DEBRETABOR UNIVERSITY
FACULITY OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCINCE
PROJECT DOCUMENTATION
ON
" WEB BASED PHARMACY MANAGEMENT SYSTEM FOR RED CROSS PHARMACY DEBRE TABOR BRANCH"
 A DOCUMENTATION SUBMITTED TO THE FACULTY OF TECHNOLOGY DEPARTMENT OF COMPUTER SCIENCE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BSC IN COMPUTER SCINCE
BY:

NAME	ID
1. Amsalu Workie	Comp/1306/05
2. Azeze Derso	Comp/1311/05
3. Admasu Nigusie	Comp/1303/05
4. Amare Tilaye	Comp/1305/05
5. Helen Birhane	Comp/1361/05

Advisers Name

Main _adviser M.r Mersha N.

Co_adviser   M.r Dharnasi Prasad.

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ABSTRACT

This project is insight into the design and implementation of a Pharmacy Management System. The primary aim of is to improve accuracy and enhance safety and efficiency in the pharmaceutical store. Today management is one of the most essential features of all form. Management provides sophistication to perform any kind of task in a particular form. This is pharmacy management system; it is used to manage most pharmacy related activities in the pharmacy.

CHAPTER ONE

1.1 Introduction

Technology is spreading its wing in almost every walks of human life activities. Now a day it is better if every activity is done using new technology in order to fulfill the need of human being, Organization and Enterprise. As today's world there are many organizations and each organizations needs to be preferable, computable and work on fastest way in order to satisfy users interest. I.e. they should have facilitated their activities in computerized way. Hence Red Cross Pharmacy management system is a system that is designed to improve accuracy and to enhance the performance of the task in the pharmacy. It is a computer based system which helps to the employee inside the pharmacy to facilitate the activity of the pharmacy in a simple way. In the pharmacy there are two places in which the drug are available. Those are stock and store. The stock is the place in which the drug that needs to be sold is stored. And the store is the place in which the new bought drug is stored. At present manual system is being utilized in the pharmacy. It requires the pharmacist to manually monitor each drug that is available in the pharmacy. This usually leads to mistakes as the workload of the pharmacist increases. Red cross pharmacy uses manual system to manage the pharmacy. But managing the pharmacy manually is bulky and tedious due to:- wastage of time, work overload, loss of data, data redundancy and the like problems. to avoid this problem debre tabor pharmacy tries to change the manual system in to computerized system to overcome or reduce the problem of the manual system by developing a system that register customers, register drugs, view the available drugs, remove the unwanted drugs, differentiate expired drugs from normal/new drugs ,update drugs and search drugs .

1.2. Background of organization

Red Cross pharmacy was established for minimizing the shortage of drugs in the country and it expands their branch in different regions. Among those debre tabor Red Cross pharmacy is the one branch that found in amhara region at south Gonder this institution was established in 1993 E.C but it doesn't continue its work until 2003 E.C because of awareness of the society due to the usage of drugs. Then, in 2004E.C it starts its service in case of wideness of towns and establishment of university in debre tabor, know at the time it runs its service by using manual system. The pharmacy buys drugs from Ethiopia Drug Organization.

Red Cross pharmacy uses the manual system in order to manage the stock item. These are shelf drug control, First In First Out, and pharmacological order of drug. The new system will generally change this manual system in to computerized system. Careful management of pharmaceuticals is directly related to a country's ability to address public health concerns. There are shortages of pharmacist in Debre tabor town to solve people's problems in health care. Red Cross pharmacy has the following functions to the societies and community's Such as:- supplement of drug to the society ,increase the access of drug in the town and customize the need of customers. Pharmaceutical management represents the whole set of activities aimed at ensuring the timely availability and appropriate use of safe, effective, quality medicines and related products and services in any health care .

1.3. Statement of the problem

Managing a very large pharmacy with records on papers will be tedious and difficult to keep track of inventory with regards to the drugs in the stock inside the pharmacy. since it is manual system quantity of drugs available based on the categories and their Functions can't be easily known, difficulty of getting full information about drugs when needed immediately, difficult to identify which drugs are expired, the most sensitive data may lost, not efficient enough to the customers, Preparing report for each drug takes long time and also most of the time redundant data may occur [2].

1.4. Objectives of the projects

1.4.1. General Objective

The general objective of this project is to design and develop web Based Pharmacy Management System for Red Cross pharmacy in debre tabor branch.

1.4.2. Specific Objectives

➢ To analysis the existing system**.**
➢ To develop computerized recordable system.
➢ To delete or remove expired drugs.
➢ To generate report with in short period of time.
➢ New store item registration.
➢ To identify expired date of drug.

1.5. Scope of the project

The scope of the project is listed in the following:-
- ➢ Check availability items in the data base.
- ➢ Checks expired date of the drug.
- ➢ Register drug.
- ➢ Register customer.
- ➢ View drug.
- ➢ Delete drug.
- ➢ Validate input.
- ➢ Search drug.
- ➢ Update drug.
- ➢ Generate report.
- ➢ Employee registration.
- ➢ Delete employee.
- ➢ Manage account.

1.6. Limitation of the project

- ➢ The system applies to only Red Cross pharmacy debre tabor branch.
- ➢ The system unable to pay salary to the employee who has the job in the pharmacy.
- ➢ The system unable to generate report for other like federal and regional branches.
- ➢ The system does not have any physical control mechanism.

1.7. Significance of the project

- ➢ Better stock management.
- ➢ It provides efficient, flexible and reliable items' storing, locating and distributing.
- ➢ Provide better data stock in the systems.
- ➢ To minimize the workload of the employees.
- ➢ Enhance best controlling method for the drug.

1.8. Beneficiaries of the project

Here the team member described the benefits that are expected to gain after the development of the system.

To the team members:-Having knowledge how real life problem should be solved.

To the pharmacist:- Decrease more time consumption, increasing job satisfaction by eliminating complex tasks and helping the pharmacists by decreasing the workload.

To the customer:-Will have more confidence or trust about the drug.

To the manager:-To control the activity which is done in the pharmacy in simple manner.

1.9. Methodology of the Project

1.9.1. Data source

The data sources for the new system is:- Red Cross pharmacy.

1.9.2. Data Gathering Techniques

In our project the team member will use Object Oriented Software Development Methodology. To gather an accurate data from customers and the concerned body our team will use the following traditional fact finding techniques:-

Interview: - This is one of data collection method that enables to gather information from the organization directly in the form of asking question and getting answers for those questions.

Document analysis: - To get historical information of the organization activities and to know the organization rules and regulations the team will analyze documents which are relevant to the new system.

Observation:-To get first hand accurate information about how the existing system works   the team will observe the current system directly. We are observing the situation encountered in the organization .The pharmacist gives the drug for customers by seeing the receipt paper come from the other service.

Questioner:-To get full information about the pharmacy the team member want to prepare the questions by the document form, and then the manager gives detail information about the pharmacy, what actions done there by the written form.

1.9.3 Analysis and Design

Since object oriented analysis and design method has many useful features like increased extensibility, improved quality, managed complexity and reusability of code by creating a common class for different modules, support for customization and distributed computing, easily maintainable and has a large acceptance we selected this approach in this project [3]. For analysis and getting the needed information to develop this project we have planned to use an object oriented approach. We choose this approach because of the following advantages:

- ➢ Increased reusability: object oriented support reusability of system.
- ➢ Increased extensibility: to add and change the existing module without affecting the rest of the program
- ➢ Improved quality: introduces user participation which improves quality of the   project
- ➢ Improved chance of project success: since object oriented approach has good documentation.

1.9.4. Development

The team member will use prototype development modeling, because of the following reason:-

- ➢ Users are actively involved in the development
- ➢ Since in this methodology a working model of the system is provided, the users get a better understanding of the system being developed.
- ➢ Errors can be detected much earlier.
- ➢ Quicker user feedback is available leading to better solutions.
- ➢ Missing functionality can be identified easily

1.9.5. Implementation

Software: When we will come to implementation, we will select hypertext preprocessor and hypertext markup language as frontend tool. For database storage and retrieval we select Structured Query Language as backend tool, since it is open source and has great support and compatibility with hypertext preprocessor.

1.9.6.Testing

After a successful completion of developing the software, we must test it for its correct functionality of the system according to customer requirement and scope boundaries. A test method that we will use in this project includes:

Unit testing: To conduct test in this method we select sample code (one function or module) and run it separately to look its correct functionality. For example we can take module that checks whether the drug is expired or not according to given range and checking it.

Integration testing: The different module developed and tested in the previous phase are integrated and then tested in this phase. The integration testing done step-by-step in which some modules will first be integrated and tested, and when successful, more modules will be added. Another way is to put all-modules together and then test the whole system.

Acceptance testing: During the interface design process, usability evaluation has an important role that includes interactive cycle of designing and evaluation. Used to demonstrate that the system can be ready to use the end use. It tested with the real data in real or simulated environment. Where product being delivered to customer and then customer execute the acceptance test see whether the expectation of the functionality meet/fulfill their requirements.

1.10. Development Tools

During system development the team member will use the following system development tools.

Development tool	Tool name
Software tool	HTML and PHP:-for designing web interface.
	Wamp server 2.0:-for database.
	E draw 7.9:-For designing UML diagrams.
	Microsoft power point 2007:-for presenting the document.
	Microsoft office word 2007:- for documenting.
Hardware tool	8 GB flash.
	700 MB CD
	4096MB RAM size, Intel(R) core (TM) i3-2328M CPU @ 2.20GHz (4cpus) processor , Intel(R) HD 3000 Personal computer

Table 1.1 Development tool

1.11. Feasibility study

Feasibility study is essential to evaluate the cost and benefits of the new system. On the basis of the feasibility study decision is taken on whether to proceed or to cancel the project. Need of the feasibility study:-

➢ Determines the potential of the existing system.

➢ It used to determine/finds out the problem of the existing system.

➢ To determine all goals of the new system.

➢ It finds all possible solutions of the problems of the existing system

1.11.1. Operational feasibility

The new system will increase and improve the activity of customers by replying the reliable data, response time, and increase efficiency of work in the pharmacy. The project is welcomed with great pleasure by the organization. The employees are more cooperated to give needed information. This indicates that the project is operationally feasible.

1.11.2. Technical feasibility

The proposed system doesn't require much technical expertise. The system to be developed by using technologically system development techniques such as PHP, Java script, css and Wamp server 2.0 Database without any problems.

1.12. Work break down and deliverables

No.	Task	Starting date	Finishing date	Expected output
1	Title selection	October 1	October 7	Title submission
2	Gather information	October 8	October 15	Start proposal
3	Requirement planning	October 16	November 13	Requirement analysis document
4	System analysis	November 14	December 21	System analysis document
5	System design	December 22	January 3	System design document
6	Final documentation		January 4	Final documentation submission
7	System implementation	February 1	June 10	Complete implementation
8	Testing	June 11	June 20	Test
9	Final project		June 21	Final project submission

Table 1.2 work break down and deliverables

1.13. Budget breakdown

To complete our project starting down from the beginning up to the end of this project we planned the following cost list.

No.	Resource	Quantity	Unit price/quantity	Amount of price
1	Pen	12	5	60
2	paper	1	100	100
3	color print	10	5	50
	Normal print	80	2	160
	Copy	450	50	225
4	CD	5	15	75
5	Transport	10	15	150
6	Flash	2	150	300
7	Others	-	-	2000
	Total	-	-	3,020

Table 1.3 Budget breakdown

CHAPTER TWO: System requirement Specification and Analysis

2.1 Introduction/ overview

This chapter describes the overview of the existing system, overview of the proposed system functional and non functional requirement of the system will be discussed and modeled using unified modeling language (UML) such as use case documentation for each use case identified in the use case diagram, sequence diagram, activity diagram, analysis level class diagram or conceptual modeling, user interface prototyping and supplementary specifications.

The proposed system documentation involves the requirement elicitation, where the team members gather requirements of the system from user, analysis of the requirement that focuses on the functional, object and dynamic modeling (state diagram), system design and object design. The project is intended to advocate for the need of Red Cross pharmacy to use facilitated computerized drug information system. As a result the team member believed that the user will have the expected satisfaction of the service provided by the pharmacy. Therefore, the team member recommends Red Cross pharmacy manual system to the computerized system to facilitate their service and benefit of the organization.

Part one: - System requirement specification

2.2 Description of the existing System

The main purpose of studying the existing system is to develop a new system which efficiently performs activities than current one and understanding existing problems. To solve problems document analysis, form designs, some constraints and rules of the existing system incorporated. In general the reason behind for studied the existing system:-to identify the existing system problems, to identify the scope and limitation of the new system, to know the business rules and constraints of the organization, to design the new proposed system based on the boundary or the total activity of the existing system of the organization, to determine the system user requirement. The current system of Red Cross pharmacy information management is manual system. That means checking expired date and availability of drugs is done by checking every drug inside the Pharmacy. This leads loosing time and resource of the organization. An existing

system compromises different players to carry out its job. Those are pharmacist, manager, store coordinator and cashier [5].

Pharmacist : The customer comes with the ordered prescription then the pharmacist looks that order of drug and gives the drug accordingly. The customer gets his/her requested service from the pharmacist.

Manager : The manager gets reports from the pharmacist, store man, and cashier. The reports help the manager to see how services are given to the client.

Store coordinator : Store man is responsible to register the drugs that buy from the private sectors or from the governmental association, and also control the drug that are goes out to the stock.

Cashier: The cashier receives the cost of the drug from the customer ordered by the pharmacist.

2.3   Supplementary Specification

The Supplementary Specifications capture the system requirements that are not readily captured in the use cases of the use-case model. Such requirements include:-

- ➢ Legal and regulatory requirements and application standards.
- ➢ Quality attributes of the system to be built, including usability, reliability, performance, and supportability requirements.
- ➢ Other requirements such as operating systems and environments, compatibility requirements, and design constraints and the other Supplementary specifications are the business rules .The business rules is a principle or a policy in which the proposed system operates accordingly. It deals with access control issue.

2.4. Business Rule of the organization

The existing system has its own mechanism in which its customers are treated. These include:
BR1:The pharmacist must treat customers in good manner and should address customer's request.
BR2:The cashier should receive the price of medicine honestly from customers and he/she should generate report for manager.

BR3: Manager should control the entire activity in the stock and should receive clear and appropriate report from the workers of the pharmacy.

BR4:Sold drug should order in their identifiable type to facilitate searching requested drug.
BR5:Manager should control the overall information from any biases properly.

BR6: Forms should contain stock information appropriately.

BR7:Pharmacist doesn't sell the expired drug.

2.5 Requirement elicitation model

2.5.1 Essential use case modeling

Essential use cases are of primary importance early in a project's analysis phase. Their purpose is to document the business process that the Application must support without bias to technology and implementation. The narrative in the Essential use case is to be expressed in the language of the application domain of users. Essential Use cases should achieve the following goals: Serve as an effective communication tool between users and analysts, is diagrammed using the standards documents, Be documented in text format using the standard "Essential Use case Specification Template". Essential use case modeling is a simplified abstract, generalized use case that captures the intentions of the user in a technology and implementation independent manner. It identifies use case and actors of the existing system.
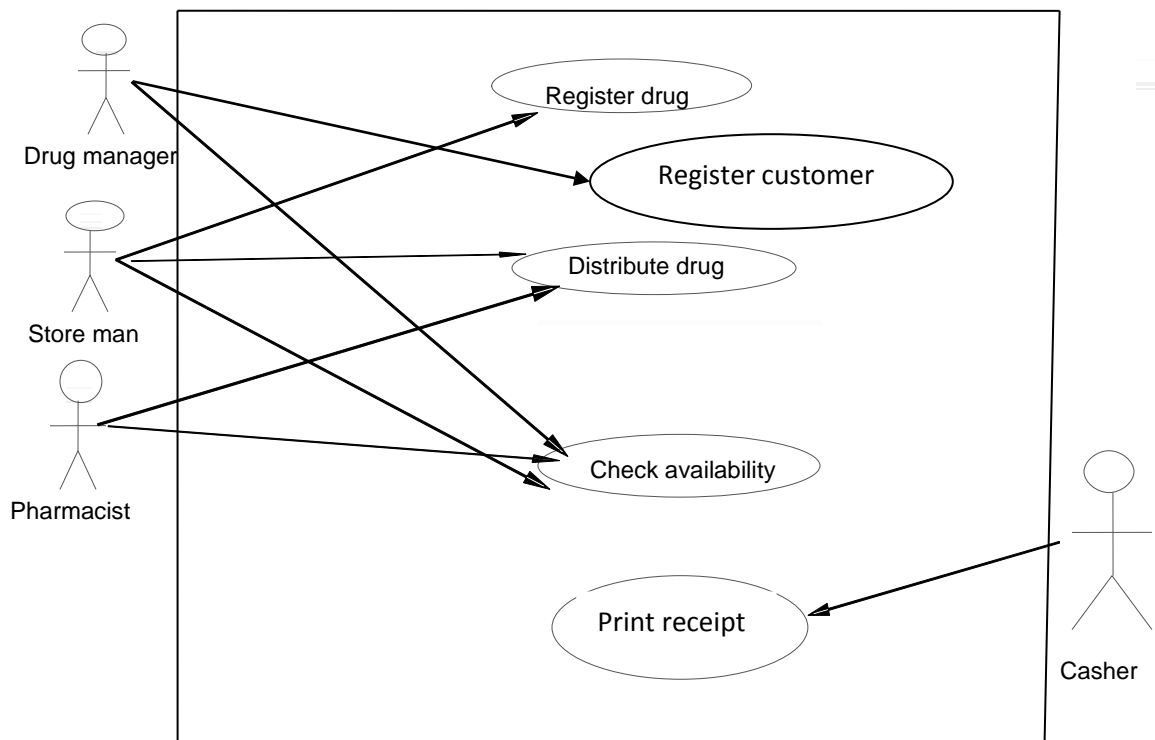

Figure 2.1. esential use case diagram

2.5.2 Essential user interface (UI) prototype.

Forms and Other Documents of the Existing Systems as mentioned before, forms are used for different purposes. Also they are the backbone of the system. The existing system uses deferent types of forms. Some of them are listed below

የኢትዮጵያ ቀይ መስቀል ማህበር

Ethiopian Red Cross society

የእቃ መቀበያ ደረሰኝ ቅጽ

Goods receiving note   NO 284049ላኪ.ው

ድርጅት......................................   የያዘው ከፍል..

Sender org   ordering Dept

ያጓጓዘ ስም..
Transported by

የማጓጓዣ ሰነድ ቁጥር.................................   የሰሌዳ ቁጥር...

Waybill No   plate No

የመሸኛ ሰነድ ፋይል ቁጥር..............................   ቀን..

Packing list No   date

ደረሰኝ ቁጥር...

Receipt No

የትዛዝ ቁጥር...

Order No

ተረካቢ ድርጅት..

Receiving org

No	Code No	Type of Goods	location	Measurement	quantity	Unit price	Total price

ፊርማ   ....

አስረካቢ   ተረካቢ

Figure 2.2   goods receiving for the existing system

የኢትዮጵያ ቀይ መስቀል ማህበር

Ethiopian Red Cross society

ወጪ	
ተመላሽ	

የዕቃ ማዉጫና መመለሻ ሠነድ ቅጽ   No 111919

Issues or turn-in form

ከ   _____   ቀን   _____

from   Date

ለ   _____   የሂሳብ መደብ

To   A/C No   _____

የአሽከርካሪዉ ስም   የስሌዳ ቁጥር   _____
          _____

Driver's name   plate No

No	የዕቃዉ አይነት Type of Goods	መለኪያ unit	የተሰጠ ብዛት Amount	ያንዱ ዋጋ Unit price	ጠቅላላ ዋጋ Total price

_____   _____   _____   _____

ስምና ፊርማ   ላኪዉ   ያጸደቀዉ   ተቀባይ   የመዝጋቢ ስም

Name and sign   sender   Approved by   received by   posted by

Figure 2.3 issues of turn in form of the existing system

የኢትዮጵያ ቀይ መስቀል ማህበር

Ethiopia Red Cross Society

...........................መድህኒት ቤት /መደብር

................................pharmacy/drug store

የእጅ በእጅ ሽያጭ ደረሰኝ Cash sales invoice

 ከኢትዮጵያ ቀይ መስቀል ማህበር

From Ethiopia Red Cross Society   ለ..

አድራሻ...................................ክ/ከተማ........................ቀበሌ.........   To...

Address   sub city   kebele   አድራሻ...................................ክ/ከተማ........................ቀበሌ.........

የተ.እ.ታ.ቁጥር..   Address   sub city   kebele

VAT No ....   የተ.እ.ታ.ቁጥር..

መለያ ቁጥር...   VAT No ....

Tin No..   መለያ ቁጥር...

የተመዘገበበት ቀንና ዓ.ም...............   Tin No...

Date of registration....................   የተመዘገበበት ቀንና ዓ.ም...............

                                                                                        Date of registration......

No	የዕቃዉ አይነት Type of Goods	መለኪያ unit	የተሰጠ ብዛት amount	ያንዱ ዋጋ Unit price	ጠቅላላ ዋጋ Total price

        የገንዘቡ ልክ በፊደል.................

 የከፍያ ሁኔታ   በጥሬ............በቼክ...........ቼክቁጥር..............ቫዉቸር ቁጥር.............

የአዘጋጅ ስምና ፊርማ....................የገንዘብ ተቀባይ ስምና ፊርማ

    Figure 2.4 cash sales invoice of the existing system

Part two: System analysis

2.6 Description of the proposed system

By carefully analyzing and observing the problem of existing system we came up with a solution that the current manual system should be computerized. The computerized system will eliminate/reduce the problem on time, work load and complexity on storing drugs information. The system will include a database for recording drugs that facilitate fast information retrieval, modifying, inserting and deleting. It also includes an attractive user interface that facilitates accessing the database and recording drugs easily.

The system allows the user to enter expiry date for a particular product or drug during opening stock and sales transaction. It also involves arrival of new batches of drugs, getting information about the drugs e.g. expiry date, number of drug type left, and location of a drug in the pharmacy. Players represent external entities that interact with the system. Players manage and perform the Systems functionality and also players can access the proposed system at any time, improving the efficiency of the system by ensuring effective managing of services and activities, Generating report, reducing the employees' workload in the organization.

2.7 Functional and Non functional Requirement

2.7.1 Functional requirement

Functional requirement is concerned with actual performance of the system that is going to be developed. Functional requirements describe the functionality or service provided by the new system. The functional requirement is the services that are provided by the system. It also describes the interactions between the system and the user. The new system is expected to provide the following functionality

Input requirement

> ➢ The system should register drug.
> ➢ The system should verify the requested information.
> ➢ The system should check Store items by item name.

➢ Each input item information must include item id, item name, code, quantity, manufactured company, and expiry date.

Output requirement

➢ The system generates a report.

➢ The system should store all the data related with all the tasks performed into a database.

➢ The system should display store item that are reach to expired date.

➢ The system should display employee information to the manager.

2.7.2 Non functional requirement

Nonfunctional requirement describe visible aspects of the system that are not directly related to the system. Unlike functional requirement, non-functional requirement deals with additional quality of the system such as performance, error Handling, usability, availability and security matter.

Some of the non-functional Requirements are:

Performance Characteristics

The system should provide response for the users with less time than the previous system. If a user follows the correct way of execution the system will stay safe if not the system will respond to that action. It is expected that the system will serve many clients at a time.

Error Handling

The system handles errors by giving error-message and warning to the user. The error handling can be seen in different aspects. The system should check the validity of a user during log in. Any user can view the different part of the system based on the role assignment that the system provides. The system should handle errors which are occurred due to invalid inputs of the user then displays error message and additional information's on how to correct it

Quality Issues

Usability: - the user interface shall be simple for the user on how to use the system and easy to learn.

Availability: The product is available at all time with the availability of power. The system shall be available for twenty four hours.

Reliability: - The application will run without failure. The system will be reliable in all aspects since all activities and operations are performed by machines.

Physical Environment

Since Debre Tabor Red Cross pharmacy is currently growing in technology issues from time to time. Its main data center may afford server machine to deploy the system effectively. The system is expected to withstand the following external factor.

➢ Less processer speed of personal computer that are caused by dust and other unnecessary things happened in client computers for accessing the system.

➢ Less power that causes the system fail or stop functionality.

➢ The server and the other devices in which system installed should kept in a secured and air conditioned rooms

Security Issues

The system is secured from malicious users from accessing the database because most of the information is stored in the server. The authentication is done through password protection in database manipulation. This means that before entering to the database the system will request user name and password. This will prevent unauthorized data modification on the database.

➢ The system follow a role based security which means the access level and privilege for each Users are set by the system administrator.

➢ The system has authentication mechanism (Username and password).

Maintainability

Through time there are always changes when the user's needs another additional functionality, when the system administrator identifies the system need to be modified, while the organizations work style is changed and depending on different reasons. Some of the user interface and basic modification can be performed by the collection of developers but the system developers are the right persons to update the system.

2.8 The proposed system models

2.8.1 System use case model

Use Case represents interaction between a user (human or machine) and the system. Use case components:

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

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

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

Actor identification In the use cases an actor interacts with the system to perform a piece of meaningful work that helps them to achieve a goal and has access to define their overall role in the system and the scope of their action. Depending on the above explanation actors in this system are the following:

Manager: Controls the overall activity in the shop.

Pharmacist: Manages the drug information in the stock.

Store coordinator: Manages the outgoing and incoming drug from the stock.

Cashier: Collect the price of the sold items and generate report to the manager.

Use case identification

Each Use Case describes the functionality to be built in the proposed system, which can include another Use Case's functionality or extend another Use Case with its own behavior. The most important and basic use cases of this system are the following:-

- ➢ Login
- ➢ Register employee
- ➢ View employee
- ➢ Delete employee
- ➢ Register drug
- ➢ Register Customer
- ➢ View drug
- ➢ Delete drug
- ➢ Check expire date

➢ Check item

➢ Prepare prescription

➢ send prescription

➢ receive prescription
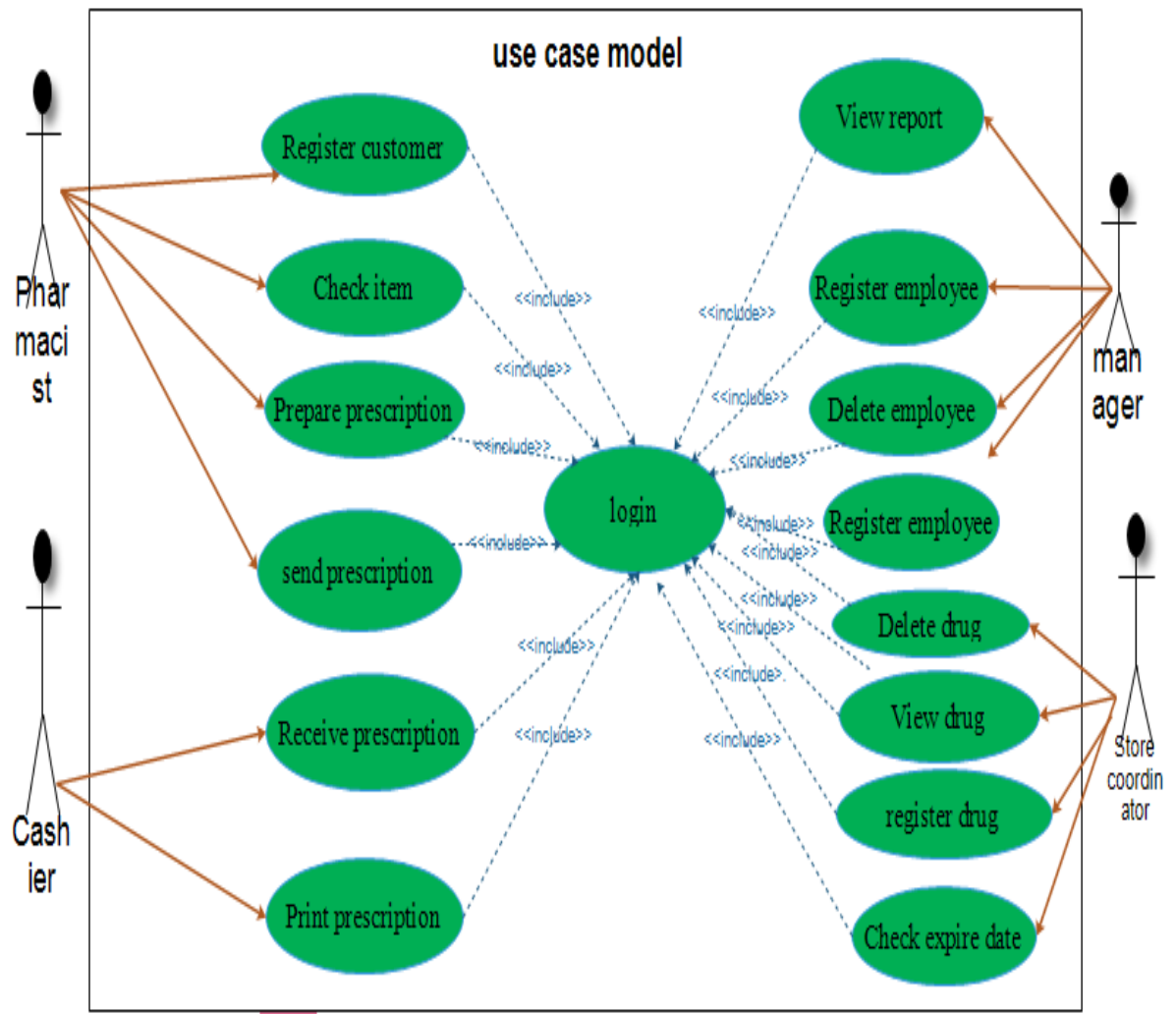
Figure 2.5 use case diagram.

Use Case Description

Name	Login
ID	UC1
Actors	Manager, Pharmacist, Casher, Store coordinator
Description	In order to get into or access the system
Pre condition	1. The Manager, Store coordinator, pharmacist, or Cashier must open the system
Flow of events	1. Open the system. 2. Click on login link. 3. Login form displayed. 4. Select account type and enter user name and password. 5. Click on the login button. 6. System verifies in the account database. 7. Main form displayed. 8. End of use case.
Post condition	1. Access the system

Table 2.1 Use case description for login

Name	Employee Registration
ID	UC2
Actor's	Manager
Description	Register the information of the workers in the pharmacy
Pre condition	1. Initiate the system 2. Have user name and password
Flow of event	1. The manager opens the system. 2. The manager log to his or her page 3. The manager click on the register employee link. 4. The system displays the register employee form. 5. The manager inserts the necessary information of the employee. 6. The manager click on the register button. 7. Then the system will generate successfully message 8. End of use case.
Post condition	1. Access the system 2. Close the system

Table 2.2 Use case description for employee registration

Name	Delete Employee
ID	UC3
Actor's	Manager
Description	Delete the employee when it is necessary.
Pre condition	1. Initiate the system. 2. Have user name and password
Flow of event	1. The manager log to his or her page. 2. The manager click on delete employee link. 3. The system displays the delete employee form. 4. The manager enters the idno of the employee. 5. Click on the delete button. 6. Then the system will generate successfully message 7. End of use case
Post condition	1. Return to home page or 2. Close the system

Table 2.3 Use case description for delete employee

Name	Register Drug
ID	UC 4
Actors	Store coordinator
Description	Registering the new drug from the store in to the data base.
Pre condition	1. Initiate the system. 2. Have user name and password.
Flow of event	1. The Store coordinator opens the system. 2. The Store coordinator log to his or her page. 3. The Store coordinator click on Register drug link. 4. The system displays the register drug form. 5. The Store coordinator will enter the attributes of the drug. 6. Then click on submit. 7. Then the system will generate successfully message. 8. End of use case
Post condition	1. Return to home page or 2. Close the system

Table 2.4 Use case description for drug registration

Name	Check Expired Date
ID	UC 5
Actors	Store coordinator
Description	In order to check the drug that is the verge of the expired date.
Pre condition	1. Initiate the system. 2. Have user name and password.
Flow of event	1. Open the system. 2. The Store Coordinator log to his or her page. 3. The Store coordinator click on check expired date link. 4. Then the form will be displayed. 5. The Store coordinator enters the expired date of the drug. 6. Then Store coordinator clicks on search button. 7. The system displays the list of the dug that is inserted in its date. 8. The Store coordinator click on the clear button. 9. Then the system will response successfully message. 10. End of use case.
Post Condition	1. Return to home page or 2. Close the system

Table 2.5 Use case description for check expired date

Name	register customer
ID	UC 6
Actors	Pharmacist
Description	To purchase the drug to the customer
Pre condition	1. The customer brings with his/her prescription
Flow of event	1. The pharmacist opens the system. 2. The home page will be displayed. 3. The pharmacist inserts user name and password. 4. The system will verify the user name and password. 5. The pharmacist click on check list link. 6. Then the system displays the drug list. 7. Then return to sale drug link. 8. Click on sale drug link. 9. Enter the necessary information of the customer and the drug. 10. Then click on the load button. 11. Then the system will response successfully message. 12. End of use case.
Post condition	1. Return to home page or 2. Close the system

Table 2.6 Use case description for register customer

Name	Print
ID	UC 7
Actors	Cashier
Description	Printing soled drug for the customer
Pre condition	1. There must be list of drug that must be inserted by the pharmacist.
Flow of event	1. Open the system. 2. The home page will be displayed. 3. The cashier inserts user name and password with their account type. 4. The system will verify the user name and password. 5. Then the system display his/her page. 6. The cashier click on fetch drug link. 7. The list of drugs with corresponding quantity and price. 8. The cashier calculates the total price. 9. Then click to print. 10. Then the system will display response. 11. End of use case.
Post condition	1. Return to their appropriate page. 2. Close the system

Table 2.7 Use case description for print use case

2.8.2 Sequence diagrams

The sequence diagram is used primarily to show the interactions between objects in the

sequential order that those interactions occur. The main purpose of a sequence diagram

is to define event sequences that result in some desired outcome.

Sequence Diagram for login
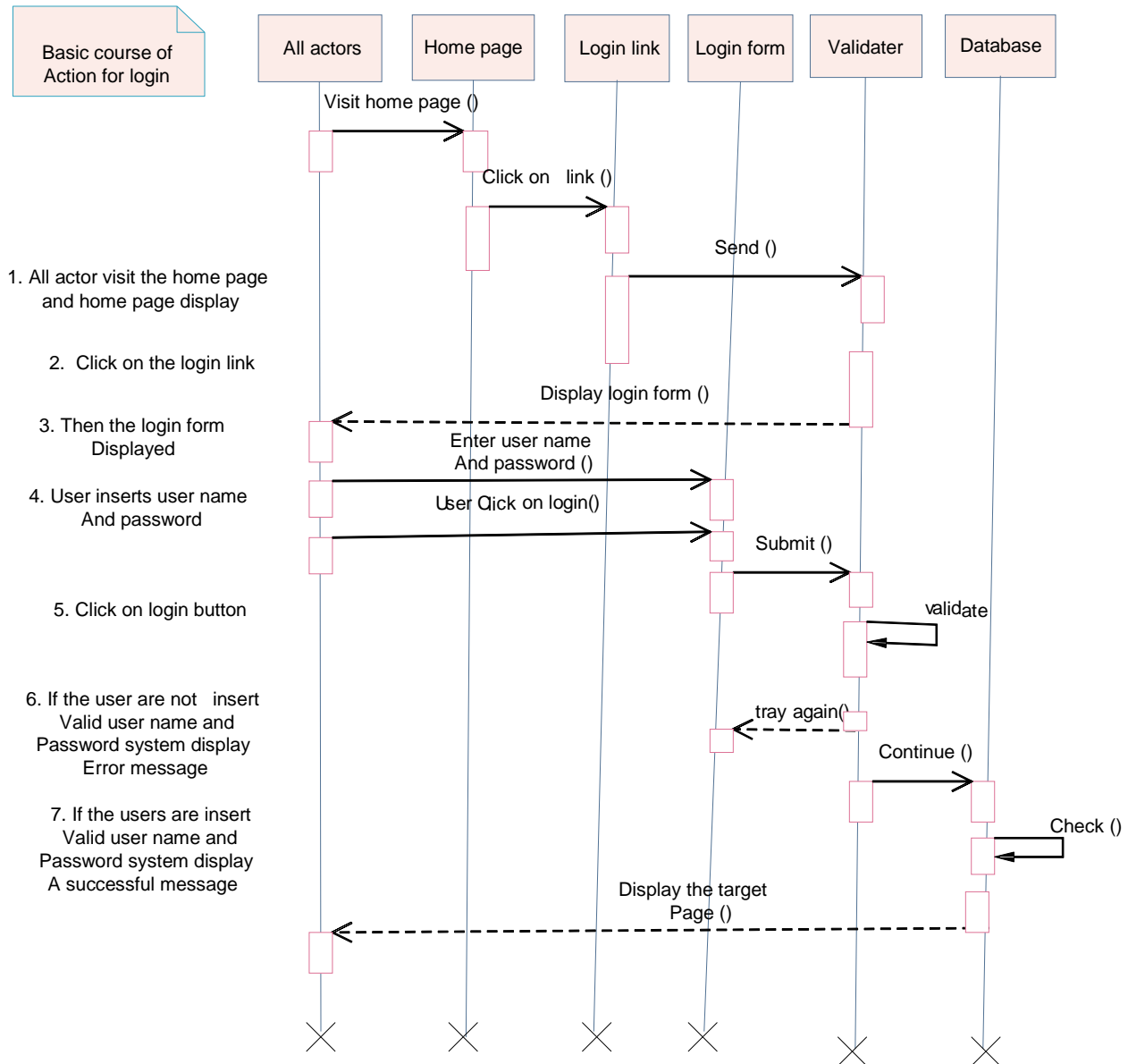
Figure 2.6 sequence diagram for login
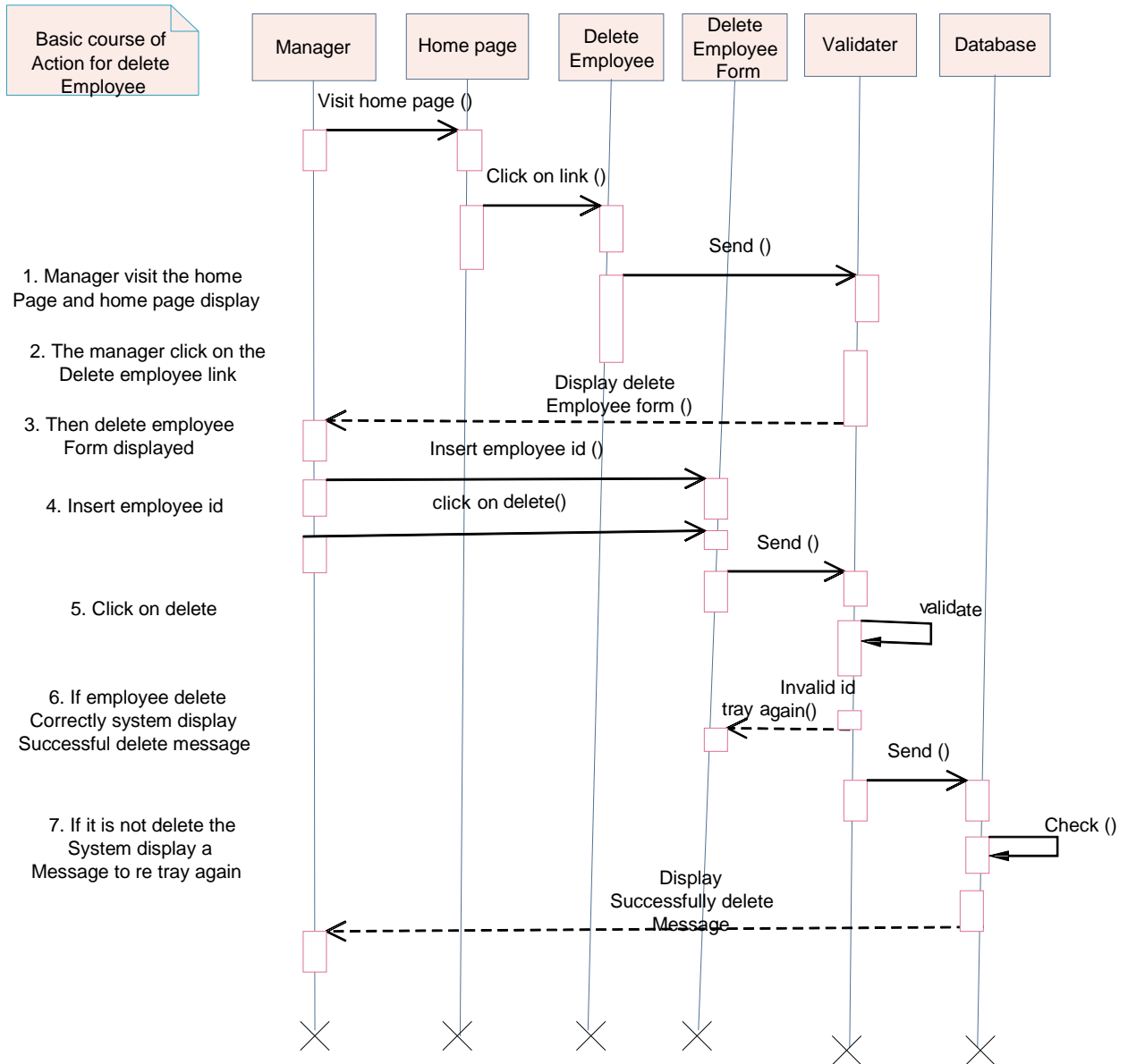
Figure 2.7 sequence diagram for delete employee
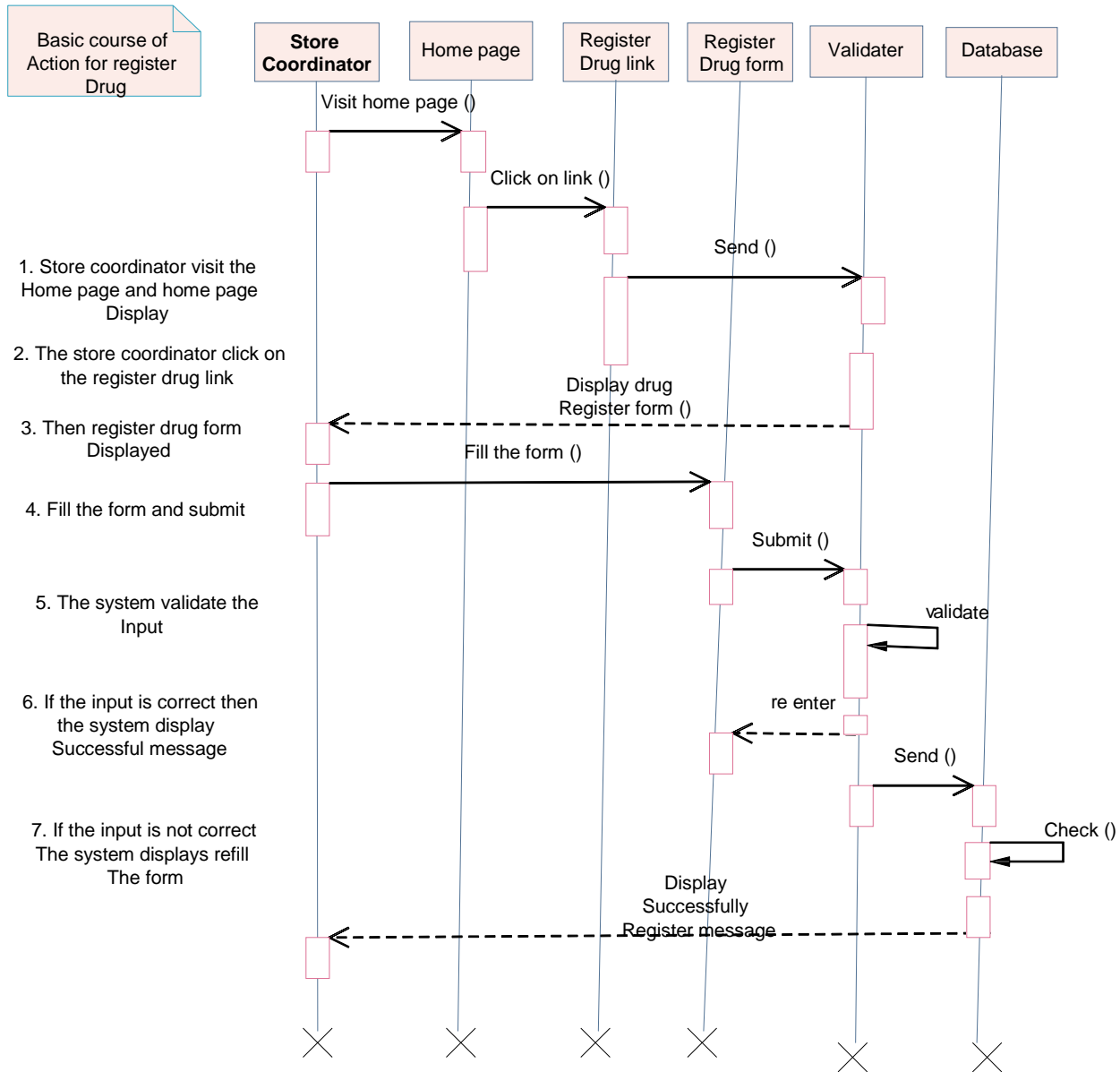
Figure 2.8 sequence diagram for register drug
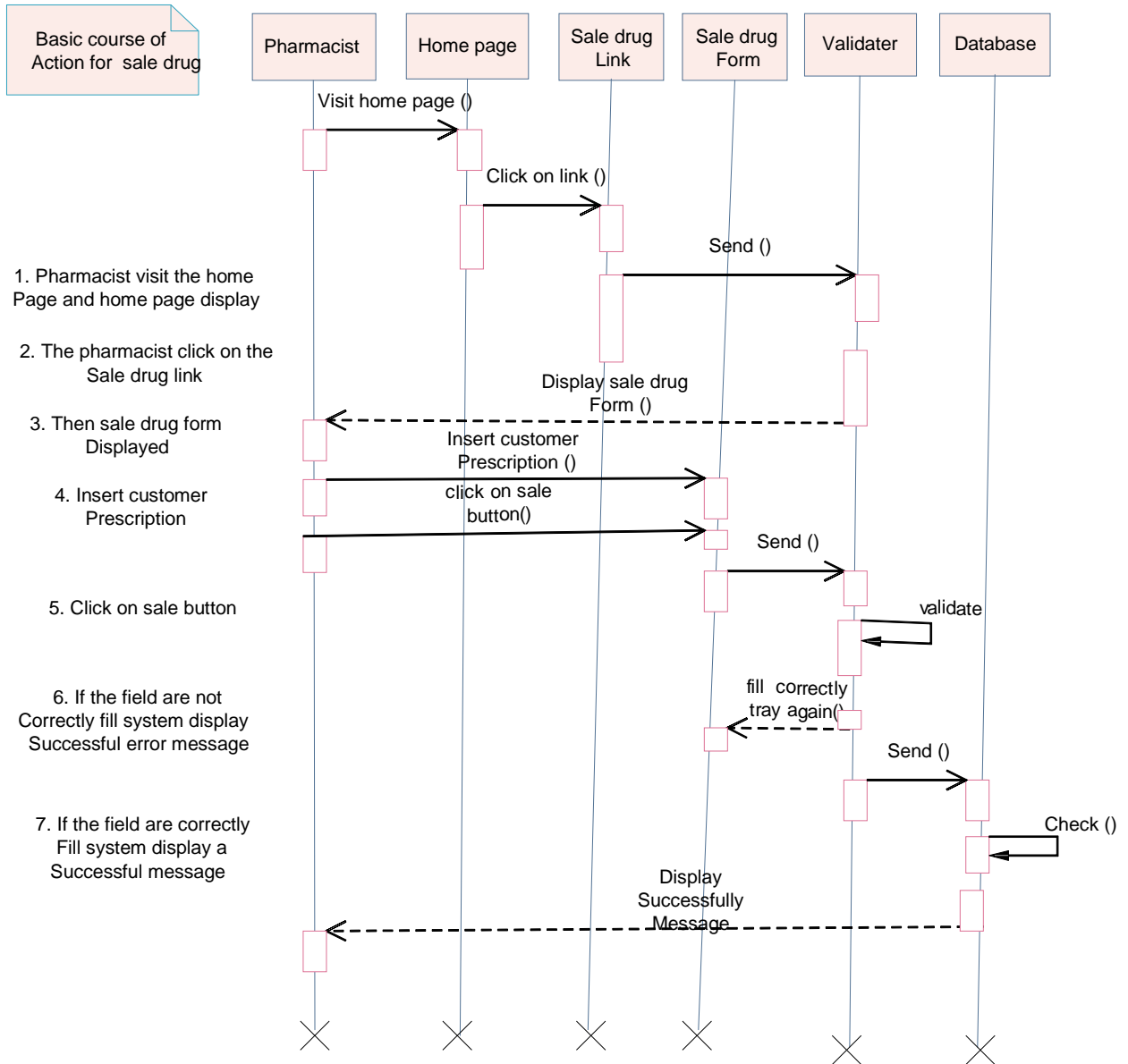
Figure 2.9 sequence diagram for sale drug

Basic course of
Action for check
Expired date

Store
Coordinator

Home page

Check
Expired
Link

Expired list

Validater

Database

Visit home page ()

Click on   link ()

Send ()

Check ()

1. Store coordinator visit the
Home page and home page
Display

2. click on the check expired
Link

3. Then the system checks if
There is expired drug or not

display if there
exist()

4. The system displays the
List if there is an expired
Drug

Click on clear ()

5. Click on clear button

Send ()

6. Then the system display
A successful message

Display successful
Message ()

Figure 2.10   sequence diagram for expired date

2.8.3 Conceptual class model

Class diagram is static model that shows the classes and the relationships among classes that remain constant over the time. Class is the main building block of class diagram, which stores and manages information in the system. A class diagram describes the type of objects in the system and the various kinds of static relationships that exist among them.That show the class of the system. Their interrelation ships (including inheritance, aggregation and association) and the operations and attributes of the class and constraints those apply to the way objects are operations and attributes of the class and constraints that apply to the way objects are connected.
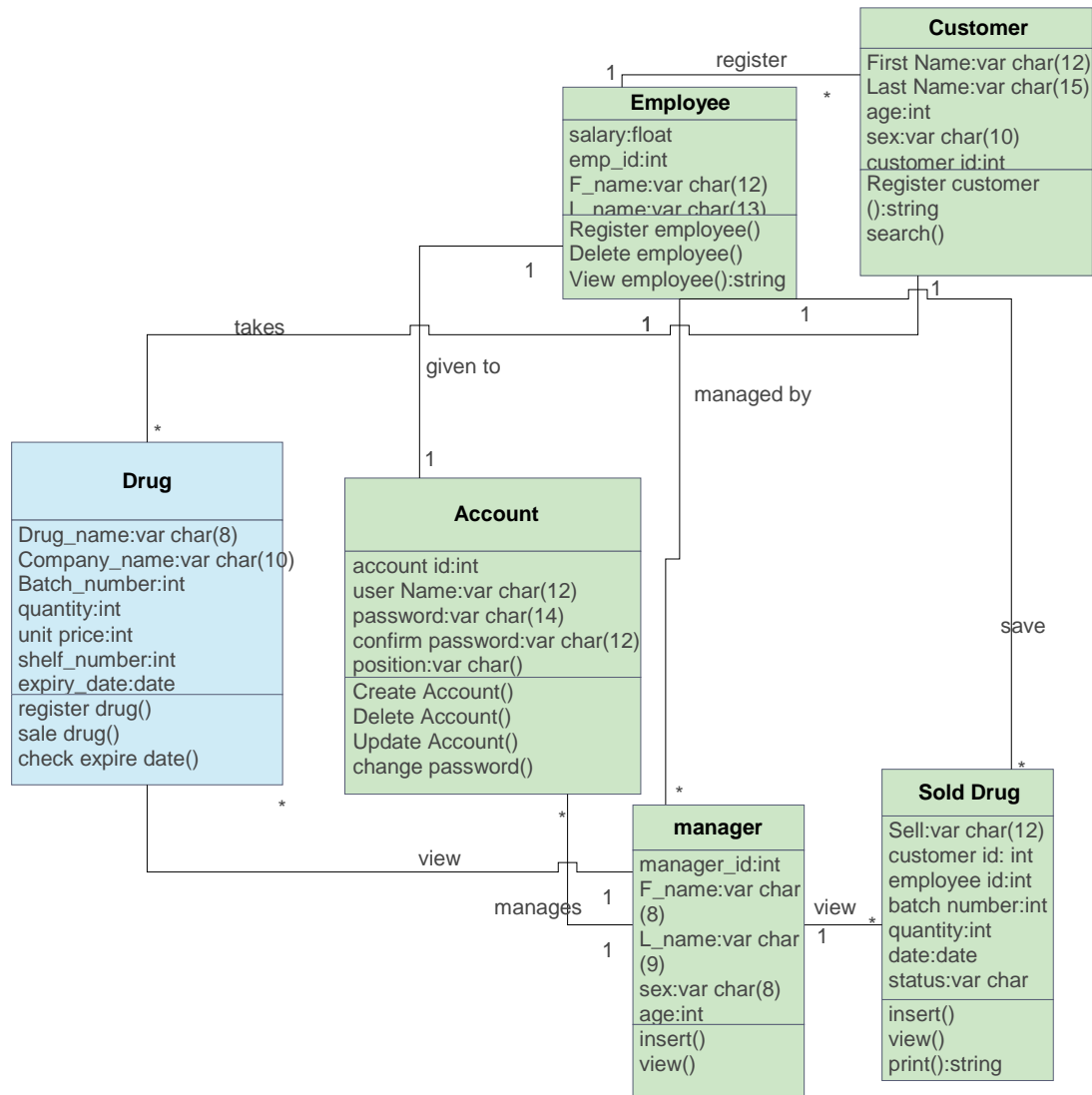
Figure 2.11 Analysis level class diagram

2.8.4 User interface (UI) flow diagram

User interface-flow diagrams are typically used for one of two purposes. First, they are used to model the interactions that users have with our software. Second enable to the user to gain a high-level overview of the user interface for our application. This overview is effectively the combination of all the behavioral views derived from your use cases, the result being called the architectural view of your user interface
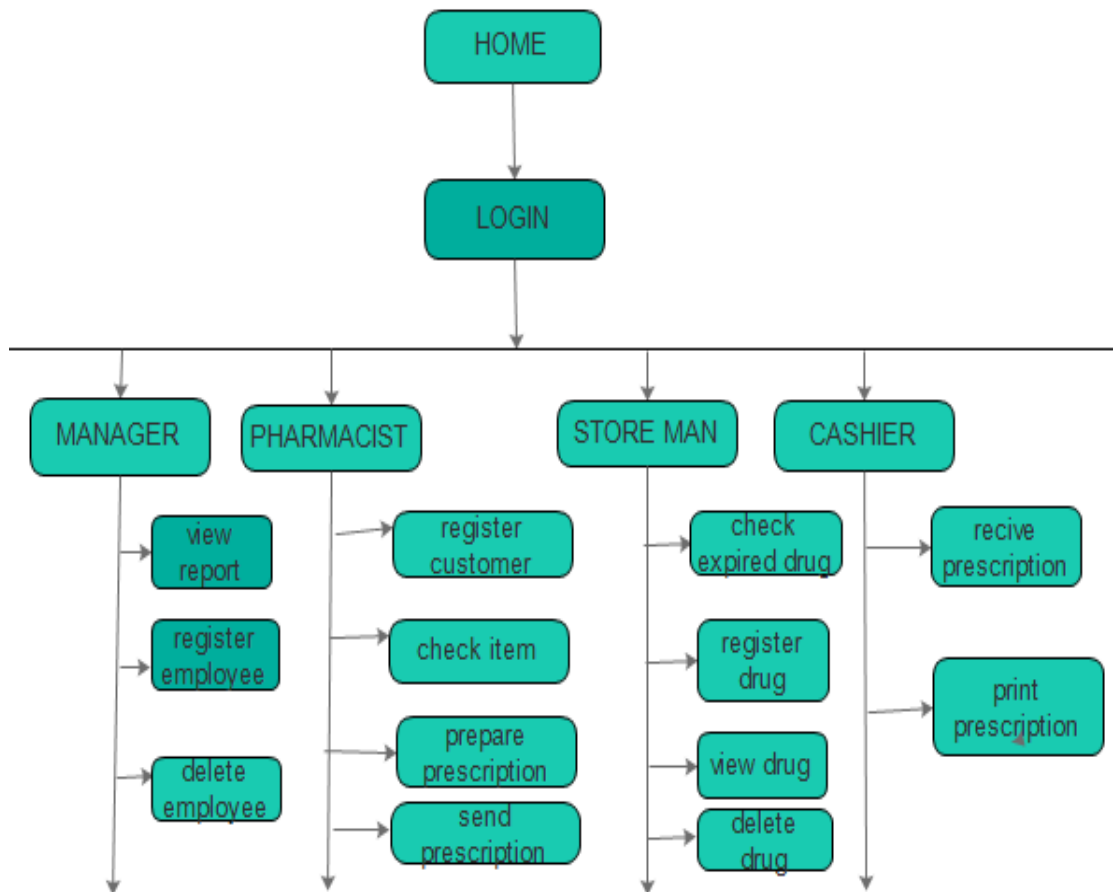
Figure 2.12 diagram for user interface flow diagram

2.8.5 Activity diagram

Activity diagram is another important diagram in UML to describe dynamic aspects of the

System. Activity diagram is basically a flow chart to represent the flow of information one

Activity to another activity.
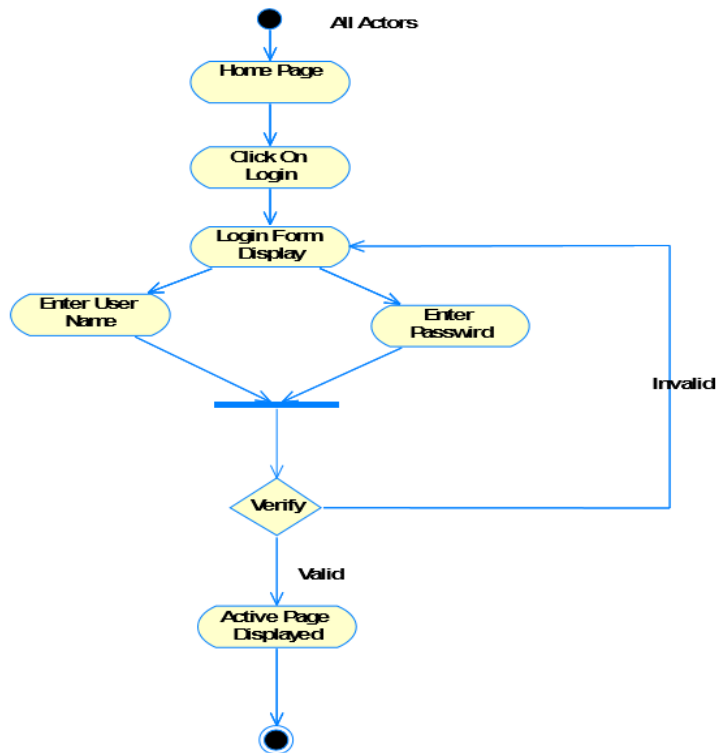
Figure 2.13 Activity diagram for login
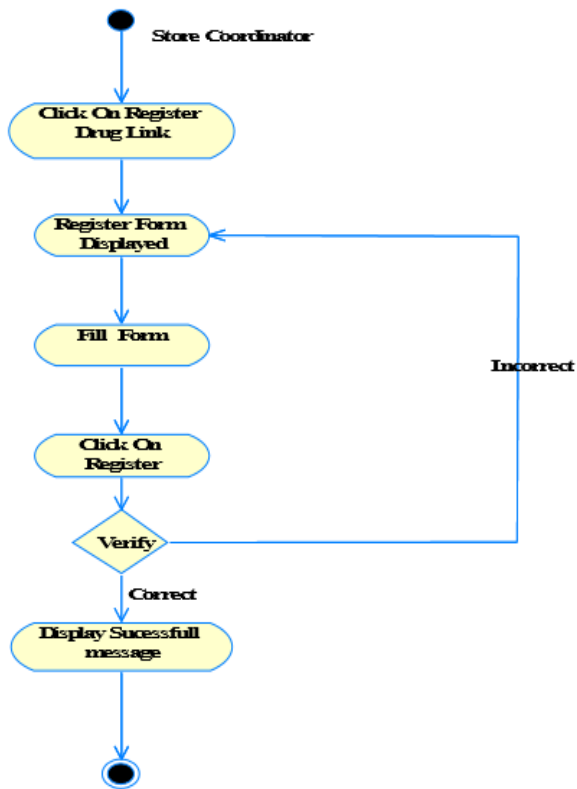
Figure 2.14: Activity diagram for register drug
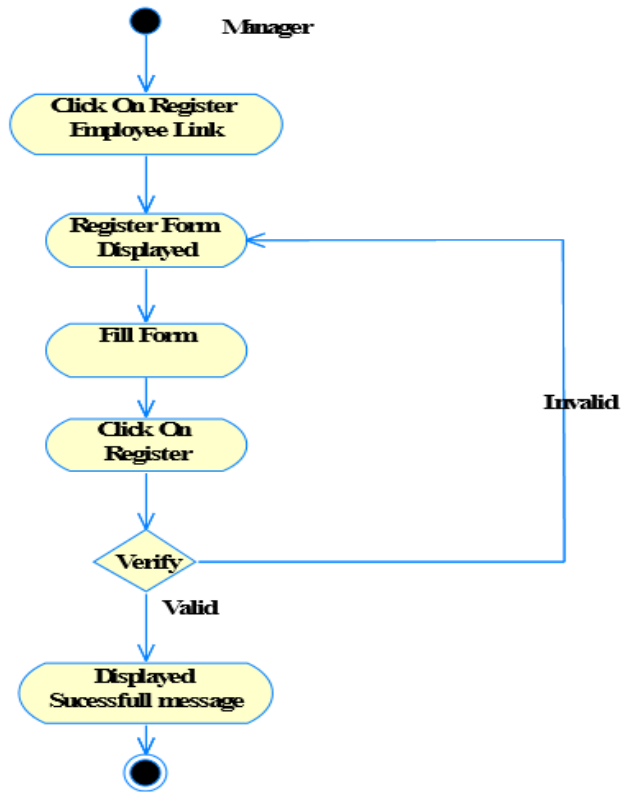
Figure 2. 15: Activity diagram for register employee
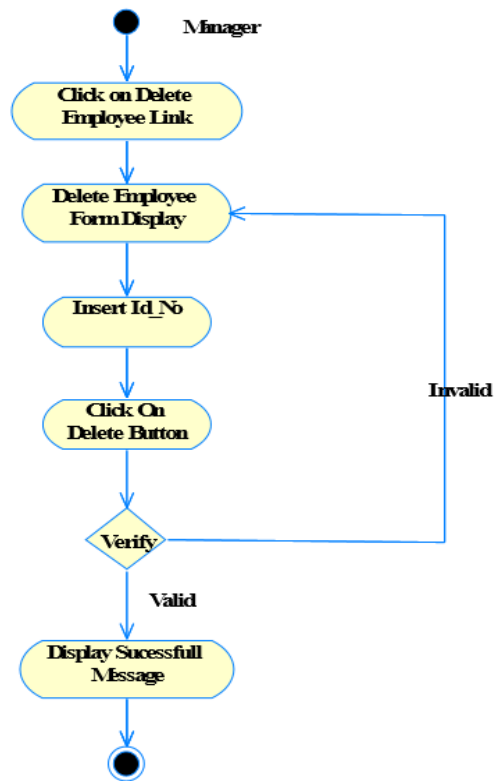
Figure 2.16: Activity diagram for delete employee
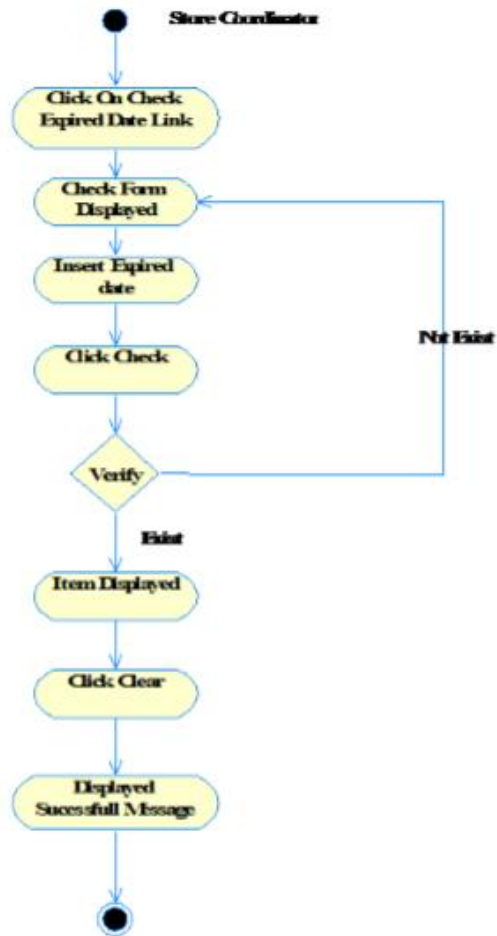
Figure 2.17: Activity diagram for check expired date
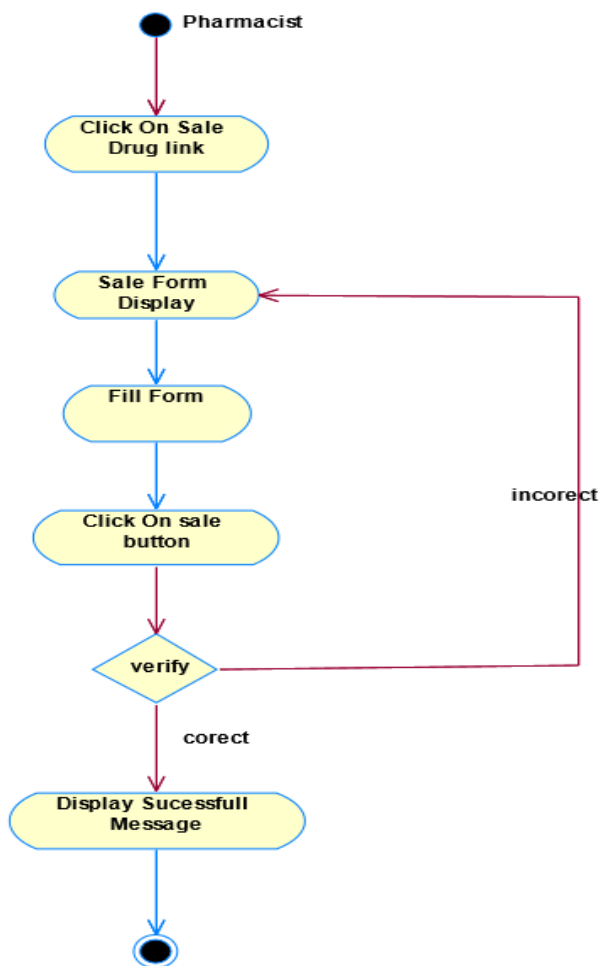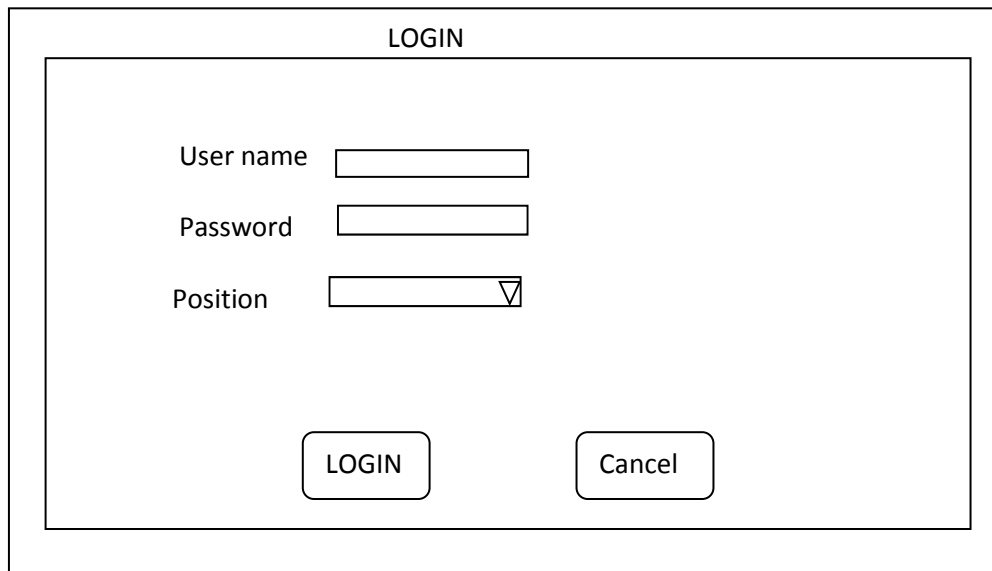
Figure 2.18: Activity diagram for sale drug

2.8.6 User interface prototype

User interface prototyping is an iterative analysis technique in which users are actively involved in the making up of the UI for a system. UI prototyping has two purposes: First, it is an analysis technique because it enables us to explore the problem space our system addresses. Second, UI prototyping enables us to explore the solution space of our system.   The user interface prototyping of this project is depicts as follow.

Figure 2.19 : User interface prototype for login

Employee registration form

First name

Last name

Employee id

Sex

Age

Salary

Address

Position

Figure 2.20: User interface prototype for employee registration

Drug registration form

Drug Name

Company Name

Batch Number

Quantity

Unit Price

Shelf Number

Expiry Date

Register   Cancel

Figure 2.21 user interface prototype for drug registration

CHAPTER THREE: Design Specification

3.1 Introduction /overview

Systems design is the transformation of the analysis model into a system design model. This chapter mainly concerned with the design part of the pharmacy management system. The purpose of this chapter is to provide an overview as to how to actually build the proposed system and to obtain the information needed to derive the actual implementation of our system. In addition to these systems design makes the implementation easy the design is very important. In this section we will see different types of system modeling techniques that will be used for the implementation of the system such as component modeling, deployment diagram, data base design and class mapping [4].

3.2 System architecture

The system architecture defines how pieces of the application interact with each other, and what functionality each piece is responsible for performing. There are three main classes of application architecture. They can be characterized by the number of layers between the user and the data. The three types of application architecture are single-tier (or monolithic), two-tier, and n-tier, where n can be three or more. In a three-tier or a multi tier architecture has client, server and database. Where the client request is sent to the server and the server in turn sends the request to the database. The database sends back the information/data required to the server which in turn sends it to the client. So our system has three tier architecture representations [2].
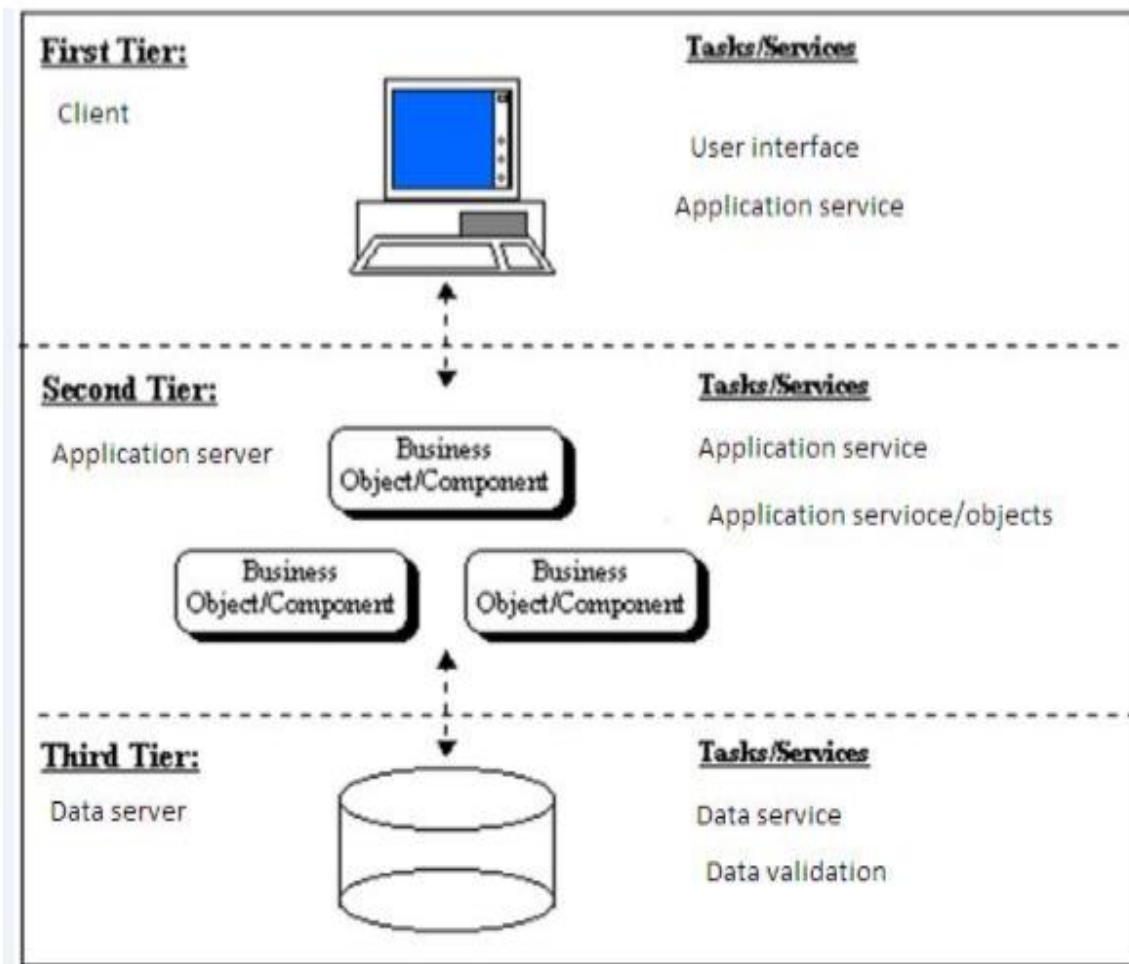
Figure 3.1 System architecture model for the new system

3.2.2 Describing an Architecture using UML
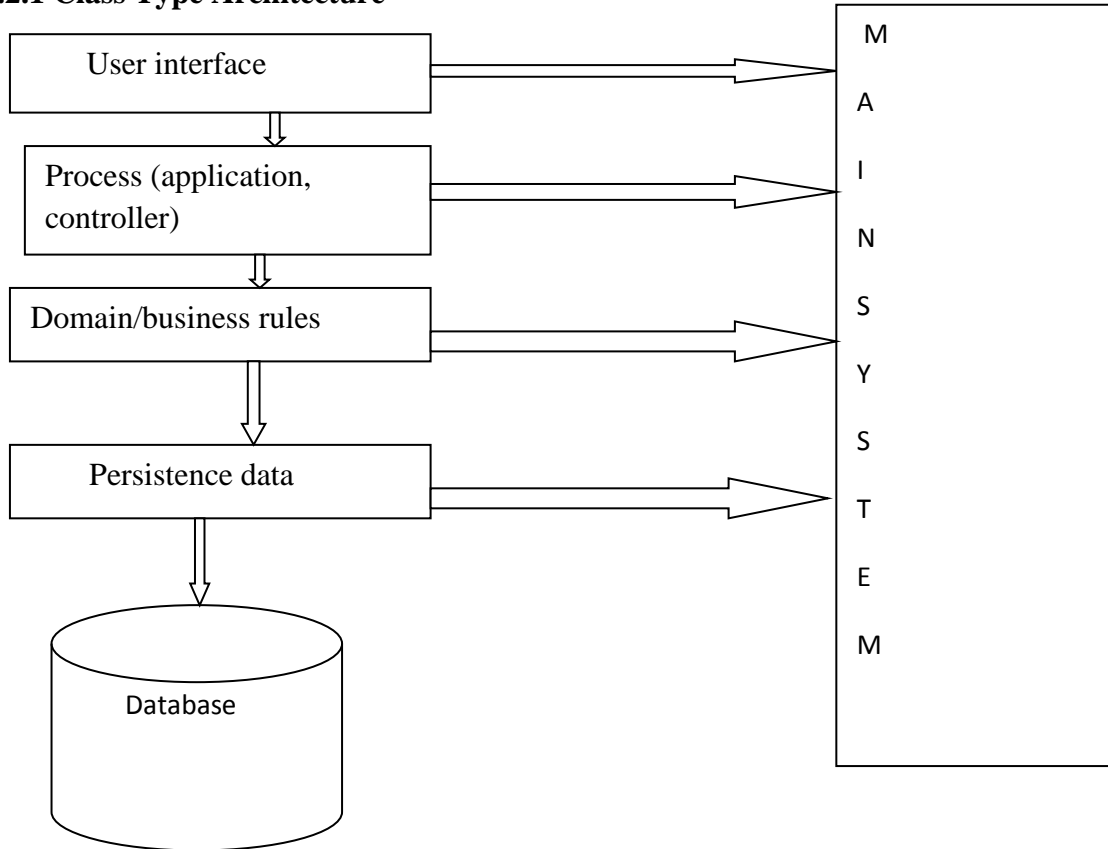
3.2.2.1 Class Type Architecture

Figure 3.2 Class type architecture

The purpose of class type architecture is the static structure of how our software will be built the only difference with that of analysis class architecture is that it focuses on domain solution rather than problem domain and it introduce changes to our class model based on implementation technologies in the project we have six classes.

User interface layer

This layer wraps access to the logic of the system. There are two categories of interface class – user interface (UI) classes that provide people access to the system and system interface (SI) classes that provide access to external systems to the system. Graphical user interface (GUI) screens implement UI classes.

Controller\process layer

The process layer implements business logic that involves collaborating with several domain classes or even other process classes.

Business\domain layer

This layer implements the concepts pertinent to the business domain such as drugs focusing on the data aspects of the business objects, plus behaviors specific to individual objects.

Persistence layer

Persistence layers encapsulate the capability to store, retrieve, and delete objects/data permanently without revealing details of the underlying storage technology.

System classes

System classes provide operating-system-specific functionality for the applications, isolating the software from the operating system.

3.2.2.2 Component Diagram

Component diagrams are often used to model high-level software components and how they interact. The interfaces between these components become clear as the model grows, which provides a much clear delineation of duties of each component. So from that point component diagrams are used to visualize the physical components in a system. These components are libraries, packages, files etc. Component diagrams can also be described as a static implementation view of a system. Static implementation represents the organization of the components at a particular moment. It does not describe the functionality of the system but it describes the components used to make those functionalities. A single component diagram cannot represent the entire system but a collection of diagrams are used to represent the whole.
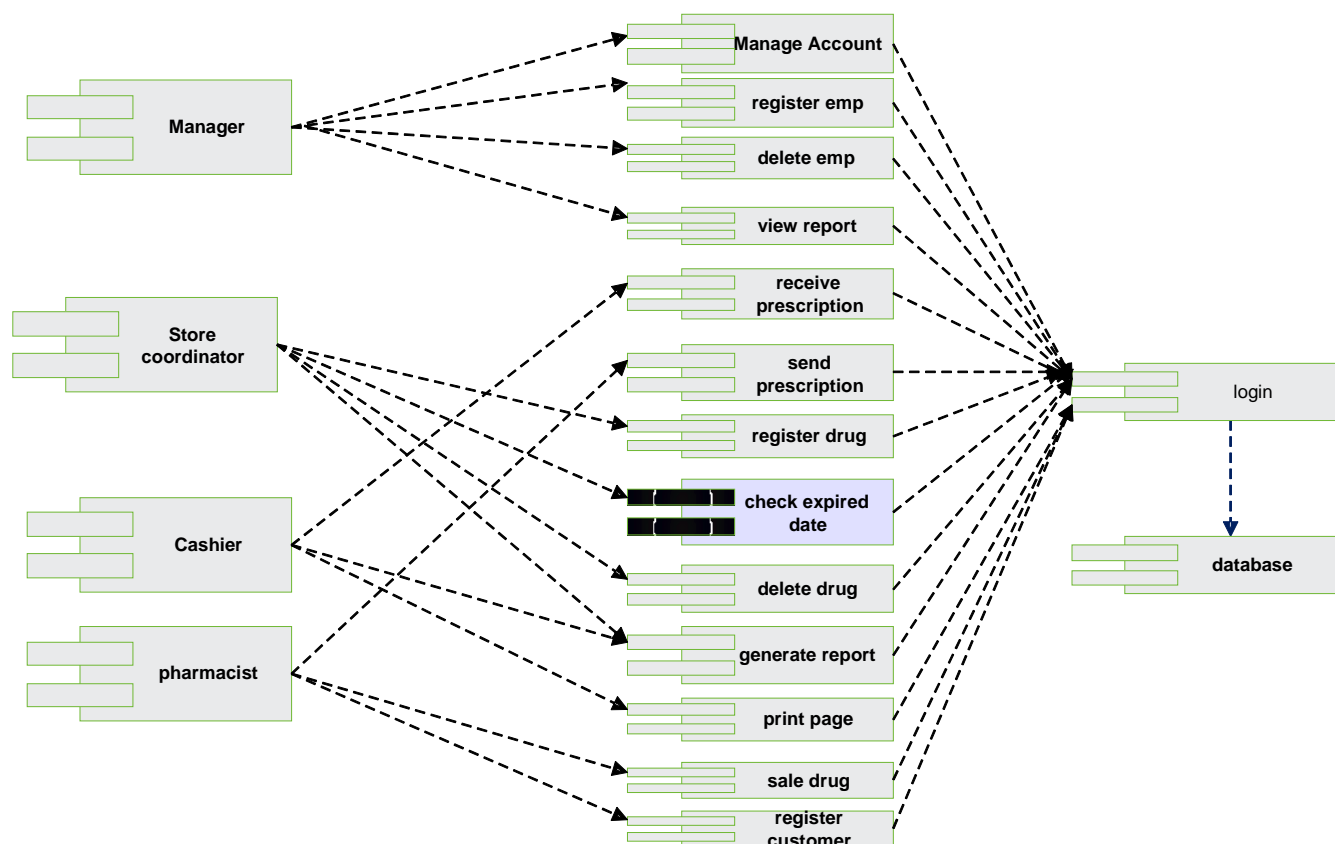
Figure 3.3 component diagram

3.2.2.3 Deployment Diagram

The deployment diagram shows how the software components, processes, and objects are deployed into the physical architecture of the system. It shows the configuration of the hardware units (e.g. Computers, communication devices, etc) and how the software components are distributed across the units [4].
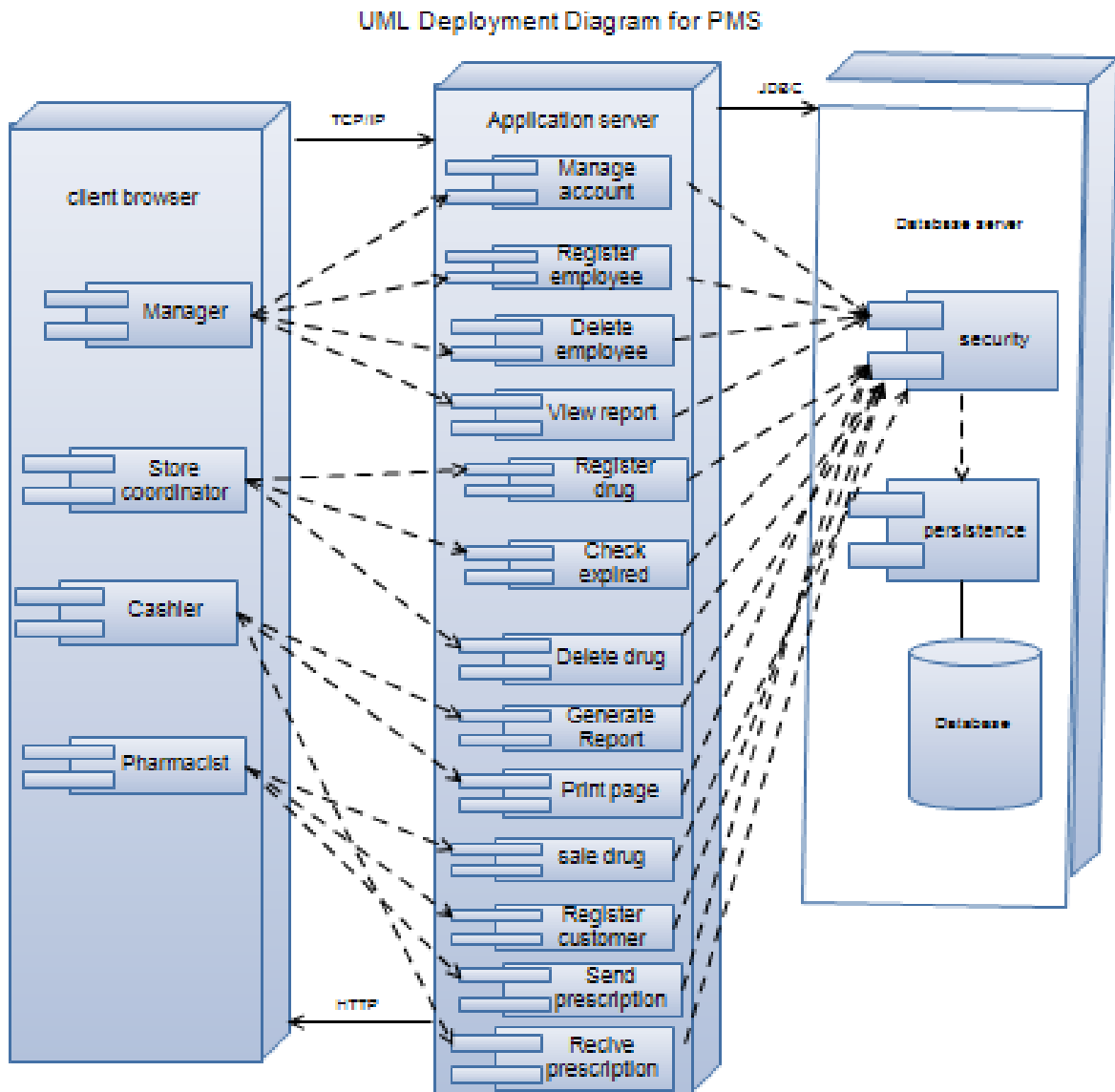

Figure 3.4 deployment diagram

3.2.2.4 Persistent Diagram

Persistent Diagram is the process of producing a detailed data model of a database. This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity. It can be thought of as the logical design of the base data structures used to store the data [4].
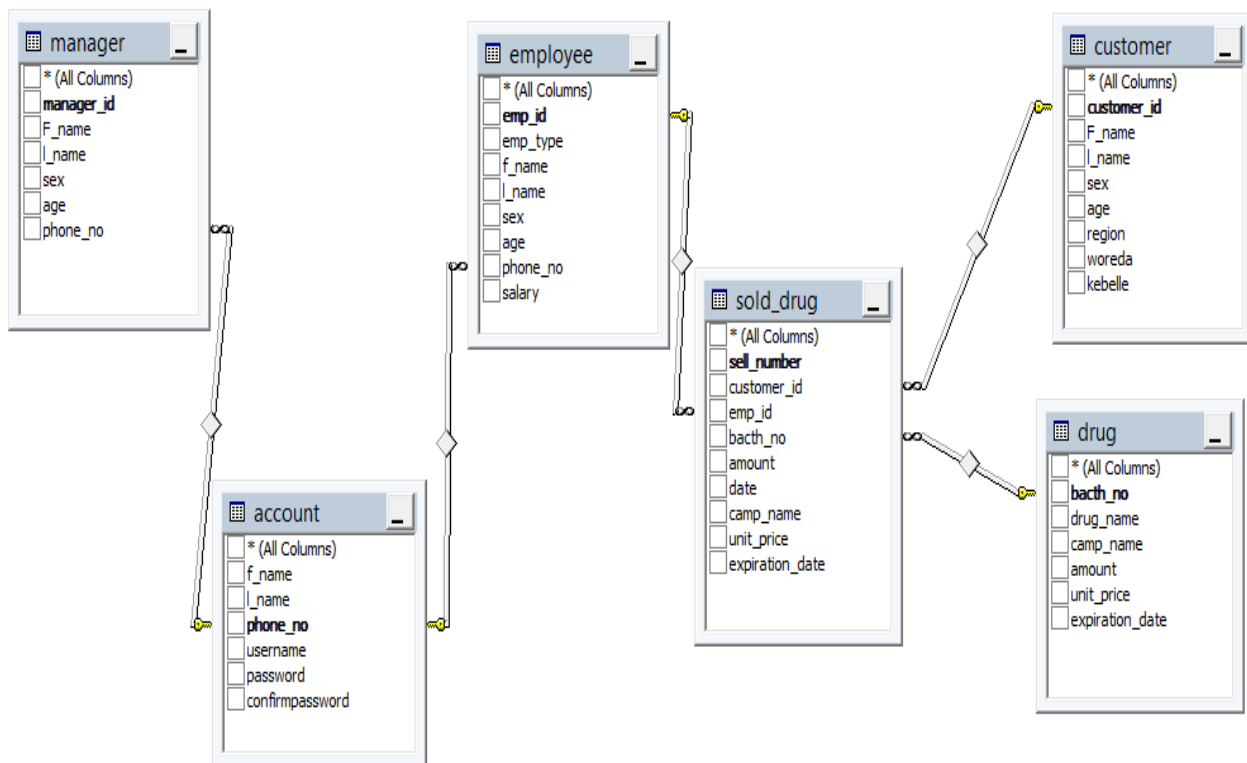

Figure 3.5 persistent diagram

3.2.3 Detailed Design of the System

3.2.3.1 State chart Diagram

A state chart diagram is a view of a state machine that models the changing behavior of a state. State chart diagrams show the various states that an object goes through, as well as the events that cause a transition from one state to another. The common model elements that state chart diagrams contain are: States, Start and end state, Transitions.
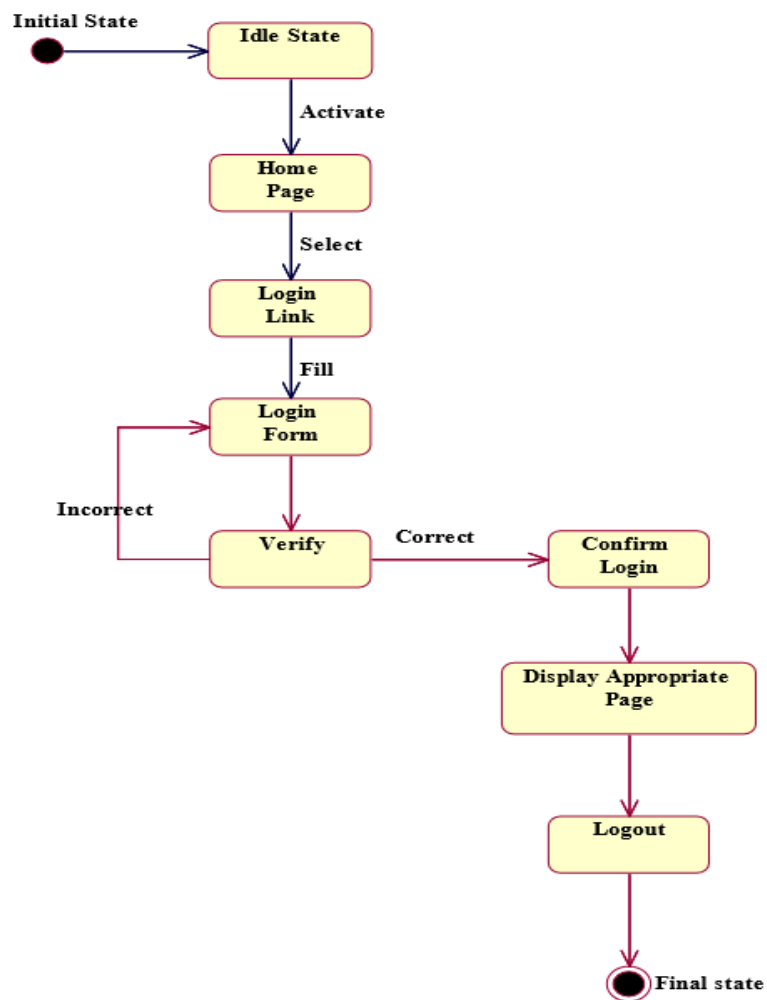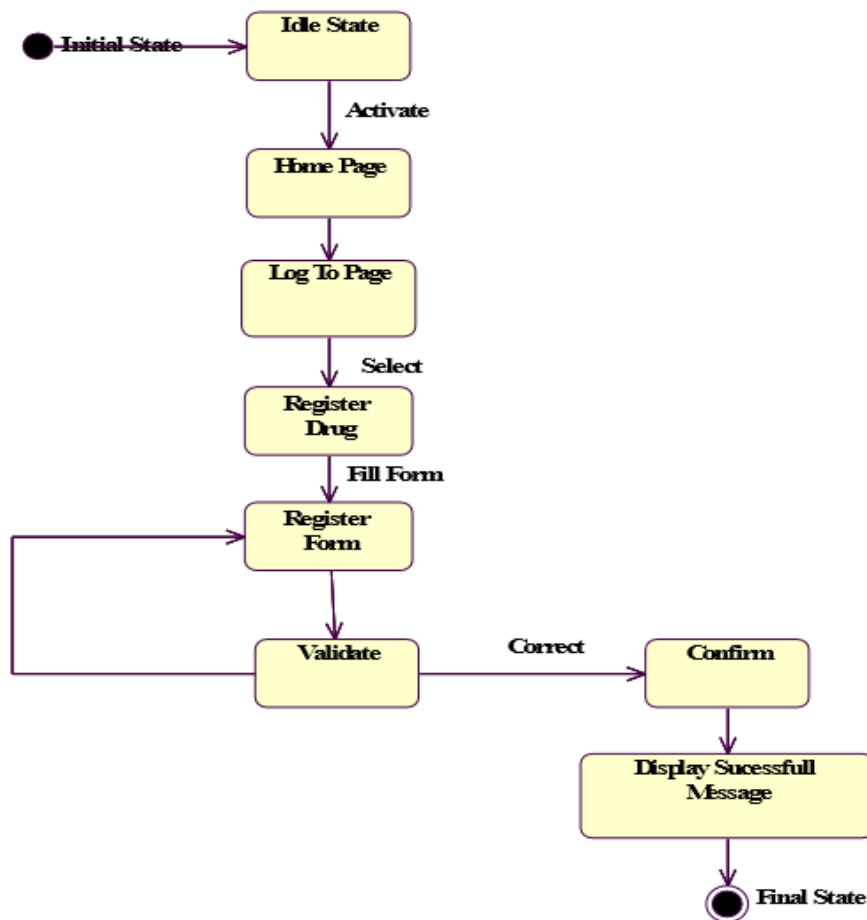

Figure 3.6 State chart digram for login

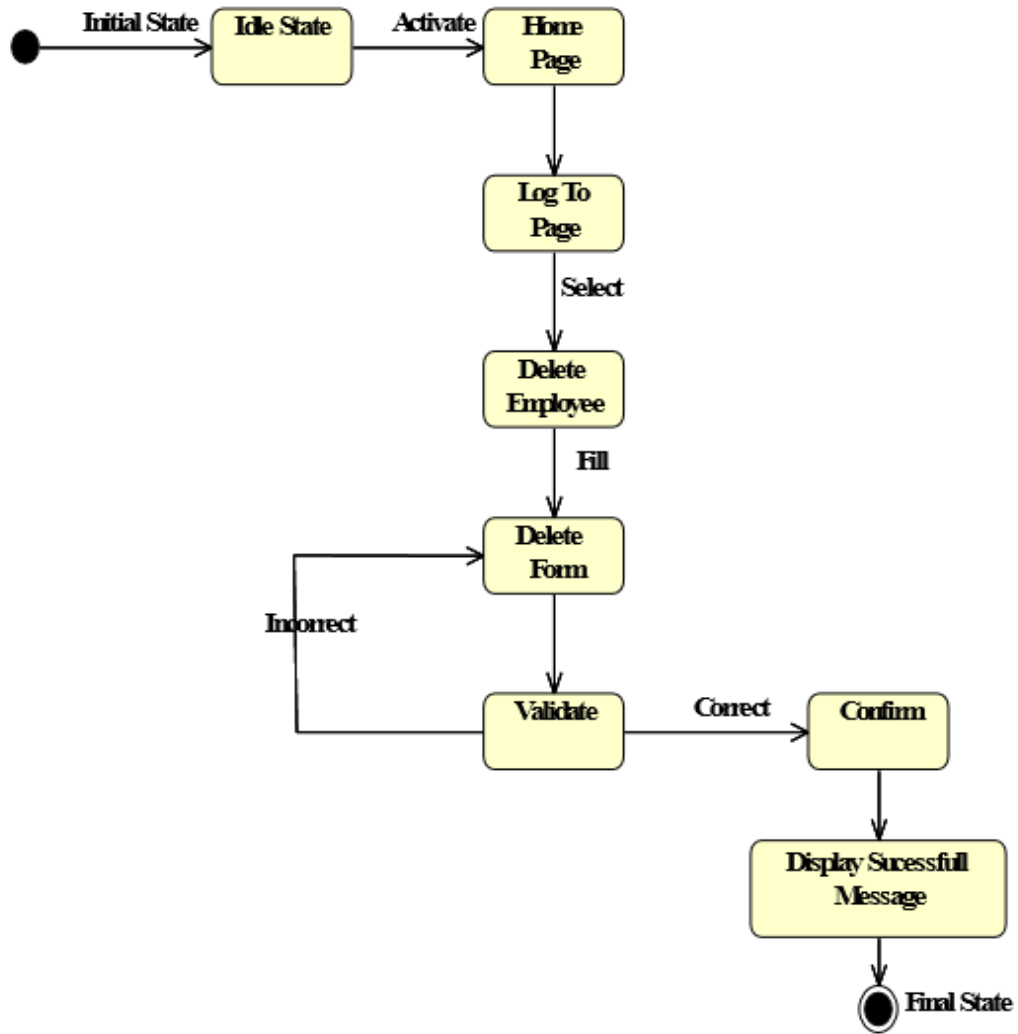Figure 3.7 State chart digram for register drug
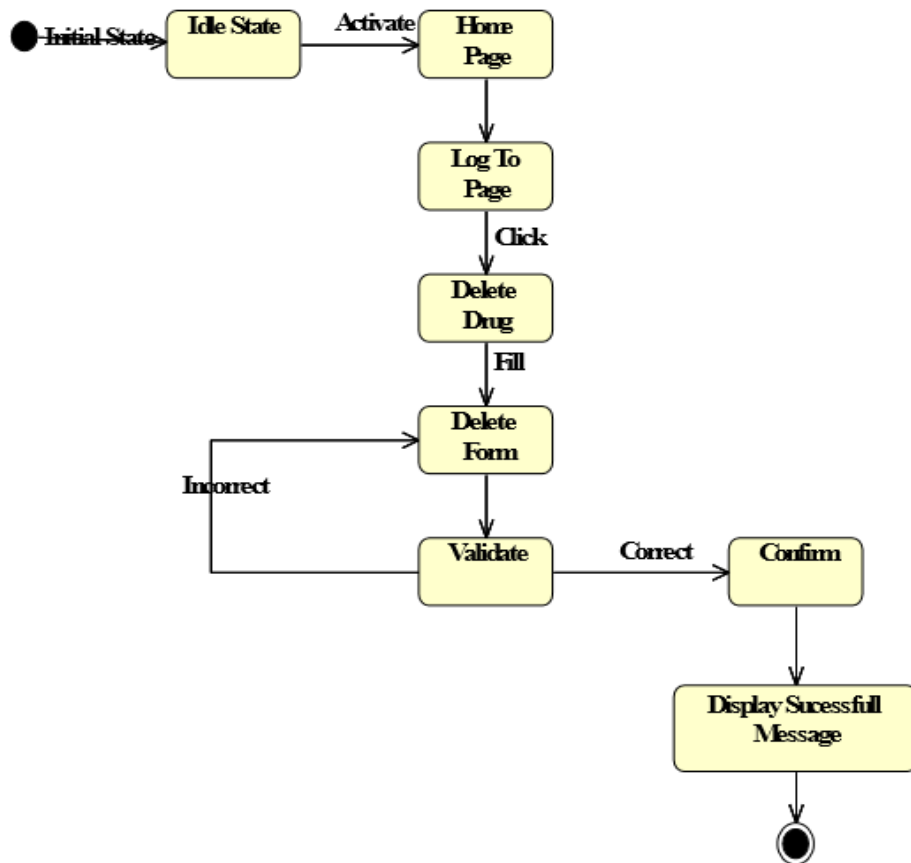
Figure 3.8 State chart diagram for delete employee

Figure 3.9 state chart diagrams for delete drug

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December 2013. Retrieved 7 January 2015.

[2] American Society of Health-System Pharmacists. (2014). ASHP statement on the

Pharmacy technician's role in pharmacy informatics. American Journal of Health-System

Pharmacy, 71(3), 247–50.

[3] S.A Kalkar, **Software Engineering**, 3rd edition, 2007

[4]   Brian Wilkerson, **Object oriented design** 1st edition, 2004

[5] Workers in red cross pharmacy

Appendix
Interview Questions

The main objective of this interview questions is to elicit requirement from red cross pharmacy that will help for the development of a system. The interviewer records the respondents" response using pen, pencil and paper during managing, are there any problems?

1. How drug information management system is going on?
2. During managing, are there any problems?
3. Who is responsible for what?
4. When your organization has been established?
5. How much members are present in your company?
6. Is their work division among those members?
7. How can you differentiate outdated drugs from normal drug?