

**SOFTWARE REQUIREMENTS
SPECIFICATION**

Report

for

Hospital Management Project

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Hospital Management

Chapter 1

Introduction

My project Hospital Management system includes registration of patients, storing their disease details into the system. My software has the facility to give a unique id for every patient and stores the details of every patient. The Hospital Management System can be used by entering respective username and password. It is accessible either by an administrator or receptionist. Only the respective person can add data in the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected and data processing is very fast, accurate and relevant.

1.1 Need/Motivation

It can be used in any Hospital, Clinic, Dispensary or Pathology labs for maintaining patient details and their test results.

- The Software is for the automation of Hospital Management.
- It maintains two levels of users:-
 - Administrator Level
 - User Level
- The Software includes:-
 - Maintaining Patient details.
 - Providing Prescription, Precautions and Diet advice.
 - Providing and maintaining all kinds of tests for a patient.
 - Billing and Report generation.

1.1.1 Technologies to be used

This project will be desktop application to be develop in VB6.0 having MsAccess/Php as backend.

- Database Design (Ms Access/Php)
- Form Design (VB)
- Coding (VB)
- Testing (VB)

Chapter 2

Literature Survey

Project is related to Hospital Management System.
The project maintains two levels of users:-

- Administrator Level-Doctor
- User Level-Data Entry Operator

Main facilities available in this project are:-

- Maintaining records of indoor/outdoor patients.
- Maintaining patients diagnosis details, advised tests to be done.
- Providing different test facilities to a doctor for diagnosis of patients.
 - X-Ray
 - Urine Test
 - Stool Test
 - Sonography Test
 - Gastroscopy Test
 - Colonoscopy Test
 - Blood Test & Biochemistry Test

Objectives

- 1. Planned approach towards working:** - The working in the organization will be well planned and organized. The data will be stored properly in data stores, which will help in retrieval of information as well as its storage.
- 2. Accuracy:** - The level of accuracy in the proposed system will be higher. All operation would be done correctly and it ensures that whatever information is coming from the center is accurate.
- 3. Reliability:** - The reliability of the proposed system will be high due to the above stated reasons. The reason for the increased reliability of the system is that now there would be proper storage of information.
- 4. No Redundancy:** - In the proposed system utmost care would be that no information is repeated anywhere, in storage or otherwise. This would assure

economic use of storage space and consistency in the data stored.

5. Immediate retrieval of information: - The main objective of proposed system is to provide for a quick and efficient retrieval of information. Any type of information would be available whenever the user requires.

6. Immediate storage of information: - In manual system there are many problems to store the largest amount of information.

7. Easy to Operate: - The system should be easy to operate and should be such that it can be developed within a short period of time and fit in the limited budget of the user.

Chapter 3

Requirements

3.1 Functional Requirements

- There are a lot of software requirements specifications included in the functional requirements of the e-prescription System, which contains various process, namely Registration and Database.

Registration Process of SRS

- The Hospital enables the staff in the front desk to include new patients to the system.
- The HMS enables the staff in the front desk to provide a unique ID for each patient and then add them to the record sheet of the patient.

Database

- Every patient has some necessary data like phone number, their first and last name, personal health number, postal code, country, address, city, 'patient's ID number, etc.

A Hospital is a place where Patients come up for general diseases. Hospitals provide facilities like:-

- Consultation by Doctors on Diseases.
- Diagnosis for diseases.
- Providing treatment facility.
- Facility for admitting Patients (providing beds, nursing, medicines etc.)
- Immunization for Patients/Children.

Various operational works that are done in a Hospital are:-

- Recording information about the Patients that come.
- Generating bills.
- Recording information related to diagnosis given to Patients.
- Keeping record of the Immunization provided to children/patients.
- Keeping information about various diseases and medicines available to cure them.

3.2 Non-Functional Requirements

- The work is done as follows:-
 - Information about Patients is done by just writing the Patients name, age and gender. Whenever the Patient comes up his information is stored freshly.
 - Bills are generated by recording price for each facility provided to Patient on a separate sheet and at last they all are summed up.
 - Diagnosis information to patients is generally recorded on the document, which contains Patient information. It is destroyed after some time period to decrease the paper load in the office.
 - Immunization records of children are maintained in pre-formatted sheets, which are kept in a file.
 - Information about various diseases is not kept as any document. Doctors themselves do this job by remembering various medicines.
- There are a lot of software requirements specifications included in the non-functional

requirements of the e-Prescription system, which contains various process, namely Security, Performance, Maintainability, and Availability.

3.2.1 Security

- Patient Identification: The system needs the patient to recognize herself or himself using the phone.
- Login ID: Any users who make use of the system need to hold a Login ID and password.
- Modifications: Any modifications like insert, delete, update, etc. for the database can be synchronized quickly and executed only by the ward administrator.
- Administrator rights: The administrator can view as well as alter any information in the e-prescription System.

3.2.2 Performance

- Response Time: The system provides acknowledgment in just one second once the 'patient's information is checked.

- Capacity: The system needs to support at least 1000 people at once.

3.2.3 Maintainability

- Back-Up: The system offers the efficiency for data backup.
- Errors: The system will track every mistake as well as keep a log of it.

3.2.4 Availability

- The system is available all the time.

3.3 Hardware Requirements

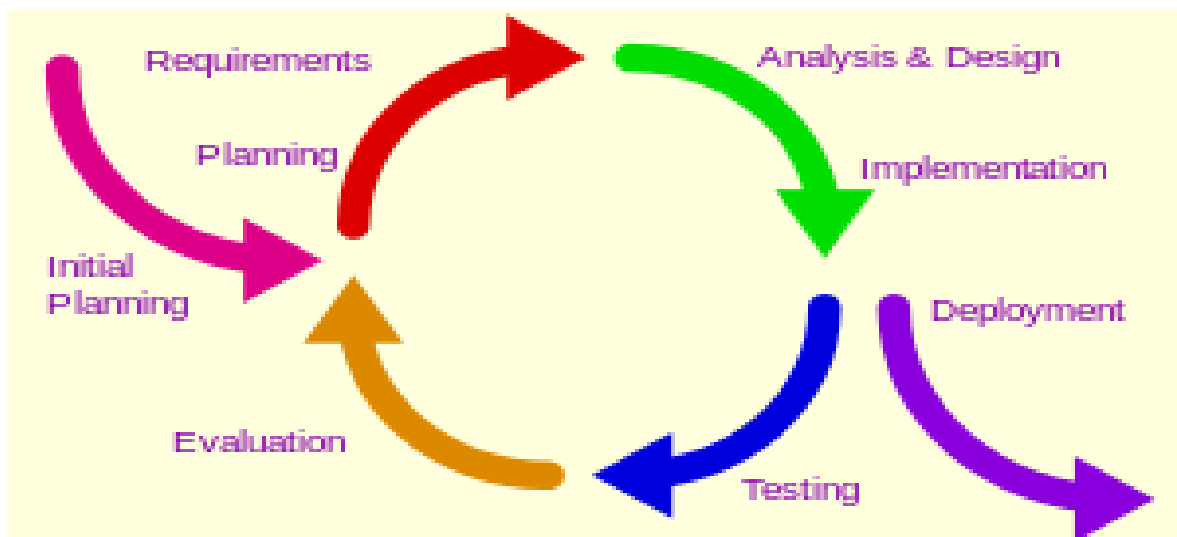
Processor	RAM	Disk Space
Pentium II, Pentium III, Pentium IV or Higher	64 MB or Higher	130

3.4 Software Requirements

Operating System	Database
Win-98, Win-XP, Linux or any other higher version	Ms Access

3.5 Iterative and incremental Model

- This model is developed in response to the shortcoming of waterfall model. It does not start with full specification requirement of a project, rather specify and implement some part of the software one at a time in order to review it at every step along the line to identify any further requirement. These processes have to be done again and again to produce a new requirement & version for the software and as shown in the figure below, the process starts with the initial planning, and then moves further to the real planning stage before the requirement stage.



- Iterations models follows the phases listed below:
 - Inception: In this phase, the scope of the project, requirements for functional and nonfunctional parts included.
 - Elaboration: Complete detailed assessment of the project which includes risk assessment
 - Construction: This phase is the most important and delicate part of the project because at This stage, the architectural part with the already written code from the analysis, designs, implementation and testing are incrementally inscribed into the project.
 - Transition: The last phase of the project is the point where the system is facilitated with the operation environment.

3.6 Feasibility Study

The prime focus of the feasibility is evaluating the practicality of the proposed system keeping in mind a number of factors. The following factors are taken into account before deciding in favor of the new system.

3.6.1 Economic Feasibility

- Economic justification is generally the “Bottom Line” consideration for most systems.
- Economic justification includes a broad range of concerns that includes cost benefit analysis.
- In this we weight the cost and the benefits associated with the candidate system and if it suits the basic purpose of the organization i.e. profit making, the project is making to the analysis and design phase.

3.6.2 Operational Feasibility

- It is mainly related to human organizations and political aspects. The points to be considered are:
- What changes will be brought with the system?
- What organization structures are disturbed?
- What new skills will be required? Do the existing staff members have these skills? If not, can they be trained in due course of time?
- The system is operationally feasible as it very easy for the End users to operate it. It only needs basic information about Windows platform.

3.6.3 Schedule Feasibility

- Time evaluation is the most important consideration in the development of project.
- The time schedule required for the developed of this project is very important since more development time effect machine time, cost and cause delay in the development of other systems.
- A reliable Hospital Management System can be developed in the considerable amount of time.

Chapter 4

System Architecture

4.1 Client-Server Architecture

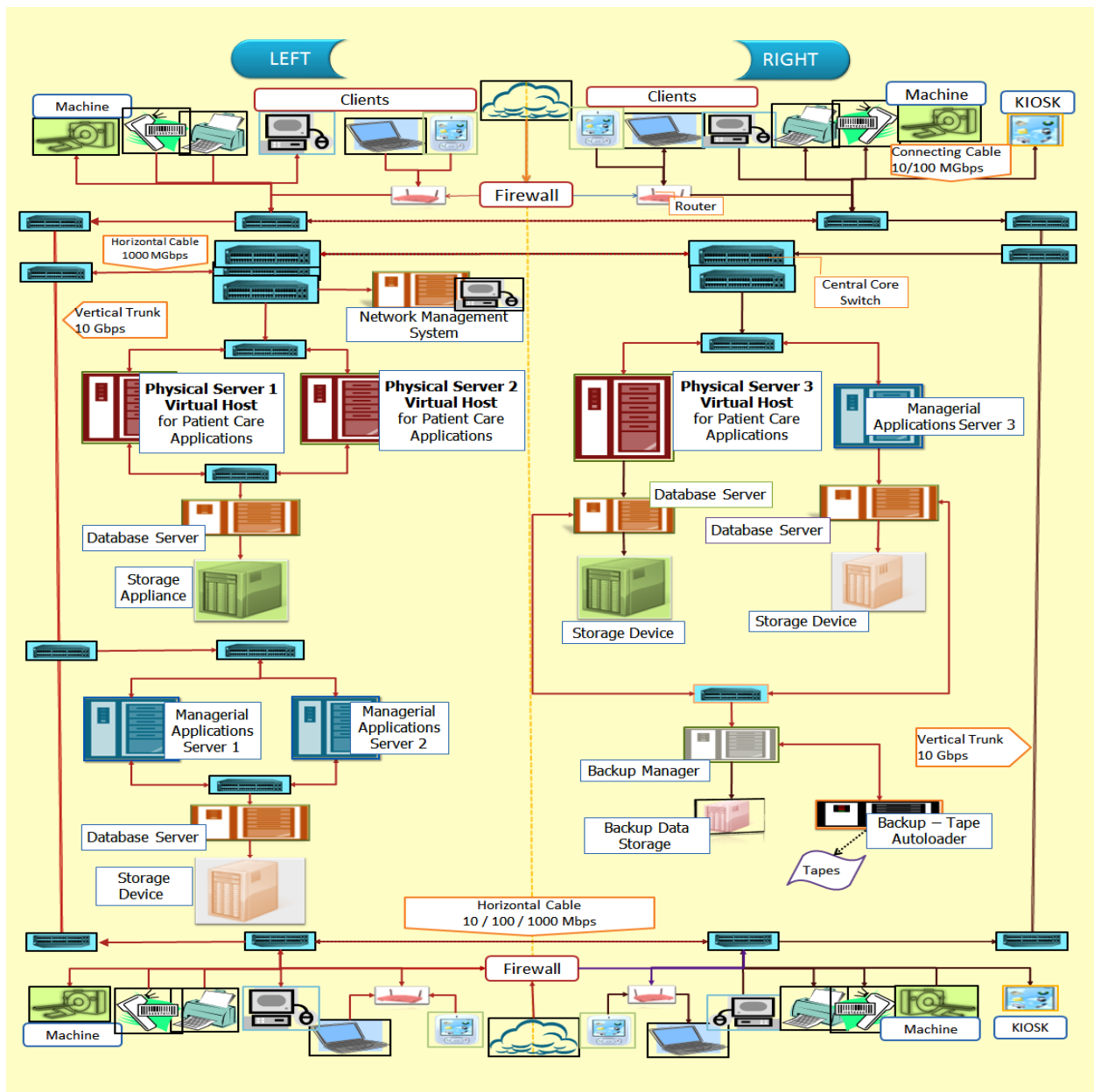


Fig.4.1 Client-Server Architecture

The information system for a single hospital is best built around a Multi-tiered Client-Server Local Area Network (LAN) architecture. By this, it is meant that users enter and retrieve data using clients i.e. computers with display monitors and data input devices such as keyboard and mouse, obtain various applications software from the Application server and store the data via the Storage server into Storage devices (hard disks). All the tiers are linked through a network consisting of cables joined by switches and routers. Part of the network can also be wireless.

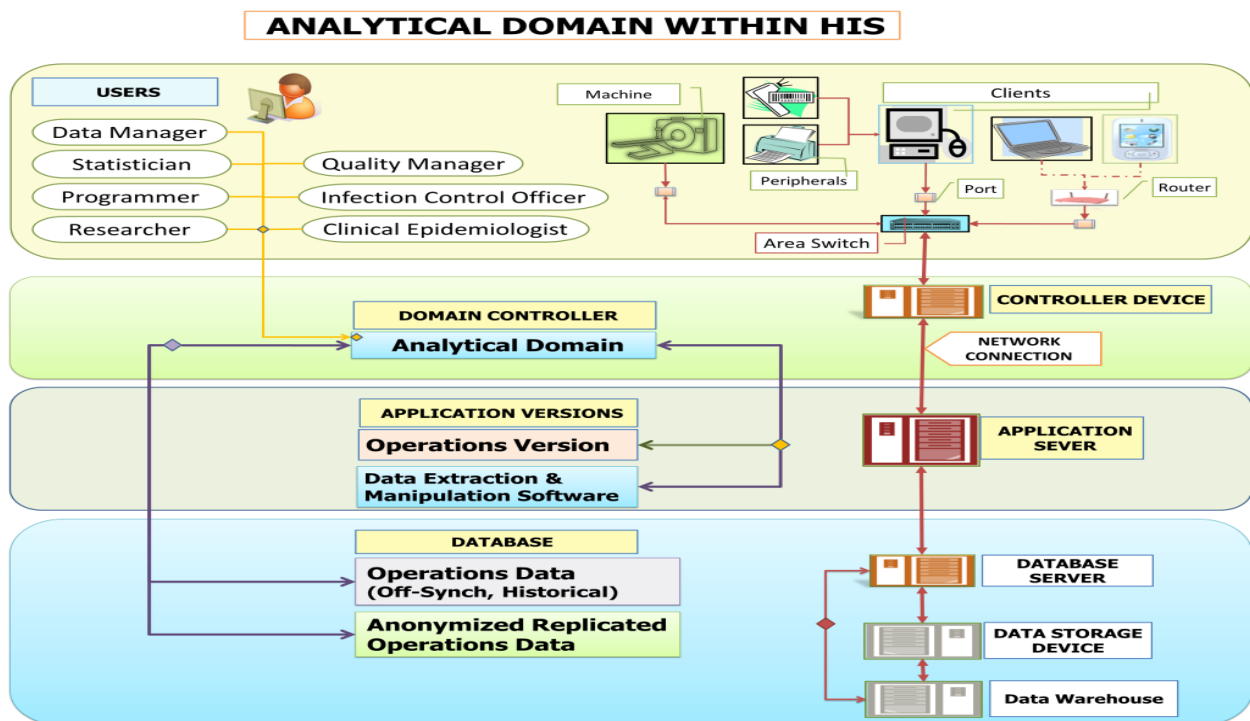


Fig.4.2 System Architecture of HMS

A domain is created strictly for IT management purposes. No access is given to HIS patient data. Access to sensitive information such as configurations of different devices in (servers, applications, network devices, storage devices), access credentials, SNMP settings and Access control list will be strictly controlled using suite of Network Management System consisting of Network Configuration Manager, Storage Manager, Virtualization Manager etc. (e.g. Solar Winds or Manage Engine). Privilege will be segregated based on job category and individual person. System Administrator staff Roles, Permissions, and Activity Tracking available in the same application will be used to protect against unauthorized network configuration changes and ensures compliance with regulations, such as HIPAA and PCI with our change management software. Authentication of administrators and users will be collected from a domain which is strictly used for IT purposes.

Chapter 5

DESIGN AND IMPLEMENTATION

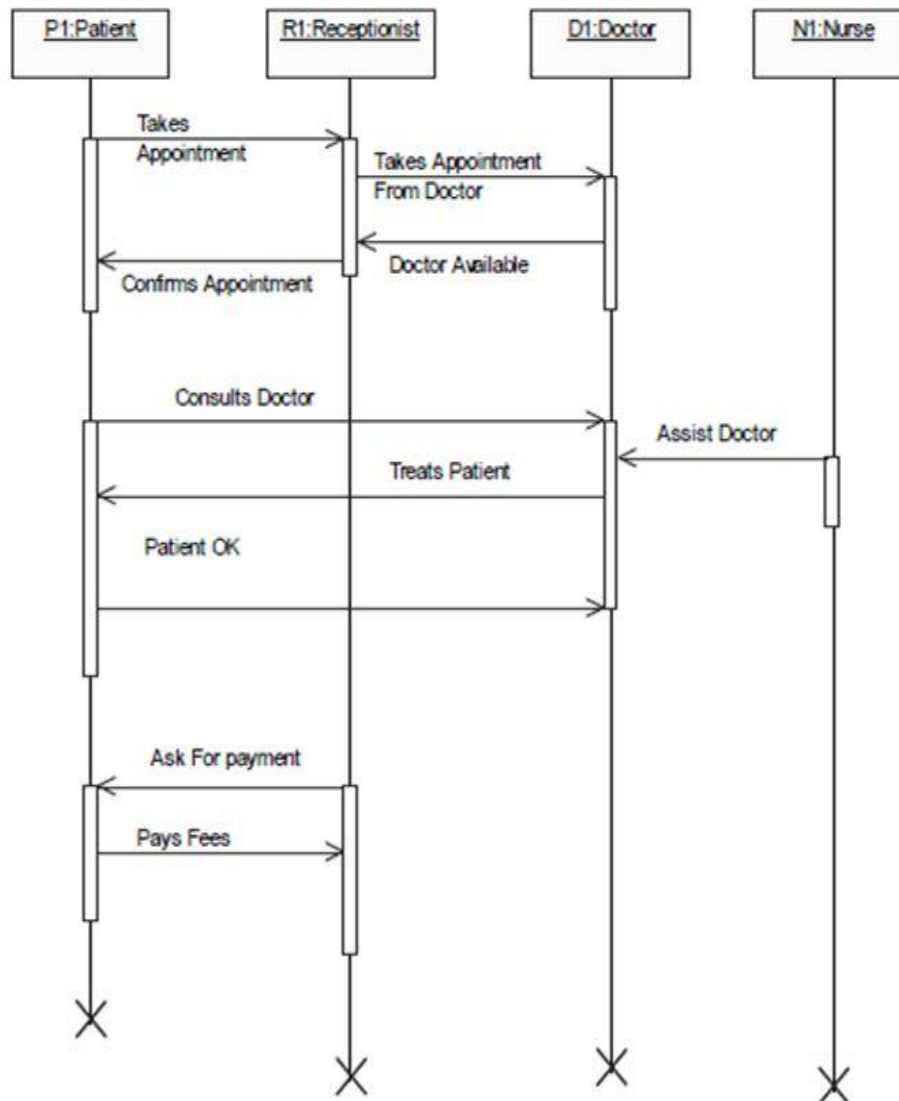
5.1 Product Features

Another alternative solution can be used of computer based batch system for maintaining the information regarding purchase details, customers and employees. A batch system refers to a system in which data is processed in a periodical basis. The batch system is able to achieve most of the goals and sub goals. But a batch system data is processed in sequential basis. Therefore batch system is not suggested.

Online System:-This system (HMS) provides online storage/ updations and retrieval facility. This system promises very less or no paper work and also provides help to Doctor and operational staff. In this system everything is stored electronically so very less amount of paper work is required and information can be retrieved very easily without searching here

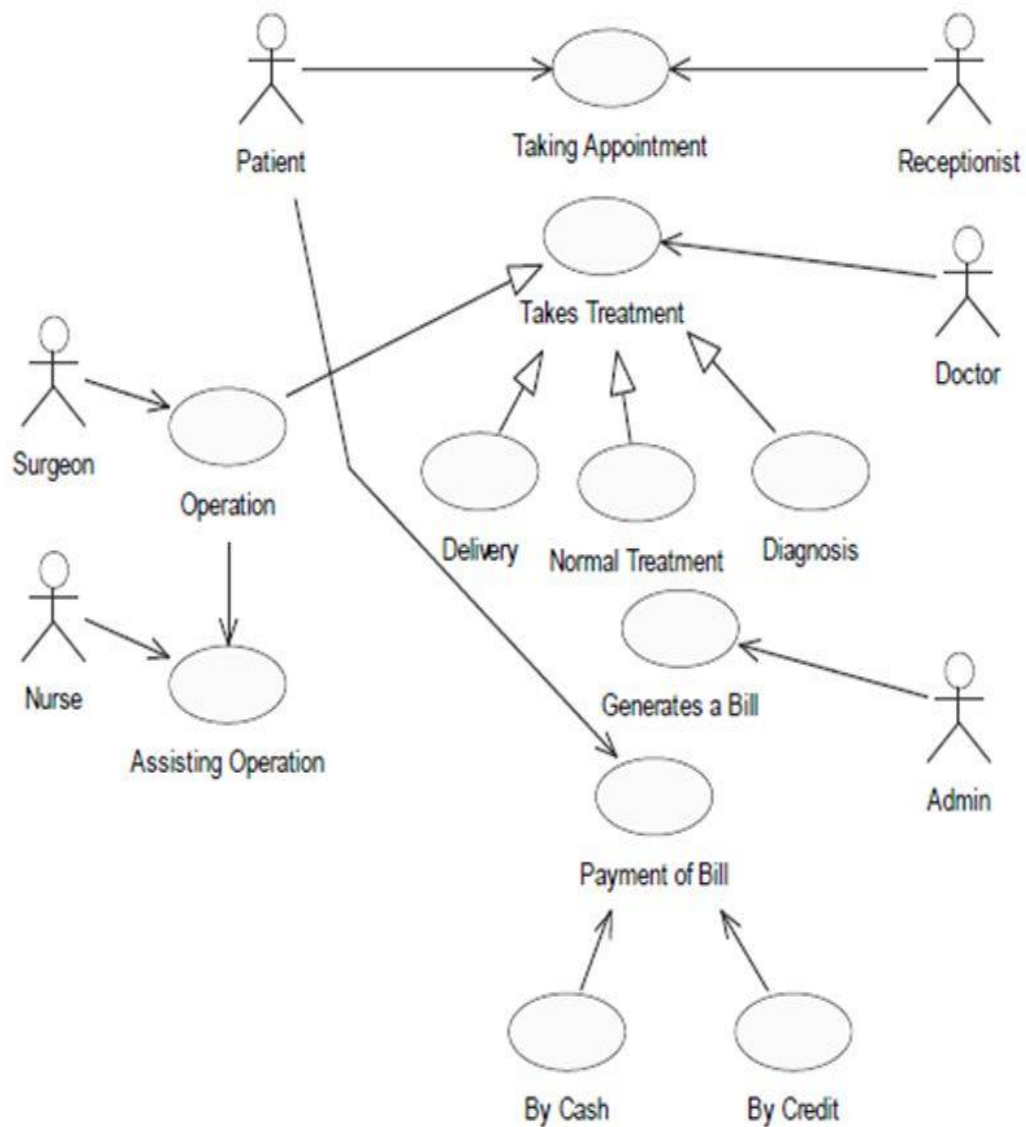
and there into registers. This system is been discussed here.

5.2 Sequence Diagram Design



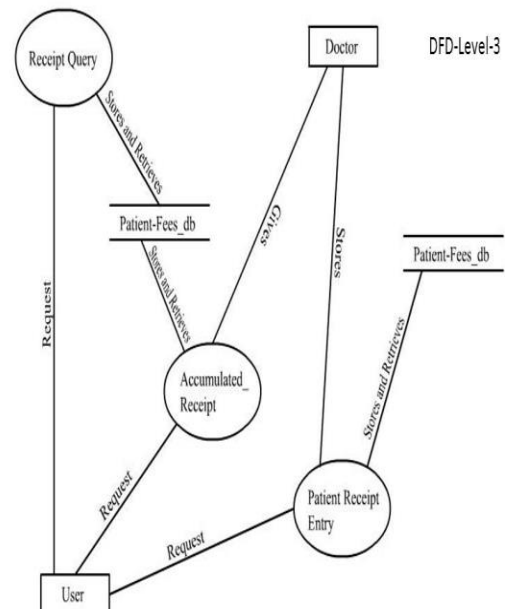
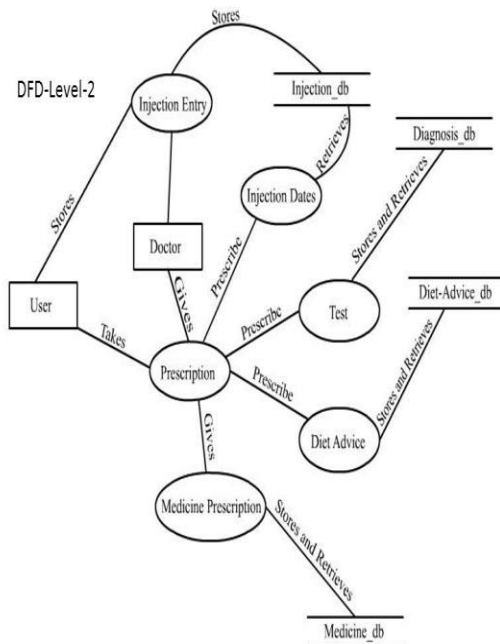
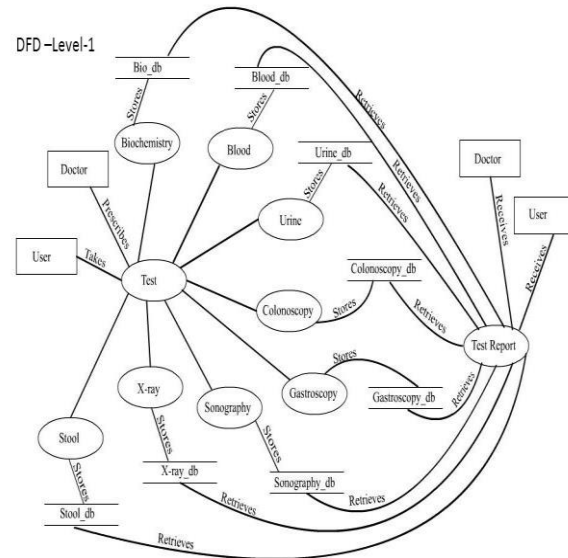
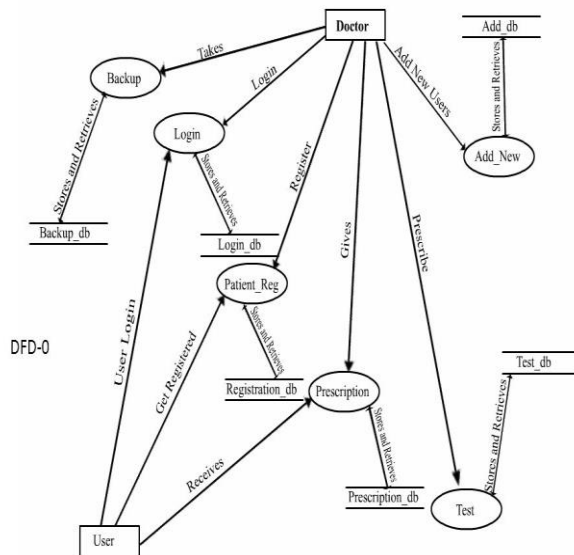
Sequence Diagram

5.3 Use-Case Diagram Design

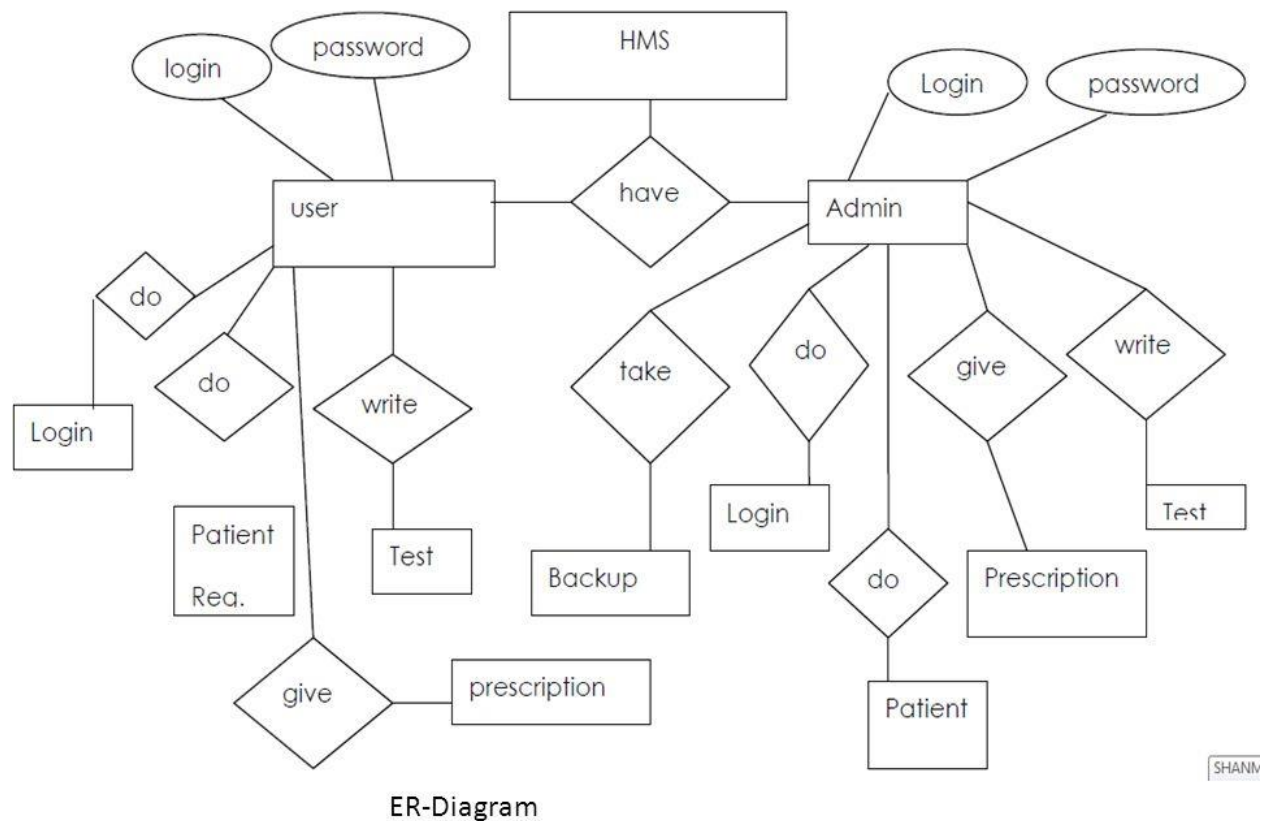


Use -Case Diagram

5.4 DFD-Level Design



5.5 E-R Diagram Design



5.5.1 Normalization

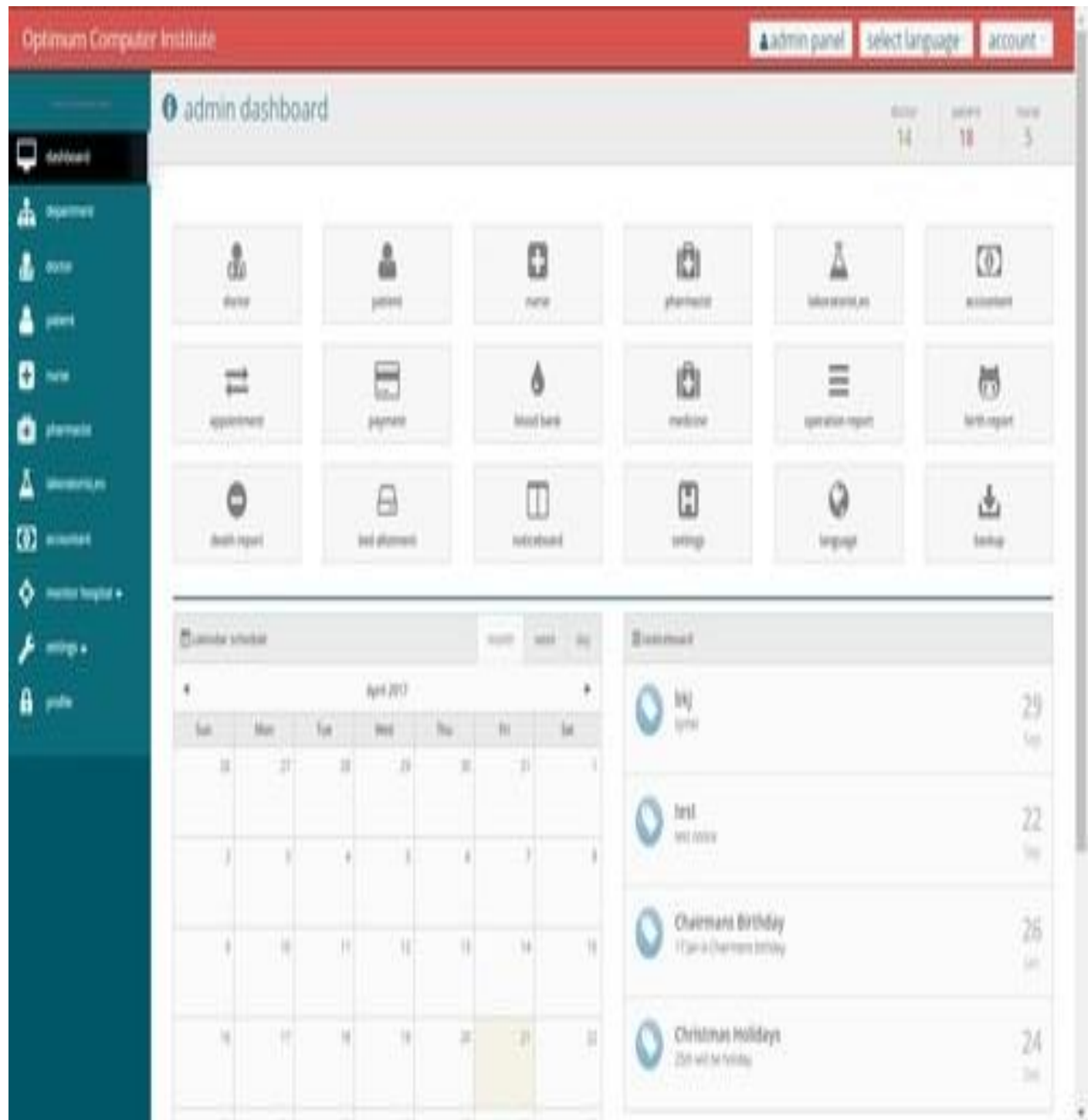
- The basic objective of normalization is to be reduce redundancy which means that information is to be stored only once. Storing information several times leads to wastage of storage space and increase in the total size of the data stored.

- If a Database is not properly designed it can give rise to modification anomalies. Modification anomalies arise when data is added to, changed or deleted from a database table. Similarly, in traditional databases as well as improperly designed relational databases, data redundancy can be a problem. These can be eliminated by normalizing a database.

- Normalization is the process of breaking down a table into smaller tables. So that each table deals with a single theme. There are three different kinds of modifications of anomalies and formulated the first, second and third normal forms (3NF) is considered sufficient for most practical purposes. It should be considered only after a thorough analysis and complete understanding of its implications. Here We have Normalized up to 3NF.

Chapter 6

SNAPSHOT



Chapter 7

TESTING AND RESULT

The reason behind testing was to find errors. Every program or software has errors in it, against The common view that there are no errors in it if the program or software is working. Executing the programs with the intention of finding the errors in it is therefore testing; hence a successful test is one which finds errors. Testing is an activity, however it is restricted to being performed after the development phase is complete, but is carried parallel with all stages of system development, starting with requirement specification. Test cases were devised with purpose in mind. A test case is a set of the data that a system will process as normal input. The software units developed in the system are modules and routines that are assembled and integrated to perform the required function of the system. Test results once gathered and evaluated, provide a qualitative indication of the software quality and reliability and serve as basis for design

modification if required. In this phase testing is done at different levels. Actually testing phase of the implementations works accurately and efficiently before live operation commences.

7.1 Unit Testing

The unit testing was done after the coding phase was done. The purpose of the unit testing was to locate errors on the module, independent of the other modules. Some changes in the coding were done during the testing. Finally all the modules were individually tested from bottom up starting with smallest and lowest modules and proceeding one at a time.

7.2 Black Box Testing

This method of software testing tests the functionality of an application as opposed to its internal structures or working (i.e. white box testing). Specific knowledge of the application's

code/internal structure and programming knowledge in general is not required. Test cases are built around specifications and requirements, i.e., what the application is supposed to do. It uses external descriptions of the software, including specifications, requirements, and design to derive test cases. These tests can be functional or non-functional, though usually functional. The test designer selects valid and invalid inputs and determines the correct output. There is no knowledge of the test object's internal structure.

7.3 White Box Testing

This method of software testing tests internal structures or workings of an application, as opposed to its functionality (i.e. black-box testing). In white-box testing an internal perspective of the system, as well as programming skills, are required and used to design test cases. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs.

7.4 Integration Testing

Once the unit was over, all the modules were integrated for integration testing. External and internal interfaces are implemented and work as per design, the performance of the module is not degraded.

7.5 Validation Testing

At the culmination of integration testing, software is said to be completely assembled as a package; interfacing errors have been uncovered and corrected. Then as a final series of software test, validation tests were carried out.

7.6 Acceptance Testing

This is the final stage in the testing process before the system is accepted for operational use. Any requirement problem or requirement definition problem revealed from acceptance testing are considered and made error free.

Chapter 8

CONCLUSION

Taking into account all the mentioned details, we can make the conclusion that the hospital management system is the inevitable part of the lifecycle of the modern medical institution. It automates numerous daily operations and enables smooth interactions of the users. Developing the hospital system software is a great opportunity to create the distinct, efficient and fast delivering healthcare model. Implementation of hospital management system project helps to store all the kinds of records, provide coordination and user communication, implement policies, improve day-to-day operations, arrange the supply chain, manage financial and human resources, and market hospital services. This beneficial decision covers the needs of the patients, staff and hospital authorities and simplifies their interactions. It has become the usual approach to manage the hospital.

Books & References

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