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2) Project Idea and need

2.1 Project Idea

The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow.

The EHR has the ability to generate a complete record of a clinical patient encounter - as well as supporting other care-related activities directly or indirectly via interface - including evidence-based decision support, quality management, and outcomes reporting. The current system was found to be completely manual faced with numerous problems like duplication, loss of records, huge storage space and time consuming.

This system is fast, convenient in terms of storage, makes it easy to share information and it is user friendly. Health records management is such an important area in health care delivery because without proper records, planning is rendered difficult. Hospitals and other health units base their decisions on records to know which drugs to stock and which services to prioritize. It is important therefore to give due attention to health records management to ensure that right information is available at the right time in the right place.

The aim of this study was build a computerized records management system that would be more effective and efficient than the existing manual system.

This was done by looking at the existing health records management system, analyzing its strong and weak points design and implementation of a new system. Interviews, observation and document reviews were tools used in data collection. MySQL database management systems, Apache server, JAVA scripting language embedded in HTML were used for design. Data flow diagram, relationship diagram and the data dictionary were results of the design and implementation saw different interfaces.

2.2 Project Need

The portal seamlessly connects all stakeholders of the healthcare and provides easy and secured access to health records of the patients. Now Clinics, Hospitals, Diagnostic Centers, Patients, Health Insurance Companies and Employers can have easy but secured access to Health Records. The different areas where we can use this application are:

- Any clinic can make use of it for providing health information about patient.
- It can be used by laboratory to submit health records. The health records can be print, email, and share to other user.

3. Software Requirement Specification

1) Introduction

(a)Background

On average the hospital handles about 300 patients / clients per day. Out of the services provided, and the load of work handled per day, a lot of records are generated which are handled manually. For example the clinical writer keeps a register, the laboratory keeps another, the wards and the theatre also keep theirs. Medical follow up charts are also produced and kept. This registration at different levels usually leads to duplication. Various reports are generated periodically for use at different levels of management. The hospital is required to make weekly disease surveillance reports, hospital monthly reports and annual reports plus any situational reports in case of an outbreak. Production of these reports using manual system is not only difficult but also time consuming. Because all this is done with pen and paper, sharing of these records among the health professionals is usually difficult and time consuming. Health workers spend more time looking for information than they spend on caring for the patients therefore patients have to wait for a long time.

There is a lot of paper work which is kept in the records center. This makes it difficult for clinicians to make right decisions which leads to prescription mistakes or mistreatment. It is the researcher’s considered view that a computerized system that will handle the huge records, quicken the generation of reports, ease the sharing of health information and store the

huge amount of data more efficiently and effectively is needed to replace the current manual system.

(b) Overall Description

The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. The EHR has the ability to generate a complete record of a clinical patient encounter - as well as supporting other care-related activities directly or indirectly via interface - including evidence-based decision support, quality management, and outcomes reporting.

The aim of this study was build a computerized records management system that would be more effective and efficient than the existing manual system.

(1) Product Perspective

The Health Vault System will provide secured access to Health Records by Clinics, Hospitals and Diagnostic Centers to any Stake Holder of Healthcare like other clinics, hospitals, diagnostic centers, patients, health insurance companies and employers with just few mouse clicks. Importantly Activity List keeps log of all happenings on the record.

(2)Product Features

The EHR has the ability to generate a complete record of a clinical patient encounter - as well as supporting other care-related activities directly or indirectly via interface - including evidence-based decision support, quality management, and outcomes reporting.

The current system was found to be completely manual faced with numerous problems like duplication, loss of records, huge storage space and time consuming.

This system is fast, convenient in terms of storage, makes it easy to share information and it is user friendly.

There are two different users who will be using this product:

- Administrator user will have all privileges.
  The features that are available to the Administrator are:
  - Admin can add different users like Doctor, Nurse, Laboratory user, and patient.
  - Can edit any user.
  - Can view all users activity list.

- Doctor of the Clinic who will be accessing the HVS online.
  The features that are available to the Doctor are:
  - A doctor can add health record of the patient.
  - Can edit health record created by itself.
  - Can delete health record created by itself.
  - Can print health record.

- Can email health record.
- Can share health record.
- Can take notes on the health record.
- Can change password.
- Can see activity list of the health record.

- Nurse of the Clinic who will be accessing the HVS online.

  The features that are available to the Nurse are:
  - A nurse can print health record.
  - Can email health record.
  - Can share health record.
  - Can take notes on the health record.
  - Can change password.

- Laboratory user who will be accessing the HVS online.

  The features that are available to the laboratory user are:
  - A laboratory user can add health record of the patient.
  - Can edit health record created by itself.
  - Can delete health record created by itself.
  - Can print health record.
  - Can email health record.
  - Can share health record.
  - Can take notes on the health record.
  - Can change password.
  - Can see activity list of the health record.

- Patient who will be accessing the HVS online.

  The features that are available to the patient are:

  - A patient can add its own health record.
  - Can edit health record created by itself.
  - Can delete health record created by itself.
  - Can print health record.
  - Can email health record.
  - Can share health record.
  - Can take notes on the health record.
  - Can make trusted contact who can have all access of that patient.
  - Can change password.
  - Can see activity list of the health record.

Built for **speed**, **productivity, and usability**

Adapts to the workflow of different providers

Robust functionality

Comprehensive data and interoperability platform

An EHR built for **speed** and **productivity**

In these economically challenging times, the only way to increase practice revenue is to see more patients and to do so more efficiently. SRS Electronic Health Record provides lightning-fast access to information and streamlines workflows, enabling physicians to enhance their productivity dramatically. The uniqueness of SRS derives from its Unified Desktop™, open architecture, and browser-based platform.

Created by **high-performance** specialists

SRS has a 100% successful adoption track record. The SRS Electronic Health Record doesn't slow physicians down, not even a little bit, and not even during implementation. We understand the needs of high-volume physicians.

EHR adapts to providers' workflow

The SRS EHR is easily customizable to meet the disparate data needs and design preferences of individual physicians. Practices can use our software development kit (SDK) to create Clinical Summary Apps or make modifications to connect to other applications.

Robust Functionality

SRS delivers the full range of EHR functionalities and more—all with a focus on physician productivity and office efficiency. Modules include—among others—meaningful use, ePrescribing, data capture, reporting, lab management, order management, and chart access.

2) Goals of Implementation

The main objective of this document is to illustrate the requirements of the project Health Vault System. The document gives the detailed description of the both functional and nonfunctional requirements proposed by the client. The document is developed after a number of consultations with the client and considering the complete requirement specifications of the given Project. The final product of the team will be meeting the requirements of this document.

Diagnostic center not only saves money but also speed-up delivery of test reports.

No need to send reports either through courier or by email, they just need to be connected by HVS (Health Vault System).

c) Environmental Characteristics

(i) Hardware

The System must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system.

Server Side:

Operating System: Windows 9x or above, Windows ME
Processor: Pentium 3.0 GHz or higher
RAM: 256 Mb or more
Hard Drive: 10 GB or more

Client side:

Operating System: Windows 9x or above, MAC or UNIX.
Processor: Pentium III or 2.0 GHz or higher.
RAM: 256 Mb or more

(ii) Peripherals

Software Development Tools & Technologies

- My Eclipse 8.5
- Net beans 6.8 : J2EE (Servlet, JSP, JDBC)
- JDK 1.6
- HIBERNATE 3.1 Framework
- My SQL

All Technologies will be used for this project is open source which makes system economically feasible.

(iii) People

1) Clinic
2) Patient
3) Doctor
4) Laboratory user

3) Functional Requirements

Interface Requirements

This section describes how the software interfaces with other software products or users for input or output.

User Interfaces

It describes how this product interfaces with the user.

GUI

Describes the graphical user interface if present. This section should include a set of screen dumps or mockups to illustrate user interface features.

Description

The user interface must be customizable by the administrator.

1. Criticality

This issue is essential to the overall system. All the modules provided with the software must fit into this graphical user interface and accomplish to the standard defined.

2. Technical issues

In order to satisfy this requirement the design should be simple and all the different interfaces should follow a standard template. There will be the possibility of changing colors and images, plus switching between interfaces with the minimum impact for the users.

3. Risks

To reduce the circumstances under which this requirement might not able to be satisfied, all the designers must have been developed web sites previously and they must be aware of html restriction and cross browsers implementations before starting the designing. In order to reduce the probability of this occurrence the entire design team will be trained in basic html development and macromedia fireworks, this tool will be used instead of Photoshop.

4. Dependencies with other requirements

All user interfaces should be able to interact with the user management module and a part of the interface must be dedicated to the login/logout module

4) Nonfunctional Requirements

4.1 Hardware Interfaces

Server Side:

- Operating System: Windows 9x/xp ,Windows ME
- Processor: Pentium 3.0 GHz or higher
- RAM: 256 Mb or more
- Hard Drive: 10 GB or more

Client side:

- Operating System: Windows 9x or above, MAC or UNIX.
- Processor: Pentium III or 2.0 GHz or higher.
- RAM: 256 Mb or more

4.2 Software Interfaces

- Database: SQL Server.
- Application: ASP (Active Server Pages)
- Web Server: IIS (Internet Information Services (IIS) is a powerful. Web server that provides a highly reliable, manageable, and scalable Web application infrastructure)

4.3 Communications Interfaces

The Customer must connect to the Internet to access the Website:

- Dialup Modem of 52 kbps
- Broadband Internet
- Dialup or Broadband Connection with a Internet Provider.

4.4 Performance Requirements

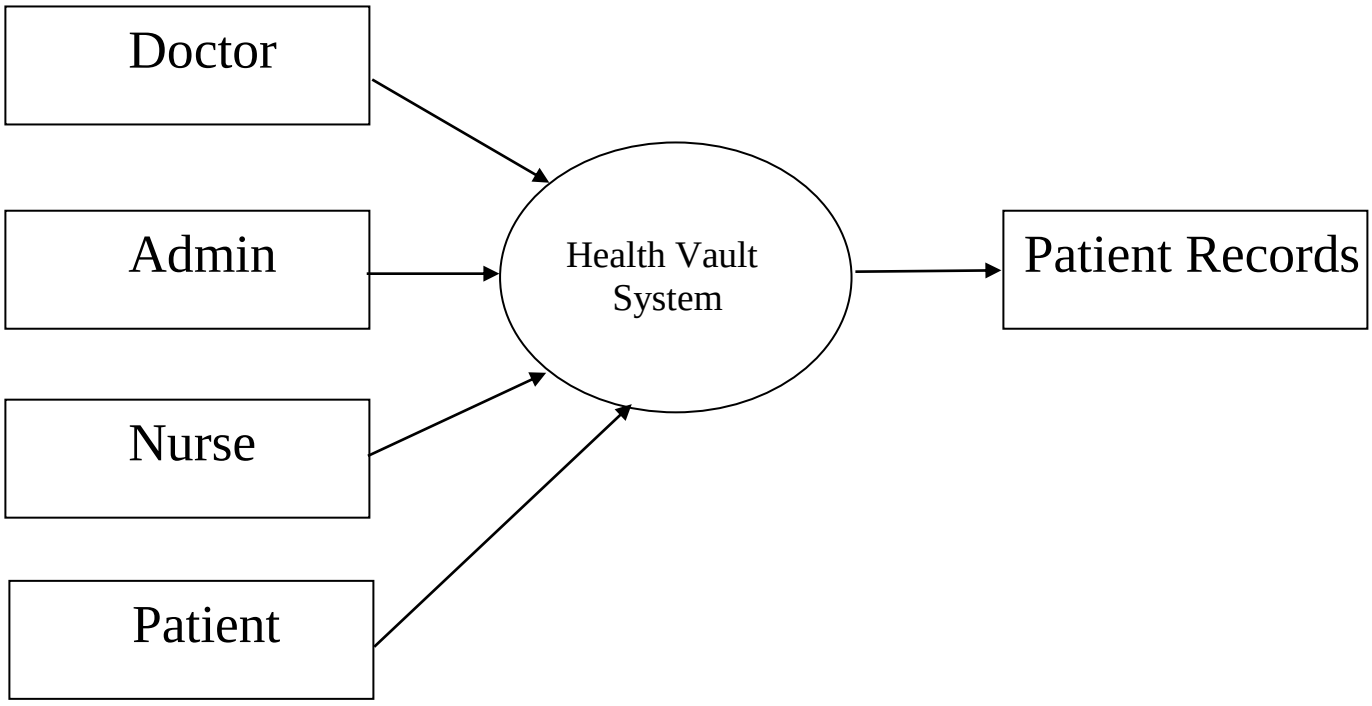
The proposed system that we are going to develop will be used as the Chief performance system within the different clinic which interacts with the patient, clinic, doctor and laboratory. Therefore, it is expected that the database would perform functionally all the requirements that are specified by the Clinic.

4.5 Design Constraints

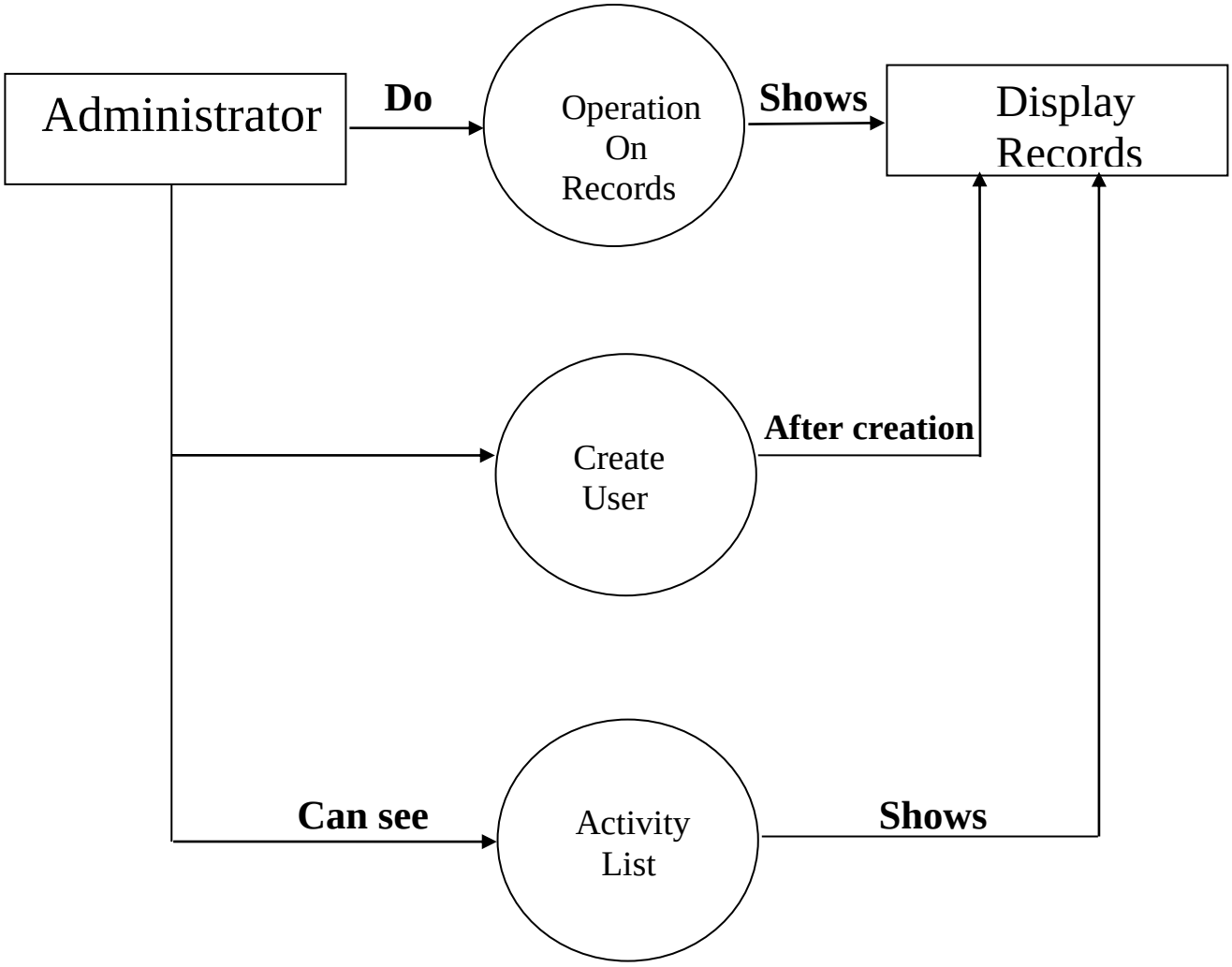
The system must be designed to allow web usability. That is, the system must be designed in such a way that will be easy to use and visible on most of the browsers.

4. Data Flow Diagram

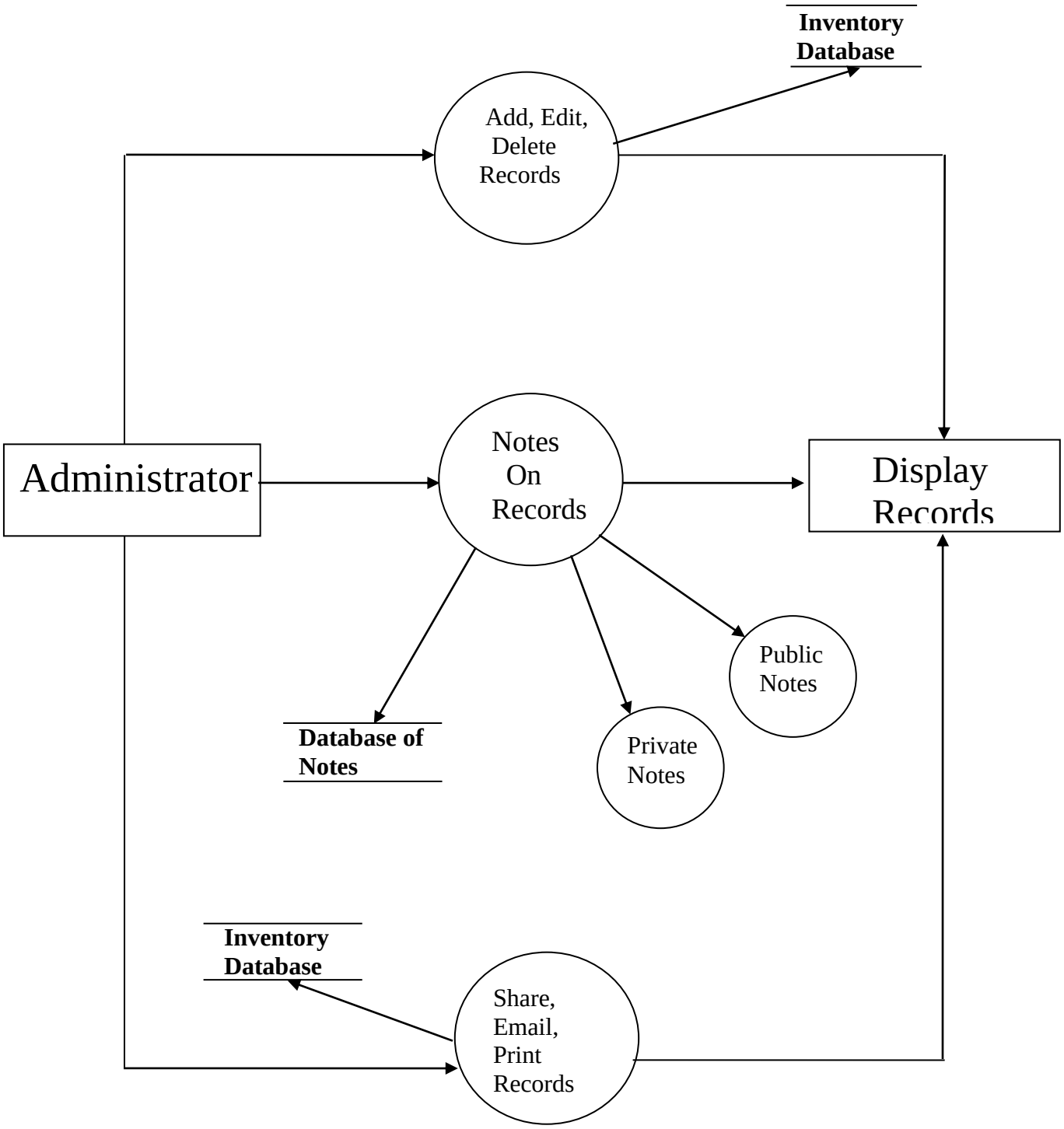
DFD-Level 0



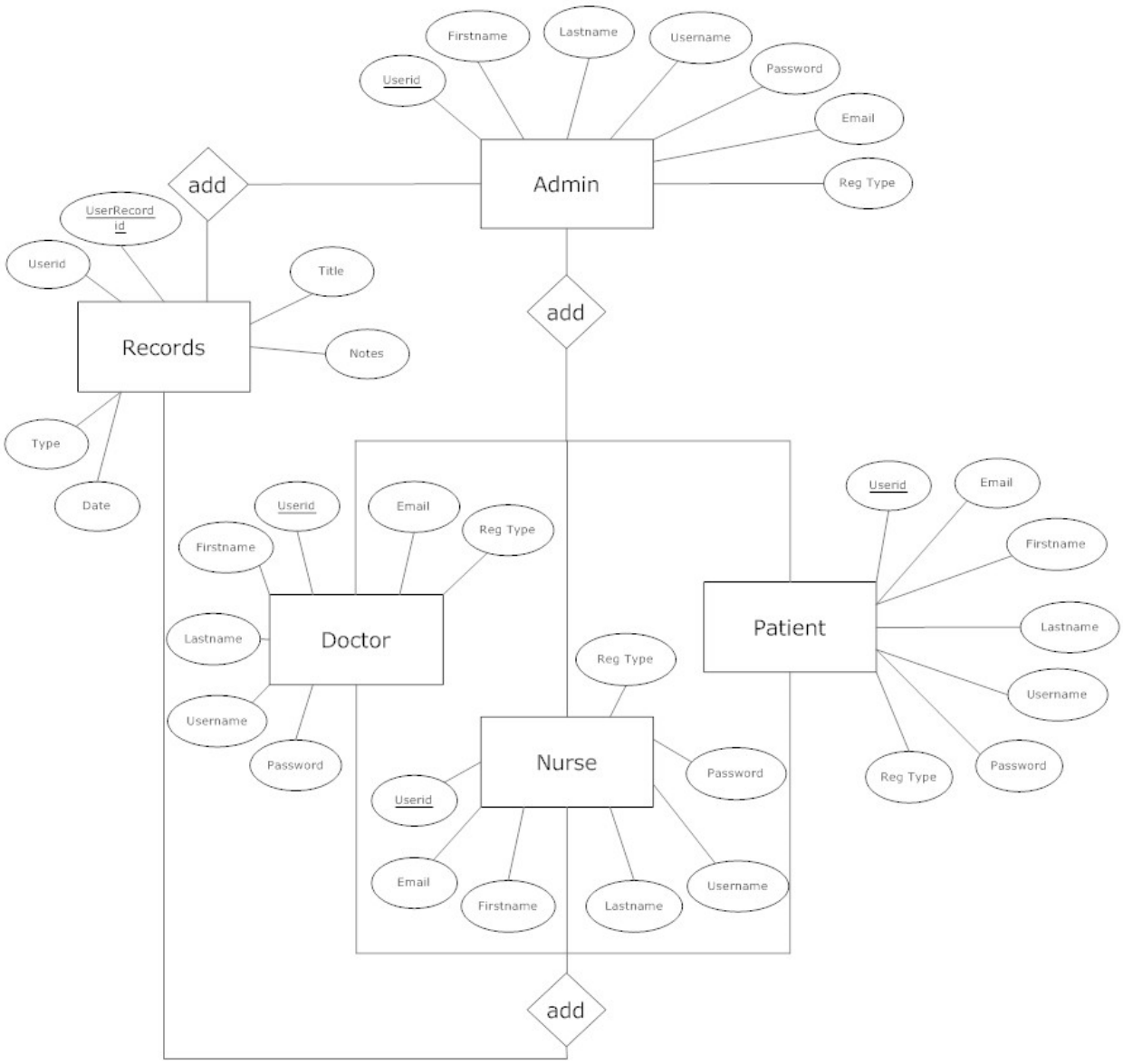
DFD- Level 1


Administrator
Do
Operation On Records
Shows
Display Records
Create User
After creation
Can see
Activity List
Shows

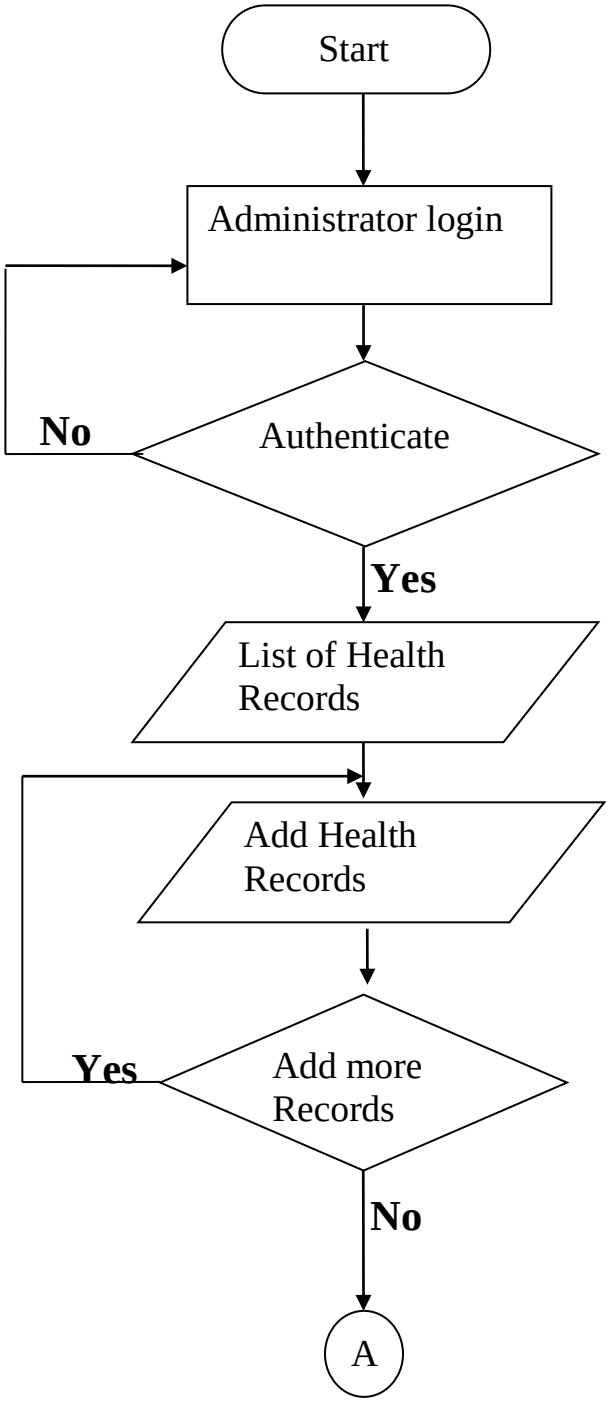
DFD - Level 2


Inventory Database
Add, Edit, Delete Records
Administrator
Notes On Records
Display Records
Public Notes
Database of Notes
Private Notes
Inventory Database
Share, Email, Print Records

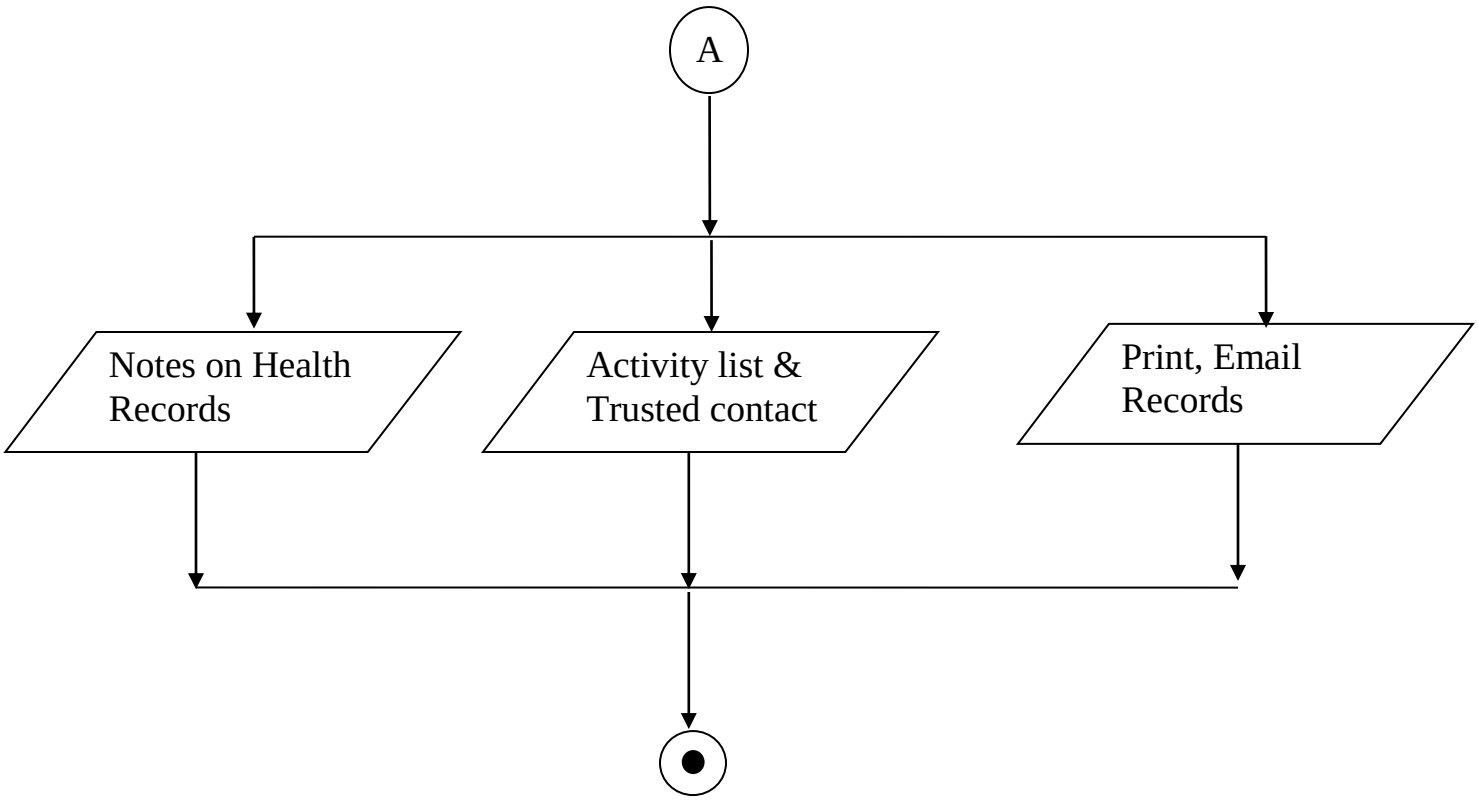
5. ER diagram


Firstname
Lastname
Username
Password
Userid
Email
Reg Type
Admin
add
UserRecord id
Userid
Title
Records
Notes
Type
Date
add
Userid
Email
Reg Type
Firstname
Lastname
Doctor
Username
Password
Reg Type
Nurse
Password
Userid
Email
Firstname
Lastname
Username
Userid
Email
Firstname
Lastname
Patient
Username
Reg Type
Password
add

6. Workflow diagram



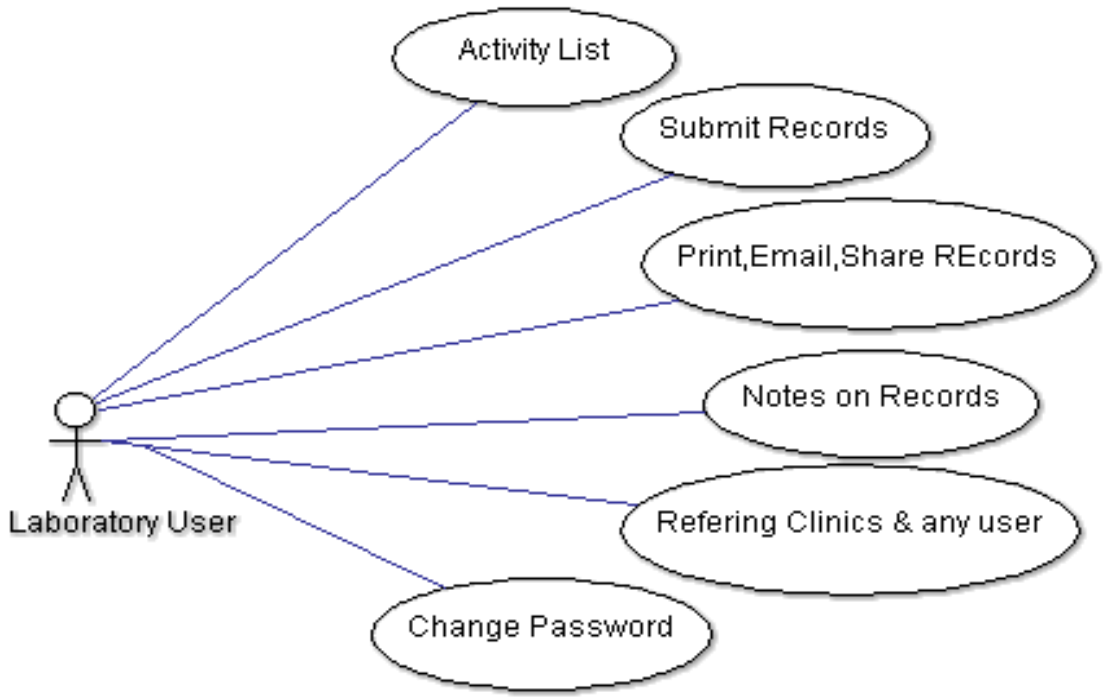
Health Vault System



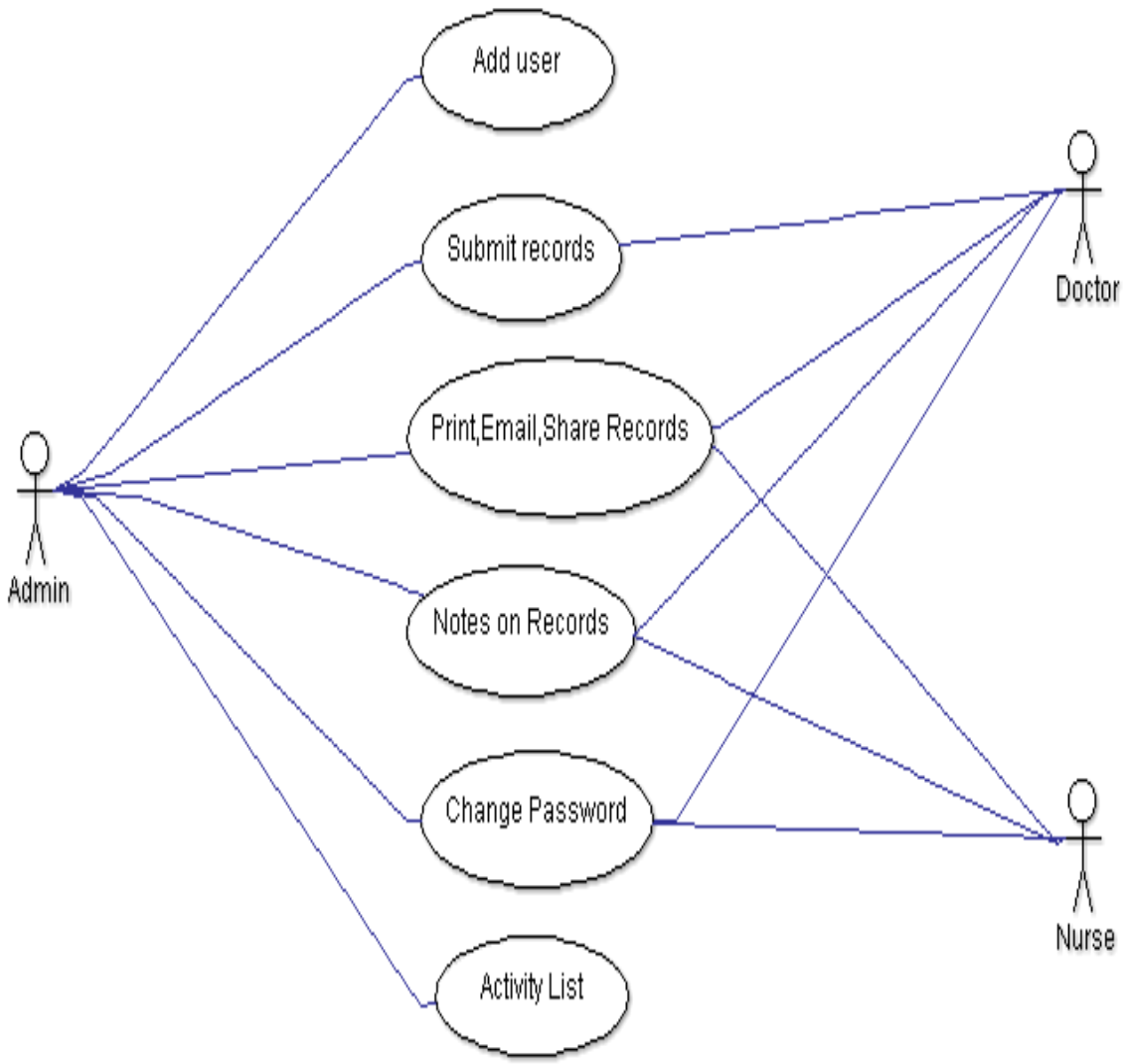
7. UML diagrams

1) Use Case

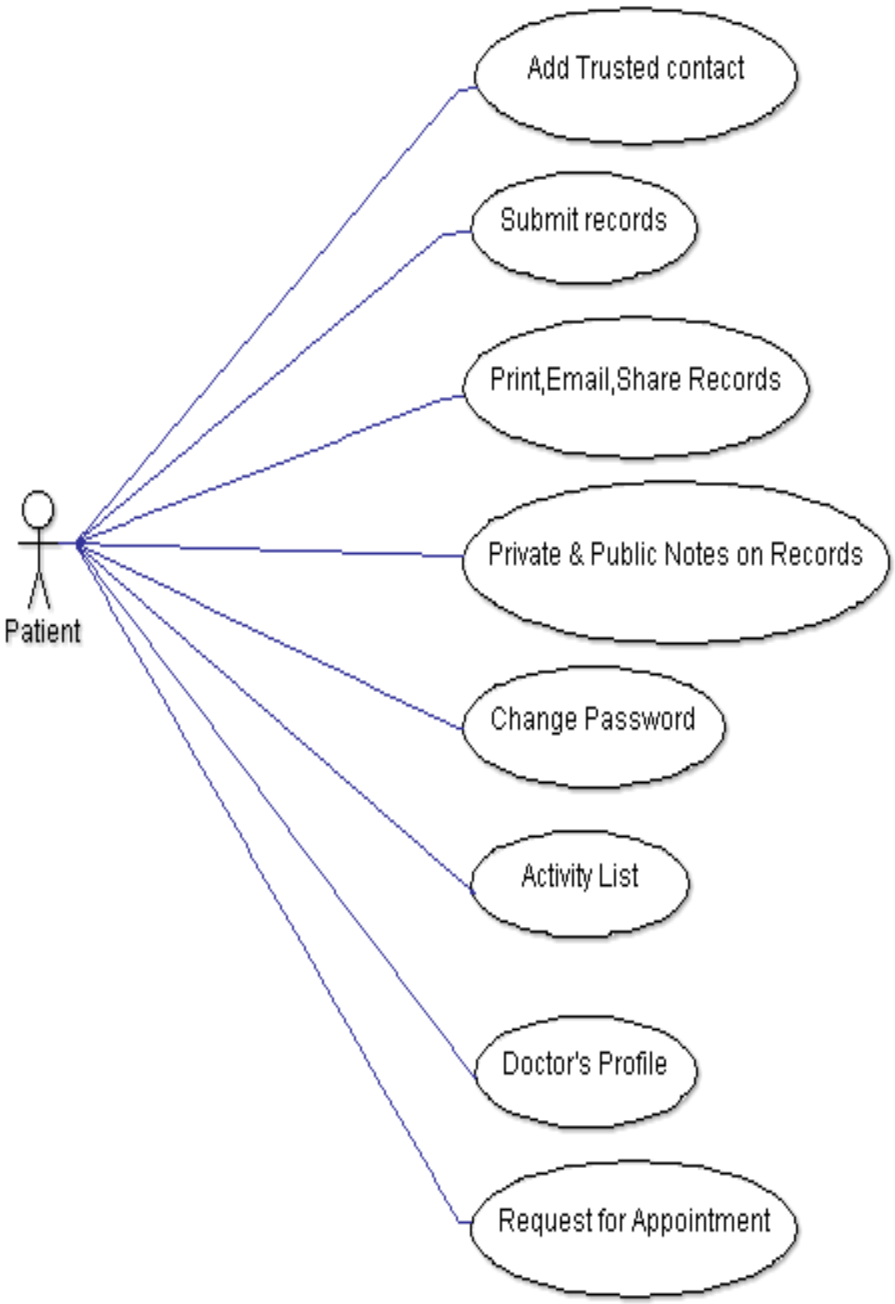
1) Use case diagram of Laboratory user



2) Use case Diagram for Clinic

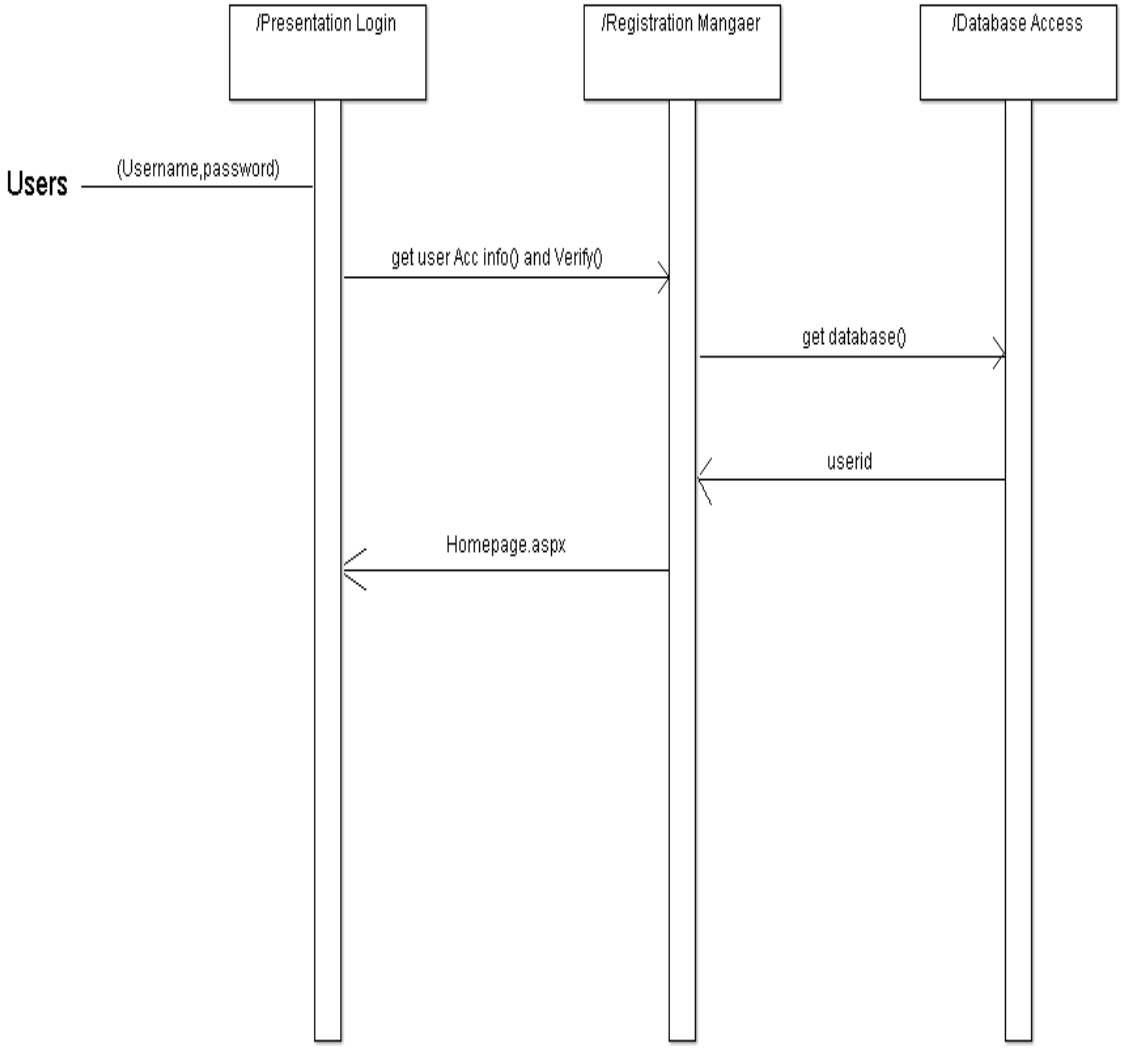


3) Use case Diagram for Patient

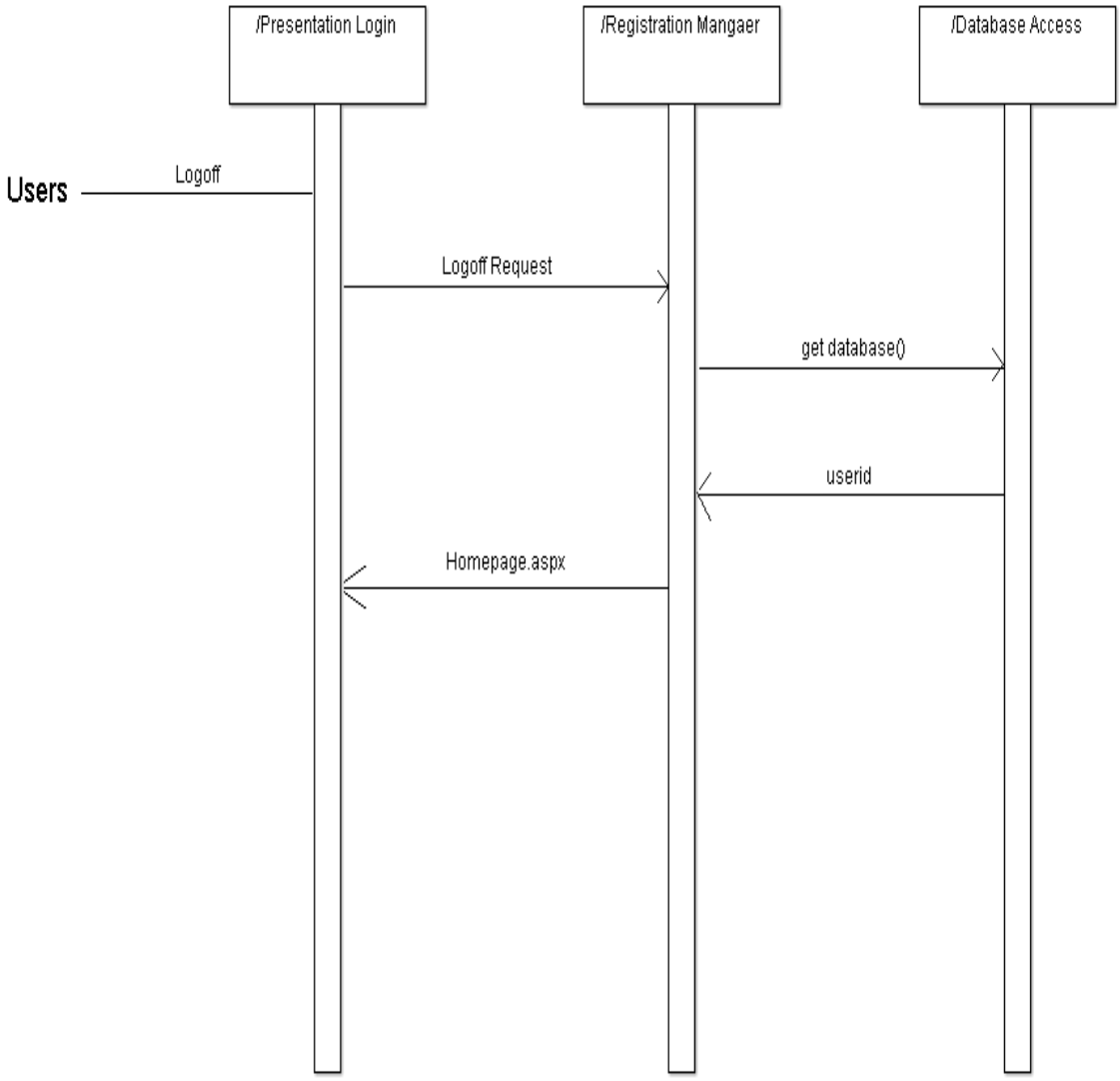


2) Sequence diagram

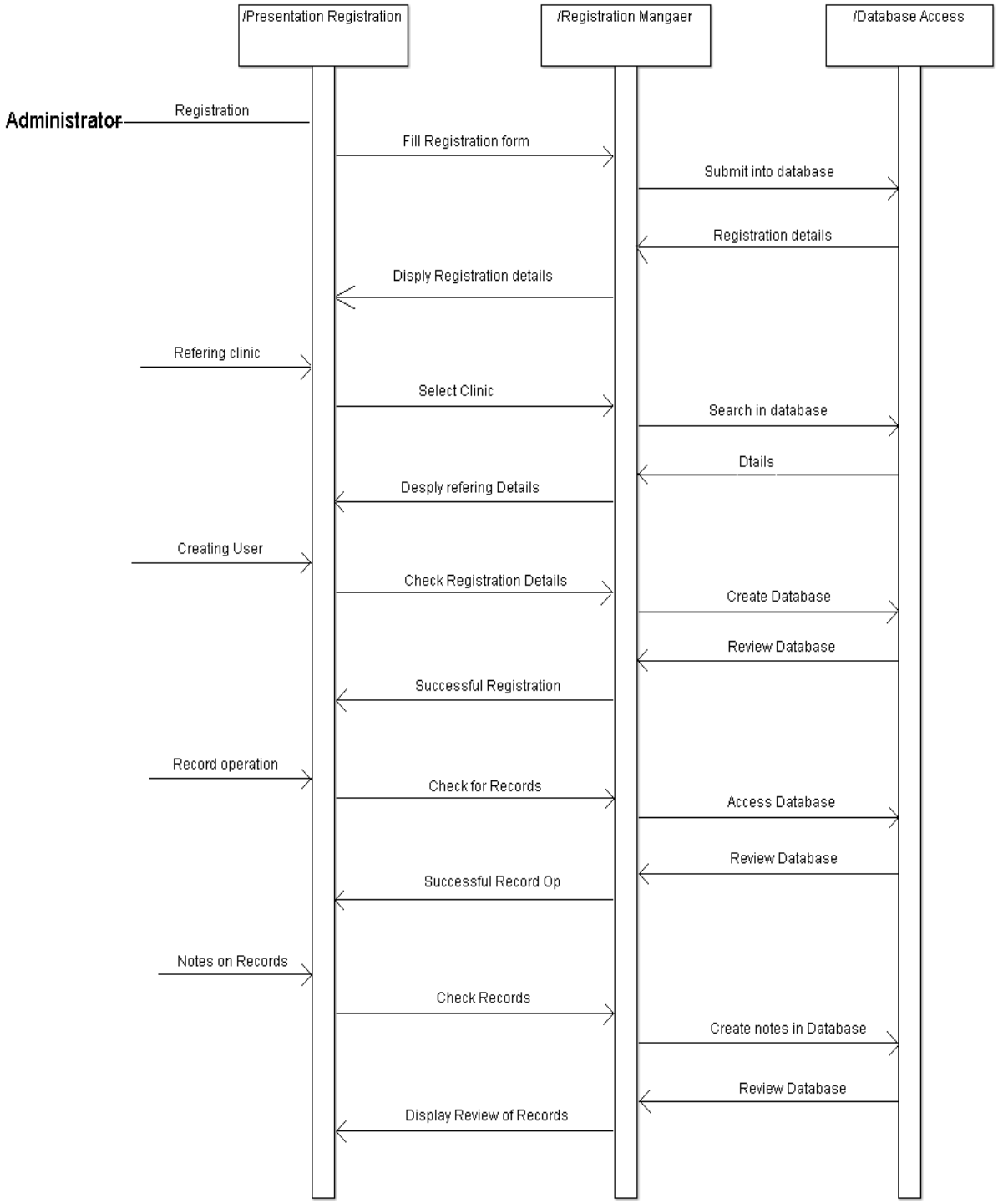
1) Sequence Diagram for Login



2) Sequence Diagram for Logoff

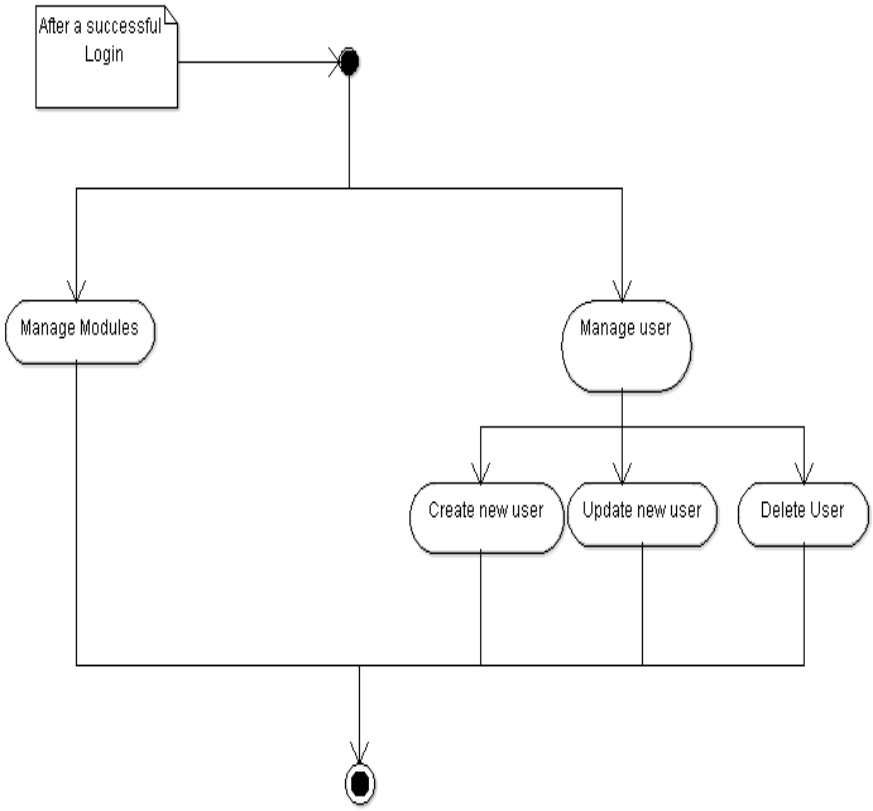


3) Sequence Diagram for Administrator functionality

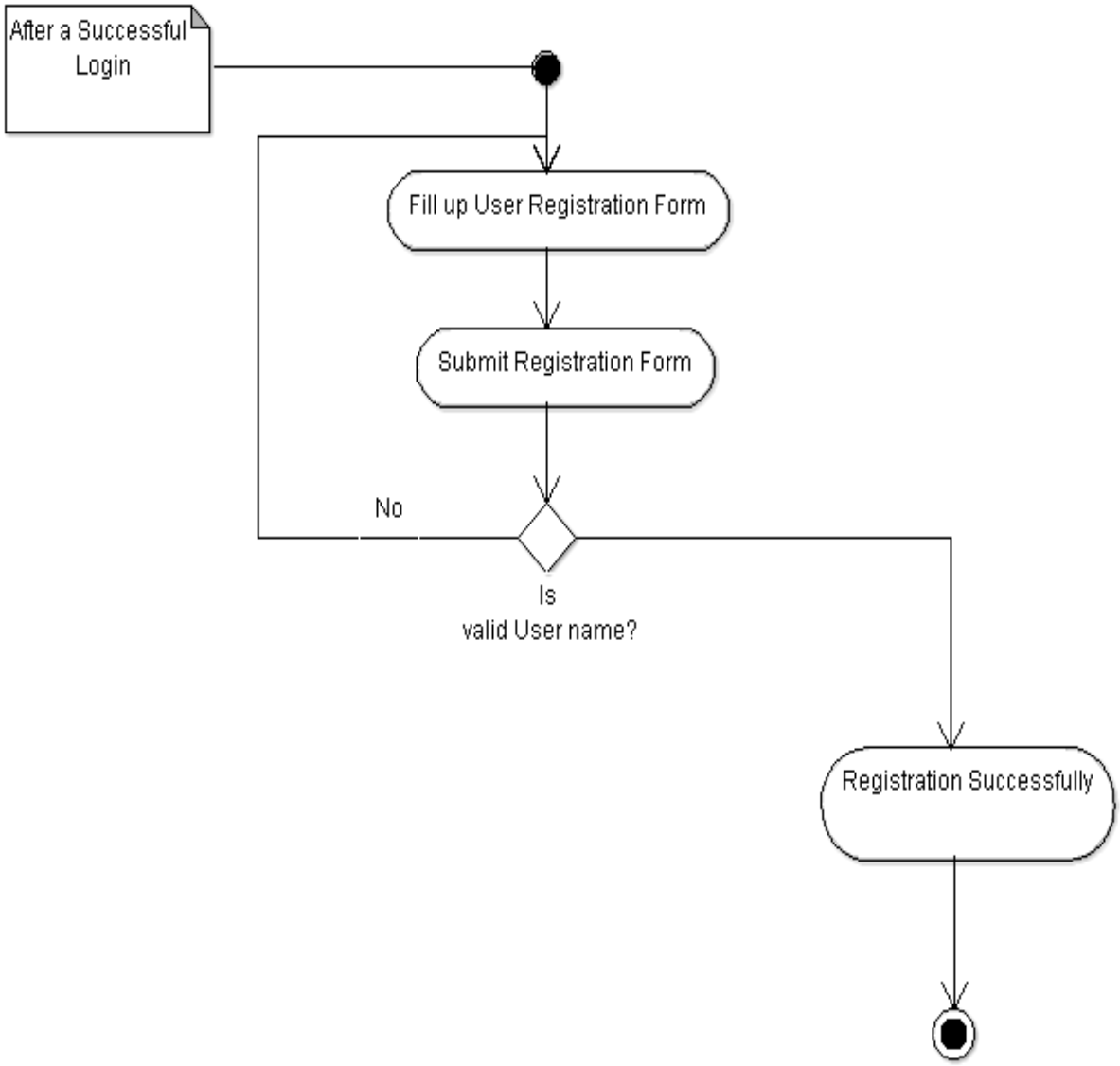


3) Activity Diagram

1) Administrator Activity Diagram



2) Administrator user registration



3)Doctor’s Record Submission