A

Minor Project (Stage-1) Report

on

ANALYSIS ON MEDICINES AND DOCTOR'S AVAILABILITY IN HOSPITAL

Submitted in Partial Fulfillment of
the Requirements for the Third Year
of

Bachelor of Engineering

in

Computer Engineering

to

**Kavayitri Bahinabai Chaudhari
North Maharashtra University, Jalgaon**

Submitted by

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2019 - 2020

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CERTIFICATE

This is to certify that the minor project (stage-1) entitled *Analysis on Medicines and Doctor's Availability in Hospital*, submitted by

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in partial fulfillment of the Third Year of *Bachelor of Engineering* in *Computer Engineering* has been satisfactorily carried out under my guidance as per the requirement of North Maharashtra University, Jalgaon.

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Place: Jalgaon

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Acknowledgements

We would like to express our deep gratitude and sincere thanks to all who helped us to complete this Minor project successfully. We would like to thanks Our principal Prof. Dr. K. S. Wani and vice principal Dr. S. P. Shekhawat SSBT COET for having provided us with facilities to complete our Minor Project work. Our deep gratitude goes to Prof. Dr. G. K. Patnaik, Head of the Department, for granting us opportunity to conduct this Minor Project work. we are also sincerely thankful to Mr. Nitin Y. Suryawanshi, Minor Project guide,for his valuable suggestions and guidance at the time of need. We are sincerely thankful to Mrs.Yogeshwari Borse, Incharge of Minor Project and Great thanks to our friends, our Project associates and all those who helped directly or indirectly for completion of this Minor Project. Last but not least thankful to our Parents and Almighty.

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Abstract

In current situation, Software is being used in any firm of business. As software is also being used in hospital management system for better efficiency and it fulfilling its aim. But only keeping the systematic record of them is not sufficient. To use these data efficiently is also important. So during peak time of disease the availability of doctors and medicines are managed by using this information.

This project sincerely aims to reduce the manual processing of each department. The proposed system gives idea about the units of medicines which are available based on inflow of patients by using patients information. The proposed system enables better patient care, patient safety, patient confidentiality, efficiency, reduced costs and better management information system. The proposed solution does not need any extra manpower to do so. Individuals can simply install the application, register in it, and use it.

After successful implementation of this project, there is a real time system which can generate report for analysis of medicines and doctors availability based on patient's information stored in hospital database.

Chapter 1

Introduction

By almost any form of evaluation, lacking of medicines is a growing problem due to inadequate management of medicines or by not clear idea on analysis of medicines. During the peak time of a disease, some medicines are not available in the hospital. Based on patients historical and current data, system can generate a report on what all medicines should be available in the hospital and in what quantity at particular time and location of the hospital. Doctors and specialists availability needs to be managed as per the inflow of patients. Many times patients do not find the required doctor during the peak of a disease or shortage of doctors in a hospital. Based on patient inflow for a particular ailment or disease, historical data and current data, system could generate the requirement of number of doctors required in a hospital on daily basis and also during a peak of a disease.

The organization of chapter is as follows. Section 1.1 describes Background, Motivation is described in Section 1.2, Section 1.3 describes Definition, Scope is described in Section 1.4, Section 1.5 describes Objectives, section 1.6 describes Selection of Life Cycle Model For Development, Organization of Report is described in Section 1.7, Finally last Section describes Summary of chapter.

1.1 Background

The management of availability of medicines and doctors during the peak time of disease continues to be a major challenge in recent scenario of the hospitals particularly in the rapidly growing cities of the developing world. There is a strong need to develop a system based on data science who can generate report which can give idea about the quantities of medicines which are available at particular instant.

1.2 Motivation

There are several projects going on around the world. The best option to manage availability of medicines is to embedded it into the software which will give idea about how much units of medicines are available during the peak time based on the past information.

1.3 Problem Definition

Development of a Health care Information system to provide analysis on Medicines availability in hospitals and analysis on increasing the efficiency of the hospital by managing availability of doctors and specialists. Analytics to bring in efficiency in Operational functioning by Medicine, number of doctors and specialists availability in hospitals.

1.4 Scope

Scope of this project is very broad in terms of having idea about required units of medicines. It can be used in any Hospital, Clinic, Dispensary or Pathology labs for maintaining records of medicines and manage their availability. The approach provides better management rather than traditional approaches.

1.5 Objective

- Manage the availability of medicines during the peak time.
- Manage the availability of doctors based on the inflow of patients.
- develop a system which analyses the past information and give idea about availability of medicines and doctors.
- The Software is for the automation of Hospital Management.

1.6 Selection of Life Cycle Model For Development

A software life cycle model is a particular abstraction that represent a software life cycle. A software life cycle is often called as Software Development Life Cycle(SDLC). A Variety of life cycle models have been proposed and are based on task involved in developing and maintaining software. The most familiar model is Waterfall Model, which is given

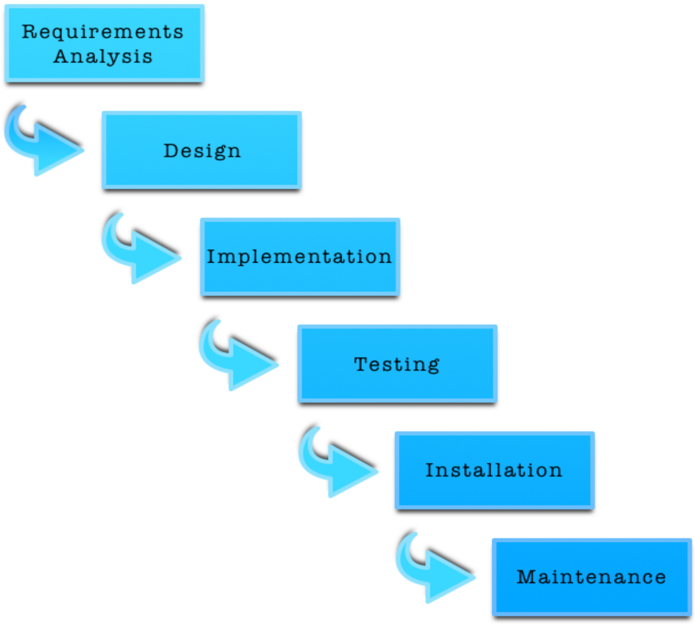


Figure 1.1: Waterfall Model

The model has five phases : Requirements Analysis and Specification, Design implementation, Unit testing, integration and system testing, and operation and maintainance. The phases always occurs in this order and do not overlap. The developer completes each phase before the next phase begins. This model is named Waterfall Model, because its diagrammatic representation resembles a cascade of waterfalls.

1.7 Organization of Report

The report is described in following way,

- Chapter 1 titled Introduction, describes Background, Motivation, Problem Definition, Scope and Objective.
- Chapter 2 titled Project Planning and management, which presents proposed system and Feasibility Study.
- Chapter 3 titled System Analysis, which presents System Architecture and UML Diagrams.
- Chapter 5 titled Conclusion, concludes about the minor project.

1.8 Summary

In this chapter, Introduction for Analysis on Medicines and Doctor Availability in Hospitals is presented. In the next chapter, Project planning and Management is presented.

Chapter 2

Project Planning and Management

Project Planning is the process of gathering and interpreting facts, diagnosing problem and using the fact to improve the system.

The organisation of the chapter is as follow:-
Feasibility study is describe by section 2.1.Section 2.2 presents the Risk Analysis. Project Scheduling presented in Section 2.3.Section 2.4 describes Effort Allocation. Cost Estimation described in Section 2.5.Finally, the last section presented summary.

2.1 Feasibility Study

Once scope has been identified, it is reasonable to ask:Can we build software to meet this scope? Is the Project feasible? all too often, software engineers rush past this questions(or are pushed past them by impatient managers or customers), only to become mired in a project that is doomed from the onset.

Feasibility is the analysis of risks, costs and benefits relating to economics,technology and user operation.

There are several types of feasibility depending on the aspects they covers. Some important feasibility is as follows:-

- Economical Feasibility
- Operational Feasibility
- Technical Feasibility

2.1.1 Economical Feasibility

More commonly known as cost/benefit analysis the procedure is to determine the benefit and saving that are expected from system and compare them with costs, decisions is made to design and implement the system. This part of feasibility study gives the top management of the economic justification for the new system. The proposed system will give the minute information, as a result the performance is improved which in turn may be expected to provide increased profits. This is an important input to the medical and hospitals because very often the medical and hospitals does not like to get confounded by the various technicalities that bound to be associated with a project of this kind. A simple economic analysis that gives the actual comparison of costs and benefits is much more meaningful in such cases. In the system, the hospitals and medical are most satisfied by economical feasibility. Because, if medical and hospitals implements this system, it need not require any additional hardware resources as well as it will be saving lot of time.

2.1.2 Operational Feasibility

Operational Feasibility determines whether the proposed system satisfied the user objective and can be fitted to current system operation. The system, Analysis on medicines and doctor's Availability in hospital can be justified as operationally feasible based on the following operational feasibility determines if the proposed system satisfied the user objective and can be fitted in to current system operation. The system, Analysis on medicines and doctor's Availability in hospital can be justified as operationally feasible based on the following:the methods of processing and presentation are completely acceptable by the user because they meet all their requirements.

2.1.3 Technical Feasibility

Technical feasibility centres on the existing manual system of the test management process and to what extend it can support the system. According to feasibility analysis procedure the technical feasibility of the system is analysed and the technical requirement such as software facilities, procedure, inputs are identified.

It is also one of the important phases of the system development activities. System offers greater level of a user friendliness combined with greater processing speed. Therefore the cost of maintenance can be reduced. Sinse processing speed is very high and the work is reduced in maintenance point of view management convince that the project is operationally feasible.

2.2 Risk Analysis

Risk analysis in software testing is an approach to software testing where software risk is analyzed and measured. Traditional software testing normally looks at relatively straight forward function testing (e.g. $2 + 2 = 4$). A software risk analysis looks at code violations that present a threat to the stability, security, or performance of the code.

Software risk is measured during testing by using code analyzers that can assess the code for both risks within the code itself and between units that must interact inside the application. The greatest software risk presents itself in these interactions. Complex applications using multiple frameworks and languages can present flaws that are extremely difficult to find and tend to cause the largest software disruptions.

Implementing risk analysis in software testing typically requires a detailed evaluation of the source code to identify how it interacts with other components of a complete application. This evaluation looks at the various code components and maps how the code interacts. With this map, transactions can be identified and evaluated.

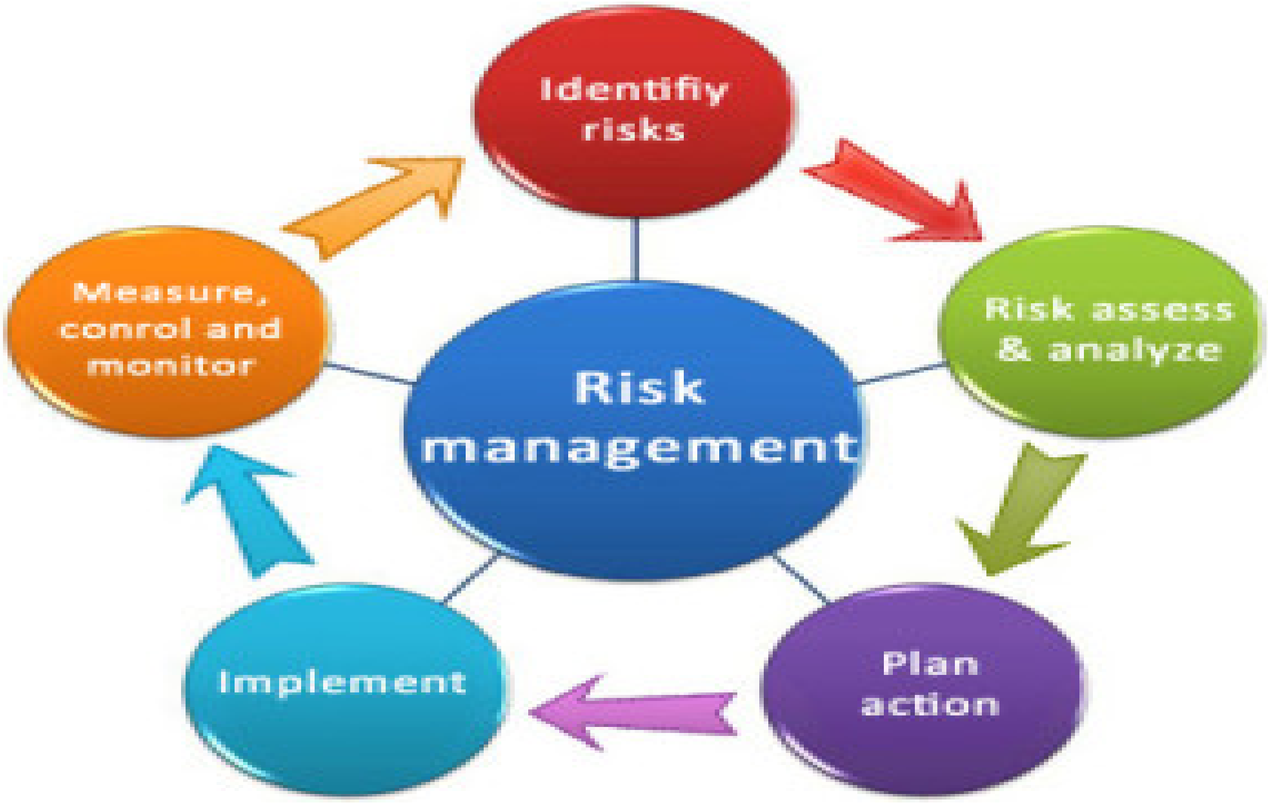


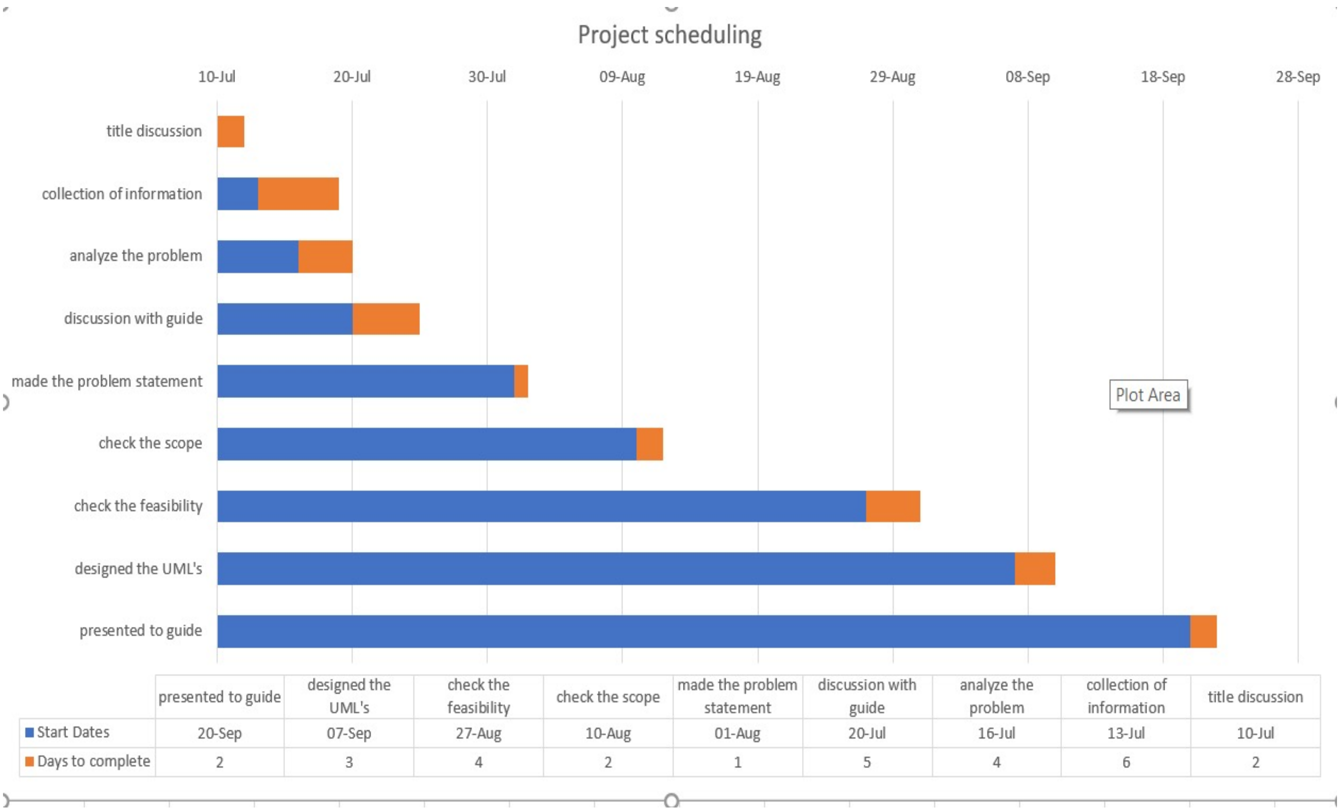
Figure 2.1: Risk Management

2.3 Project Scheduling

Project scheduling is a mechanism to communicate what tasks need to get done and which organizational resources will be allocated to complete those tasks in what time frame. A project schedule is a document collecting all the work needed to deliver the project on time.

Table 2.1: Project Scheduling Table

Task	Start Dates	Days to complete
Title discussion	10-JUL	2
Collection of information	13-JUL	6
Analyse the problem	16-JUL	4
Discussion with guide	20-JUL	5
Made the problem statement	01-AUG	1
Check the scope	10-AUG	2
Check the feasibility	27-AUG	4
Designed the UML's	7-SEP	3
Presented to guide	20-SEP	2



	presented to guide	designed the UML's	check the feasibility	check the scope	made the problem statement	discussion with guide	analyze the problem	collection of information	title discussion
■ Start Dates	20-Sep	07-Sep	27-Aug	10-Aug	01-Aug	20-Jul	16-Jul	13-Jul	10-Jul
■ Days to complete	2	3	4	2	1	5	4	6	2

Figure 2.2: Project Scheduling Chart

2.4 Effort Allocation

Effort estimation is the process of predicting the most realistic amount of effort (expressed in terms of person-hours or money) required to develop or maintain software based on in complete, uncertain and noisy input. Effort estimates may be used as input to project plans, iteration plans, budgets, investment analyses, pricing processes and bidding rounds.

Table 2.2: Effort Allocation

website	Gaurav	Vaibhav	Gopal	Saurabh
1.Identification of project and requirement Gathering	P	P	P	P
2.Study of existing system	P	P	P	P
3.Selection process model	P	A	P	A
4.Identifying Functional and Non-Functional Requirements	A	P	A	P
5.Architectural Design	P	P	P	P

- P- Present
- A- Absent

2.5 Cost Estimation

Cost estimation in software engineering is typically concerned with the financial spend on the effort to develop and test the software, this can also include requirements review, maintenance, training, managing and buying extra equipment, servers and software. Many methods have been developed for estimating software costs for a given project.

2.5.1 COCOMO Model

Cocomo (Constructive Cost Model) is a regression model based on LOC, i.e number of Lines of Code. It is a procedural cost estimate model for software projects and often used as a process of reliably predicting the various parameters associated with making a project such as size, effort, cost, time and quality. It was proposed by Barry Boehm in 1970 and is based on the study of 63 projects, which make it one of the best-documented models.
types of Models:
These are types of COCOMO model:

- Basic COCOMO Model
- Intermediate COCOMO Model
- Detailed COCOMO Model

2.5.2 Basic Model

The basic COCOMO model provide an accurate size of the project parameters. The following expressions give the basic COCOMO estimation model. The effort is measured in Person-Months and as evident from the formula is dependent on Kilo-Lines of code.

$$E = a(KLOC) \tag{2.1}$$

- a&b are constant,
- KLOC is kilo number of Lines of Code,
- E is effort,
- a7.4,
- b7.05

2.6 Summary

In this chapter, the Project Planning and Management of the project is described. In next chapter, the Analysis of project is described.

Chapter 3

Analysis

Analysis of this project is first have to studied about the current condition of the medicines and doctors available in hospital. due to lack of knowledge proper medicines and doctors availability management is not done. A medicines and doctors that available for one individual can be need of another individual. Hence this application provides a platform where people can give a way or received the available medicines and doctors as per requirement.

Section 3.1 Requirements Collection and Identification. Hardware and software requirement is describe by section 3.2, Section 3.3 Describe the Functional and Non-Functional requirement of the project. Section 3.5 Describe Software Requirement Specification. Finally Summary is describes in the last Section.

3.1 Requirements Collection and Identification

Requirement Analysis is the phase in which the entire requirement related to software are collected which helps the designer to design a actual system. Requirement Analysis enables the system engineer to specify software function and performance indicates software interface with other system elements and establish constraints that can be translated into data, architectural, interface, and the user with means to assess quality once project is built For collection of actual requirement it is neccessary to select the flow of action/phases. The Requirement collection flow is divided into 4 phases namely Preparation, Elicitation, Engineering, Negotiation.

- Preparation:-
  Is initial state of requirement gathering phase which promote the introductory part of stake-holders,Developers and User.In this phase, All actual information is collected from customer for development of application in which the information about the

medicines and doctors availability in hospital are gained. If the development of software is accepted then requirement collection phase moves towards Elicitation phase.

- Elicitation:-
  Elicitation phase focuses on listening quote;Use stories quote;for collection of Requirements. In this phase knowing actual current situation for checking availability of medicines and doctors in hospital. After deciding some major Requirements,Flow moves toward next phase i.e Engineering.
- Engineering:-
  Engineering phase specifying what elicited for checking availability of medicines and doctors in hospital. This requirement help to reduce human efforts and increase the efficiency of hospital.
- Negotiation and Decision Making:-
  In this phase of our android application Emergency time requirement of patients is accepted and taking Decision regarding availability of medicines and doctors in hospital.

3.2 Hardware Requirement

The Hardware Requirement includes:

- PC
- Mobile

3.3 Software Requirement

Software Requirement deal with defining software resource requirement and pre-requisites that need to be installed on a computer to provide optimal functioning of an application.These Requirements or pre-requisites are generally included in the software installation package and need to be installed separately before the software is installed.

- Operating System - Windows operating system and above
- Front End - HTML, CSS/JS.
- Back End - PHP.
- Browser - Internet Explorer and others
- Database - MySQL.
- Server - XAMPP.

3.4 Functional Requirement

It deals with the functionalities Required from the system which are as follows. Our application will help patients and Doctors both.

3.5 Non Functional Requirement

There are Quality Requirements that stimulate how well a software does what it has to do Performance no. of terminals to be supported is dependent on the server that we will use at the time of deployment.

3.5.1 Reliability Requirement

The system should provide a reliable environment to both patients and Doctors. All results and important data should be reaching at both the parties without any errors.

3.5.2 Usability Requirement

This Application is use to provide a registered non-profit platform for the individuals willing to provide their unnecessary items to the people in need.

3.6 Software Requirement Specification

Software Requirement Specification is the official statement of what is required to the system developers. It should include both user requirement and a detailed specification of the system requirements. A software Requirements specification (SRS) is a detailed description of a software system to be developed with its functional and non-functional requirements. The SRS is developed based the agreement between customer and contractors. It may include the use cases of how user is going to interact with software system. The software requirement Specification document consist of all necessary requirements required for project development. To achieve this there is a need to continuous communication with customers to gather all requirements. Requirement Analysis is done in order to understand the problem the software system is to solve.

3.7 Summary

In this chapter, describes the various requirement, such as hardware and software requirement and also the functional and non-functional requirement. In next chapter, describes the System Design.

Chapter 4

Design

System Design provides the understanding and procedural detailed necessary for implementing the system. Software Design is the process of defining software methods, functions, objects, and the overall structure and interaction of your code so that the resulting functionality will satisfy your users requirements. Design is also the best approach to mitigate the risk you have no idea about.

The organization of chapter is as follows. Section 4.1 describes System Architecture, section 4.2 Data flow diagram, section 4.3 UML Diagrams(Use case, Sequence, Component, Deployment, State chart, Class Diagram, Component Diagram etc.) of the project. Finally the last section describes summary of chapter.

4.1 System Architecture

The System architecture provide details of how the components or modules are integrated and is described with the help of Unified Modeling Diagrams.

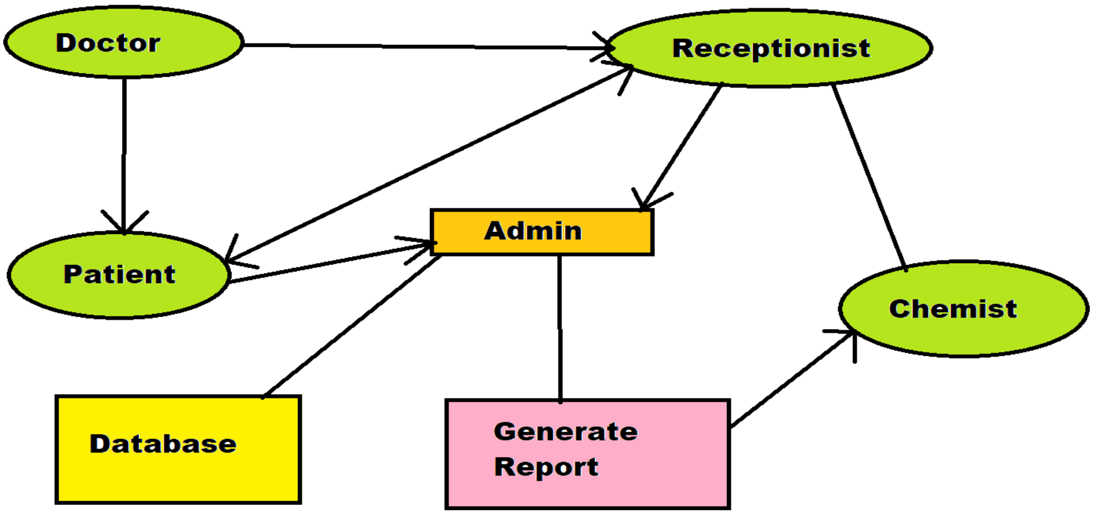


Figure 4.1: System Architecture

4.2 Data Flow Diagram

A Data Flow Diagram (DFD) is a structured analysis and design tool that can be used for flowcharting. A DFD is a network that describes the flow of data and the processes that change or transform the data throughout a system. This network is constructed by using a set of symbols that do not imply any physical implementation. It has the purpose of clarifying system requirements and identifying major transformations. So it is the starting point of the design phase that functionally decomposes the requirements specifications down to the lowest level of detail. DFD can be considered to an abstraction of the logic of an information-oriented or a process-oriented system flow-chart. For these reasons DFDs are often referred to as logical data flow diagrams.

The physical data flow diagram describes the implementation of the logical data flow. There are two levels of Data Flow Diagrams.

4.2.1 Level 0 Data Flow Diagram

0-level DFD: It is also known as context diagram. Its designed to be an abstraction view, showing the system as a single process with its relationship to external entities. It represents the entire system as single bubble with input and output data indicated by incoming/outgoing arrows.

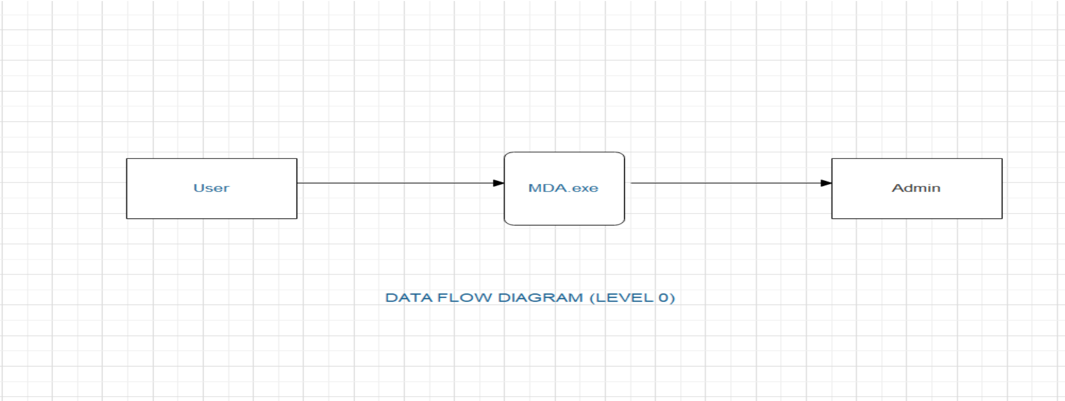


Figure 4.2: Data Flow Diagram(Level 0)

4.2.2 Level 1 Data Flow Diagram

In 1-level DFD, context diagram is decomposed into multiple bubbles/processes. In this level we highlight the main functions of the system and breakdown the high-level process of O-level DFD into sub processes.

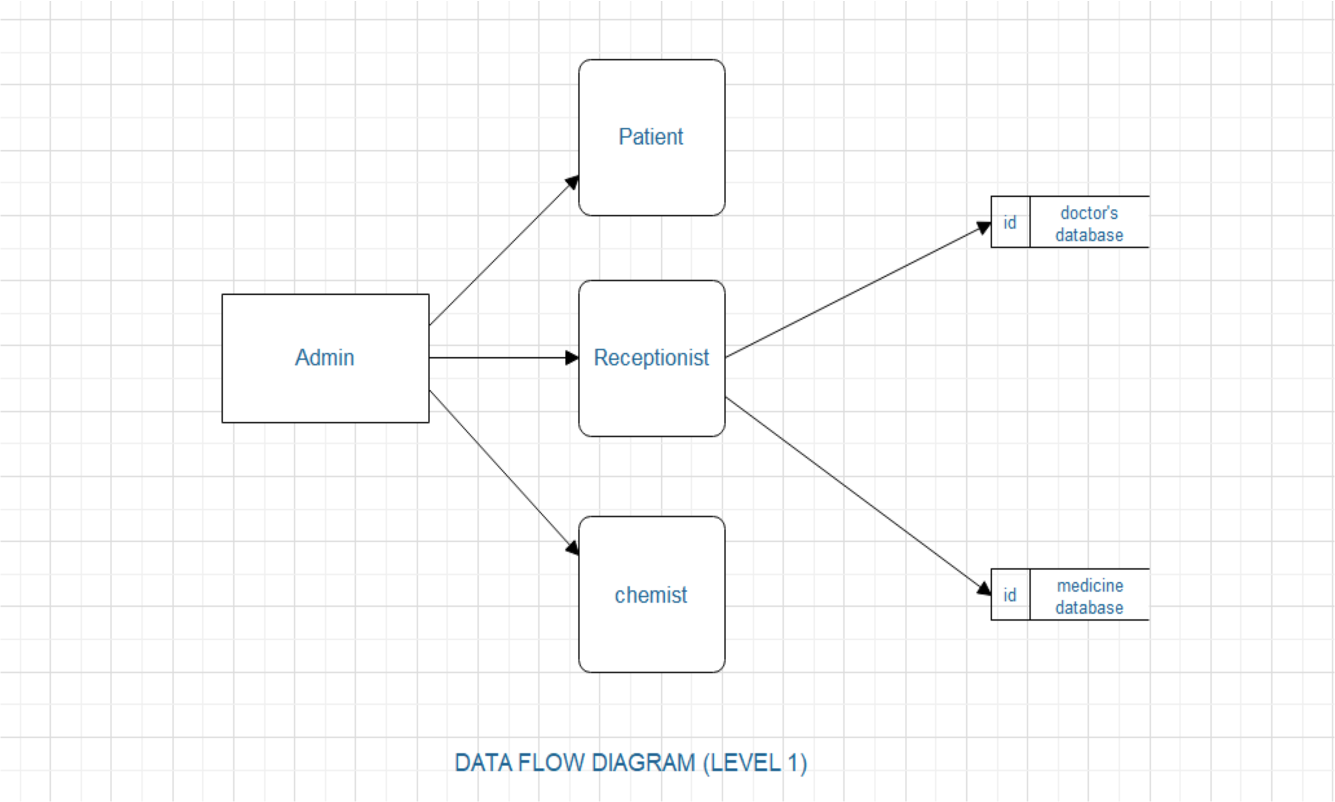


Figure 4.3: Data Flow Diagram (Level 1)

4.3 UML Diagrams

4.3.1 Use case Diagram

A UseCase diagram shows the interaction [4] between the system and entities external to the system. These entities are called actors which have specific role in the system. The Figure, shows the usecase diagram for proposed system. It consists of actors like Patient, Admin, Receptionist, Doctors.

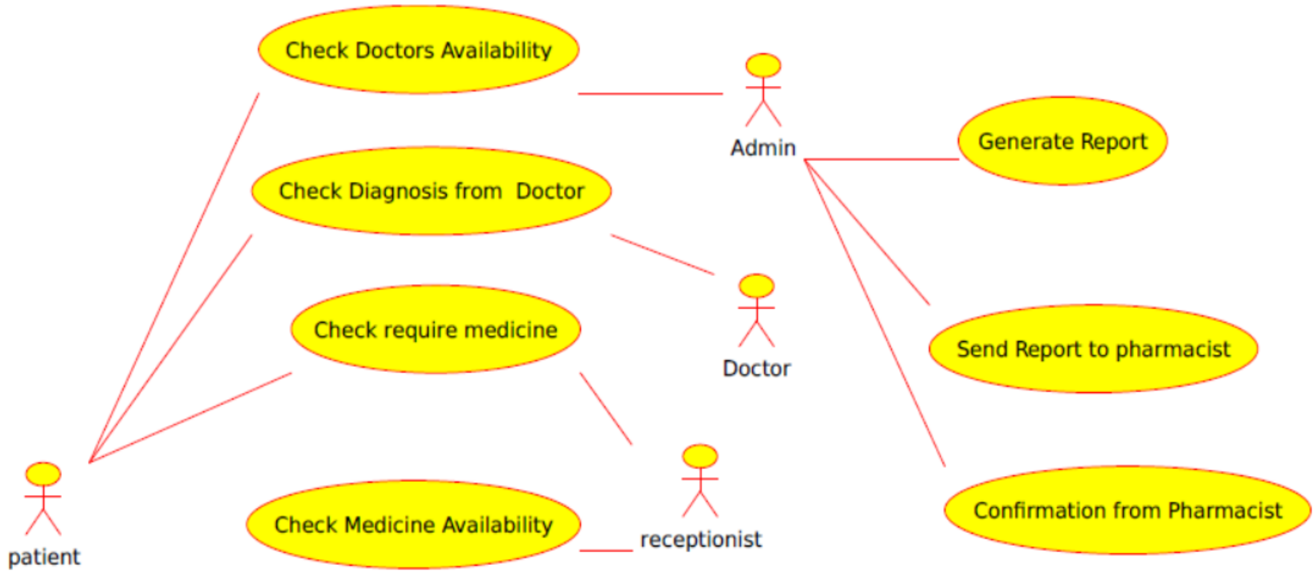

Check Doctors Availability
Admin
Generate Report
Check Diagnosis from Doctor
Check require medicine
Doctor
Send Report to pharmacist
receptionist
Confirmation from Pharmacist
patient
Check Medicine Availability

Figure 4.4: Usecase Diagram

4.3.2 Sequence Diagram

A Sequence diagram is a structured representation of behaviour as a series of sequential steps over time. The Figure shows the sequence diagram for the system. The sequence diagram shows the work flow, message passing and how elements cooperate over time to achieve a result.

The vertical dashed line called object lifeline, represents the existence of an object over a period of time. The tall, thin rectangle called focus of control, shows the period of time during which an object is performing an action.

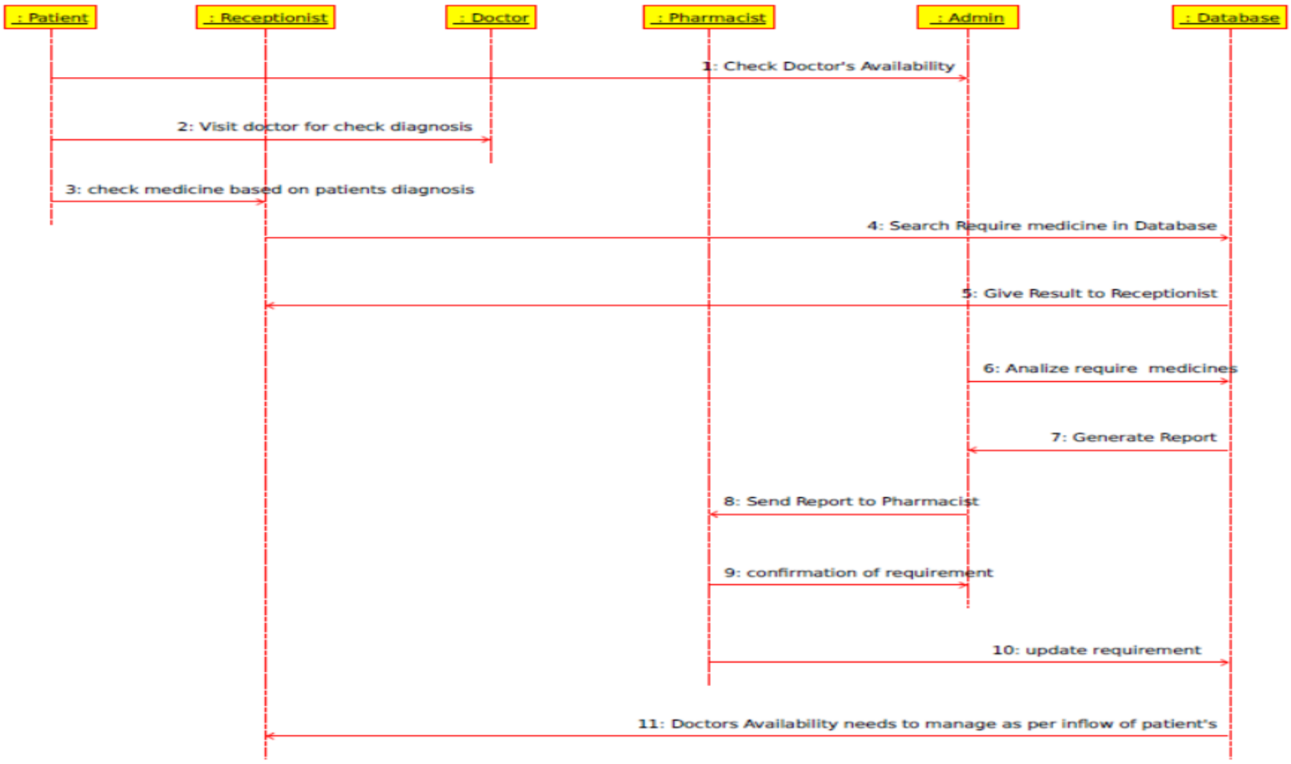

: Patient
: Receptionist
: Doctor
: Pharmacist
: Admin
: Database
1: Check Doctor's Availability
2: Visit doctor for check diagnosis
3: check medicine based on patients diagnosis
4: Search Require medicine in Database
5: Give Result to Receptionist
6: Analize require medicines
7: Generate Report
8: Send Report to Pharmacist
9: confirmation of requirement
10: update requirement
11: Doctors Availability needs to manage as per inflow of patient's

Figure 4.5: Sequence Diagram

4.3.3 Class Diagram

A Class diagram is used to represent the static view of the system. It mainly use classes, interfaces and their relationships. The Figure shows the class diagram for proposed system.

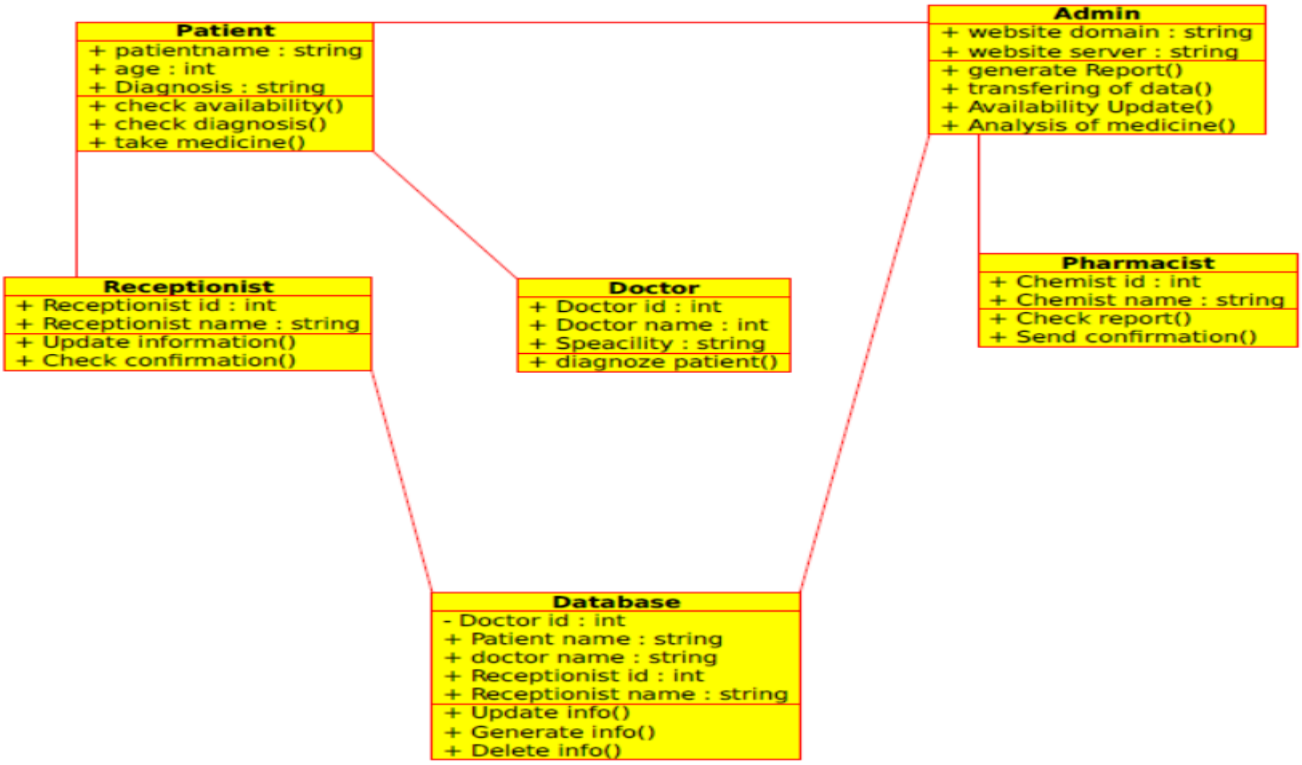


Figure 4.6: Class Diagram

4.3.4 State Diagram

A State diagram shows the state of objects. These diagrams are used to model static view of the system. The Figure shows the component diagram for the proposed system.

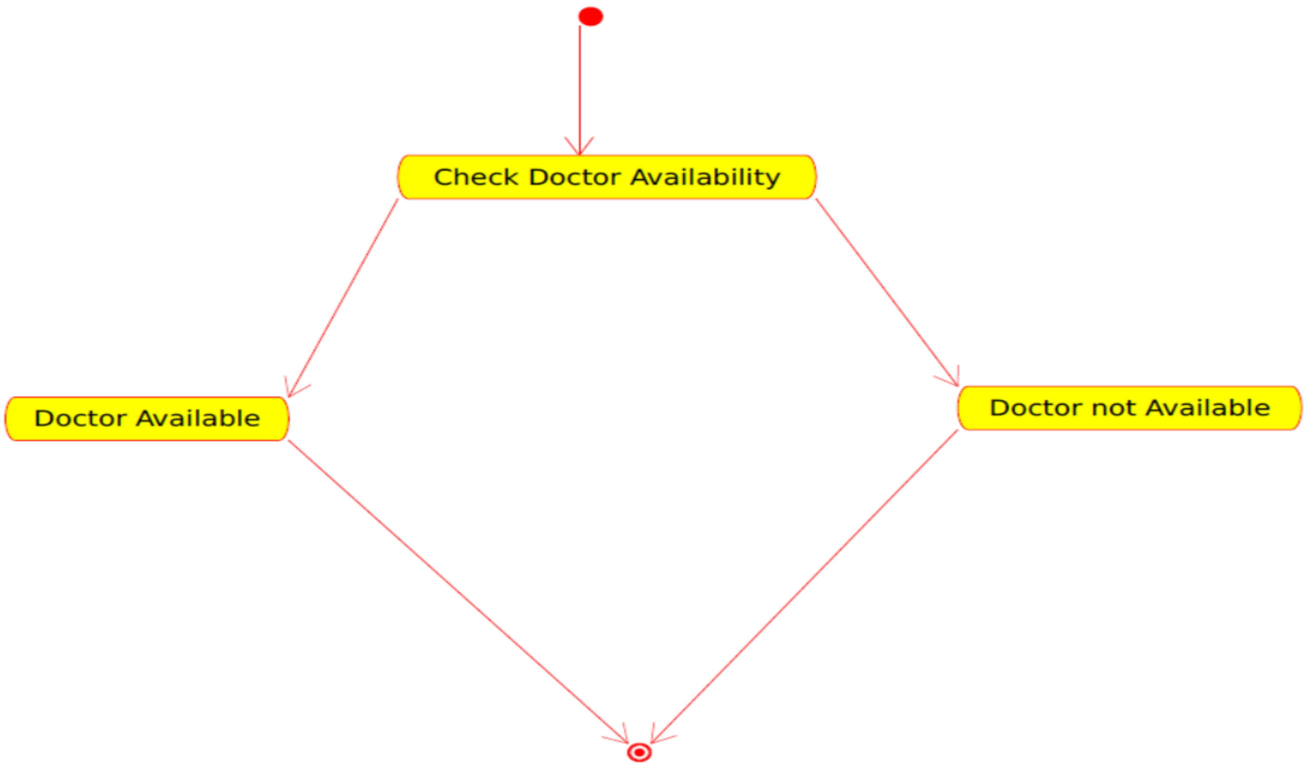


Figure 4.7: State Diagram

4.3.5 Component Diagram

A Component diagram shows the organization and dependencies among set of components. These diagrams are used to model static view of the system. The Figure shows the component diagram for the proposed system.

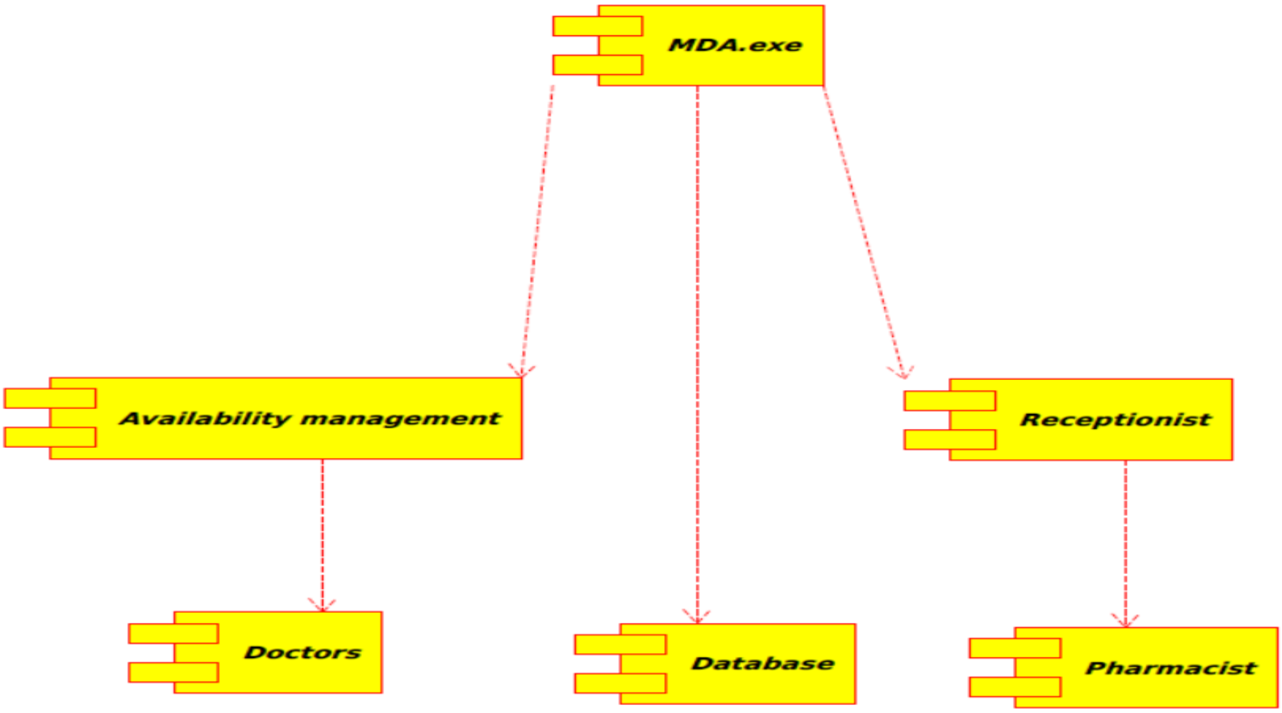


Figure 4.8: Component Diagram

4.3.6 Deployment Diagram

A Deployment diagram represents the configuration of run time processing nodes and the components that live on them. The Figure shows the deployment diagram for system.

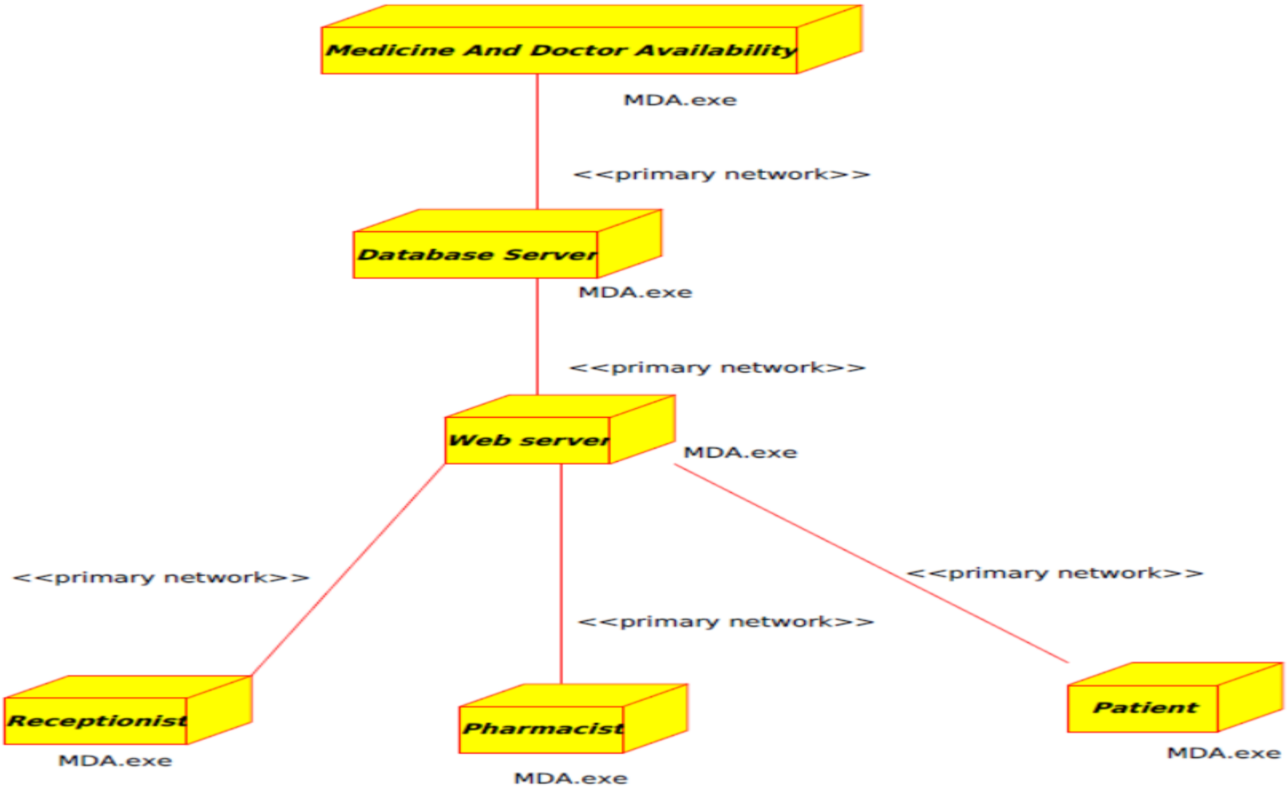


Figure 4.9: Deployment Diagram

4.4 Summary

In this chapter, describes the System Architecture, such as DFD and also the UML diagrams. In next chapter, the project conclusion and Future Work is described.

Chapter 5

Conclusion and Future Work

5.1 Conclusion

Since we are entering the patient details based on past history of patient diagnosis report in hospitals. using this application we can retrieve patient history with a single click thus processing information will be faster . this application reduces human effort and increase the efficiency of the hospitals.

The proposed system is Analysis on Medicines And Doctor's Availability in Hospitals. We can enhance This system by including more facilities like pharmacy system for stock details of medicines in the pharmacy. Providing such features enable the user to include more comments into the system.

5.2 Future Work

The implementation of the project will be done as per the described life cycle model as per the requirements gathered about the project. The coding part will be performed in python language along with PHP so that it can be accessible in windows system. The testing phase will be performed after the code is properly prepared and ready to test. When the testing is perfectly done the application will be ready to deploy in the market. Only goal of the application is to serve better in hospital management system and try to give idea about availability of medicines and doctors during peak time.

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