A PROJECT REPORT ON

# HOSPITAL RECOMMENDATION AND MEDICAL HISTORY MAINTENANCE

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE
IN THE FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE

OF

## BACHELOR OF ENGINEERING (COMPUTER ENGINEERING)

SUBMITTED BY


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UNDER THE GUIDANCE OF

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**2021-2022**

# CERTIFICATE

This is to certify that the project report entitles

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# ACKNOWLEDGEMENT

It gives us great pleasure in presenting the project report on **Hospital Recommendation And Medical History Maintenance.**

We would like to take this opportunity to thank our internal guide **Prof. Dipali Kadam** for giving us all the help and guidance we needed. We are really grateful to her for her kind support. Her valuable suggestions were very helpful.

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# ABSTRACT

Recommendation System of hospitals works through big data analysis on the basis of various parameters such as patient feedback, medication time, hygiene, infrastructure . Blockchain technology is used to record the health history of the patient, smart contacts are used to define the access to various users which are doctors, pharmacist and patient. The proposed system is divided into two modules. The first one is the recommendation system and second is the longitudinal record maintenance.

Data processing will be a wiser choice to do that process at a fast time and effective price. Data processing techniques are used on huge databases to extract hidden patterns using diverse tactics from machine learning, and database technology.Digital Health Profile system will be like Health database record of patient giving the insights of patients medical history as and when required by medical personnel thereby reducing the Emergency response time and optimizing the treatment to greater extent.

**Keywords:** Blockchain, Digital health profile, Data Analysis, Recommendations

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# CHAPTER 1

# INTRODUCTION

## 1.1 Motivation

When a person is acknowledged of some health issue, there is always confusion among the family members which doctor to consult. The main questions are:-

- Which hospital to consult?
- What is there success rate for such cases?
- Is it genuine or just money-minded?

And even after selecting a hospital it is always hectic to carry your entire health history of various lab tests whenever you visit hospital, whether you have visited the hospital earlier or not these things are always demanded from patients for efficient diagnosis which often leads to repeat test and unnecessary headache of maintaining all your medical record.

## 1.2 Problem Definition and Objectives

### 1.2.1 Problem Definition

To develop a hospital recommendation system on a web portal and a health profile management system on an android application

### 1.2.2 Objectives

- To understand and study Hospital recommendation systems using data analysis.
- To create a Hospital Recommendation System using data analysis techniques.
- To develop a web-based app and the necessary back-end for the application.
- To backup the medical history.

# CHAPTER 2

# LITERATURE SURVEY

## 2.1 A Hospital Recommendation System Based on Patient Satisfaction Survey

1. Author :Mohammad Reza Khoie, Tannaz Sattari Tabrizi, Elham Sahebkar Khorasani, Shahram Rahimi, and Nina Marhamati.

2. Aim : Develop Hospital Recommendation System Based on Patient Satisfaction Survey.

3. Result : The suggested recommendation system uncovers information that an expert studying the surveys would miss, eliminating the necessity for a subjectmatter expert. The analysis method was created with the structure of the typical HCAHPS survey in mind; however, it can be applied to other domains where customer surveys are relevant.

4. Conclusion : This paper introduces an unsupervised exploratory data mining methodology for discovering connections between patient demographics and various satisfaction markers. A two-layer cluster analysis is used to extract such relationships, as well as the salient aspects of each cluster. Statistical tests are used to validate the connections, which are then ranked according to their significance. The idea was to exploit these connections to develop a hospital recommendation system based on patient happiness. The methodology was applied to HCAHP data from the CAHPS Database, and statistical tests were used to confirm the derived recommendations. The proposed methodology was used to extract nineteen relationships from the HCAHPS dataset of a hospital with 2652 records in the case study given in this paper. Ten of the nineteen connections were statistically validated.

## 2.2 Electronic health records in a Blockchain: A systematic review

1. Author : André Henrique Mayer, Cristiano André da Costa, Rodrigo da Rosa Righi.

2. Aim : Electronic health records in a Blockchain.

3. Result : The proposed quality criteria scores were assessed for each obtained article. Although most articles did not fully satisfy all six criteria for evaluation, they responded positively to at least four out of six of the quality assessment criteria that are described in section "Quality assessment." All the assessed articles clearly presented their research purpose, presented a literature review, and were supported by a research methodology, bibliographical references, or models/architectural proposals.

4. Conclusion : In this study, a systematic literature review regarding EHRs within a Blockchain was conducted, with the objective of identifying and discussing the main issues, challenges, and possible benefits from Blockchain adoption in the healthcare field. The application of Blockchain has exceeded the scope of the field of economics and we have highlighted Blockchain's potential for the healthcare area, while also revealing that it still highly depends on the acceptance of the new technology within the healthcare ecosystem. Analyzing the results that were obtained from the literature review, we conclude that Blockchain technology might be a future suitable solution for common problems in the healthcare field, such as EHR interoperability, establishing sharing trust between healthcare providers, auditability, privacy, and granting of health data access control by patients, which would enable them to choose whom they want to trust and with whom to share their medical records. However, additional research, trials, and experiments must be carried out to ensure that a secure and established system is implemented prior to using Blockchain technology on a large scale in healthcare, since a patient's health data are personal, highly sensitive, and critical information.

## 2.3 DESIGN AND DEVELOPMENT OF MEDICAL RECOMMENDATION SYSTEM FOR HOME CARE SERVICE FOR GERIATRICS

1. Author : Be¸sik, Saliha ˙Irem
2. Aim : Design and development of medical recommendation system.
3. Result : :Determined the system requirements through a user study conducted with health professionals who work in Numune Hospital and did not use any virtual data. Patients data were taken from Numune Hospital and followed standardizations of Minister of Health of the Republic of Turkey. RHCS is compatible with drug barcode standards and ICD-10 classification system.
4. Conclusion : RHCS is ontology-based and it makes system advantageous in terms of interoperability, scalability and expandability.RHCS follows the international standard, ATC classification system, to provide interaction with different health care systems. RHCS can work for different patients outside of our clinical data repository. RHCS uses user-based collaborative filtering recommendation approach and it is empowered by historical data of patients.Conducted both offline experiments and a user study. Offline experiments are evaluated by precision, recall and f-measure. Offline evaluation results are 89 all higher than 60 percent and it demonstrates that RHCS is a successful recommendation system. 13 medical doctors are participated in user study. We evaluated user study through generating a relevancy score. We measured this relevancy score as approximately 98 percent and it shows an evidence that according to 13 medical doctors, RHCS generates relevant recommendations.

## 2.4 The HealthChain Blockchain for Electronic Health Records: Development Study

1. Author : Kevin Clauson and Peng Zhang
2. Aim : Combining token and sentence level features for short answer grading.
3. Result : HealthChain meets both functional and nonfunctional needs. It can store electronic health records (EHRs) in a distributed ledger and disseminate them to diverse parties. Furthermore, it exhibits exceptional characteristics such as privacy preservation, security, and high throughput. These are the key reasons for proposing HealthChain.
4. Conclusion : Hyperledger Fabric v1.4.1, an enterprise-grade permissioned distributed ledger platform [16], is used to build the HealthChain prototype. It's running Ubuntu on a computer with an Intel Xeon E5-26xx v4 2.4 GHz CPU and 2 GB RAM. All servers are Docker 18.06.1-ce-based, which means that all peers and orderers are virtualized into containers that share the same hardware and kernel. Docker Compose, a tool for defining and running multicontainer Docker applications, built the HealthChain network. Besides, the two parameters of batch timeout and batch size have a high impact on the performance of HealthChain. The former denotes the maximum time to wait before creating a block, and the latter is the maximum number of EHR transactions in a block. No matter which one is satisfied first, the block is generated. This paper tests the performance of HealthChain with the parameters varying. We ran every transaction three times, and the average values of latency and throughput are provided in the paper.

# CHAPTER 3

# SOFTWARE REQUIREMENTS SPECIFICATION

## 3.1 Introduction

Whenever a person is diagnosed with a disease or any kind of unknown health-related problems. A patient always seeks a third party advice from his/her friends or relatives because he/she is unaware of which hospital or doctor to refer for the best treatment. Often this kind of suggestions are not reliable and may lead to time delay which is very crucial in times of emergency. If we have a recommendation system in place, this type of situations can be avoided thus providing appropriate medication at right time.

Now even though the user knows which hospital/doctor to visit, he/she may have to carry all the previous medical history documents with them which is not absolutely feasible at all times. This data can be recorded on a platform and can be used for future purpose whenever required.

### 3.1.1 Project Scope

First system will be implemented on chain of hospitals from a city, then chain cities from a state, then chain of states from country and at last it will be accepted by all healthcare system of country as one.

Testing labs can also be included making the system more automated, small clinics could also be linked to treat small illness and even recording all medication at minute level of healthcare system.

In case of health insurance where the patients are being given reimbursement for the medical bills. The patient won't need to submit the medical bill physically. In turn the medical reports will be uploaded on server which can be accessed by the officials,speeding the whole process.

### 3.1.2 User Classes and Characteristics

1. User 1: Patient - Accessing the recommendation system and managing the account on health profile system.

2. User 2: Doctor - Responsible for recording the medication given to the patient.

3. User 3: Hospital - Access the patient's health related expenses and deal with billing details.

4. User 4: Pharmacist - Provide the medicines prescribed by the doctor to the patient.

5. User 5: Students - Can access the type of medication given to the patient for their academic study.

## 3.2 Assumptions and Dependencies

### 3.2.1 Assumptions

1. The systems accuracy is determined by the input of the health condition given by the user. If the input is correct, it will generate better outcomes.
2. The analysis is done using some attributes, anticipating if the user has disease other attributes to be checked by the doctor.

### 3.2.2 Dependencies

1. The Recommendation Systems are written in R program, and the R Studio needs to be installed to run, along with the following dependencies-
   - Shiny
   - GGmap
   - Rlang
2. The data will be stored on FireBase and hence requires the following dependencies-
   - Firebase Firestore Connection dependencies
   - SHA 256 Java dependency

### 3.2.3 User Classes and Characteristics

1. Technical users: They should be familiar with system along with Blockchain and Data Analysis methodologies and should be knowledgeable of development process.
   - Software developers – who will develop the system
2. Non-technical users: Have little or no knowledge about the system or the technologies powering it.
   - End users (Patients) - Responsible for checking the health medical history of themselves and recommendation for themselves.

## 3.3 FUNCTIONAL REQUIREMENTS

### 3.3.1 Data Conversion

This project uses data from data set that contains information on over 4,000 Medicare-certified hospitals in the United States. The goal was to create a tool that would help inform people's decisions on what hospital to go to based on why they needed to go to the hospital and how far they were able to travel. We used various measures of hospital performance to recommend to users what hospital to go to, changing which ones were used depending on why the user input they were going to a hospital..

### 3.3.2 Analysis and Forecasting

This module is responsible for the main functionality of the system which is to use the structured data and perform computations on it that can then predict disease according to the model answer.

### 3.3.3 Storage

The structured data will be kept on a cloud system, which will give the system benefits such as resource pooling, easy maintenance, availability, automated system, cost-effectiveness, and security.

## 3.4 NON-FUNCTIONAL REQUIREMENTS

### 3.4.1 Performance Requirements

- User satisfaction:

  It's a metric for how well an application or service meets or exceeds a customer's expectations.

- Average response time:

  Average Response Time. Response time refers to the amount of time the Application Server takes to return the results of a request to the user.

- Application Availability:

  The amount to which an application is operational, functional, and useable for completing or satisfying a user's or business's requirements is known as application availability.

### 3.4.2 Software Quality Attributes

- Correctness

  The correctness of a software system refers to agreement of program code with specifications.

- Reliability

  The likelihood that a software system will perform a function (given by the requirements) over a certain given set of input trials under specified input parameters in a particular time frame is described as reliability (assuming that hardware and input are free of errors).

- Learnability

  The learnability of a software system is determined by the user interface design as well as the clarity and simplicity of the user instructions (tutorial or user manual).

- Robustness

  Operational problems, inaccurate input data, and hardware failures are all addressed through robustness.

### 3.4.3 Usability Requirements

- The UI of the web-based app should be user-friendly and easy to use.
- The font used in app must be uniform.

### 3.4.4 Compatibility Requirements

- Web-based app must be compatible with browser version 9.0 or above

## 3.5 SYSTEM REQUIREMENTS

### 3.5.1 Software and Platform requirements

- App as a Service (Cloud): Android Studio, Firebase
- Web-based : Shiny R

  Server side : R program

### 3.5.2 Hardware Requirements

1. Processor (i5 or higher): Fast and efficient systems are needed to handle intensive loads and provide efficient throughput.
2. RAM (8GB minimum): Helps in performing fast computations and optimizes execution process.

## 3.6 ANALYSIS MODELS: SDLC MODEL TO BE APPLIED

- SDLC is a process which is followed by any software project, within an organization.
- It consists of a thorough plan explaining how to build the software using the proper techniques, how to maintain the program once it has been done, and how to replace, update, or enhance certain elements of the project.
- This project employs an Agile process technique. It finally satisfies the consumer or user through early and consistent delivery. It's adaptable enough to meet shifting requirements. This approach involves collaboration between the customer and the development team, and messages are transmitted orally, face-to-face, resulting in good design and technical perfection.
- Each iteration brings together a group of stakeholders who are simultaneously working on various areas of the project development for further processing.
- The different phases of Agile Model are-

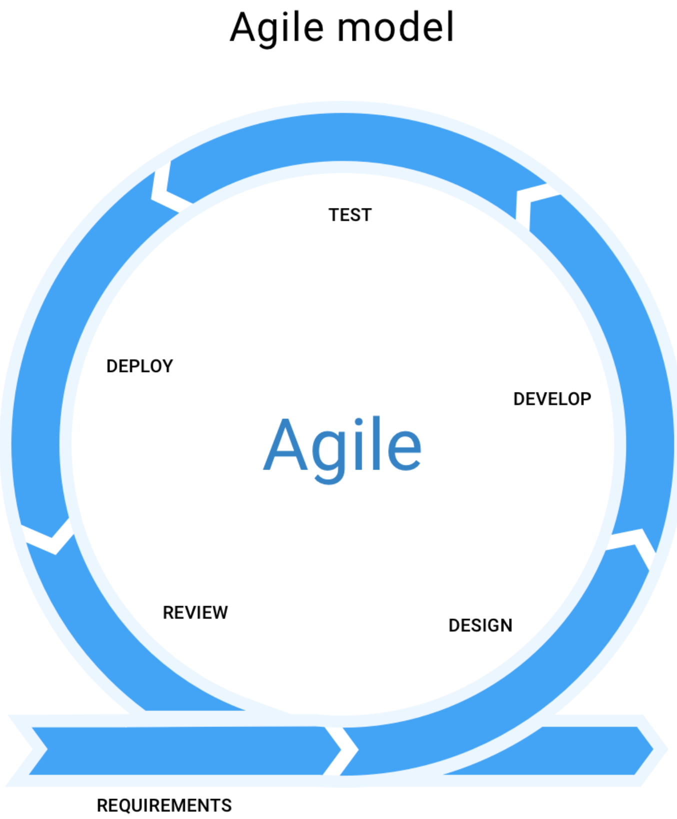


Figure 3.1: Agile Model for SDLC

# CHAPTER 4

# SYSTEM DESIGN

## 4.1 SYSTEM ARCHITECTURE

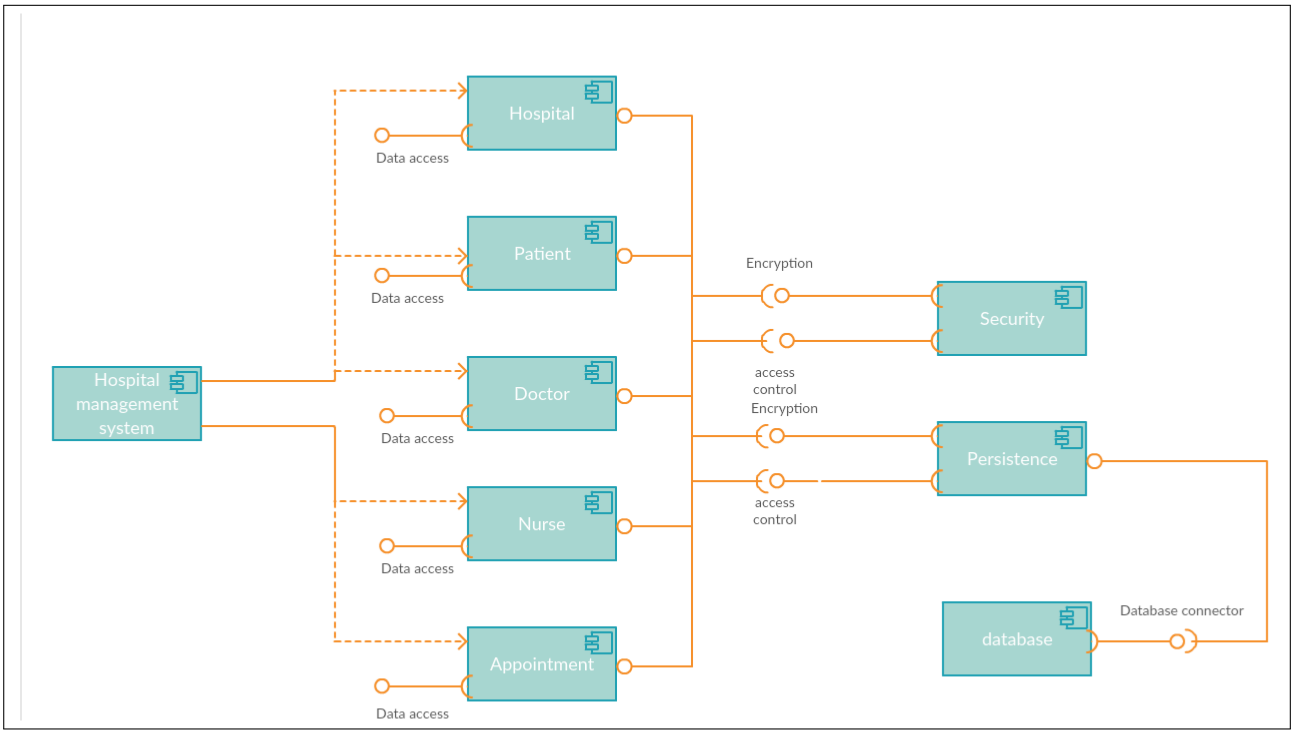


Figure 4.1: Overall System Architecture

System architecture is the structural design of systems. Systems are a class of software that provide foundational services and automation.

## 4.2 DATA FLOW DIAGRAM 0 FOR RECOMMENDATION

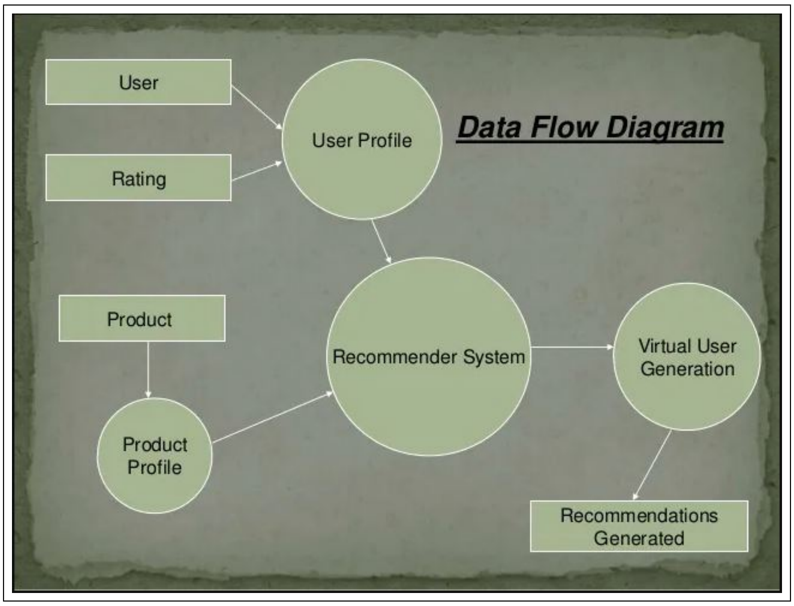


Figure 4.2: DFD Level 0

A data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

## 4.3 DATA FLOW DIAGRAM 1 FOR RECOMMENDATION

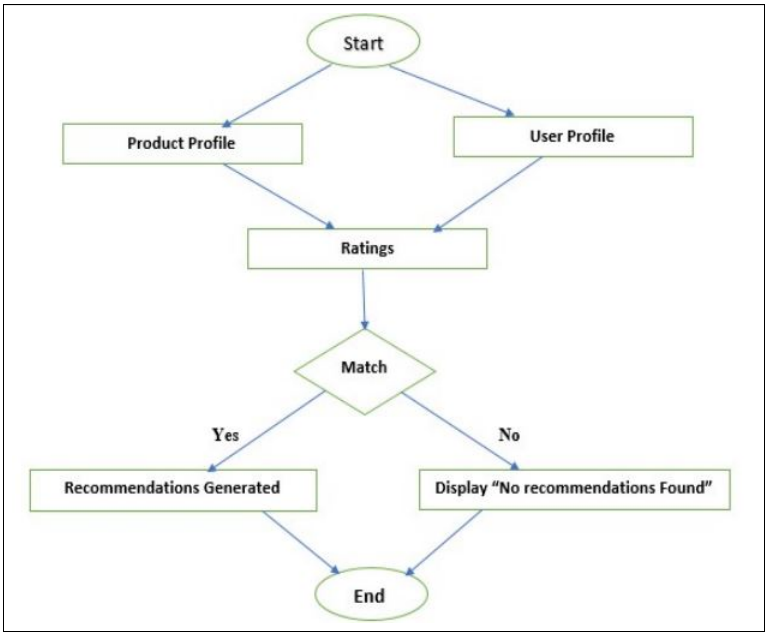


Figure 4.3: DFD Level 1

A data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

## 4.4 DATA FLOW DIAGRAM 2 FOR RECOMMENDATION

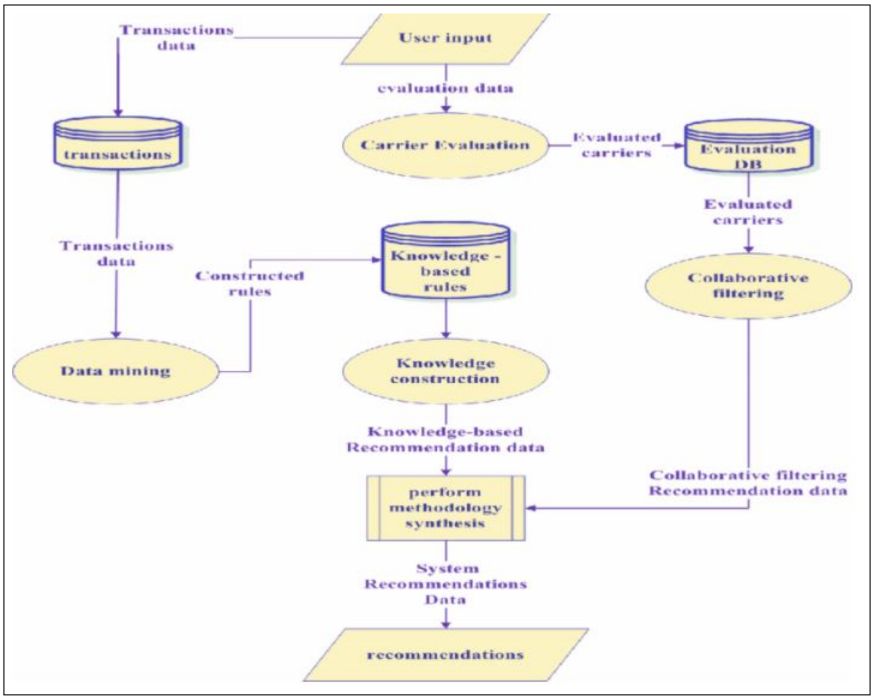


Figure 4.4: DFD Level 2

A data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

# 4.5 DATA FLOW DIAGRAM 0 FOR HEALTH PROFILE

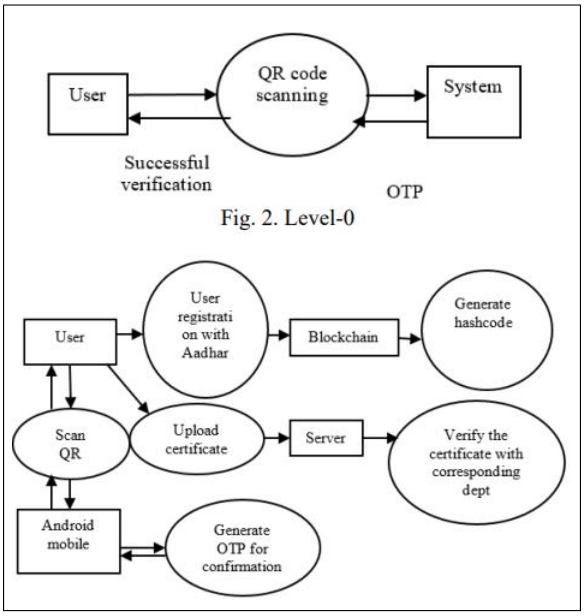


Figure 4.5: DFD Level 0

A data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

## 4.6 DATA FLOW DIAGRAM 1 FOR Digital Health Profile

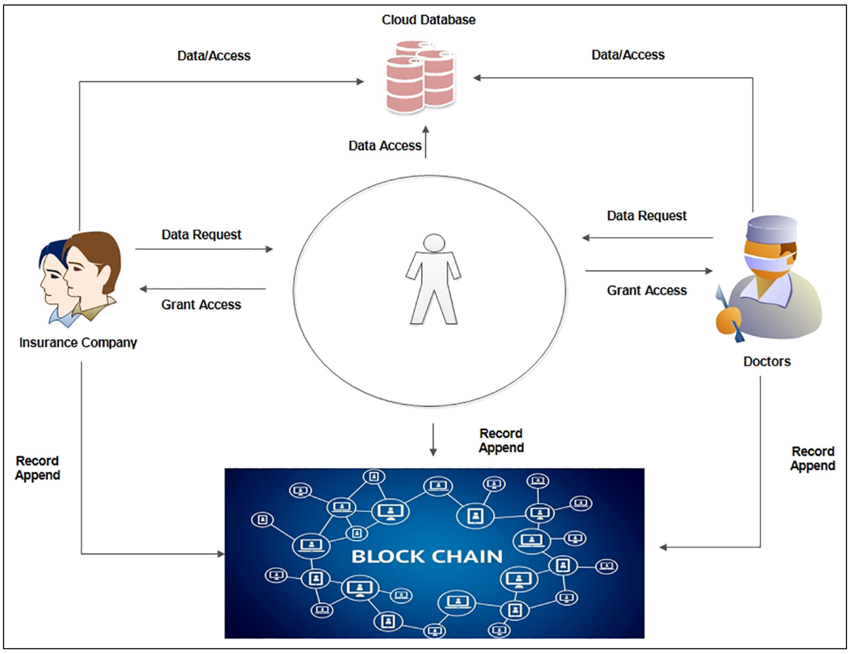


Figure 4.6: DFD Level 1

A data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

## 4.7 ER Diagram

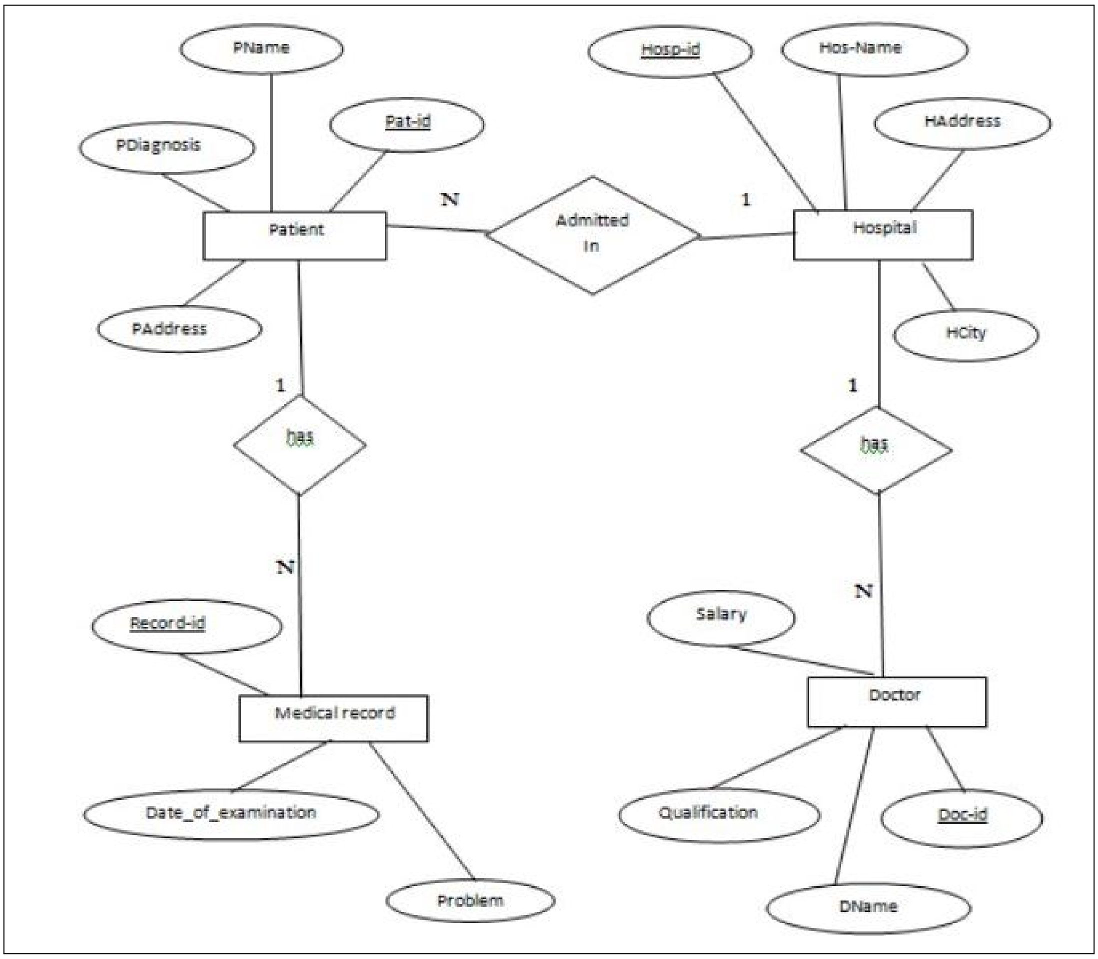


Figure 4.7: ER Diagram

## 4.8 USECASE DIAGRAM

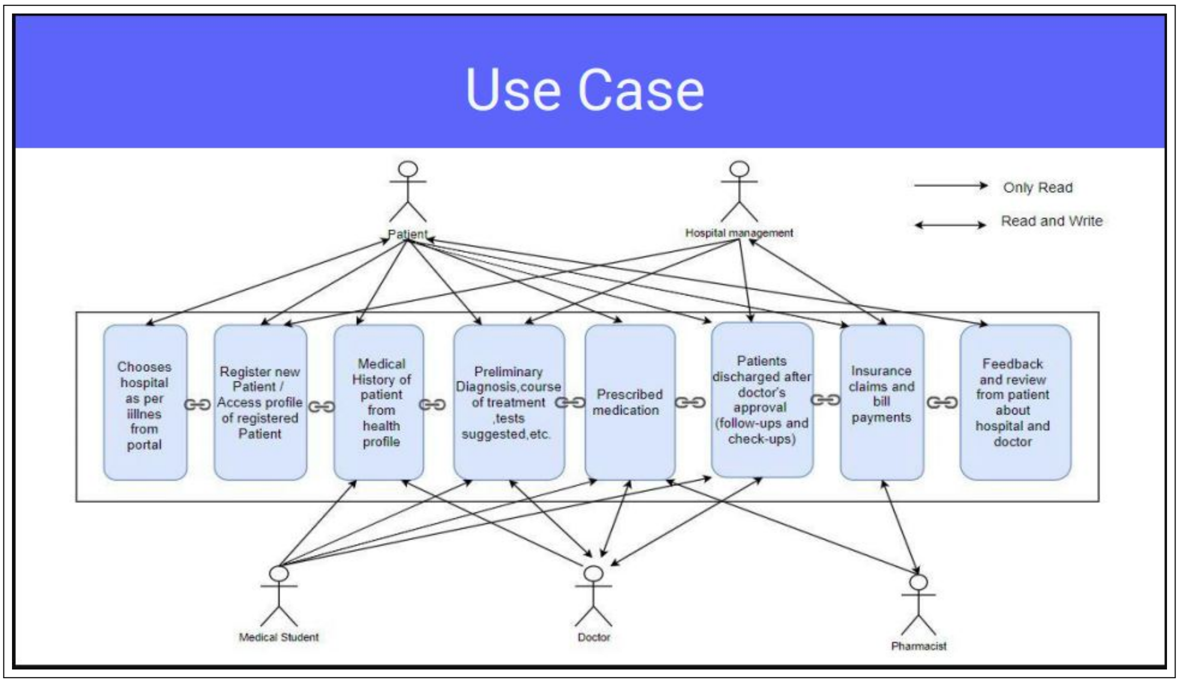


Figure 4.8: Usecase Diagram

A use case diagram is a tool that maps interactions between users and systems to show the interactions between them

# CHAPTER 5

# SYSTEM IMPLEMENTATION PLAN

## 5.1 Project Plan

| Sr No. | Task | Due Date |
|---|---|---|
| 1. | Literature Survey | 2nd week of August |
| 2. | Defining Problem Statement | 3rd week of August |
| 3. | Designing class diagrams, E-R diagrams and related models | 3rd week of September |
| 4. | Review of Design | 4th week of September |
| 5. | Finding Appropriate Dataset | 1st week of November |
| 6. | Preparation and cleaning of final structured data. | 3rd week of November |
| 7. | Visualizing trends and communicating reports | 1st week of December |
| 8. | Selecting the appropriate algorithms | 3rd week of December |
| 9. | Complete Model Testing | 3rd week of February |
| 10. | Application Development | 2nd week of March |
| 11. | Testing of Application | 2nd week of March |

Table 5.1: Project Plan

# CHAPTER 6

# PROJECT IMPLEMENTATION

## 6.1 Recommendation System

- **Data Cleaning Process :**

  Sifting medical clinic by client zipcode and span. Clients need to track down clinics close to themselves; a client in Washington wouldn't find data about a medical clinic in California valuable, so we really wanted a method for sifting the emergency clinic dataset and just observe clinics closes to the client. We arranged a point of interaction where the client would choose their zipcode, their unit of distance inclination (metric or magnificent), and drag a slider correspondingly to change the span inside which they maintained that this clinic should be. Our underlying idea was to basic add and take away 10 to the given zipcode and find all relating 21 zipcodes, however that was illogical since it didn't represent the change in that frame of mind from going to one state to another (assuming somebody is living near another State's boundary, we would be ommiting emergency clinics in the other state since we aren't representing the adjustment of organization; e.g.- 980XX-994XX in WA versus 900XX-900-961XX in CA); and it wouldn't scale to zipcodes of fluctuating sizes; we wanted something more precise. We observed an API called zipcodapi which let us pass in a zipcode, unit, and distance and returned a .csv rundown of relating zipcodes and their separation from the first zipcode passed. It was free and had a day to day furthest reaches of a 1000 questions each day for this level which was ideal for our little understudy made project, so we pushed ahead with this help. Subsequent to getting the csv document containing the zipcode, their separation from our unique zipcode, the city where the zipcode was, and its relating state, we utilized this data to choose a subset of our clinic dataset of the multitude of emergency clinics held inside the given zipcodes. We currently had a rundown of zipcodes inside the clients passed zipcode and distance!

- **Data Cleaning for Complications and Healthcare Associated Infections Data :**

  To clean this information to add it to our last information table that had a segment for each action we planned to see, we changed the arrangement of the information so there was a section for each action and a column for every medical clinic. This elaborate utilizing a for-circle to reshape the information and make the new sections. You can see this work in the infections, complications, aggregation.R record and disease complications aggregation.R document. For the entanglements information, the standard blunder was determined and added as a different segment for each action, so every medical clinic had a standard mistake measure.

- **Data Analysis :**
  We figured out what clinics to suggest utilizing an examination framework that positions medical clinics in view of how well they did in various measurements, contingent upon what the client input. Those information sources were "Stroke", "Cardiovascular breakdown", "Respiratory failure", "Hip or Knee Replacement", "Coronary Bypass Artery Surgery", "Tobacco Use", "Liquor Use", "Other Surgery", "Psychological sickness", and "Other. Each was related with undoubtedly another metric we had from the emergency clinic (recorded beneath.) First and foremost, we sifted down to emergency clinics utilizing https://www.zipcodeapi.com/to get emergency clinics inside a client input range from a zipcode. The goal here was to empower the client to pick a medical clinic that was inside a distance they were willing and ready to travel. After this progression, we utilized the client's contribution of their justification behind visit to figure out what measurements we needed to pass judgment on clinics by were pertinent to their justification behind visiting. Every measurement had a score for every clinic in our dataset. Since the scores were relative just to one another, as in you were unable to think about it against an alternate measurement's score, we chose to rank clinics for every measurement and afterward join the positions. In the wake of working out the positions for every emergency clinic, we weighted each position by duplicating it by 1, 1.5 or 2, relating to low, medium, and high significance. Higher positions were preferrable in our model, as we naturally suspected it would be more instinctive to make sense of the worth of each position as having a multiplier, ex. being 2x more vigorously weighted or considered than a

low variable, rather than being weighted by utilizing division. Then, at that point, we made one weighted rank that contained the amount of the weighted positions as a whole. We utilized this worth to do the last positioning of the emergency clinics. Process in Code First, settle on a decision to the ZipCodeAPI with the information zipcode, distance, and a "mi" as the distance unit. This profits the clinics inside the distance (range) from the zipcode. For showing purposes, filtered.hospital.data contains information from a call made to the ZipCodeAPI with the zipcode 98105 and a 8 km range. Yield is a little subset of the table to show the organization. The full table isn't shown on the grounds that it has the aspects 8 x 186.

## 6.2 Digital Health Profile System

- **The Process for Issuing and Filling of Medical Prescriptions :**
  The main goal is to smooth out the clinical remedy management contact by eliminating the long waiting time process, removing the extortion component from the framework,and lowering the error rate caused by expert misinterpretations. A professional creates a solution for the patient and, using a clever agreement, adds it to the patient's medical records. The drug store then obtains this treatment through a clever arrangement on the Ethereum blockchain, which is made possible by consent granted by a critical specialist and a patient. Following getting to the remedy, the drug shop then gives the medication to the patient together with its expiration date and measurement use as recorded on the patient's medical records through clever agreements, and the medication is then made for the patient.

- **Sharing Laboratory Test/Results Data :**
  The main purpose is to share data using blockchain brilliant agreements, which allow labs, experts, crisis facilities, and other partners to access and share a patient's helpful successfully data among many parties, as shown in Figure 4. Consider a scenario in which a patient goes to the lab for a blood test. The lab will enter the results into the patient's records after they have been handled,

and the patient will receive these warnings via Ethereum blockchain, as well as a notification that the test's handled results are open, and can choose whether to authorise the lab to encode the data and put it on Ethereum blockchain. The patient signs a consent form for the data to be stored on the blockchain.

- **Enabling Effective Communication between Patients and Service Providers :**
  In this case, the patient offers a request for treatment for an ailment, as seen in Figure As a result, it utilises the clever contract framework to transmit this request to the necessary professional. A specialist should assess the request and respond with a proposal, referring the patients to the subject matter expert for further consideration when appropriate. Any information concerning the treatment's historical context should be researched in the EHR. If it's not too much work, note that the patient record is kept up with by a neighbouring data set where there are explicit guidelines for who can access the record and how much, and these guidelines are administered by Ethereum blockchain smart contracts. Another scenario is when the patient makes a request for something specific.

- **Data Flow for Healthcare Reimbursement :**
  The main goal is to speed up the payback process for the medical services framework. In this case, clinicians will prefer to continue with therapy as soon as possible rather than deferring treatment of their patient while waiting for a response from the payer. The entire cycle will be monitored by the execution of computerised clever agreements. Reducing and eventually eliminating the blunder-prone human effort of physically surveying and responding to earlier approval demands, as well as minimising requests triggered by erroneous translation of physically constructed earlier approval structures. Coverage for medical expenses Companies publish their strategy using blockchain brilliant agreements, which detail the methods used to determine approval. A provider then submits an application to the blockchain for prior approval of a professional arrangement, treatment, or remedy.

# CHAPTER 7

# SOFTWARE TESTING

- Alpha Testing : In the software business, it is the most popular method of testing. The goal of this testing is to find any potential problems or flaws before releasing the product to the market or to the consumer. It is carried out alpha testing before Beta Testing, but after the software development phase.

- Accepting Testing : The customer conducts an acceptance test to determine whether the system's end-to-end flow meets business criteria and meets the expectations of the end user. Only when all of the features and functionalities of the software perform as planned does the client accept it. It is the final stage of testing before the software is put into production. User Acceptance Testing is another name for this (UAT)

- Ad-Hoc Testing: The name implies that this testing is done on an ad-hoc basis, that is, without regard for the test case or any strategy or documentation in place for this type of testing. By executing any flow of the program, the goal of this testing is to uncover problems and break the application.

- Accessibility Testing : The goal of accessibility testing is to see if the software or application is accessible to individuals with disabilities. Deaf, colorblind, mentally impaired, blind, elderly, and other disabled populations are included in this category.

- Beta Testing : Beta testing is a type of formal software testing that is performed by the customer. Before releasing the product to the market for actual end customers, it is tested in a real-world setting.

- Comparison Testing : Comparison testing is the process of comparing a product's strengths and drawbacks against earlier versions or similar products.

- Compatibility Testing : When an input or data is entered into a front-end application, it is stored in a database, and database testing, also known as back-end testing, is the process of evaluating that database. Different databases exist, such as SQL Server, MySQL, and Oracle. During this back-end testing, issues such as data loss, deadlock, and data corruption may be discovered, and these issues must be addressed before the system goes live in the production environment.

# CHAPTER 8

# RESULTS

## 8.1 Recommendation UI

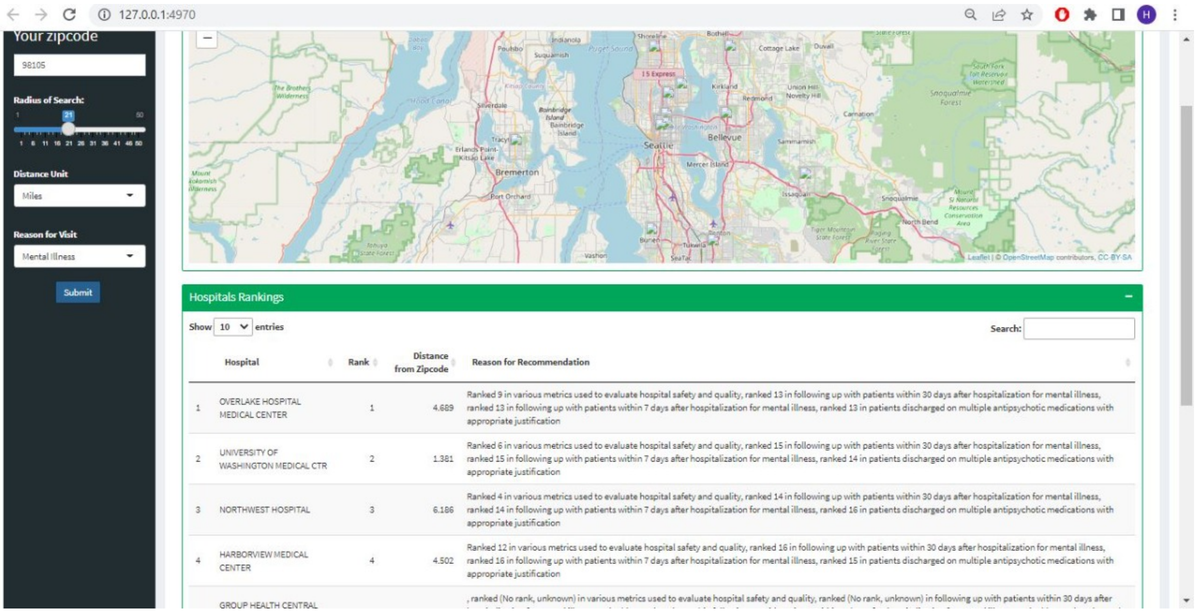


Figure 8.1: UI-1

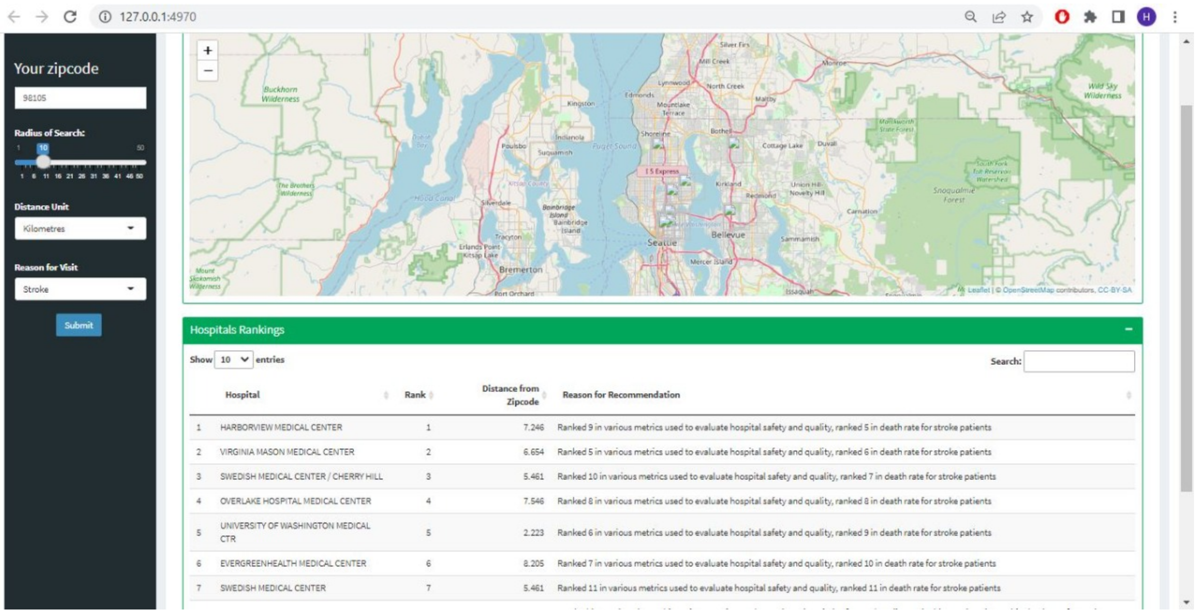


Figure 8.2: UI-2

## 8.2 Android App UI

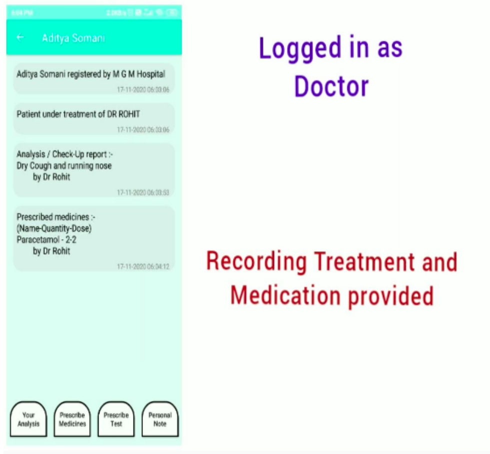


Figure 8.3: App-1

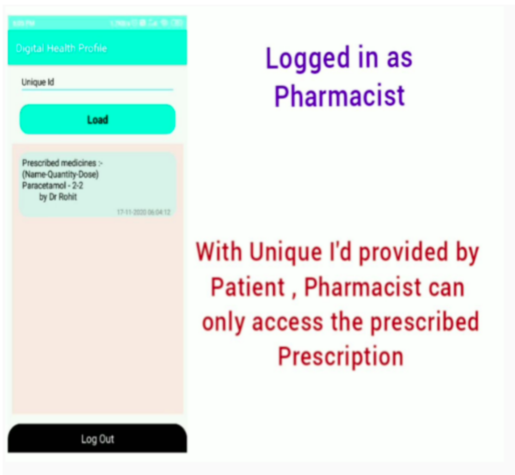


Figure 8.4: App-2

# CHAPTER 9

# OTHER SPECIFICATIONS

## 9.1 ADVANTAGES

1. As OYO is for Hotel, we believe this System can be the OYO for Hospitals all across the Country.
2. Being one of its kind in the entire country, the recommendation system we propose will be bringing in patients to the Hospitals as per hospitals ratings.
3. The Digital Health Profile system will be like Health database record of patient giving the insights of patients medical history as and when required by medical personnel thereby reducing the Emergency response time and optimizing the treatment to greater extent.

## 9.2 LIMITATIONS

1. **Written Evaluation** The model has not been taught to evaluate written reviews such as any written changes/suggestions, or other types of remarks. Because the processes necessary for evaluation differ from one patient to the next, they cannot be adequately assessed. The lack of a dataset has become a significant restriction.
2. **Decentralization** Multiple hospitals as nodes are needed to make the health profile truly de-central.

# CHAPTER 10

# CONCLUSION

## 10.1 Conclusion and Future Work

There is no proper recommendation system for hospitals in the market till now and the system will be completely data driven with zero data manipulation and self feeding data after some period of time The health record maintenance system will have many actors included according to their privileges making the system as efficient as possible There is no such system till date which gives a medical student practical knowledge about the patient's disease and their prescriptions and tests in Real-life scenario And even getting all your prescribed Medicines from Pharmacy without Actual Prescription handy, just by an Unique number is also something which is not available.

# Appendix A

# PLAGIARISM REPORT

Curiginal

## Document Information

| | |
|---|---|
| **Analyzed document** | BE_REPORT.pdf (D120784245) |
| **Submitted** | 2021-12-02T11:32:00.0000000 |
| **Submitted by** | Dipali Kadam |
| **Submitter email** | ddkadam@pict.edu |
| **Similarity** | 5% |
| **Analysis address** | ddkadam.pict@analysis.urkund.com |

## Sources included in the report

| | | |
|---|---|---|
| SA | **Pune Institute of Computer Technology / Gruop_4_BE_Project_Report_Term_1.pdf**<br>Document Gruop_4_BE_Project_Report_Term_1.pdf (D120100437)<br>Submitted by: rutujakulkarni@pict.edu<br>Receiver: rutujakulkarni.pict@analysis.urkund.com | 5 |
| W | URL: https://www.researchgate.net/publication/319975223_A_Hospital_Recommendation_System_Based_on_Patient_Satisfaction_Survey<br>Fetched: 2021-12-02T11:43:00.0000000 | 1 |

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