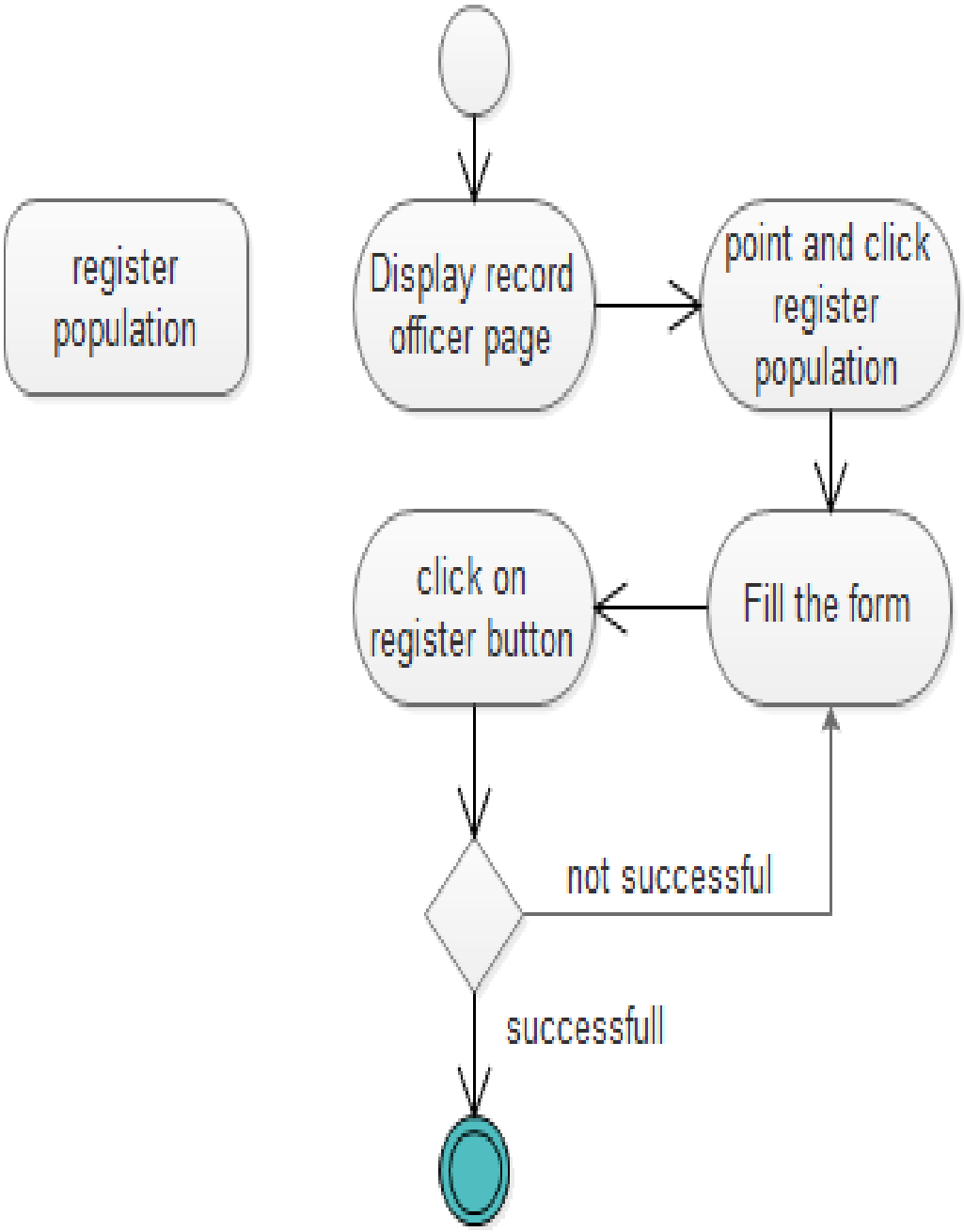

Figure 11: Activity Diagram for register population

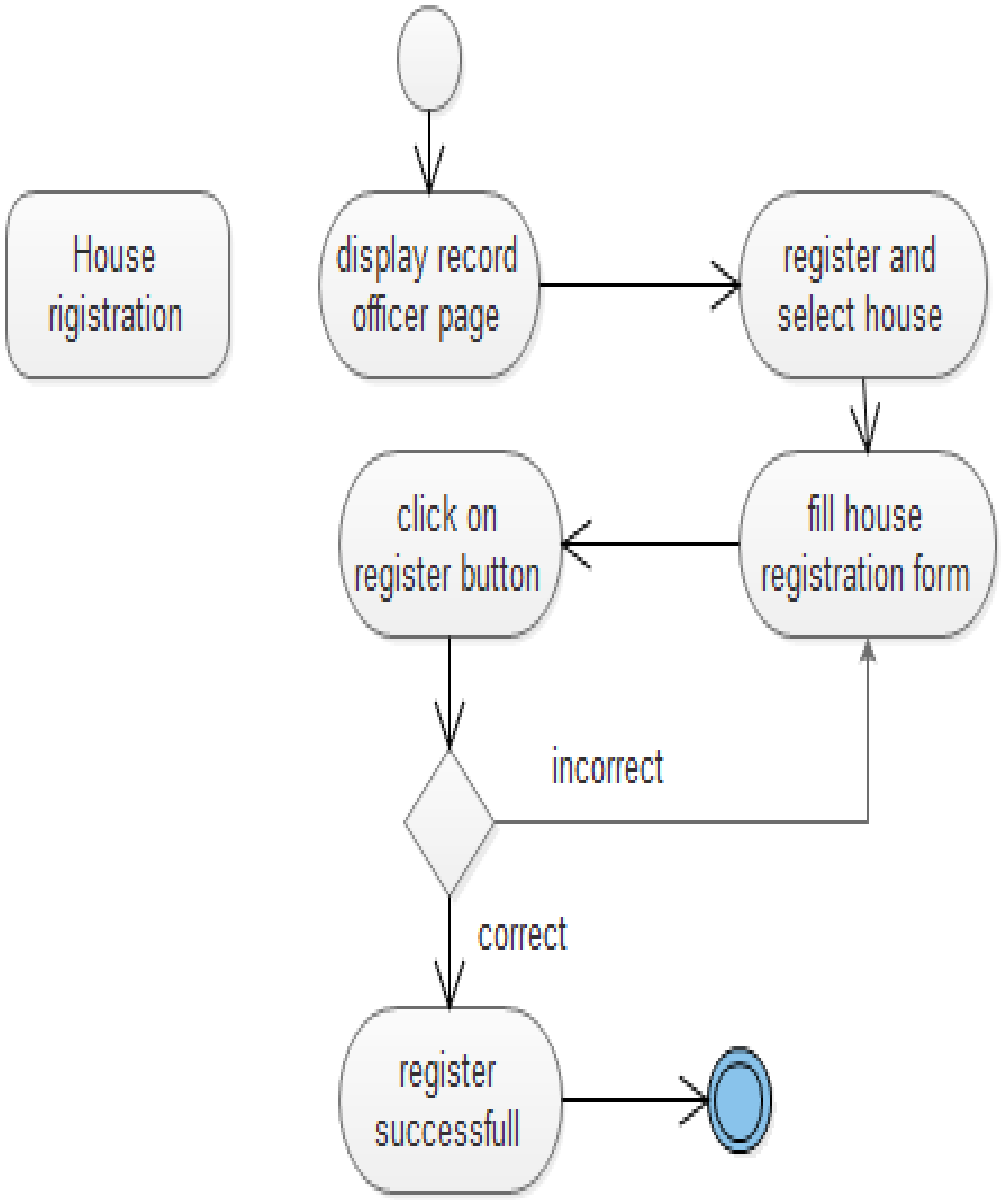

Figure 12: House Registration activity diagram

3.2.5 Analysis level class diagram (conceptual modeling)

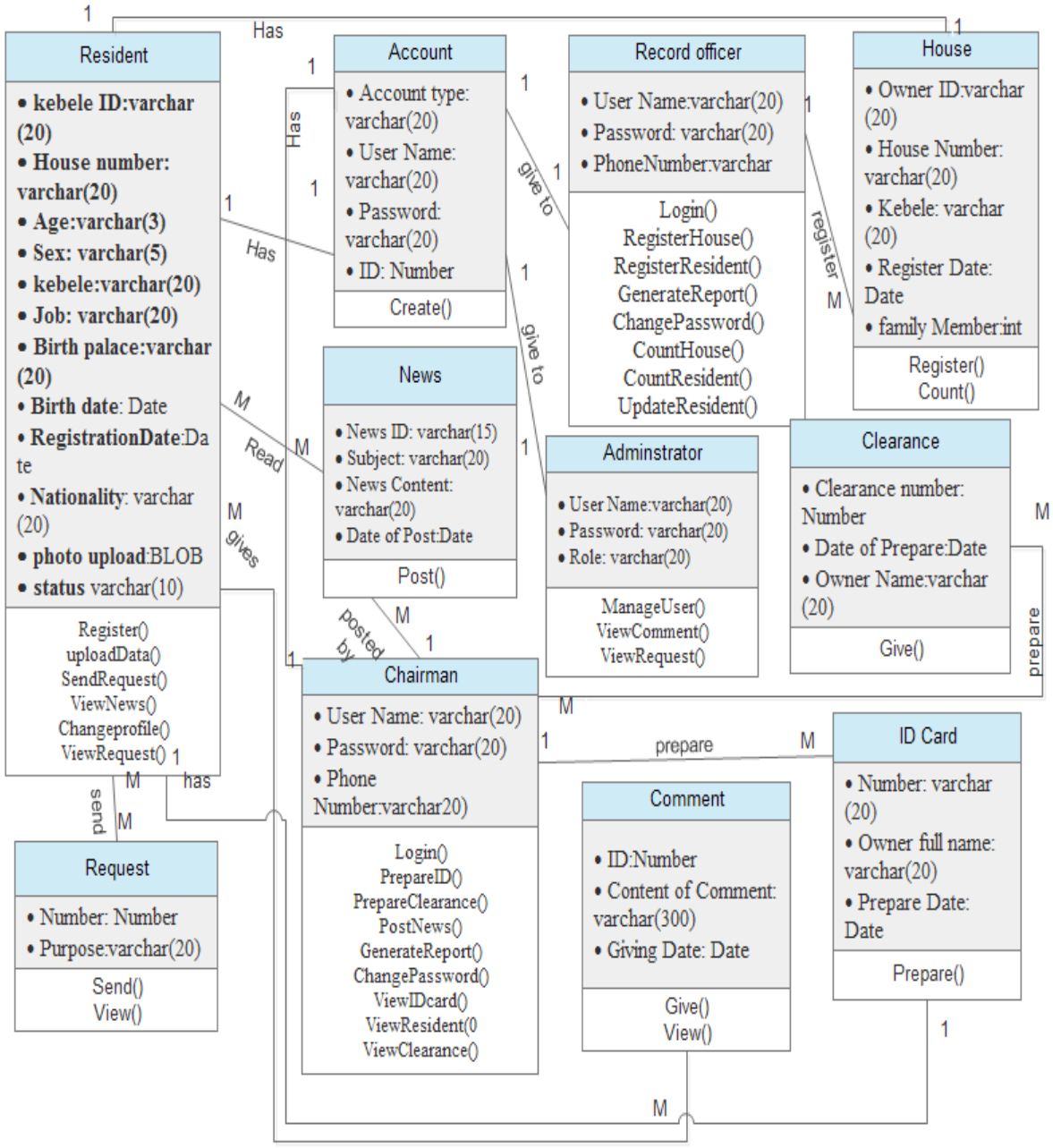

Figure 13 Analysis level class diagram

Chapter Four

System Design

4.1 Introduction

System design is the process of designing the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. So far, we have been investigating the requirements and analyzing them. As a result, the previous section of this document was dedicated to describe what the proposed system should do for the users. On the other hand, sections from this point forward are devoted to discuss ways of tackling those analyzed problems.

Once the full-fledged functionalities of the new system to be developed, that is web based resident record management system for Durame City, are known, problems are studied, and requirements are analyzed, the project crew has started to dwell on implementation details entering to the design phase. The use case, activity and class diagrams of the analyzing phase were used as a spring board to deal with design details which are supported by diagrams component, package, detailed class, and deployment diagrams. In this section we provide overview of the software architecture and the design goals. The system is decomposed in to subsystem like account management subsystem, register management subsystem, ID card and clearance management subsystem, comment management subsystem, news management subsystem and report management subsystem. The software/Hardware mapping of this system is the resident and other related information are stored in a central database server and managed by MySQL. Clients access the data using their web interface and each user has a user account to login to the system and have a restricted access control.

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirement. It is the transformation of the analysis model into a system design model.

4.2 Class type architecture

The class type architecture provides a strategy for layering the classes of our software to distribute the functionality of our system among classes. Layering is the concept of organizing

our software design into layers/collection of classes or components that fulfill a common purpose, such as implementing our user interface or the business logic of our system.

The five layers of classes are UI Classes layer, Controller/Process Classes layer, Business/Domain Classes layer, Persistence Classes Layer, and the System class's layer.

4.2.1 User Interface Layer

User interface layer classes contain a code for the user interface part of an application. It implements the major user interface elements of the system. Designing the user interfaces for the Residence management system for Durame City involves the following major interfaces which are system login screen, main menu, Inquiry display screen, problem accepting screen, equipment registration screen, user registration screen, technician assigning screen, report generation screen.

4.2.2 Controller/process layer

The purpose of a controller/process class is to implement business logic that pertains to several objects, particularly objects that are instances of different classes.

4.2.3 Business/Domain layer

Business/domain class, also called an analysis or entity class, usually they're identified during system analysis. The business layer enables you to encapsulate the basic business functionality without having to concern yourself with user interface, data management or system management issues.

4.2.4 Persistence layer

The persistence layer provides the infrastructure for the storage and retrieval of objects. It helps to isolate the application from changes to permanent storage approach. The persistence layer by encapsulating data management functionality it increases the maintainability, extensibility and portability of our application. The persistence layer only provides access to permanent storage. It is not a permanent storage mechanism. The goal of the persistence layers to reduce the maintenance effort that is required whenever changes are made to our data.

4.2.5 System layer

The system layer provides access to the operating system and non-object oriented resources. The operating system must fit the software we develop in a manner that whenever there is modification made on some classes, the operating system must not be disturbed by that change.

The system class for the most part encapsulates operating system functionalities that we need to make accessible to the objects with in an application. It is common to wrap a series of operating system calls to provide a related set of functionalities.

4.3 Class Modeling

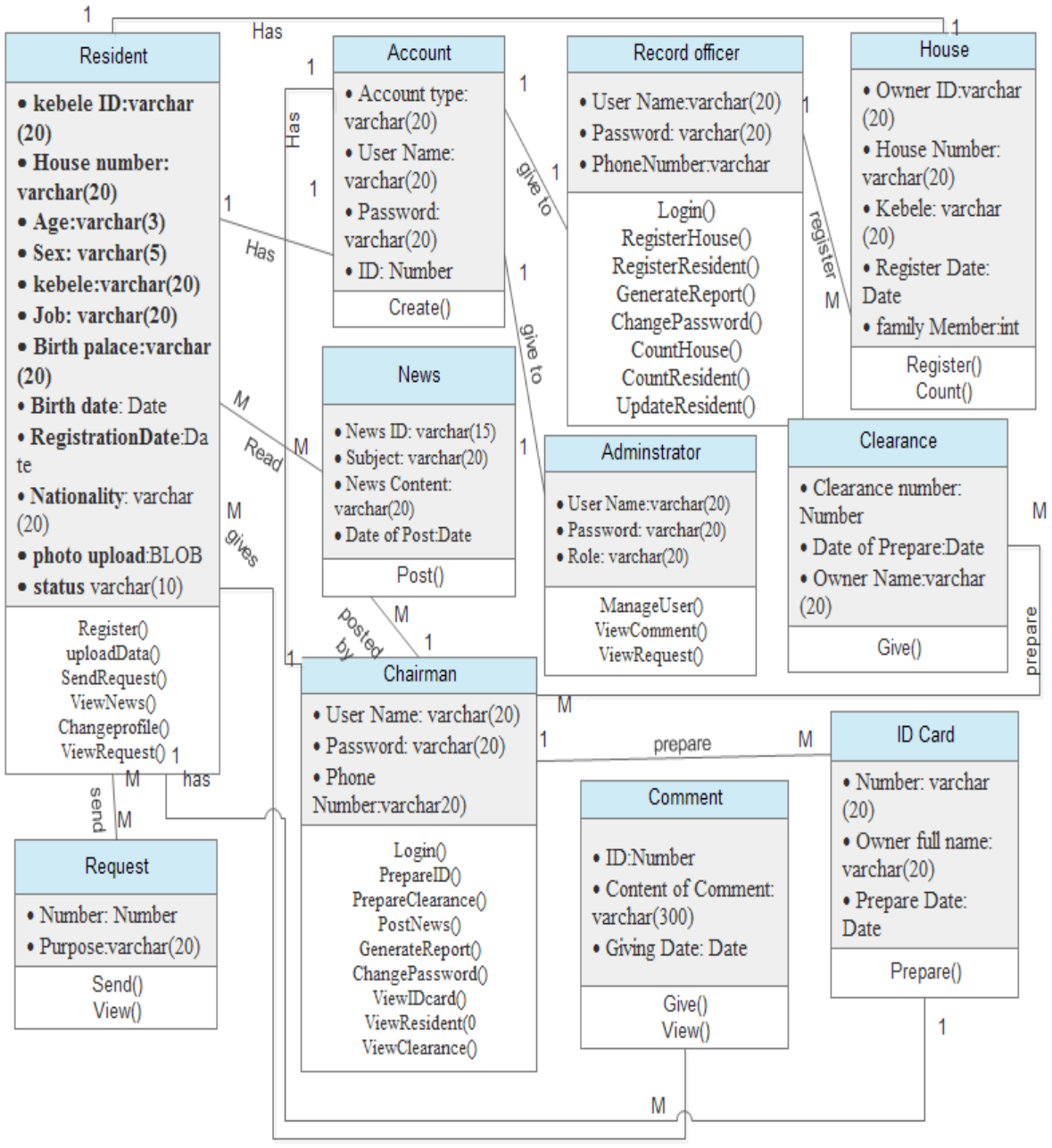

Figure 14 Diaram level class diagram

4.4 State chart modeling

The key purpose of state chart modeling is to understand complex classes better ,particularly those that act in different manners depending on their state ,describing how their instance work. UML state chart diagram depict the various states that an object may be in and transitions between those states.

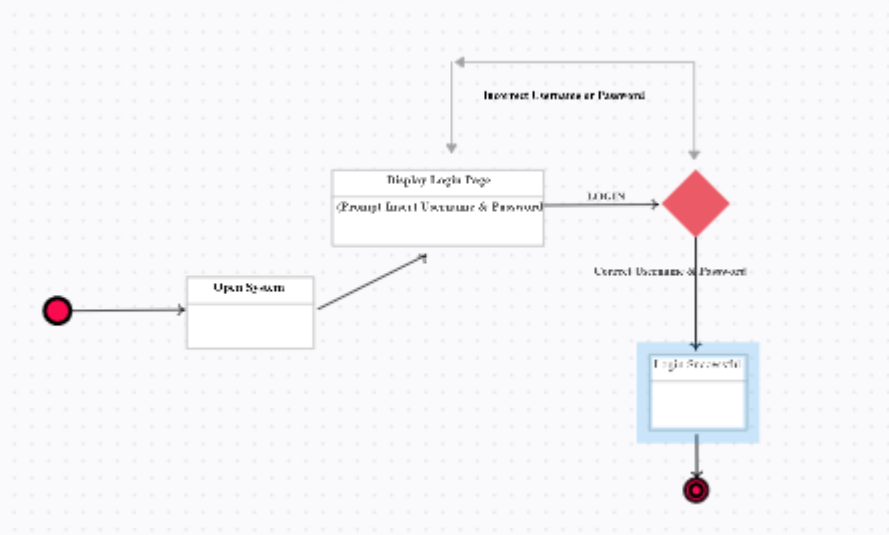

Figure 15 State chart diagram for login

4.5 Collaboration Modeling

A collaboration diagram is an interaction diagram that emphasizes the structural organization of the objects that send and receive messages. A collaboration diagram shows a set of objects, links among those objects, and messages sent and received by those objects. The objects are typically named or anonymous instances of classes, but may also represent instances of other things, such as collaboration, components, and nodes. We use collaboration diagram to illustrate the dynamic view of a system.

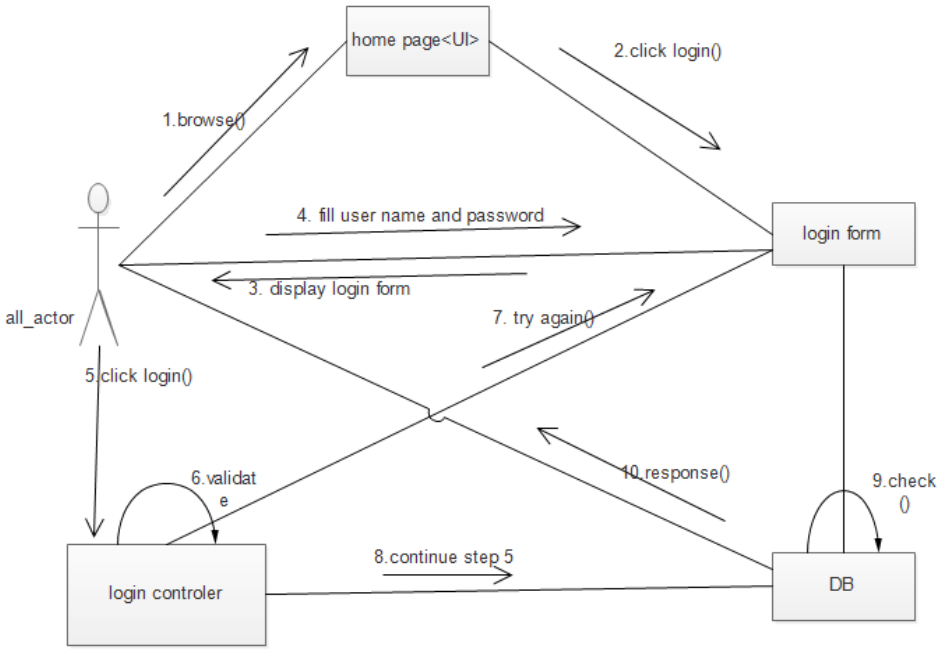

Figure 16: collaboration diagram of login

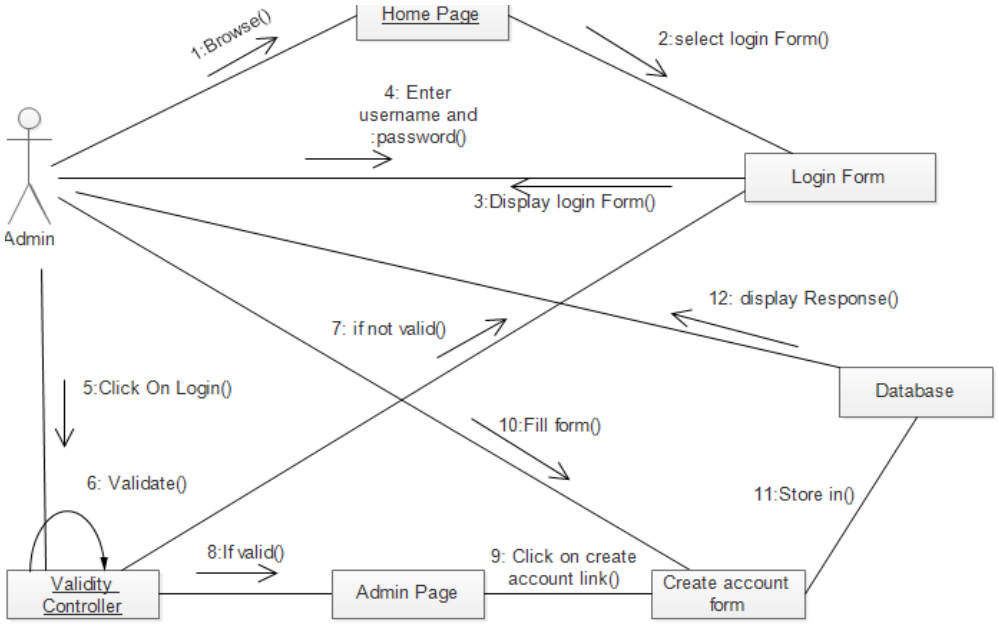

Figure 17: collaboration diagram of create account

4.6 Component Modeling

Component diagrams are integral to building your software system. They help your team understand the structure of existing systems and then build new ones. The purpose of a component diagram is to show the relationship between different components in a system. The component diagram shows the relationship between software components, their dependencies, communication, location and other conditions. The components the systems are:

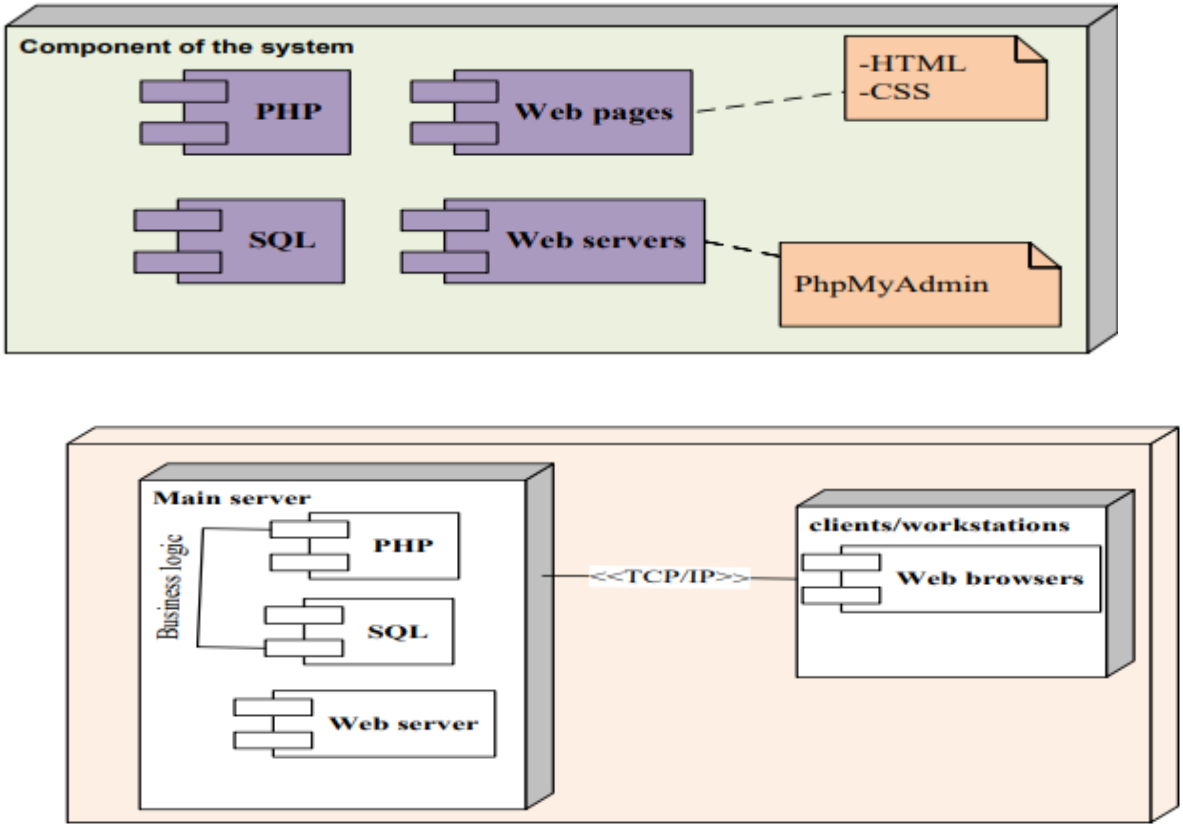

Figure 18 Component Diagram

4.7 Deployment modeling

The deployment diagram models the hardware of the implementing environment. Deployment diagrams models the mapping of software pieces of a system to the hardware that is going to execute it. It also shows the relationship the hardware and software and how these components are work together in the machine. This section describes the hardware and software mapping of the proposed system. To describe this we have use the UML deployment diagram.

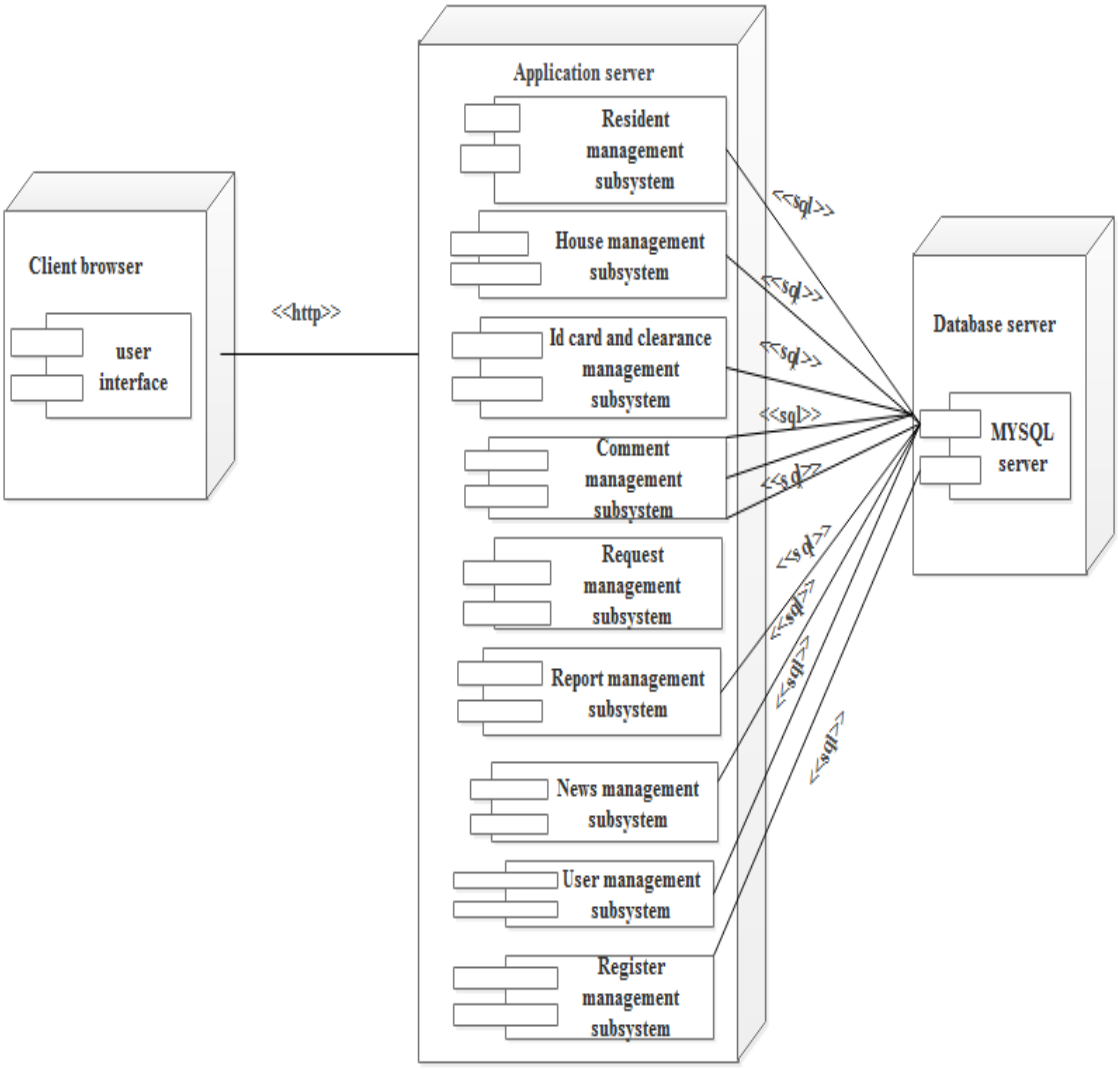

Figure 19 Deployment Diagram

4.8 Persistence modeling

Persistence models are used to design the schema of the database. Persistence model is shaped whenever relational database is used to store objects and as a mechanism to object persistence. In persistence model data is conceptually the same as the table of relational database and attributes are the same as table columns. It's also used to communicate the design of the database. These schemas for flat files are the norm within the system. The strength of persistence models is that data entities are conceptually the same as the table of relation database that the attributes are the same as table columns. The following diagram helps to clearly observe the relationship among business classes which are stored persistently.

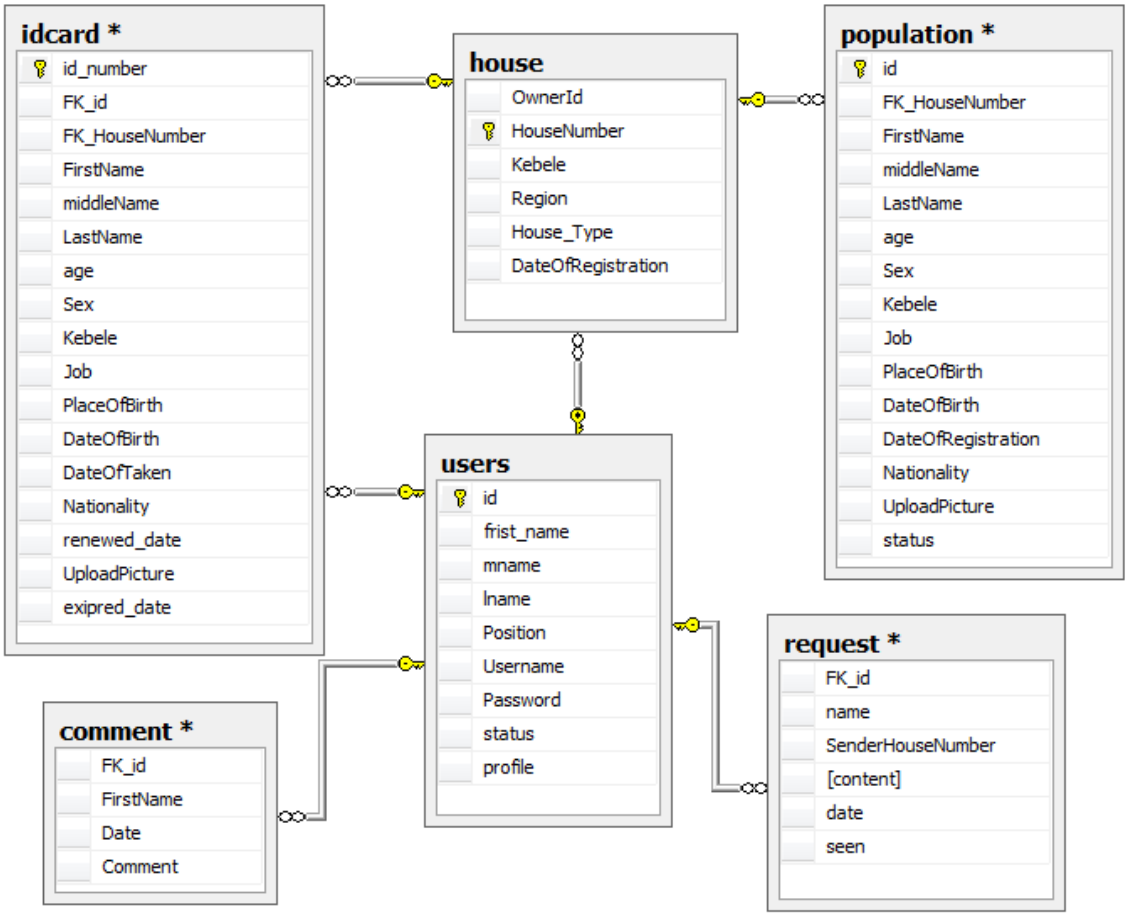

Figure 20 Persistence diagram

4.9 User Interface design

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