



GUJARAT TECHNOLOGICAL UNIVERSITY



# Sarvajanik College of Engineering & Technology

(Faculty of Computer Engineering, Computer Department)

A  
Project Report  
On

## Dr. House

Under the course of  
**DESIGN ENGINEERING – 2B (2160001)**  
B. E. III, Semester – VI  
**(Computer Engineering)**

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**GUJARAT TECHNOLOGICAL UNIVERSITY**  
Chandkheda, Ahmedabad



Affiliated

Sarvajanik College of Engineering & Technology

## **CERTIFICATE**

This is to certify that the students namely, Student Name of This is to certify that the students namely, **Bardolia Priyank (170420107501)**, **Bhutwala Bhargav (170420107506)**, **Parmar Siddhant (170420107552)**, **Srivastav Umang (170420107554)**, **Thakor Pathik (170420107557)** of **B.E. 3<sup>rd</sup> Year (Computer Engineering) Semester VI** have successfully completed the course work and related tasks for the course of **Design Engineering-(2B) (2160001)** during the academic term ending in the month of September 2019.

Date:

Place: SCET, Surat

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# **CHAPTER – 1 INTRODUCTION**

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## **1.1 About the topic**

With increasing diseases in the modern world, it is difficult for each patient to maintain the reports of all the tests that he and his family has gone through in the past 5-6 years.

Moreover, carrying MRI, X-ray and reports of other tests to the doctor frequently is tiresome and a difficult job.

Since these files require excessive care, these are difficult to move from one place to another. The wastage of patient's time when he goes to a hospital is very high. Firstly locating the reception in rush hours is time consuming. Further standing in queue for token collection is highly frustrating.

Repeated Consultation of doctor is very inefficient for patients. The patient has to revisit the doctor for further course of action after the test recommended by him has been conducted.

There is a lack of information regarding the sale of generic medicine and its advantages. The branded drugs are very expensive and generic medicines are very good alternative to them

## 1.2 Prior Art Search Summary

### Patent Search and Analysis

Part 1: Patent Search Technique Used					
		Patent 1	Patent 2	Patent 3	Patent 4
1	<b>Patent Search Database Used</b>	European Patent Office (worldwide database)	European Patent Office (worldwide database)	European Patent Office (worldwide database)	European Patent Office (worldwide database)
2	<b>Keywords Used for Search</b>	health, care, manage	records, management	patient, history	patient, history
3	<b>Search String Used</b>	or, and	and	and	and
4	<b>Number of Results/Hits</b>	15	288	67	67
Part 2: Basic Data of Patented Invention / Bibliographic Data					
5	<b>Title of Invention</b>	Health Care System for Physicians to Manage Their Patients.	Records Access and Management.	Patient Monitoring System Having a Patient History Slider	System and Method for Automated Patient History Intake.
6	<b>Publication Number</b>	US201913007 1	US201920835 4	CA2818346	US201412212 9
7	<b>Date of Application</b>	2019-05-02	2019-07-04	2012-05-24	2014-05-01
8	<b>Name of Inventor/s</b>	Chatwani Chetan	Raduchel William J, Spivy Art	Clapp Geoffrey, Durvasula Sudhir	Lesselroth Blake J, Felder Robert S, Adams Shawn M, Cauthers Phillip D, Wong Gordon J
Part 3: Technical Part of Patented Invention					

9	<b>Limitation of Prior Technology/Art</b>	No portal or terminal available between doctors and patients for communication which can record the doctor's response.	Non-availability of electronic medical record and precise predictions of data.	Remote patient monitoring is a blooming field in the medical technology sector, the ease of patients to communicate accurately/precisely with doctors from far away distance is the goal and also the detection of problem with patient by doctor from far distances.	Visual representation of medical data and pharmaceutical information is lacking in the medical technology sector.
10	<b>Brief about Invention</b>	Discloses about a web-based portal developed for physician's clinical research & related clinic operations workflow management.	Systems and methods for providing a healthcare provider with an electronic medical record of a patient, a recommendation, or an alert relating to the patient, based on an analysis of the patient's health data.	A patient monitoring system designed to monitor a patient located in a home or residence and to provide information to a health care manager located at a healthcare facility.	A system of automated patient history intake including a retrieval system for retrieving pharmaceutical information specific to a patient, a display system for displaying the pharmaceutical information, and a reconciliation system for reconciling the pharmaceutical information using visual

					data.
11	<b>How is Invention related to your project</b>	Design of a portal in which doctor can enter the patient's data.	Maintaining records and managing them, deriving results out of data, alert system.	Remote patient monitoring, design implementation.	Pharmaceutical information retrieval, visual representation of data.
12	<b>Key Learning Points</b>	Web based portal.	Deriving results/prediction from data.	Remote patient monitoring.	Visual data representation.

### Feature Analysis of other apps

Features	1mg	Netmeds	Practo	PharmEasy	Medlife
Order medicine online	✓	✓	✓	✓	✓
Lab Tests	✓	✗	✗	✓	✓
Online Q & A with doctors (online consultation)	✓	✗	✓	✗	✓
Reminder for medicine	✓		✓		✗
Order health products online	✓	✓	✓	✗	
Health articles	✓	✓	✓	✓	✗
Reminder for doctor's appointment	✗	✗	✗	✗	✓
Details of health records	✗	✗	✓	✗	✓
Search for doctors or clinics	✗	✗	✓	✗	✗
Search details about medicines	✓	✓	✓	✓	✗

## **1. A Wearable Smartphone-Based Platform for Real-Time Cardiovascular Disease Detection Via Electrocardiogram Processing (May 2013)**

Joseph J. Oresko, Student Member, IEEE, Zhanpeng Jin, Student Member, IEEE, Jun Cheng, Shimeng Huang, Yuwen Sun, Heather Duschl, and Allen C. Cheng, Member, IEEE

Cardiovascular disease (CVD) is the single leading cause of global mortality and is projected to remain so. Cardiac arrhythmia is a very common type of CVD and may indicate an increased risk of stroke or sudden cardiac death. The ECG is the most widely adopted clinical tool to diagnose and assess the risk of arrhythmia. ECGs measure and display the electrical activity of the heart from the body surface. During patients' hospital visits, however, arrhythmias may not be detected on standard resting ECG machines, since the condition may not be present at that moment in time. While Holter-based portable monitoring solutions offer 24–48 h ECG recording, they lack the capability of providing any real-time feedback for the thousands of heart beats they record, which must be tediously analyzed offline. In this paper, we seek to unite the portability of Holter monitors and the real-time processing capability of state-of-the-art resting ECG machines to provide an assistive diagnosis solution using smartphones. Specifically, we developed two smartphone-based wearable CVD-detection platforms capable of performing real-time ECG acquisition and display, feature extraction, and beat classification. Furthermore, the same statistical summaries available on resting ECG machines are provided. Index Terms—Arrhythmia detection, cardiovascular disease (CVD) detection, ECG processing, machine learning, smartphone, windows mobile.

Two smartphone-based platforms for the continuous monitoring and recording of a patient's ECG signal successfully perform real-time CVD detection and generate personalized cardiac health summary reports. They can further utilize the system to monitor their daily number of abnormal beats and investigate on their own if lifestyle changes, such as increasing exercise, diet management, reducing caffeine intake, etc., which can decrease the number of uncomfortable and potentially dangerous arrhythmic beats. In future phones, multicore processors would be able to take advantage of the current multithreaded application and the additional parallelization in order to increase the capacity of the smartphone-based CVD-detection solutions, allowing patients to become more involved with monitoring their own health.

## **2. Design and development of low investment smart hospital using internet of things through innovative approaches (March 2017)**

Patan Rizwan (1), Rajasekhara Babu M (1\*) and Suresh K (2)

1.School of Computer Science and Engineering, VIT University, Vellore, India

2.Department of CSE, Annamacharya Institute of Technology and Sciences, Rajampet, Kadapa (Dt), Andhra Pradesh, India

Currently smart hospitals are very few as well as very expensive. The cost of these smart hospital set up can be reduced by deploying Internet of Things (IoT). IoT is booming technology in many fields for smart environments. This paper presents an innovative technical support for development of smart hospitals with low investment. Automation in dealing with medical things reduces the human intervention. Patient remote monitoring system monitors the chronic disease patient's health condition continuously and generates alerts during abnormal situations of patient's health. A Patient remote monitoring system includes wearable devices which are developed by using Internet of Things. The wearable devices track the patients' health condition continuously. In addition, the hospital beds equipped with sensors that measure patient's vital signs that can be converted to deploy as Internet of Medical Things (IoMT) technology. Finally, the proposed model built with very limited capital that provides better service for all kind of peoples.

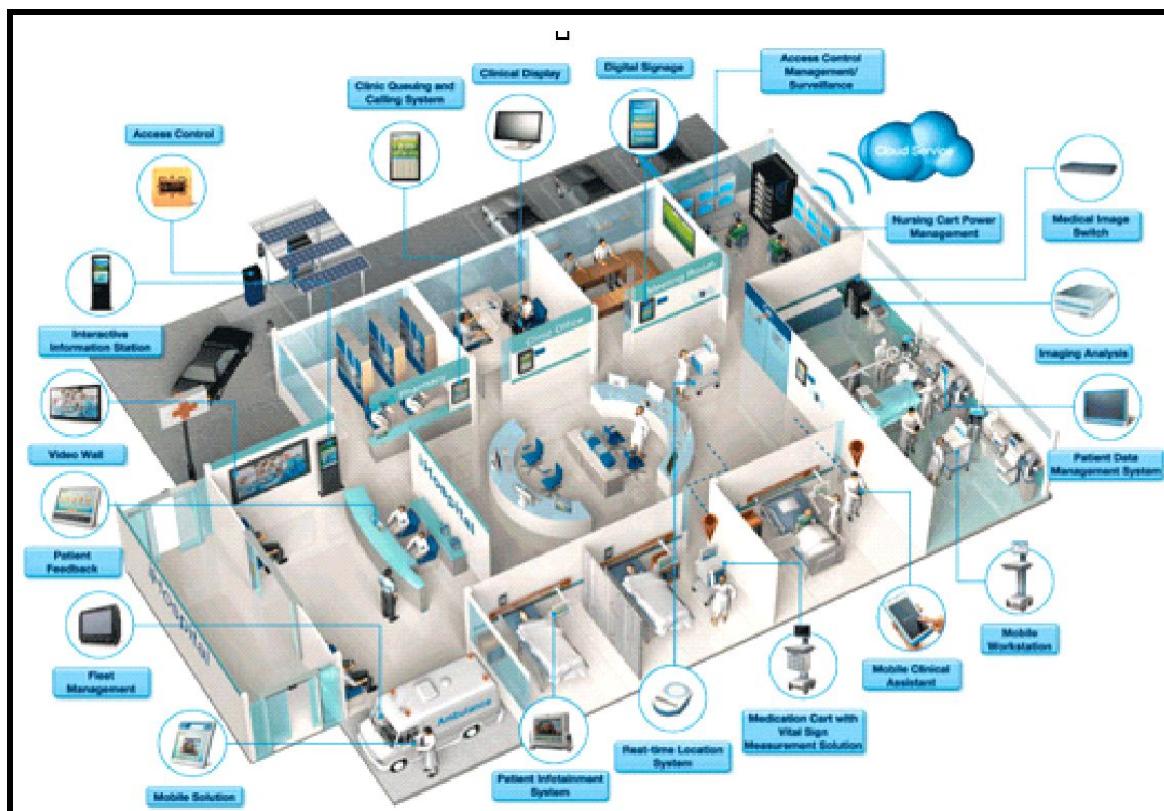


Fig 1.2.1

This paper concentrates on the general approach and technique for the IOT empowered self-governing smart hospitals facility management framework with the associated Device choice, data signifying, interoperability, data mapping and data change, data approval and data exclusion, prepare stream arrangement for occasion driven work processes, engineering and foundation choice subtle elements. The quality procedures recommended a booked routine or technique to check the legality of the device working standards. The lab management, in/out patient management, operational care, outpatient treatment, room label, medical check-ups, staff-organization, innovative avenues inter departmental operations are a portion of the arranged future utilize cases to get executed as a major aspect of the framework. The data produced out of the on-going devices result in the massive volume of data which needs the cloud and big data study phase. Proposed smart hospital development with low investments organized framework in all areas of country. Smart features to be deployed in all phases of the hospitals. The hospitals are facilitating these features in their hospitals it is reducing the waiting time, improve quality and care delivery of the patients.

### **3. Early Detection of Cardiological Issues using Mobile Applications (August 2018)**

S.Durgadevi, Kaushik.S, D.Magesh, B.Ashwin

Department of Electronics and Instrumentation Engineering

Sri Sairam Engineering College, Chennai-60004

Heart attack is an important medical emergency. It causes 35% of global deaths. Symptoms of heart attack are similar to the symptoms due to indigestion. Therefore often heart attacks are detected very late which result in a large number of casualties. Heart condition can be suspected using the heart rate and blood pressure as tools.

“Early Detection of Cardiological Issues using Mobile Applications” by S.Durgadevi , Kaushik.S , D.Magesh and B.Ashwin proposes a device that measures the heart rate , blood pressure and ECG of a patient and compares it with standard values set according to the gender and age of the patient .

If any abnormality is detected , the patient is notified and further a message is sent to the concerned person specified by the patient .The primary aim of this device is to reduce the number of deaths caused by heart attack by early detection

Hardware component include input devices like Pulse detector, BP cuff and ECG electrodes and output devices like Buzzer , Bluetooth, LED indicators. The processor processes the data sent by pulse detector and ECG electrode and sends it to the mobile phone using Bluetooth where it is analyzed. Buzzer rings an alarm when any abnormality is detected. The LED indicator indicates the pulse rate i.e. High, normal or low.

A number of Heart attack detection techniques have been introduced thus far but most of them are costly and not user friendly. The proposed product is efficient in terms of lower cost and high accuracy and can used by all the levels of society.

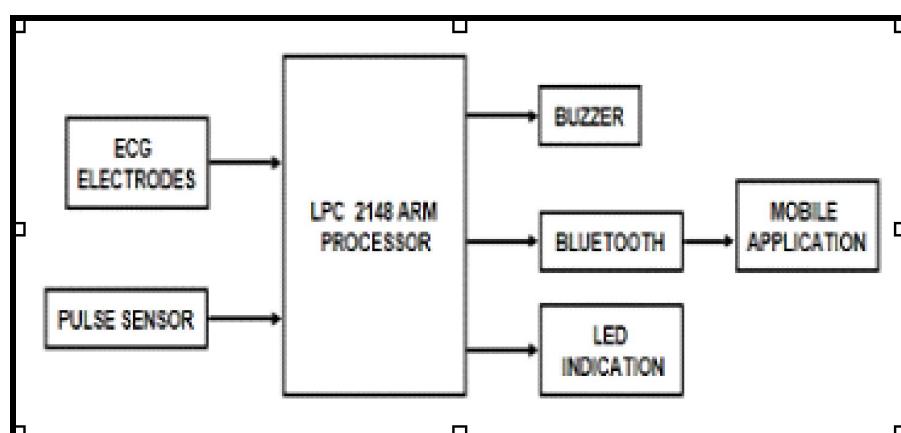


Fig 1.2.2

The inputs are Pulse sensor and ECG electrodes. The outputs are Buzzer, Bluetooth, and LED Indication. The pulse sensor senses the pulse or heart rate of the patient and sends the output to the Arm processor and the output of ECG electrodes are also sent to the processor. The processor processes these data and sends the data to the mobile application using the Bluetooth Connectivity module. A buzzer is used to provide sound whenever the pulse rate is lesser or greater than the default values. The LED indicator is used to indicate the level of pulse such as LOW, NORMAL and HIGH using different colours such as RED, GREEN, and YELLOW. The measured values of pulse rate and Blood pressure are displayed in the mobile application and the values are compared with predefined values and SMS or a call is made to the personal doctor or concerned number given by the patient.

#### **4.Gathering Requirements for Hospital Management System Using Intelligent Agents (march 2012)**

Nidhi Kushwaha, Shashank Sahu, P. Ahmed

A Hospital Management System (HMS) streamlines hospital operations, enhances administration and control, provides better patient care, strictly controls operational costs and helps in improving many other functionalities. Besides it a HMS should be able to respond to evolving requirements. Unfortunately, a HMS developed using conventional software development practices may not meet this requirement as it may need system reengineering. An intelligent agent based HMS can adapt to such situations without system reengineering. The biggest advantage of intelligent agent based system is that its constituent intelligent agents can sense, learn and dynamically modify their functionalities according to the evolving requirements. In turn, the evolving nature of agents helps agent based systems to enhance automatically their capabilities according to the user's changing working behavior. In this paper we describe a novel software intelligent agent model that automatically senses and gathers user's requirement and generates a report for HMS developer for improving the functionalities of the underlying HMS which is already deployed and operational at customer's site.

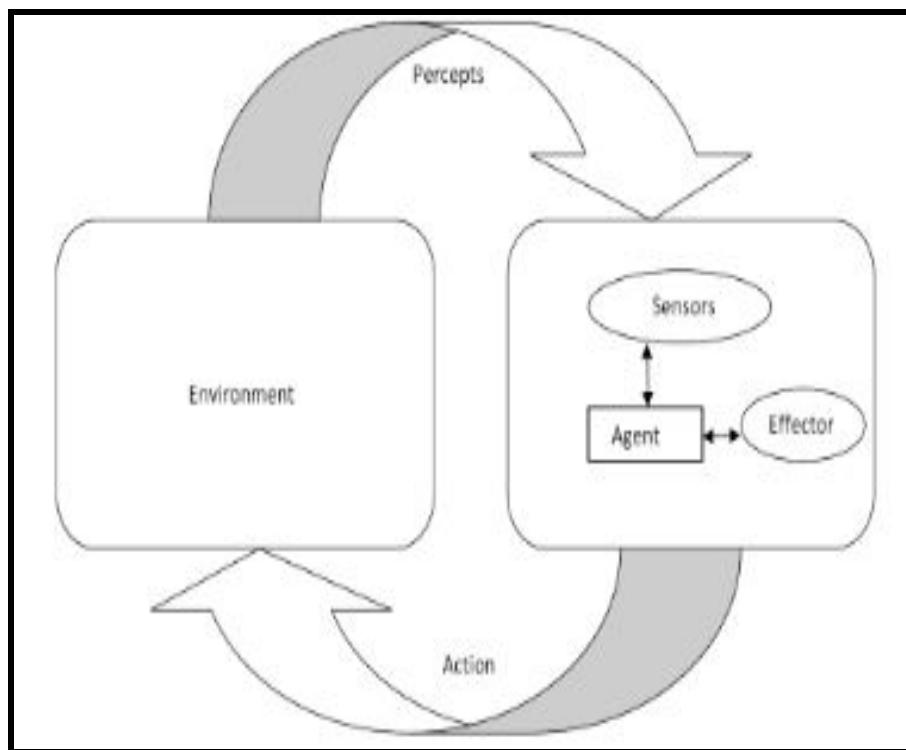


Fig 1.2.4

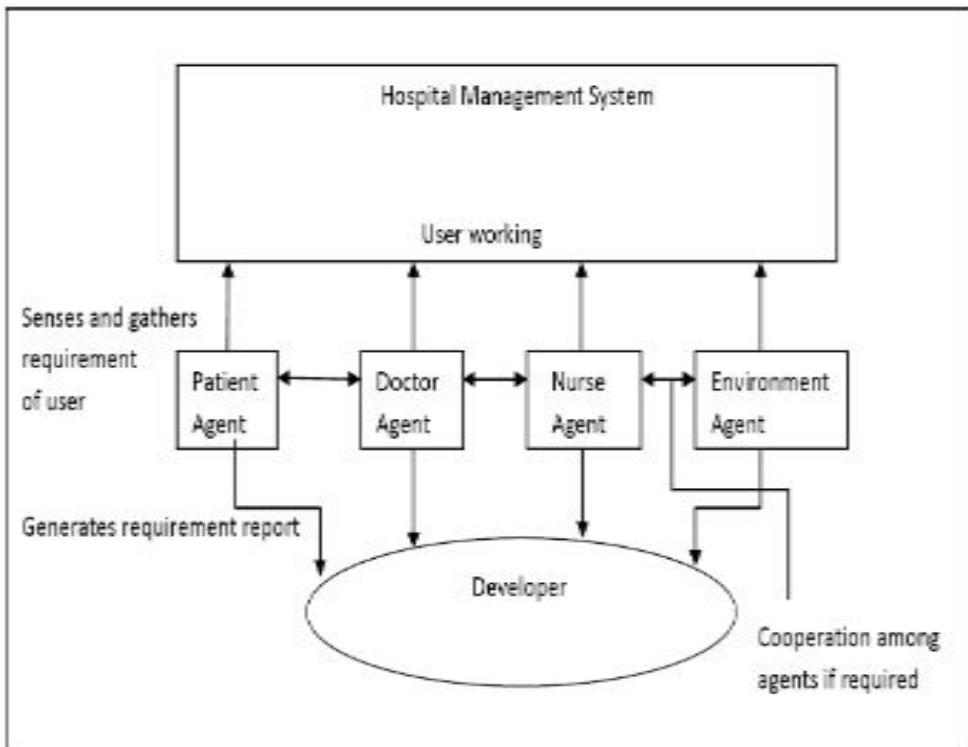


Fig 1.2.5

An intelligent agent based HMS is expected to provide feasible solutions to the problems that evolve after the deployment of HMS and during its operation. The reason is that such a system can evolve with emerging requirements captured by its intelligent agents. In addition to this, agents evolve themselves and gain expertise in better understanding of emergent requirements that bound to emerge during the system operation. Application of suitable learning and sensing technique for agents is topic of intensive research. Development of these agents opens new challenges in the software development process. Software intelligent agents reduce burden of developers and user in identifying requirements. Therefore, once the agents are developed, they reduce maintenance cost of the software that is the major issue in software production.

## **5. Development of modified mattress for patient handling in Hospital. (October 2013)**

Arvind T Wadgure, R D Ashkedkar and V N Mujbaile

Mechanical Department, K.D.K.C.E., Nagpur, India

Development of Modified Mattresses for Patient Handling in Hospital by Arvind T. Wadgure, Sandip deshmukh and Ram D. Vaidya proposes the development of modified mattresses that allow for easy movement of paralyzed / injured patients.

The Paper describes the number of times the patient is loaded and taken from a stretcher while he is being carried from the accident location to the hospital bed and further for conduction of various tests.

The movement of patient is a labour intensive work and due to which 38% of nursing and labour staff suffer from lower back pain at the age of 39. Similarly the patient also suffers discomfort during this process. Any accident during this movement can cause further damage to the patient.

The proposed product uses aluminum square tube below the mattress to maintain the straightness of the mattress . This increases the comfort of the patient and reduces the stress incurred by the staff.

### **Advantages of Trolley Cum Stretcher and Modified Mattresses**

- It eliminate the problem occur during patient handling.
- It will reduce stresses on nursing staff.

### **Limitations of Trolley Cum Stretcher**

- The cost of this project will be high as Hospital's owner has to replace all the conventional hospital bed with new one.
- Extra care has to take while moving the patient on Trolley cum stretcher.

Most of the hospitals are using fully atomized beds and stretcher for the patient handling. There are very costly and cannot be affordable to all the hospital. The stresses developed during the handling of patient in both, i.e., patient and staffs are same for all the hospital. Our aim to provide a better solution for patient handling to these hospitals whose are having limitations for the use fully automated beds and stretcher. As per the above problem we provide modified mattresses for patient handling. Cost of such type of mattresses is affordable for all type of hospital and it is beneficial for patient handling.

## **6. Big Data: A Healthcare Revolution (August 2016)**

Atmika Sharma (Bachelor of Technology Undergraduate Student, Dept. of Computer Science, Miranda House College, University of Delhi, New Delhi, India)

Research identifies the recent surge in healthcare data as the key to improving health outcomes and reducing the ever increasing healthcare costs. Harnessing this data will be revolutionary for both payers and providers in the healthcare sector. Big data analytics will help payers make informed choices and offer incentives to providers for more effective care. This paper seeks to present big data as a concept and discuss the various advantages and challenges it brings along with itself. This paper also sheds light on Big Data Analytics implementations and platforms present in today's time that help deal with this flood of data

Big data analytics which leverages legions of disparate, structured, and unstructured data sources is going to play a vital role in how healthcare is practiced in the future. One can already see a spectrum of analytics being utilized, aiding in the decision making and performance of healthcare personnel and patients [9]. Big data analytics has the potential to revolutionize the healthcare industry by benefits for both patients and providers. It not only helps patients make informed decisions but also enables providers to optimize their business outputs. The surge of data has caused this shift in the healthcare sector and not only does it concern the healthcare industry but also brings growth potential for the IT sector. Even though several challenges and hurdles need be overcome, there is scope for massive advancement in healthcare and also for the tools and platforms of analytics.

## **7. NFC based Hospital real-time Patient Management System (April 2013)**

Atluri Venkata Gopi Krishna(1), Cheerla Sreevardhan(2), S. Karun, S.Pranava Kumar (3)

1. B.Tech, ECE, KL University, Andhra Pradesh, India.

2. Assistant Professor, ECE Department, KL University, Andhra Pradesh, India

3. B.E, Mechatronics, MIT, Manipal, India.

In this paper we have described the multilayer system architecture for the development of the NFC based Real Time Hospital Patient Management System. This architecture can be used in different areas or departments across the multispecialty hospitals and super specialty hospitals as they have several cases that are dealt by different doctors. It can be used in the impatient and ward management department, nursing department, housekeeping department, helpdesk, patient billing, outpatient management, pharmacy department and also the emergency department. Finally we can even try for updating this information remotely using the smartphones that have NFC application via the internet so that they can obtain this data or information across any device that is incompatible or does not have an NFC reader. Currently, it is possible to conclude that NFC promises appear to be credible for providing a better solution to the hospital patient Management system in many hospitals.

A number of heart attack detection techniques have been introduced so far, but most of the devices invented are costly and not user friendly and also time consuming. In this modern age of smartphone, we believe and deserve that this proposed technique provides an alternate method with accurate outcome and can reach to people doorstep at every level in the society. In this proposed system different techniques are focussed and combined into a single algorithm. The user is provided with the option of choosing the technique which they need to detect heart attack. The application of the project is efficient in terms of lower cost, high accuracy and user - friendliness.

## **8.Patient's Health Monitoring System using Internet of Things (Iot) (May 2018)**

Rohit Kumar Dubey,Sakshi Mishra,Shreya Agarwal,Ravi Sharma,Nandita Pradhan,Vineet Saran

Department of Electronics and Communication Engineering

United College of Engineering and Management, Naini, Allahabad, Uttar Pradesh (211010), India

The proposed project envisages developing a health monitoring system that monitors and controls the condition of patient by sending the alert message to the predefined members of health centers for ensuring remedial action by the doctor against the patient through the application of Internet of Things (IoT). In this project we are using different sensors for knowing the real time status of the health of the patients such as temperature sensors, pulse sensors, etc in order to sense the serious health problems with the patients, so that efficient medical services can be provided to the patient in very apposite time. In patients monitoring system, one's require equipment, devices and supplies that measure, displayed record human psychological characA patient monitoring system for providing continuous monitoring of a patient includes a data acquisition and processing of data from the patient and then this health related data is sent to the medical staff through Internet of things (IoT) by using Raspberry Pi kit. This proposed project will leads to expeditious delivery of requisite medicinal help to cure the patients. There are several applications of this method in biomedical field that leads to better accuracy, design security,productivity, speed and flexibility.

### **Hardware used**

- Raspberry pi 3 kit
- Regulated power supply
- Temperature and humidity sensor
- ECG setup
- Blood pressure sensor
- PC or Android phone(user interface)

### **Software used**

- Python software language application (Version 2.7.14 or 3.6.3)
- PHP(Wamp server 32bit or Wamp server 64 bit)
- Database management system

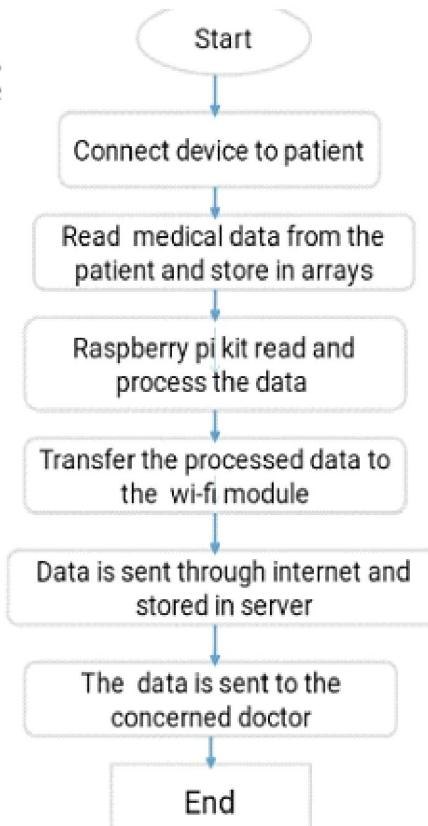


Fig 1.2.6

- i. It allows the healthcare provider to collect the medical and health data of an individual and transfers it to the clinical staff such as doctors, nurses etc.
- ii. Patient health parameter data is stored over the cloud. So it is more beneficial than maintaining the records on printed papers kept in the files.
- iii. With the IoT health monitoring, we can have the database of these changes in the health parameters. Doctors can take the reference of these changes of the patient while suggesting the treatment of the patient.
- iv. With the emerging technology or connected tools, patients, elders or clinical study participants are not required to visit hospital premises for checkup.

# CHAPTER – 2 OBSERVATIONS

## 2.1 A-E-I-O-U Frame Work

AEIOU Summary:			Group ID: 18713	Date:	Version: 1			
Environment:			Interactions:			Objects:		
PLEASANT RAINY WEATHER	UNSANITARY WASHROOM	BIG INFRASTRUCTURE	PATIENT CONSULTING DOCTOR	PATIENTS INTERACTING	DOCTORS DISCUSSING AMONG THEMSELVES	STRETCHERS	HOSPITAL BILL	WHEEL CHAIRS
PARKING GROUND	GARDEN AREA	NOISY ENVIRONMENT	PHARMACIST INTERACTING WITH PATIENT	DELIVERY BOY WITH PATIENT	PEOPLE PAYING BILLS	WATER PURIFIERS	CHAIRS	GLOVES
ANTISEPTIC ODOR	LONG QUEUE	NEW CONSTRUCTION	CALL OPERATOR WITH PATIENTS	DOCTORS ORDERING ATTENDANTS	PATIENT WITH APP	NEWSPAPER / MAGAZINES	PRINTER	BEDS
SUFFOCATION INSIDE BUILDING	AMBULANCE PARKING	CLEAN FLOOR	CALL OPERATOR WITH DOCTOR	CALL OPERATOR WITH PHARMACIST	ARGUMENTS	CASE PAPER	COMPUTERS	AMBULANCES
Activities:			Users:					
PEOPLE USING MOBILE PHONES	SUGAR TEST	NURSE GIVING VACCINES	PEOPLE READING NOTICES	DOCTORS	DELIVERY BOY	PHARMACIST	CASH COUNTER OPERATOR	
PATIENTS RUSHING	PEOPLE ARGUING	DOCTORS ATTENDING PATIENTS	AMBULANCE ON DUTY	PATIENTS	PHARMACY RETAILER	ATTENDANTS	CASE COUNTER OPERATOR	
RELATIVES VISITING PATIENTS	ATTENDANTS RUNNING	PEOPLE SITTING ON SITTING ROWS	PEOPLE READING NEWSPAPER	NURSES	PATIENT'S RELATIVES	VACCINATION SPECIALIST	BLOOD BANK OPERATOR	
BLOOD TEST	RUSH HOURS IN MORNING & EVENING	QUEUE ON CASH & CASE COUNTER	LESS RUSH IN AFTERNOON	RECEPTIONIST	SURGEONS	X-RAY OPERATOR	CHILD SPECIALIST	
URINE TEST	X-RAY CONDUCTED			COLLEGE PROFESSORS	VISITING DOCTORS			

Fig 2.1.1

## Activities :

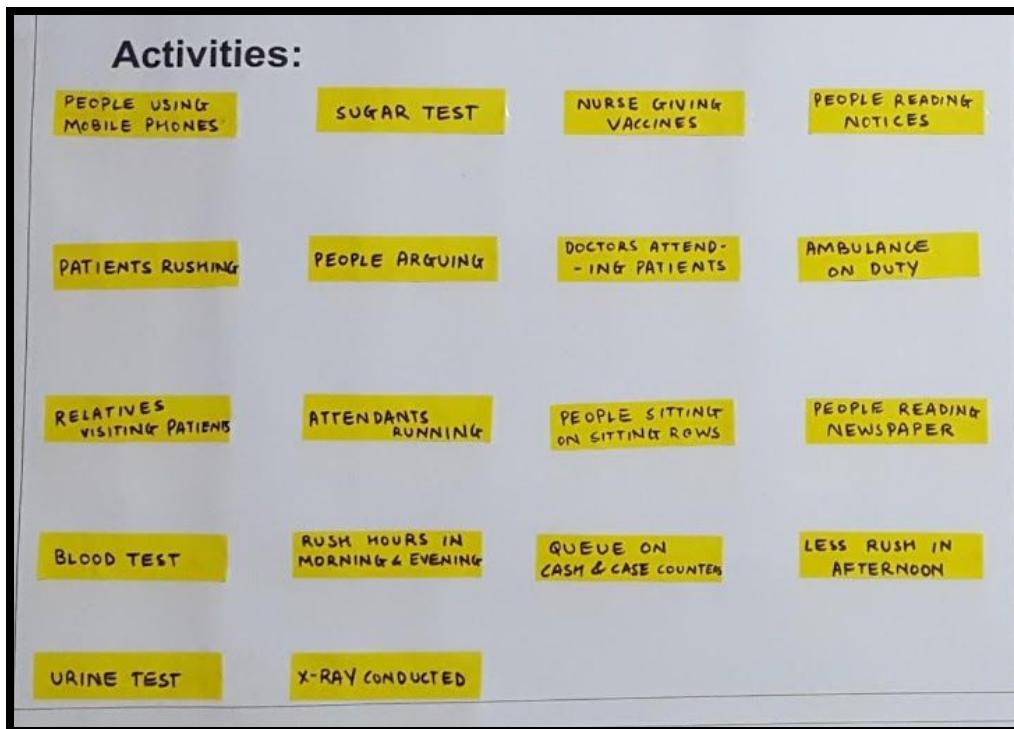


Fig 2.1.2

## Interactions :

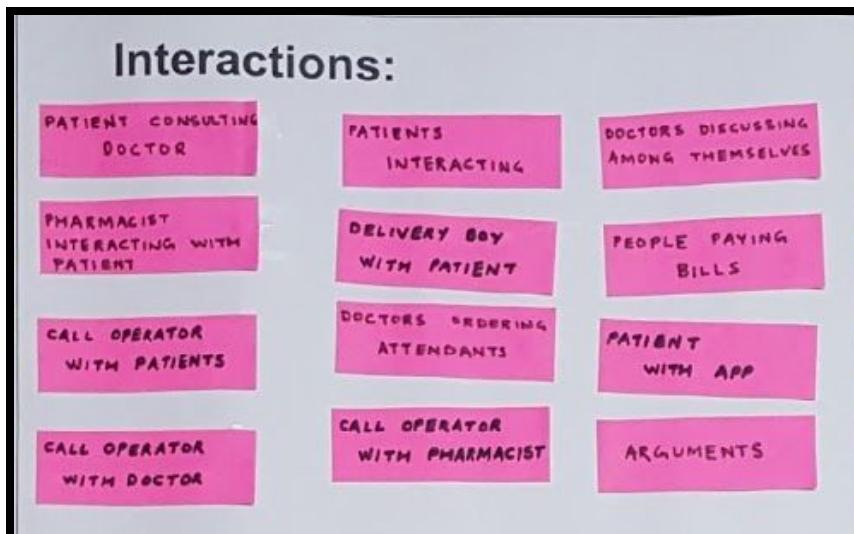


Fig 2.1.3

## Environment :

Environment:		
PLEASANT RAINY WEATHER	UNSANITARY WASHROOM	BIG INFRASTRUCTURE
PARKING GROUND	GARDEN AREA	NOISY ENVIRONMENT
ANTISEPTIC ODOUR	LONG QUEUE	NEW CONSTRUCTION
SUFFOCATION INSIDE BUILDING	AMBULANCE PARKING	CLEAN FLOOR

Fig 2.1.4

## Objects :

Objects:		
STRETCHERS	HOSPITAL BILL	WHEEL CHAIRS
WATER PURIFIERS	CHAIRS	GLOVES
NEWSPAPER / MAGAZINES	PRINTER	BEDS
CASE PAPER	COMPUTERS	AMBULANCES
X-RAY MACHINE	ATM MACHINE	OXYGEN MASKS
MRI SCANNER	FACE MASKS	GLUCOSE BOTTLES
ECG MACHINES	WIFI ROUTER	INFECTIONS
HAND SANITIZER	INSTRUMENTS	TELEPHONES

Fig 2.1.5

## Users :

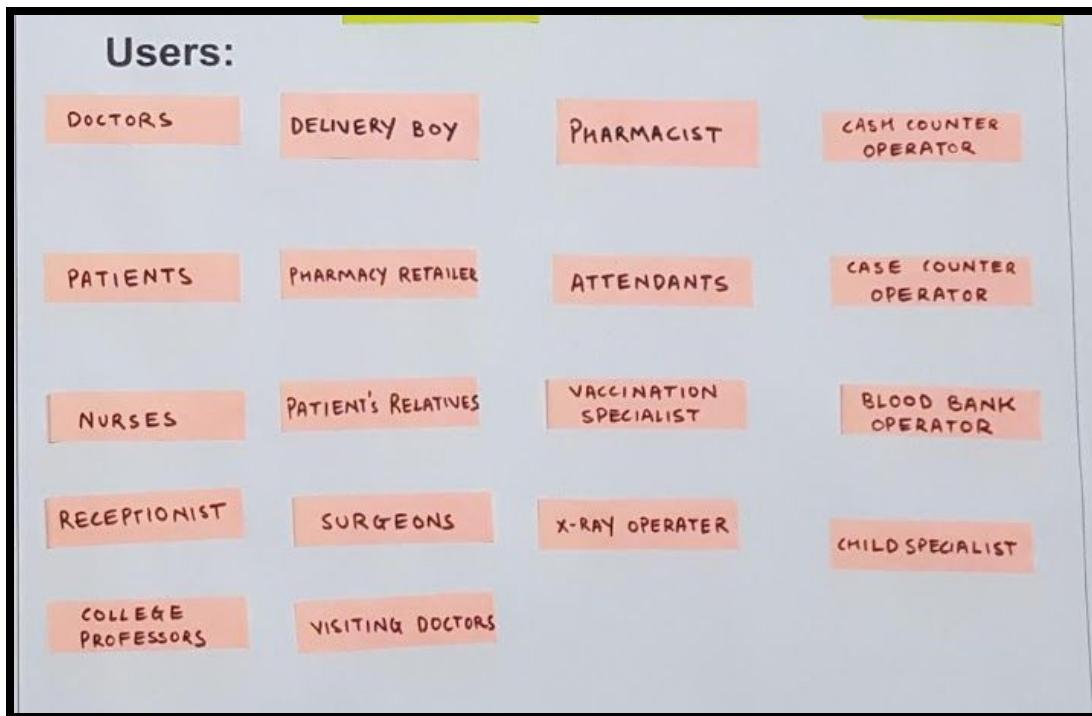


Fig 2.1.6

# CHAPTER – 3 CANVASES/FRAMEWORKS

## 3.1 Mind Mapping Canvas

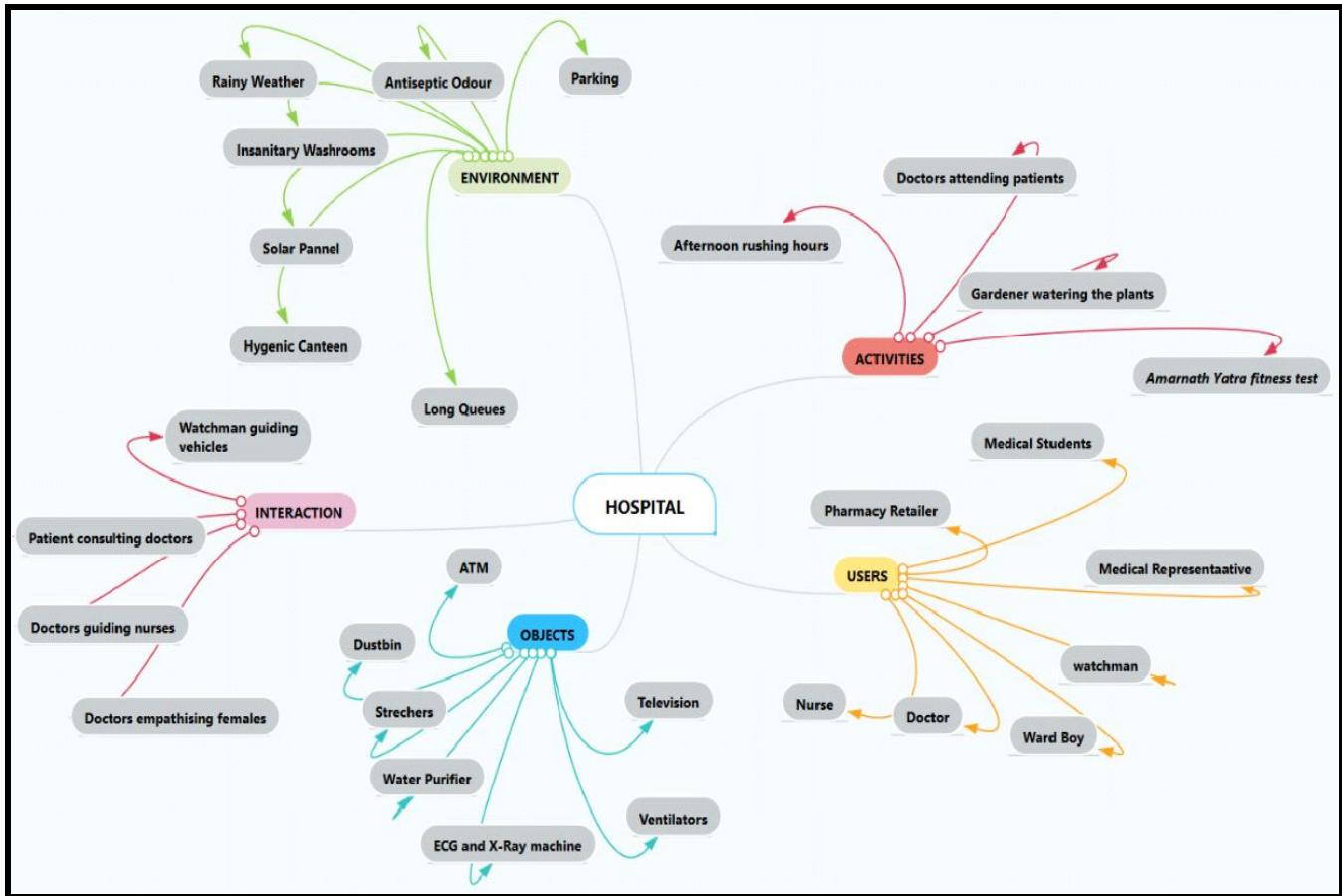


Fig 3.1.1

### 3.2 Empathy Canvas

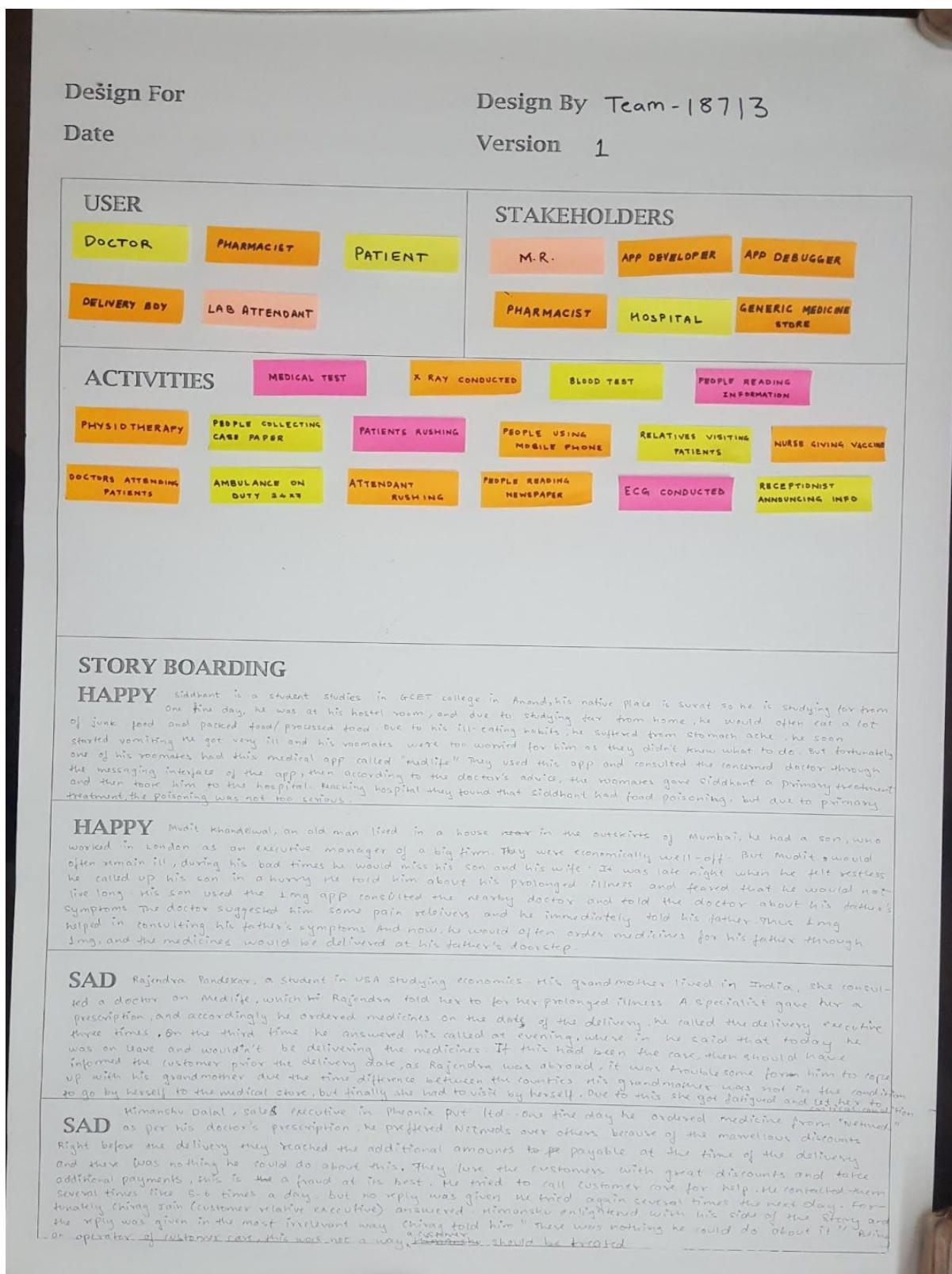


Fig 3.2.1

## Activities :

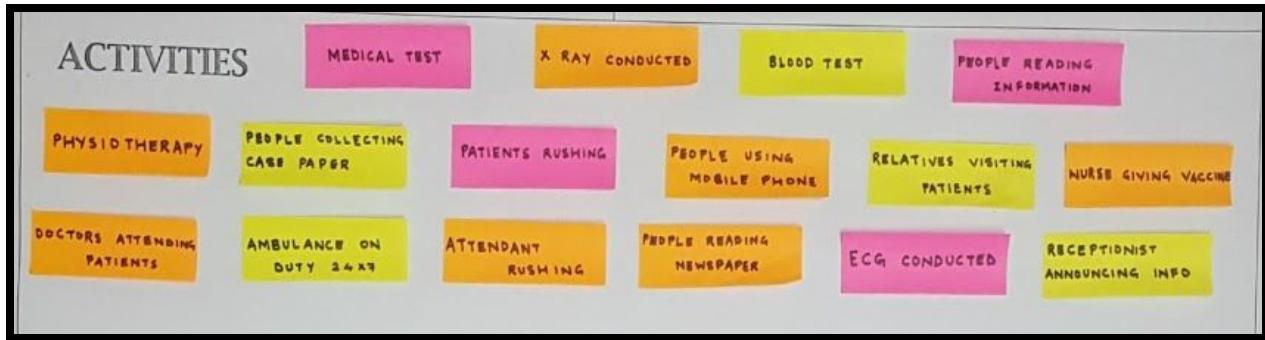


Fig 3.2.2

## Users :

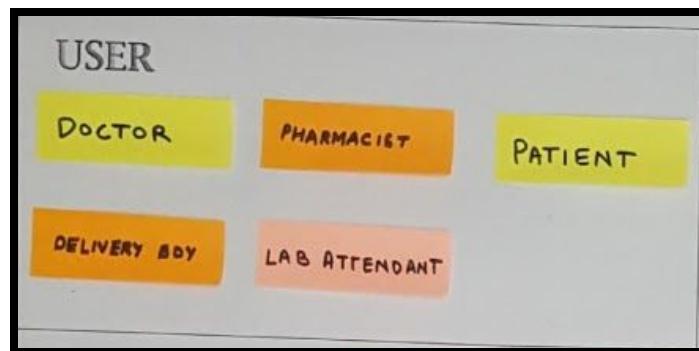


Fig 3.2.3

## Stakeholders :

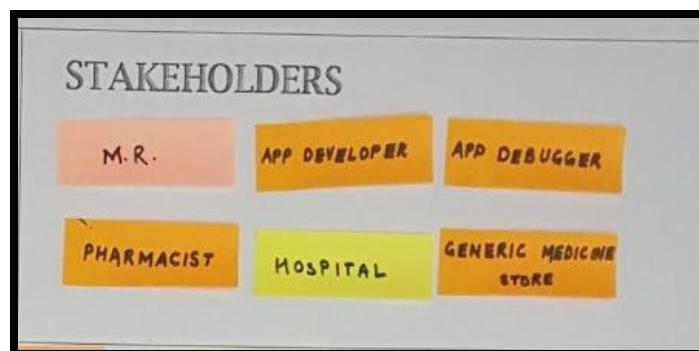


Fig 3.2.4

## Happy Stories :

### HAPPY 1:

Siddhant Sanghvi is a student studying in GCET College in Anand, his native place is Surat. One fine day he was at his hostel room. And as he is hostelite, so he would often eat a lot. Junk food

and packet food was his routine. Due to his ill eating habits he suffered from stomach ache, he soon started vomiting. He got very ill and his roommates were too worried for him as they didn't know what to do. But unfortunately one of his roommates had the medical app call medlife. They used this app and consulted the concerned doctor through the messaging interface of the app, then according to the doctor's advice, the roommates gave Siddhant a primary treatment and then took him to hospital. On reaching the hospital they found that Siddhant had food poisoning, but due to primary treatment the poisoning was not too serious.

### **HAPPY 2:**

Mudit Khandelwal, an old man lived in the house in the outskirts of Mumbai. He had a son who lived in London as an executive manager of a big firm. They were economically well- off. But Mudit would often remain ill, during his bad times he would often miss his son and wife. It was late night when he felt restless and he called up his son in a hurry. He told him about his prolonged illness and feared that he wouldn't live long. His son used the 1 mg app. Consulted the nearby doctor and told the doctor about his father's symptoms. The doctor suggested him some pain relievers and he immediately shipped that to his father's address. Thus 1 mg helped in consulting his father's symptoms. Now often he would order medication from 1 mg application and that would be delivered to his father's doorstep.

### **Sad Story :**

#### **SAD 1:**

Rajendra Pandekar, an Undergraduate in USA studying economics. His grandmother lived in India, she consulted a doctor on medlife which Rajendra told her to for her prolonged illness. A specialist gave her a prescription, and accordingly he ordered medicines. On the date of the delivery he called the delivery executive three times. On the third time he answered his calls where in he said that, he was on leave today and he wouldn't be delivering the medicines today. If this has been the case then he should have informed the customer prior the delivery date. Rajendra was abroad, it was troublesome for him to cope up with his grandmother because of the time difference. She was not in a condition to go by herself to the medical store, but she had to. Due to that she got fatigued and that led her to a critical condition.

#### **SAD 2:**

Himanshu Dalal, sales executive in Phoenix pvt. Ltd. One fine day he ordered medicines from "Netmeds". As per his doctor's prescription, he preferred Netmeds over others because of the marvelous discounts. After exiting the cart the additional was added which was to be payed at the time of the delivery and there was nothing he can do about it. They lure the customers with additional discounts and great payments. This was a fraud at its best. He tried to call customer care for help. He contacted them several times like 5-6 times a day, but no reply was given. He tried again the next day. Fortunately Chirag Jain (customer relation executive) answered..

### 3.3 Ideation Canvas

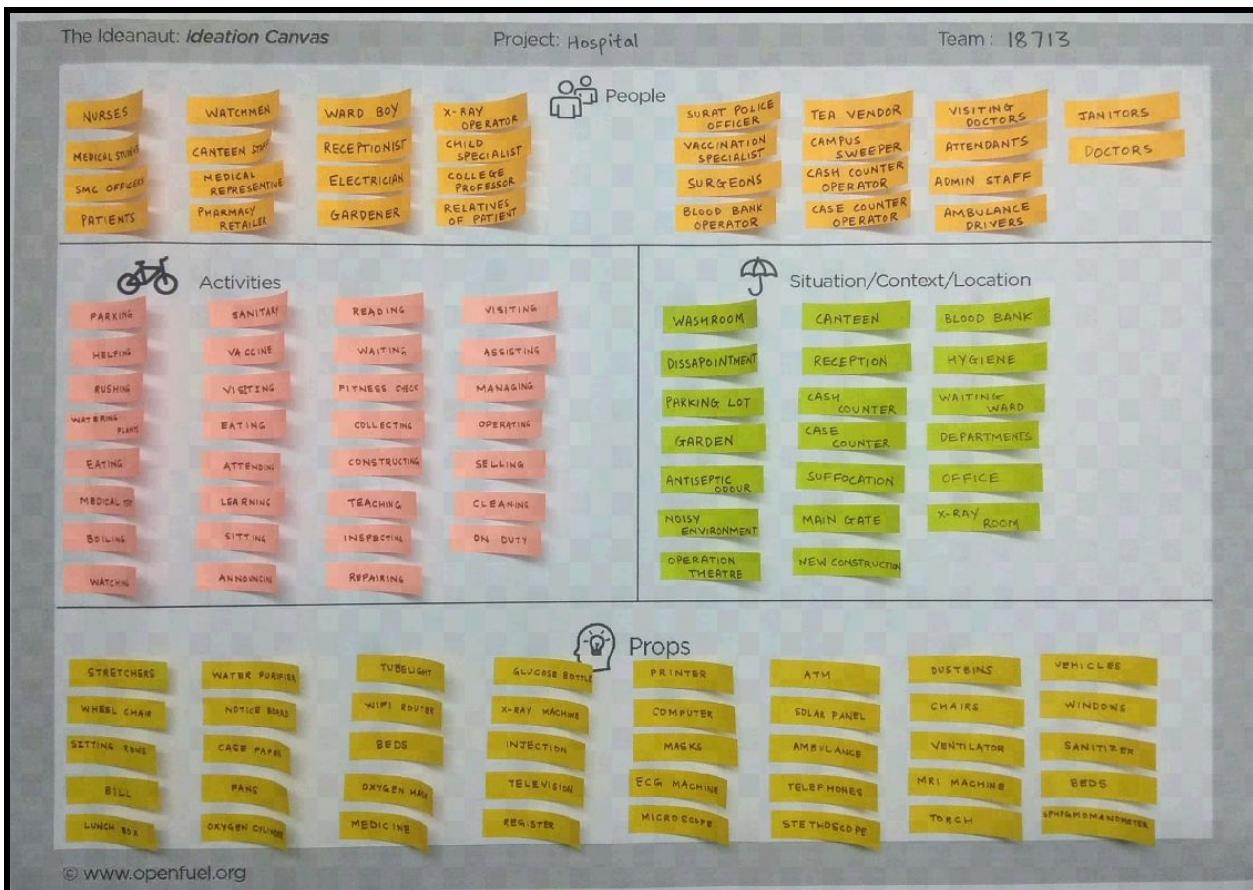


Fig 3.3.1

#### People :



Fig 3.3.2 (i)



Fig 3.3.2 (ii)

## Activities:

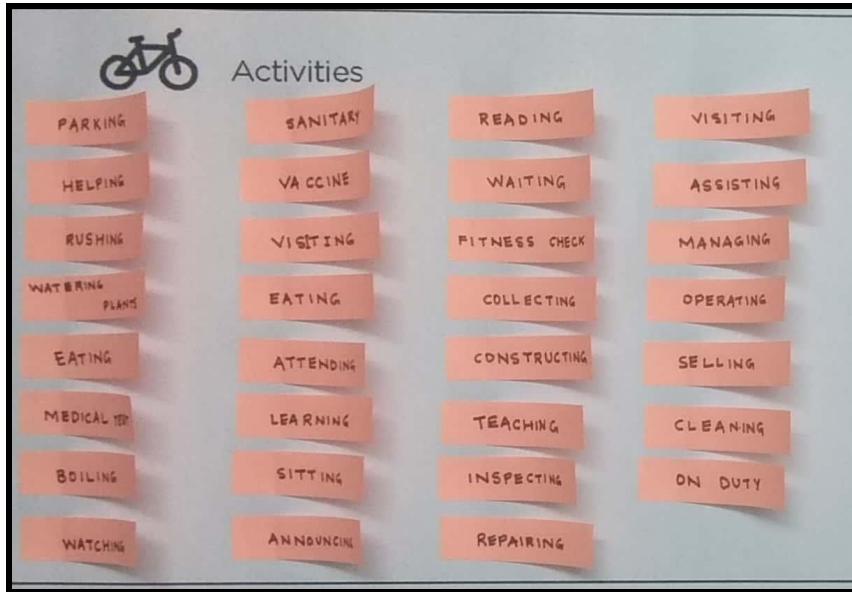


Fig 3.3.3

## Situation/Context/Location :

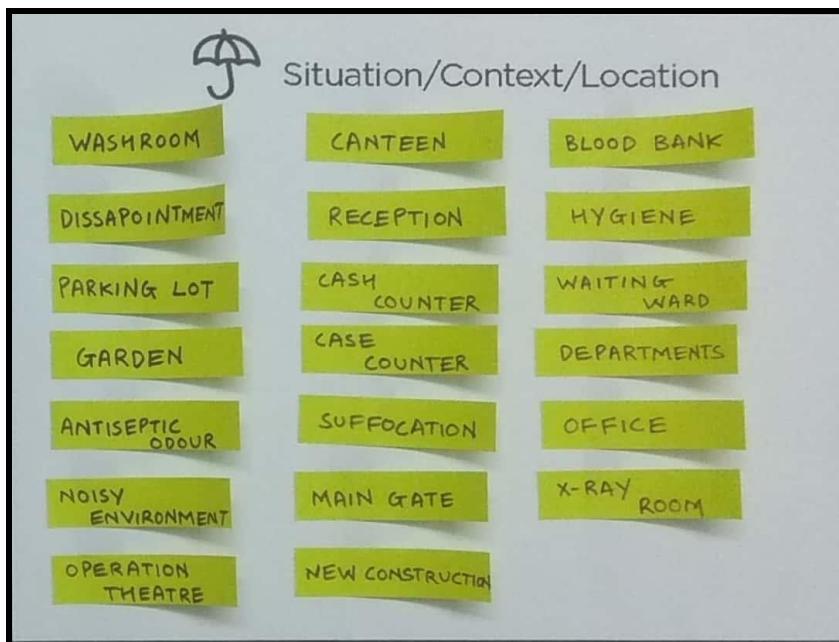


Fig 3.3.4

## Props :



Fig 3.3.5 (i)

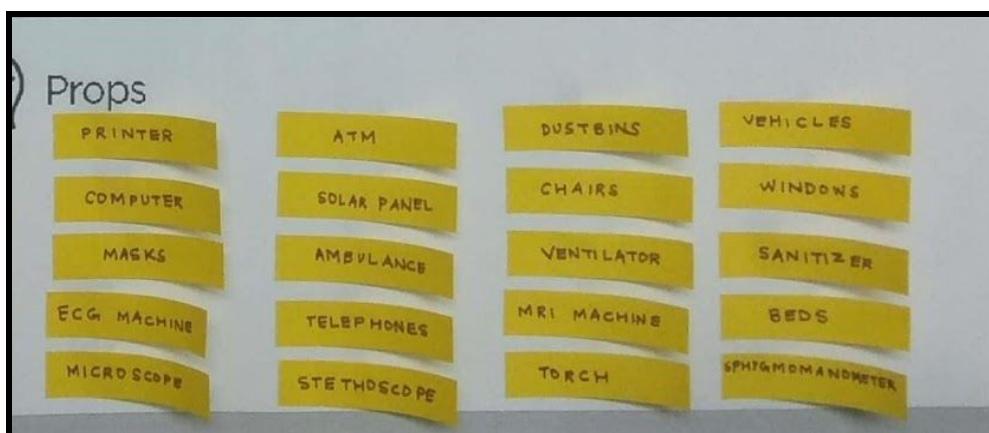


Fig 3.3.5 (ii)

### 3.4 E-R Diagram with iterations

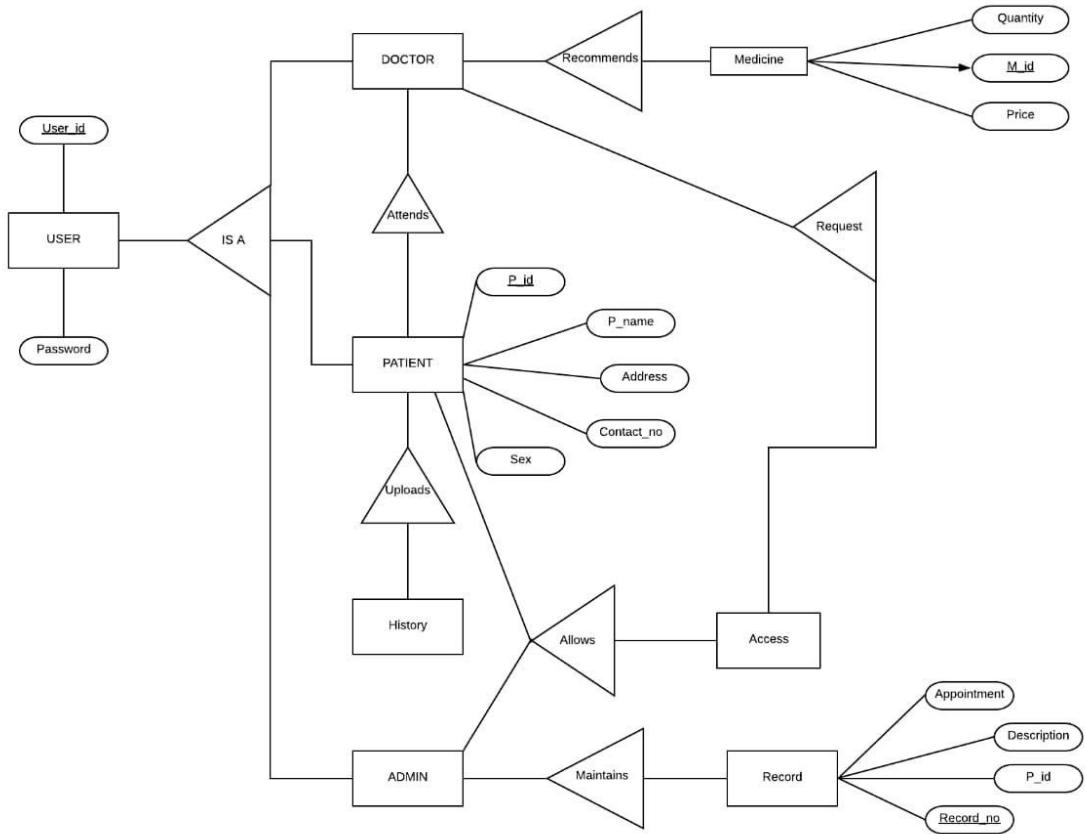


Fig 3.4.1

### 3.5 Use Case Diagram with iterations

Version 1:

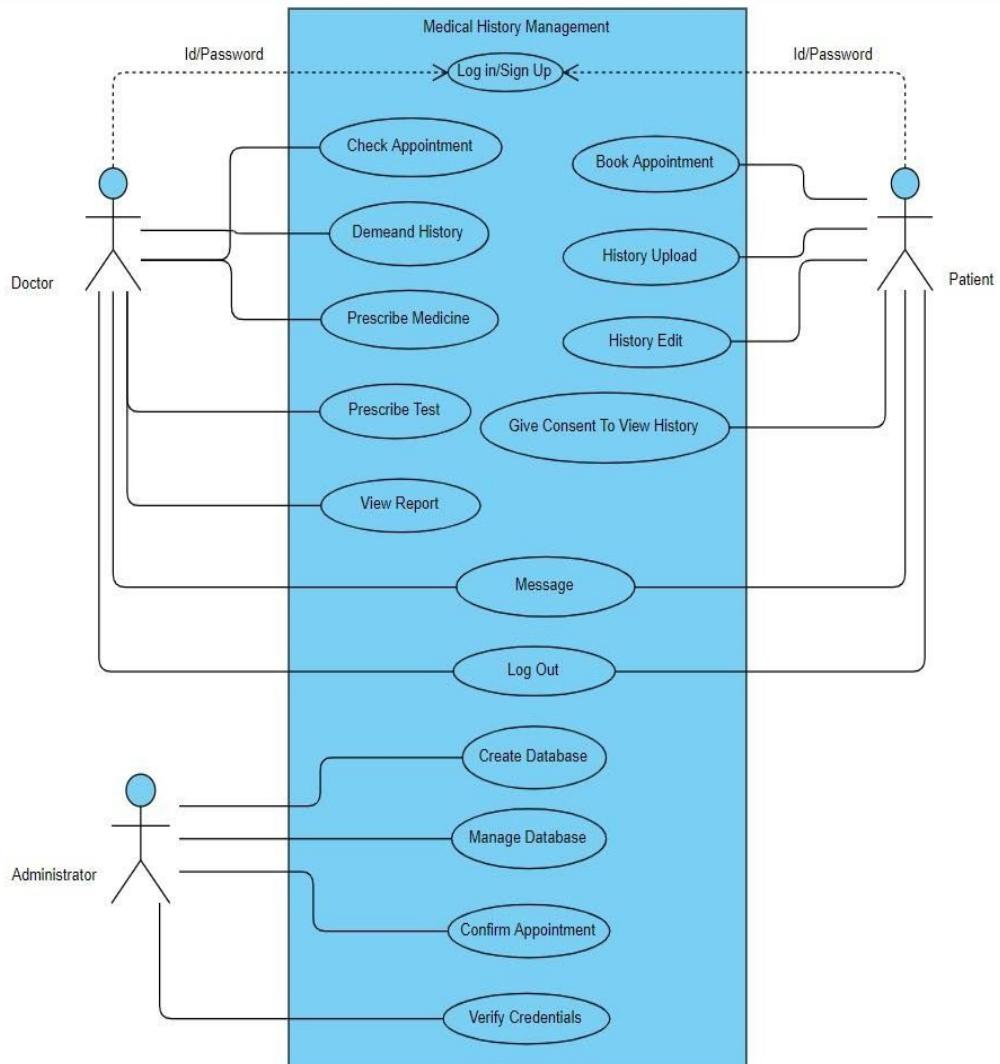


Fig 3.5.1

## Version 2:

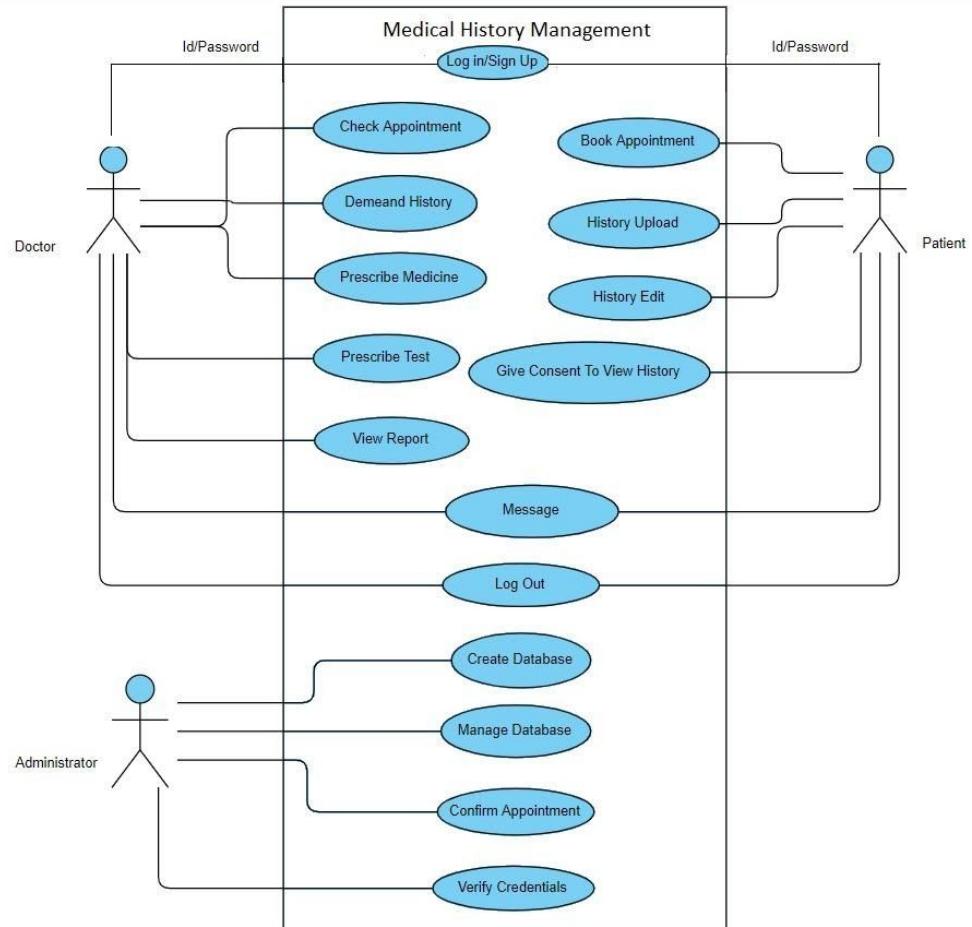


Fig 3.5.2

### 3.6 Class Diagram with iterations

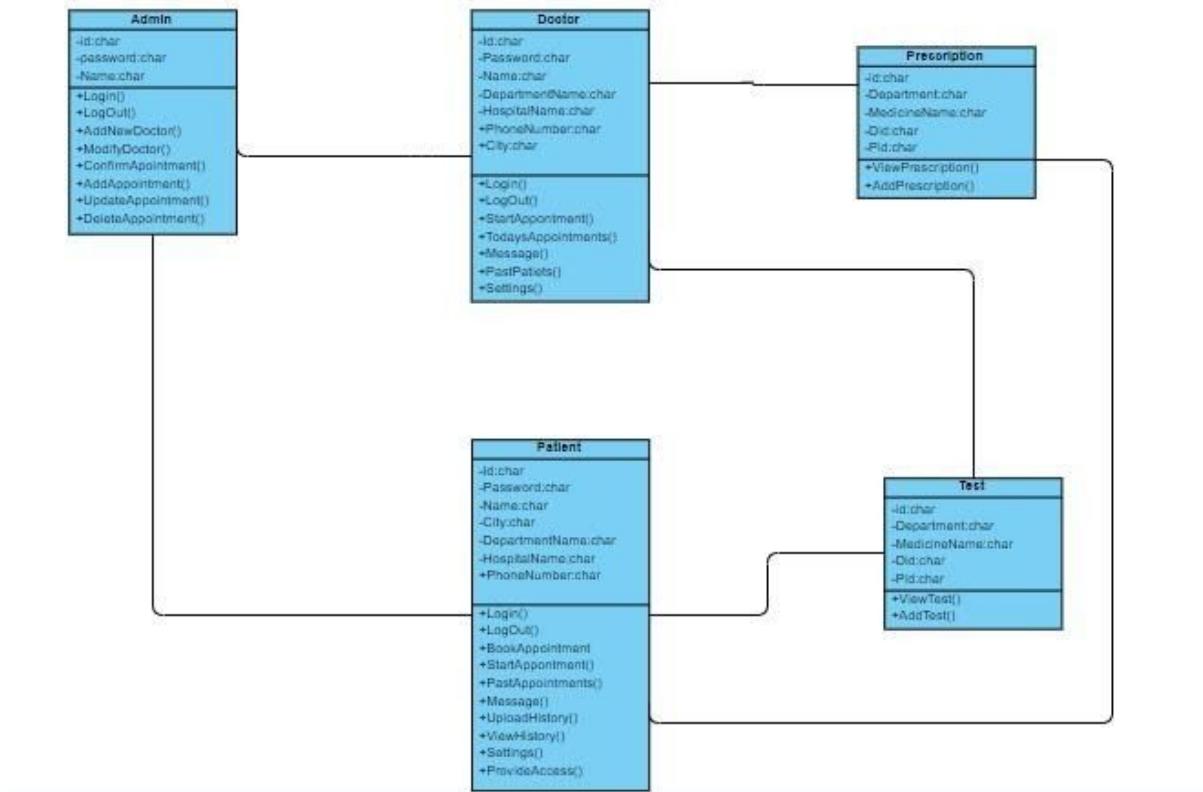


Fig 3.6.1

### 3.7 Product Development Canvas

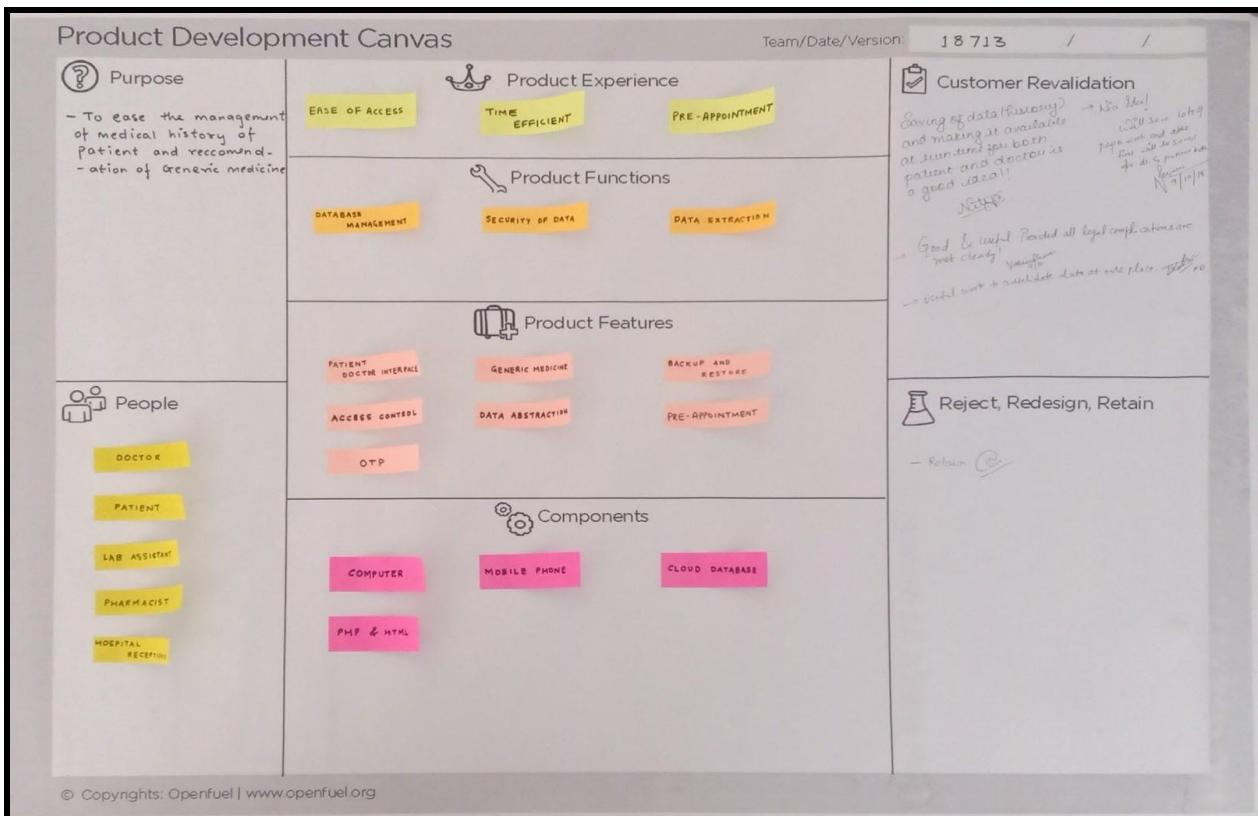


Fig 3.7.1

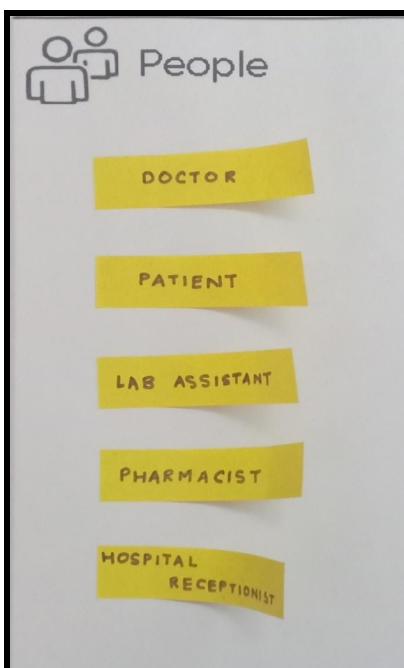


Fig 3.7.2

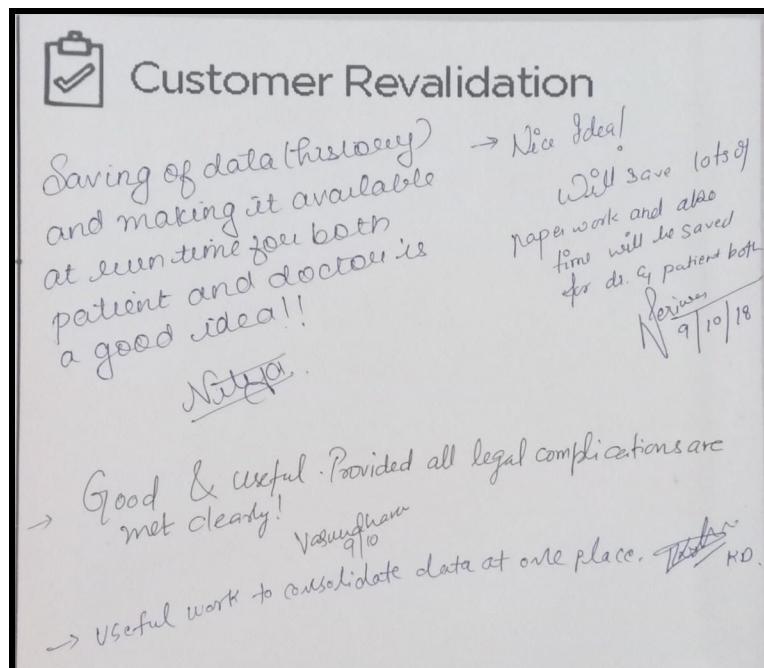


Fig 3.7.3

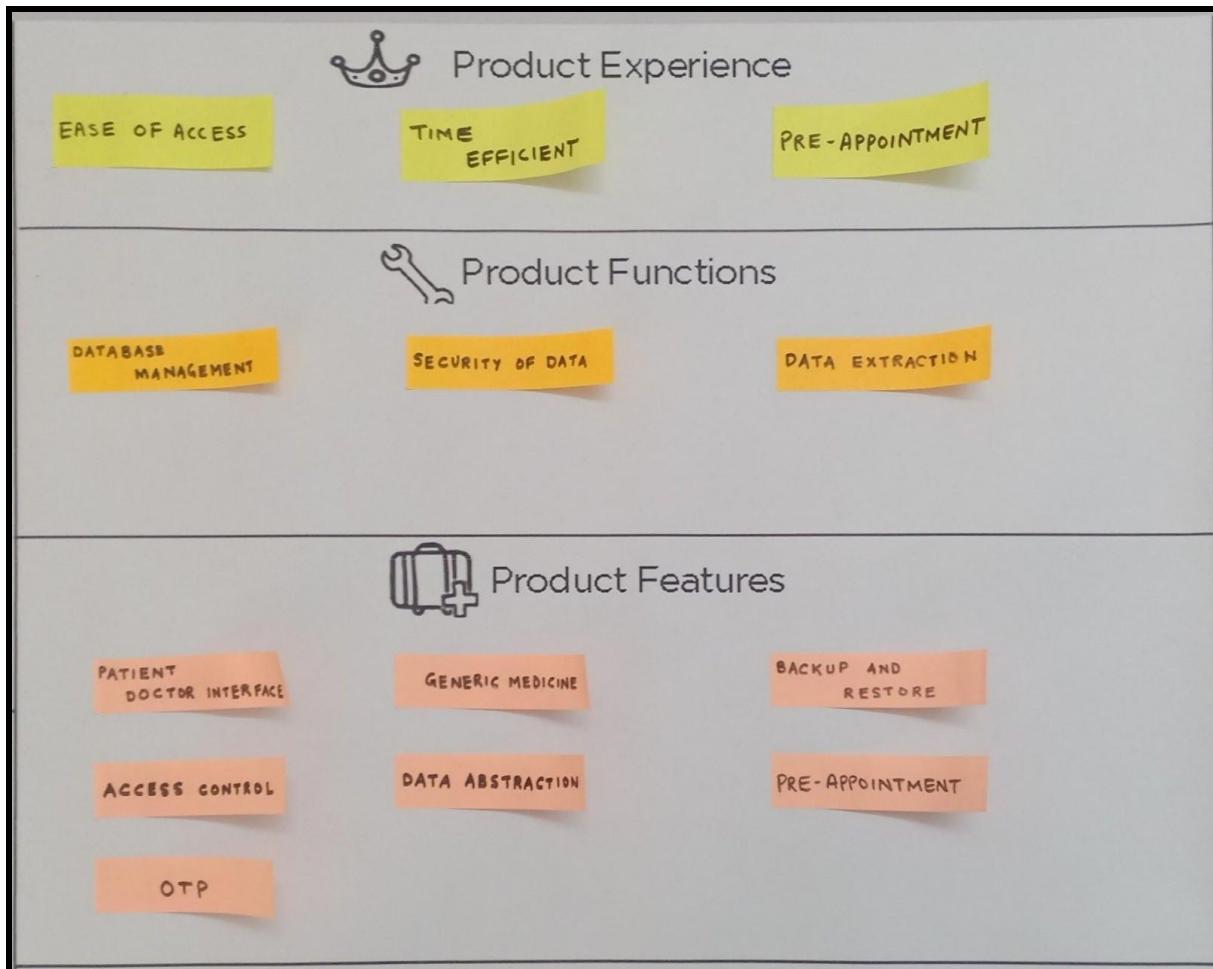


Fig 3.7.4

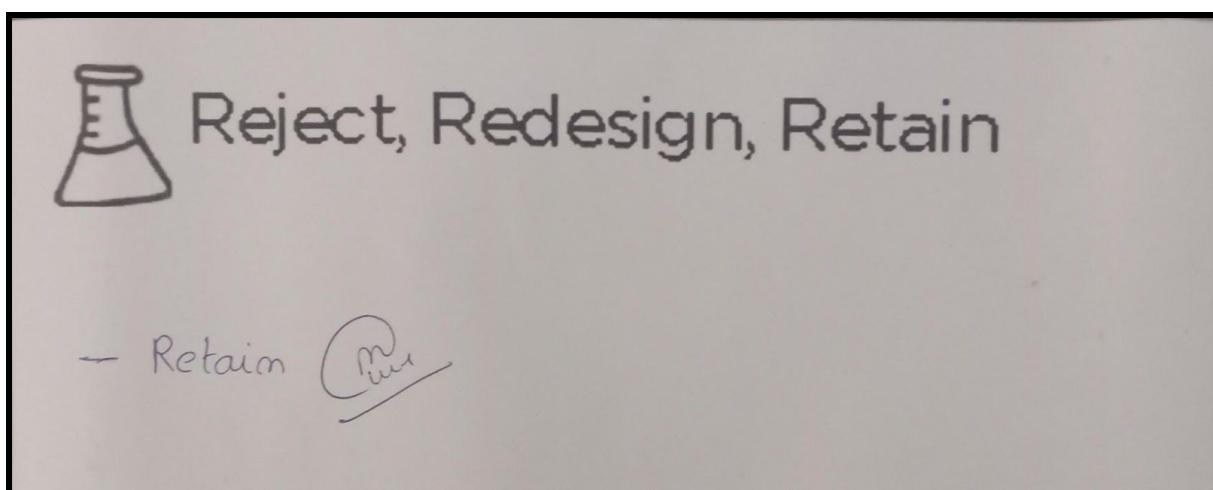


Fig 3.7.5

## CHAPTER – 4 FEEDBACK ANALYSIS

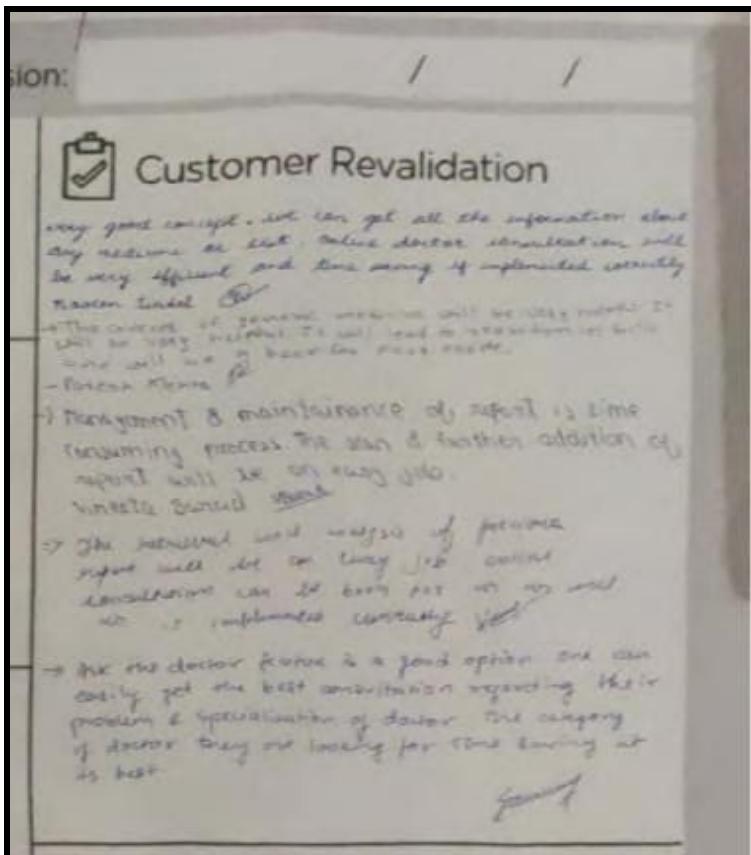


Fig 4.1

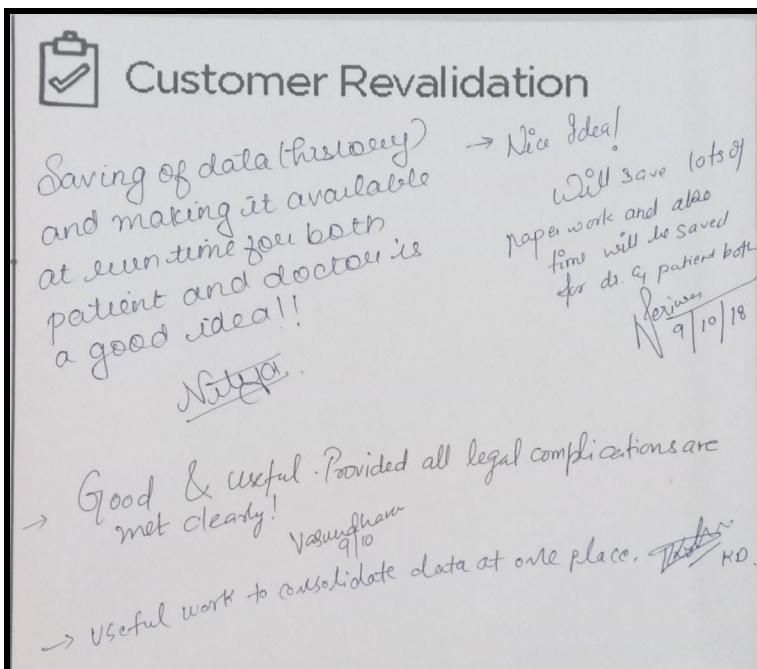


Fig 4.2

## **CHAPTER – 4 DETAIL DESIGN CALCULATION/DATA**

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### **5.1 Design for Performance, Safety and Reliability**

#### **Design for performance:**

The final product/process must perform for designed (projected in Product Development Canvas - PDC) features and functions as per the requirement of the user in actual working environment (revealed through rough-prototype validation).

#### **Design for Safety:**

Safety is the most important aspect of human centric product/process. Reasonable factor of safety should be taken into account considering all adverse and factual factors (Ideation canvas – location/context/situation may be referred back here) as there is human interaction with product/process in manifold circumstances.

#### **Design for Reliability:**

Reliability is the ability of a system or component to perform its required functions under stated conditions for a specified period of time<sup>1</sup>. Your final product/process should be reliable as required by the user and should perform its desired functions as required for desired time period.

## **5.2 Design for Ergonomics and Aesthetics**

Ergonomics is all about designing for human factors/comforts wherever they interact with product/process and surrounding environments.

According to the International Ergonomics Association within the discipline of ergonomics there exist domains of specialization:

- (a) Physical Ergonomics – is concerned with the human anatomy, bio mechanical and physiological ability and its relevance to the product and surrounding systems
- (b) Cognitive Ergonomics – is concerned with the mental ability such as perception, memory, reasoning and response power as they affect the interactions between humans and products/systems ;
- (c) Organizational Ergonomics – is concerned with the optimization of socio-technical systems including organizational structures,policies and processes.

Aesthetics is all about designing for physical appearance (looks) of the product. In current time, customers are willing to buy the products which have stunning looks with respect to their competitive products. Design for Aesthetics includes appearance, style, colour, form/shape, visuals and so on.

## **5.3 Design for Manufacturability & Assembly (DFMA)**

Design for Manufacturing and Assembly (DFMA) is an engineering methodology that focuses on reducing time-to-market and total production costs by prioritizing both the ease of manufacture for the product's parts and the simplified assembly of those parts into the final product – all during the early design phases of the product lifecycle.

Before becoming the singular philosophy it's known as today, DFMA used to be considered as two distinct methodologies: Design for Manufacturing (DFM) and Design for Assembly (DFA). DFM is concerned with selecting cost-effective raw materials and attempting to minimize the complexity of manufacturing operations during the product design phase (which would be the least disruptive and expensive time to address those issues) in order to reduce the overall manufacturing time and costs for product components. Similarly, DFA is concerned with reducing the product's assembly time, costs, and complexities by minimizing the number of individual parts, assembly steps, and potential for variability in build-quality.

Key factors that are important to consider for DFM:

### **PLANNING**

Consult with manufacturing experts on your design. Lowering manufacturing costs is never easier than at the design stage.

### **MATERIALS**

Use manufacturing-compliant materials if possible, which determines manufacturing processes and means, materials management and quality control.

### **PROCESSES**

Know the manufacture process to reduce costs. For example, 3D printing may enable one monolithic part design instead of manufacturing multiple components.

### **STANDARDS**

Use standard parts or components. This will reduce the cost of new designs, while improving inventory management and time-to-market.

## **5.4 Design for Cost, Environment (Cost Estimation with COCOMO, FP model)**

**LINES OF CODE (LOC) : 2568 lines**

### **COCOMO**

Semi-detached: effort :  $3.0(2.568)^{1.12} = 8.627$  PM  
Tdev :  $2.5(8.627)^{0.35} = 5.31$  Months

### **FUNCTION POINTER (FP)**

i/p :

o/p :

inquiries : 0

interface : 0

files :

$$TC * (0.65 + 0.01(FI)) = (0.65 + 0.01(38)) = TC * 1.03$$

### **Design for cost**

Means designing for lowest possible life cycle cost. It involves – assumed product design cost (manufacturing), delivery cost (to the end-user) as well as cost of operation and maintenance.

### **Design for environment**

Strategy describes best practices of designing a product/process to minimize health and environmental ill-impacts. Four main concepts of Design for Environment includes:

- (a) Design for Environmental aspects during Processing and Manufacturing;
- (b) Design for Environmental aspects in Packaging;
- (c) Design for Disposal or Reuse (i.e. after end of product/ process life-cycle as involved in one's case);
- (d) Design for Energy Efficiency (i.e. energy consumption during the product/ process usable life)

## 5.5 Modelling and Analysis using Software:

**Analysis Model** is a technical representation of the system. It acts as a link between system description and design model. In Analysis Modelling, information, behavior and functions of the system is defined and translated into the architecture, component and interface level design in the design modeling.

### Objectives of Analysis Modelling:

1. It must establish a way of creation of software design.
2. It must describe requirements of customer.
3. It must define set of requirements which can be validated, once the software is built.

### Elements of Analysis Model:

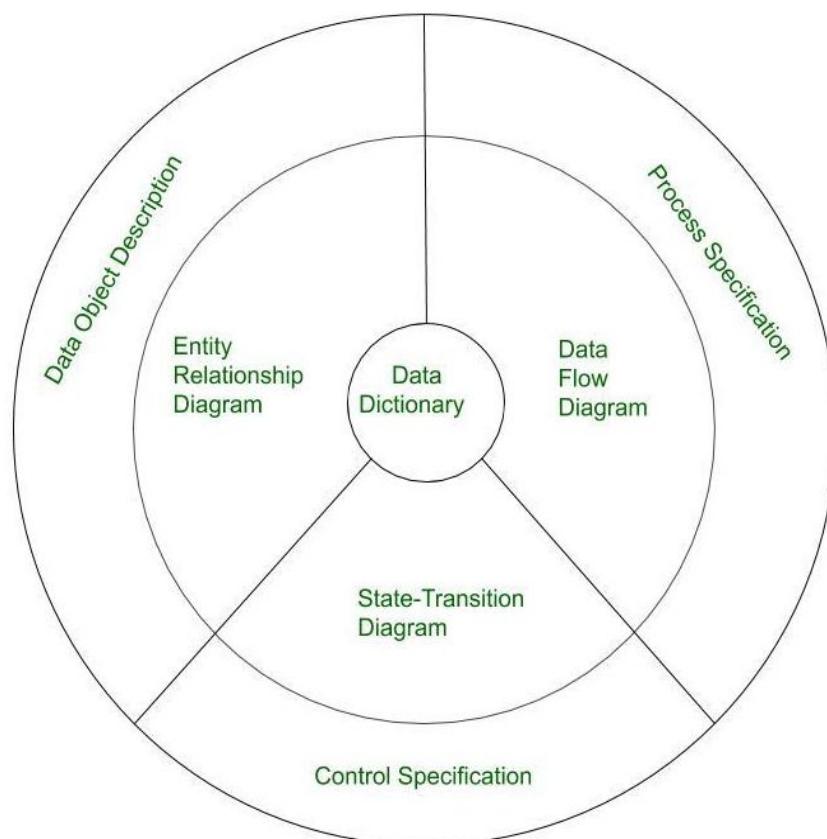


Fig 5.5.1

**1. Data Dictionary:**

It is a repository that consists of description of all data objects used or produced by software. It stores the collection of data present in the software. It is a very crucial element of the analysis model. It acts as a centralized repository and also helps in modelling of data objects defined during software requirements.

**2. Entity Relationship Diagram (ERD):**

It depicts relationship between data objects and used in conducting of data modelling activity. The attributes of each object in the Entity Relationship Diagram can be described using Data object description. It provides the basis for activity related to data design.

**3. Data Flow Diagram (DFD):**

It depicts the functions that transform data flow and it also shows how data is transformed when moving from input to output. It provides the additional information which is used during the analysis of information domain and serves as a basis for the modeling of function. It also enables the engineer to develop models of functional and information domain at the same time.

**4. State Transition Diagram:**

It shows various modes of behavior (states) of the system and also shows the transitions from one state to other state in the system. It also provides the details of how system behaves due to the consequences of external events. It represents the behavior of a system by presenting its states and the events that cause the system to change state. It also describes what actions are taken due to the occurrence of a particular event.

**5. Process Specification:**

It stores the description of each functions present in the data flow diagram. It describes the input to a function, the algorithm that is applied for transformation of input, and the output that is produced. It also shows regulations and barriers imposed on the performance characteristics that

are applicable to the process, and layout constraints that could influence the way in which the process will be implemented.

**6. Control Specification:**

It stores the additional information about the control aspects of the software. It is used to indicate how the software behaves when an event occurs and which processes are invoked due to the occurrence of the event. It also provides the details of the processes which are executed to manage events.

**7. Data Object Description:**

It stores and provides the complete knowledge about a data object present and used in the software. It also gives us the details of attributes of the data object present in Entity Relationship Diagram. Hence, it incorporates all the data objects and its attributes.

## 5.6 Prototyping and Proofing of Concepts

1. **Prototypes:** Prototypes are the first full scale and usually a functional form of design and in this sense, it is a working models of designed parts/artifacts. They are tested in the same environments in which they are expected to perform as final products.

Developing a prototype is a collective effort, which relies heavily on team communication-engineers, designers, and stakeholders should all participate when building a prototype. The founder needs to convey the product idea in a way that facilitates the introduction of all crucial elements into the prototype—when the product goes into development, it'll be easier to accurately reflect the original assumption.

In our project we performed this step by pitching our idea on a canvas and then making a static website that would act as a prototype of our actual product.

2. **Models:** A model is “a miniature representation of something”. They may be a paper model or computer model or physical model. Models are usually a smaller and made of different material than are of original products, and they are tested in laboratory or controlled environment to validate their expected behavior.

We made flow diagrams for this purpose which depicts how our actual model is going to work.

3. **Proof of Concepts:** A proof of concept, in this context, refers to a model of some part of a design that is used specifically to test whether a particular concept will actually work as proposed. Proof of concept test will validate the idea or concept in controlled environment.

## 5.7 Engineering Economics of Design

There are seven steps for engineering economics of design:

1. Problem recognition, definition, and evaluation: The first step of engineering economic analysis procedure is particularly important, since it provides the basis for the rest of analysis.

Problem must be well understood and stated in explicit form before the project team proceeds.

2. Development of feasible alternatives: There are two primary actions in this step; Searching for potential alternatives and screening them to select a smaller group feasible alternative for detailed analysis.

3. Development of outcomes and cash flows for each alternative: "It takes money to make money," is an old saying which also supports the concept of Time value of money.

Our idea of storage center also requires investment of money, and only a few of all feasible ideas can be developed if there is lack of time, knowledge and resources.

We will be taking the difference of farmers revenue and the revenue generated by our selling module so that we can add the same in the form of our assets.

4. Selection of criteria: There are two worldly accepted criteria, classical brain storming and Nominal Group Technique(NGT).

Rules such as Focus on quantity, Reserve Criticism, Welcome unusual idea, Comine and improve makes a successful brain storm. While NGT involves structured group meeting designed to incorporate individual ideas and judgements into consences.

In our project, we used both the techniques to ensure the selection criteria for economy of our design.

5. Analysis and comparison of alternatives: Also we need to compare and do thorough analysis of the alternatives that we got from above steps to the actual ideas that we came up with brain storming and NGT.

6. Selection of preferred alternatives: Now that we have compared our alternatives in above step, we need to select one and write the specification of the preferred alternative.

7. Performance monitoring and post-evaluation of results: In this step we monitor the performance of the preferred idea that we chose in above step and now we need to run post-evaluation analysis of results so that we can know the throughput of our selected idea.

## **5.8 Design for Use, Reuse and Sustainability**

In most engineering disciplines, systems are designed by composing existing components that have been used in other systems.

Software engineering has been more focused on original development (Starting from the scratch) but it is now recognized that to achieve better software, more quickly and at lower cost, we need to adopt a design process that is based on systematic software reuse.

Provides better software quality more quickly at lower cost. It often termed as “Code Reuse”

The systematic development of reusable components. The systematic reuse of these components as building blocks to create new systems.

### **Reuse Planning Factors**

Concerning motivation and driving factors, reuse can be:

1. Opportunistic – While getting ready to begin a project, the team realizes that there are existing components that they can reuse.
2. Planned – A team strategically designs components so that they'll be reusable in future projects.

Reuse can be categorized further:

1. Internal reuse – A team reuses its own components. This may be a business decision, since the team may want to control a component critical to the project.
2. External reuse – A team may choose to license a third-party component. Licensing a third-party component typically costs the team 1 to 20 percent of what it would cost to develop internally.[4] The team must also consider the time it takes to find, learn and integrate the component.

System Reuse:

1. Complete systems, which may include several application programs may be used

Application reuse:

1. Reusing an entire application by incorporation of one application inside another (COTS reuse).
2. Development of application families (e.g. MS Office).

Component Reuse:

1. Components (e.g. subsystem or single object) of one application reused in another.

Object and Function reuse:

1. Reusing small-scale software components that implement a single well-defined function

### **Challenges of Software Reuse**

Organizational Aspect:

1. Operational and technological infrastructure
2. Reuse introduction

Technical Aspect:

1. Domain Engineering
2. Component engineering
3. Application engineering

Economical Aspects:

1. Reuse metrics
2. Reuse cost estimation

Legal Aspects:

1. Copyright
2. Warranty
3. Open Source

## **Reuse Planning Factors**

1. The development schedule for the software
2. The expected software lifetime
3. The background, skills and experience of the development team
4. The criticality of the software and it's non-functional requirements
5. The application domain
6. The execution platform for the software

## **5.9 Test the prototype**

### **What is Prototype Testing?**

Prototype Testing is conducted with the intent of finding defects before the website goes live. Online Prototype Testing allows seamlessly to collect quantitative, qualitative, and behavioural data while evaluating the user experience.

Characteristics of Prototype Testing:

- To evaluate new designs prior to the actual go live to ensure that the designs are clear, easy to use and meet users requirements.
- Is best when iterative testing is built into the development process, so that changes can be easily made often to ensure that major issues do not arise well before going live.
- Provides confirmation about the new design direction, branding and messaging are going in the right direction.

## 5.10 Ethics in Design

Design ethics concerns moral behavior and responsible choices in the practice of design. It guides how designers work with clients, colleagues, and the end users of products, how they conduct the design process, how they determine the features of products, and how they assess the ethical significance or moral worth of the products that result from the activity of designing. Ethical considerations have always played a role in design thinking, but the development of scientific knowledge and technology has deepened awareness of the ethical dimensions of design. As designers incorporate new knowledge of physical and human nature as well as new forms of technology into their products, people are increasingly aware of the consequences of design for individuals, societies, cultures, and the natural environment.

The design arts are important because they are the means by which scientific knowledge and technological possibilities are converted into concrete, practical form in products that serve the needs and desires of individuals and communities. Design is difficult to define because of its breadth of application. One can discuss the design of scientific experiments, of theories of nature and society, of political systems and individual actions, of works of fine art, and of the everyday products created by engineering and the other useful or practical arts. In all of these examples, design may be described generally as the art of forethought by which society seeks to anticipate and integrate all of the factors that bear on the final result of creative human effort.

Descriptive definitions have a useful place in explaining the nature of design for a general audience—for example, "design is the art of forethought," "design is planning for action," "design is making things right." However a formal definition has the advantage of bringing together all of the causes or elements of design in a single idea so that their functional relationships are clear, and provides a framework for distinguishing and exploring the ethical dimensions of design. The following formal definition serves present purposes: *Design is the human power of conceiving, planning, and bringing to reality all of the products that serve human beings in the accomplishment of their individual and collective purposes.* There are four ethical dimensions represented in this definition, each identifying an area of ethical issues and potential moral conflict that often complicates the activity of designing but also enhances the value of the designer's work. These dimensions represent the web of means and ends that are the central concern of ethics and moral conduct in design.

## CHAPTER – 6 PROTOTYPE

**Medical Management System**

HOME CONTACT

**Patients**  
Register & Book Appointment  
[Click Here](#)

**Doctors Login**  
[Click Here](#)

**Admin Login**  
[Click Here](#)

**Patients**  
Register & Book Appointment  
[Click Here](#)

**Doctors Login**  
[Click Here](#)

**Admin Login**  
[Click Here](#)

## MMS | Patient Login

[Sign in to your account](#)

Please enter your name and password to log in.

 Username

 Password

[Forgot Password ?](#)

[Login !\[\]\(9715b9ef05fbc7e2b0e628566f336c59\_img.jpg\)](#)

Don't have an account yet? [Create an account](#)

## MMS | Patient Login

[Sign in to your account](#)

Please enter your name and password to log in.

 siddhant.parmar.150@gmail.com

 .....

[Forgot Password ?](#)

[Login !\[\]\(df25e928c649ee1d7f36b411ba46b2e6\_img.jpg\)](#)

Don't have an account yet? [Create an account](#)

User | Dashboard

localhost/hospital/hms/dashboard.php

MMS

MAIN NAVIGATION

- Dashboard
- Book Appointment
- Appointment History
- Medical History

USER | DASHBOARD

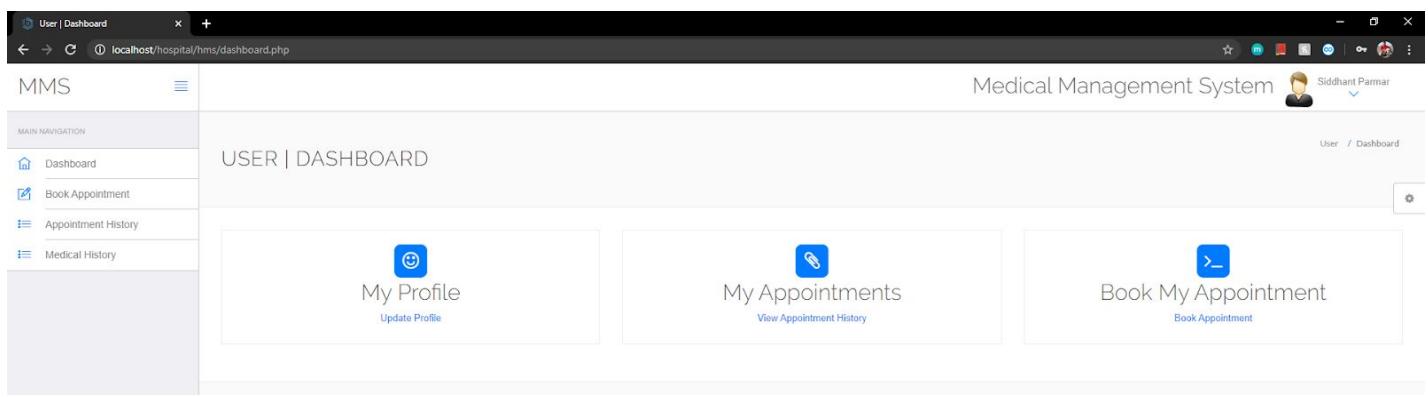
Medical Management System Siddhant Parmar

User / Dashboard

**My Profile**  Update Profile

**My Appointments**  View Appointment History

**Book My Appointment**  Book Appointment



User | Book Appointment

localhost/hospital/hms/book-appointment.php

MMS

MAIN NAVIGATION

- Dashboard
- Book Appointment
- Appointment History
- Medical History

USER | BOOK APPOINTMENT

Medical Management System Siddhant Parmar

User / Book Appointment

**Book Appointment**

Doctor Specialization  
Dermatologist

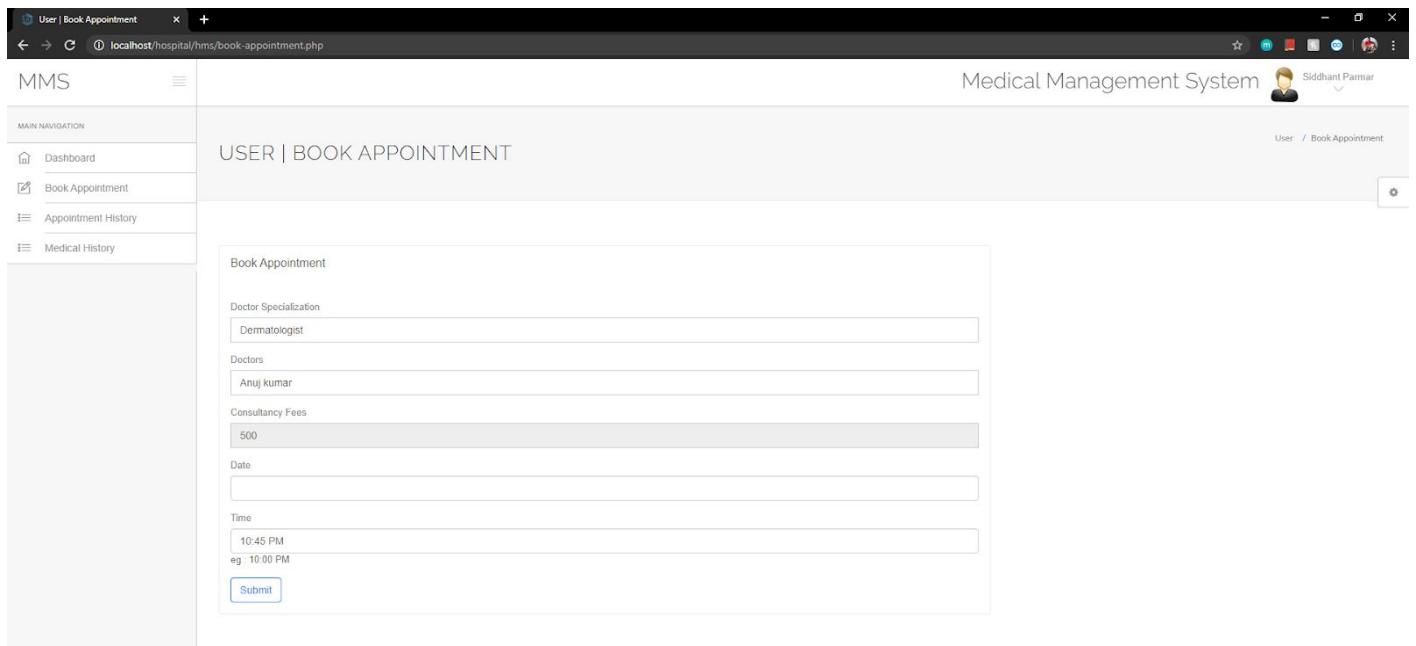
Doctors  
Anuj kumar

Consultancy Fees  
500

Date

Time  
10:45 PM  
eg: 10:00 PM

Submit



User | Book Appointment

localhost/hospital/hms/book-appointment.php

MMS

MAIN NAVIGATION

- Dashboard
- Book Appointment
- Appointment History
- Medical History

USER | BOOK APPOINTMENT

Medical Management System Siddhant Parmar

User / Book Appointment

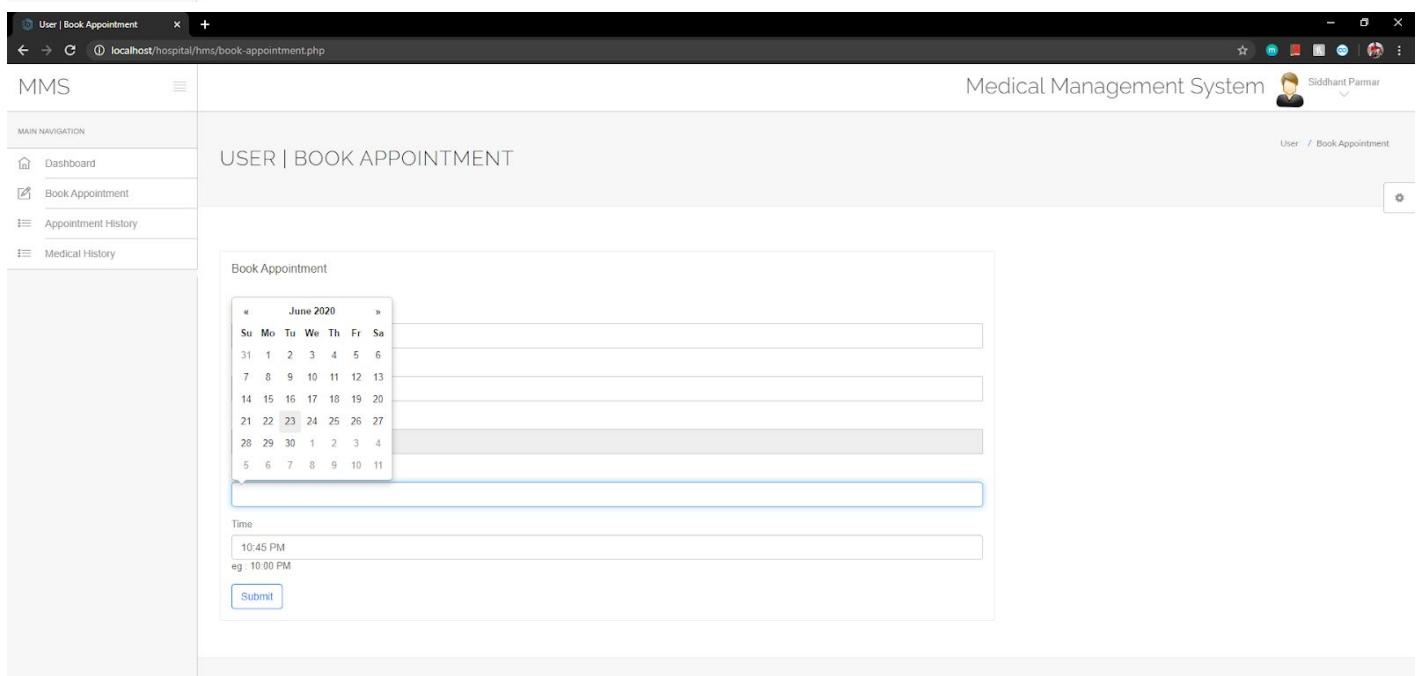
**Book Appointment**

June 2020

Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11

Time  
10:45 PM  
eg: 10:00 PM

Submit



User | Book Appointment

localhost/hms/book-appointment.php

MMS

MAIN NAVIGATION

- Dashboard
- Book Appointment**
- Appointment History
- Medical History

Medical Management System

Siddhant Parmar

USER | BOOK APPOINTMENT

Book Appointment

Doctor Specialization  
Dermatologist

Doctors  
Anuj kumar

Consultancy Fees  

  
eg : 10:00 PM

Submit

localhost says

Your appointment successfully booked

OK

User | Appointment History

localhost/hms/appointment-history.php

MMS

MAIN NAVIGATION

- Dashboard
- Book Appointment
- Appointment History**
- Medical History

Medical Management System

Siddhant Parmar

USER | APPOINTMENT HISTORY

#	Doctor Name	Specialization	Consultancy Fee	Appointment Date / Time	Appointment Creation Date	Current Status	Action
1.	Anuj kumar	Dermatologist	500	2020-06-23 / 10:45 PM	2020-06-03 22:39:41	Active	<a href="#">Cancel</a>

User | change Password

localhost/hospital/hms/change-password.php

MMS

Medical Management System

Siddhant Parmar

MAIN NAVIGATION

- Dashboard
- Book Appointment
- Appointment History
- Medical History

USER | CHANGE PASSWORD

Change Password

Current Password  
Enter Current Password

New Password  
New Password

Confirm Password  
Confirm Password

Submit

## MMS | Doctor Login

Sign in to your account

Please enter your name and password to log in.

Username

Password

[Forgot Password ?](#)

Login

Doctor | Dashboard

DE\_28 - Google Docs

localhost/hospital/hms/doctor/dashboard.php

MMS

Medical Management System

User / Dashboard

MAIN NAVIGATION

- Dashboard
- Appointment History
- Patients
- Search

DOCTOR | DASHBOARD

My Profile   
[Update Profile](#)

My Appointments   
[View Appointment History](#)

Doctor | Add Patient DE\_2B - Google Docs | + localhost/hms/doctor/add-patient.php

MMS Medical Management System abc

PATIENT | ADD PATIENT

Patient / Add Patient

Add Patient

Patient Name  
Enter Patient Name

Patient Contact no  
Enter Patient Contact no

Patient Email  
Enter Patient Email id

Gender  
 Female  Male

Patient Address  
Enter Patient Address

Patient Age  
Enter Patient Age

Medical History  
Enter Patient Medical History(if any)

Add

Doctor | Add Patient DE\_2B - Google Docs | + localhost/hms/doctor/edit-patient.php?editid=3

MMS Medical Management System abc

PATIENT | ADD PATIENT

Patient / Add Patient

Add Patient

Patient Name  
Preeyank Bardolia

Patient Contact no  
9876976798

Patient Email  
jk@gmail.com

Gender  Male  Female

Patient Address  
Chandni Chowk, Piplod

Patient Age  
20

Medical History  
No

Creation Date  
2019-11-05 16:19:41

Update

The screenshot shows a web browser window with the URL [localhost/hospital/hms/doctor/manage-patient.php](http://localhost/hospital/hms/doctor/manage-patient.php). The page is titled "DOCTOR | MANAGE PATIENTS". On the left, there is a sidebar with "MAIN NAVIGATION" containing links for Dashboard, Appointment History, Patients, and Search. The main content area displays a table titled "Manage Patients" with the following data:

#	Patient Name	Patient Contact Number	Patient Gender	Creation Date	Updation Date	Action
1.	Preeyank Bardolia	9878978798	Male	2019-11-05 16:19:41	2020-06-03 22:43:28	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
2.	Siddhant Parmar	9888989899	Male	2019-11-06 20:03:54	2020-06-03 22:44:15	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

## MMS | Patient Login

[Sign in to your account](#)

Please enter your name and password to log in.

**Invalid username or password**

Username

Password

[Forgot Password ?](#)

[Login](#)

Don't have an account yet? [Create an account](#)



## Admin Login

Sign in to your account

Please enter your name and password to log in.

**Login**

Admin | Dashboard    x    phpMyAdmin    x    DE\_2B - Google Docs    x    Login without a password is for...    x    +

localhost/hospital/hms/admin/dashboard.php

Medical Management System Admin

MMS

ADMIN | DASHBOARD

Manage Users Total Users: 8

Manage Doctors Total Doctors: 9

Appointments Total Appointments: 4

Manage Patients Total Patients: 5

New Queries Total New Queries: 1

Doctor | Manage Patients    x    phpMyAdmin    x    DE\_2B - Google Docs    x    Login without a password is for...    x    +

localhost/hospital/hms/admin/view-patient.php?viewid=4

Medical Management System Admin

MMS

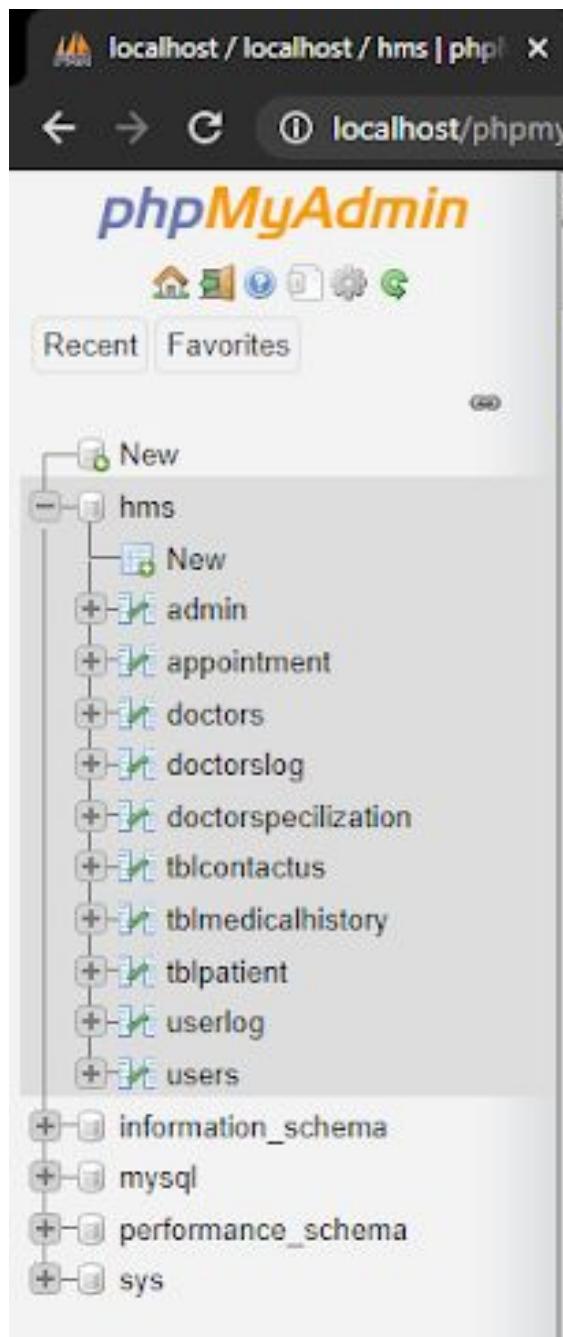
DOCTOR | MANAGE PATIENTS

Manage Patients

Patient Details			
Patient Name	Siddhant Parmar	Patient Email	sharma@gmail.com
Patient Mobile Number	9888988989	Patient Address	Pal, Adajan
Patient Gender	Male	Patient Age	20
Patient Medical History(if any)	Sinus Infection	Patient Reg Date	2019-11-06 20:03:54

Medical History

#	Blood Pressure	Weight	Blood Sugar	Body Temperature	Medical Prescription	Visit Date
1	90/120	56	120	98 F	#blood sugar high #Asthma problem	2019-11-06 20:08:33



# **CHAPTER – 7 CONCLUSION**

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## **7.1 Conclusion**

This study embarked on the hospital management system which substitutes the current method of sorting, handling, searching, and keeping of hospital records. This conclude the importance and indispensable nature of the computer and its application in the hospital. The database aimed at reducing paper work in the reception area to reduce the time wasted by patients in the course of waiting for their files to be retrieved. This also reduced the space occupied by the files and provide adequate security for patient's medical record. Based on the finding of this study, the design of hospital patient database record will be a solution to the problem being experienced by the current manual method of keeping patient medical records. The study has critically identified the importance associate with using electronic in keeping hospital record to eliminate missing files and enhance speedy retrieval of patient's record. The management of General Hospital North Bank has agreed that the manual method of keeping patient records should be change to computerized hospital records which will help them to eliminate inefficiency associated with the manual method. Through the exhausted study and analysis made in this research, it was recommend that General hospital and other medical centre that had been providing health care service should have an automated system for effective operations

## 7.2 Future Scope

There are also few features which can be integrated with this system to make it more flexible.

Below list shows the future points to be consider:

- Directly getting the images for CT Scan or X-Rays from connected device.
- Mapped with Insurance Companies for claim processing
- Billing of patients.
- Blood Bank Information.
- Management Producing ECG using connected device.
- Video Conferencing facility for remote areas for treatments.
- Hangout for different doctors and patients at different locations.

The main application cum future scope of the project is Remote Patient Monitoring.

Remote patient monitoring (RPM), also called homecare telehealth, is a type of ambulatory healthcare that allows a patient to use a mobile medical device to perform a routine test and send the test data to a healthcare professional in real-time.

RPM technology includes daily monitoring devices such as glucose meters for patients with diabetes and heart or blood pressure monitors for patients receiving cardiac care. Data can be sent to a physician's office by using a special telehealth computer system, by using a special software application installed on the patient's Internet-capable computer, smartphone or tablet PC.

The data the patient sends is stored in a relational database so the healthcare professional can view the data as a specific instance or as a trend. RPM is frequently used with the elderly and the chronically ill, two groups of people who have high levels of medical need. Remote monitoring techniques allow these patients and their physicians to closely monitor medical conditions and, if need be, intervene.

## **CHAPTER – 8 REFERENCES**

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