

# Literature Survey on Analysis of hospital health care data

TITLE	REFERENCE	DESCRIPTION	PREDICTIVE ANALYTICS	METHOD FOR DATA ANALYSIS
Face recognition for health care	Indatalabs.com	This case study proposes that the algorithm checks the database on a number of matches based on their unique facial landmarks and skin texture	Personal authentication with face recognition	1.computer use machine vision technologies along with camera and AI software to get image recognition
Analysis to prevent and control chronic diseases	IEEE	This novel proposes that creating and building a prediction model for chronic diseases is an extraordinary change to healthcare technology on the premises of data analysis and decision making.	Effective mechanisms have been used for chronic disease prediction by mining the data containing historical health records.	1.Navie Bayes 2.Decision tree 3.Support Vector Machine (SVR) 4.Artificial Neural Networks (ANN)
Analysis to support health informatics on covid-19 data	IEEE	This paper proposes that evaluation results on a real-life datasets demonstrates the effectiveness of our digital health analytics, especially in classifying patients and their medical needs.	Samples of more accessible and less expensive types of data (serology/antibody test results from blood samples) which helps to support prediction on classification of potential patients	1.Auto encoder & Few short learning
Data Analysis for heart diseases detection	IEEE	This paper proposed to develop a centralized patient monitoring system using big data. In the proposed system, large set of medical records is taken as input. From this data set, it is aimed to extract the needed information using map reduce technique.	Some features such as RR interval, QRS interval, QT interval are analysed for heart disease detection. This classification process predicts whether the patients is normal or abnormal.	1.Map reduce
Detection and prevention of AIDS	IEEE	This paper proposes that massive instruction has to be prepared in order to recognize, diagnose, identify and prevent various diseases.	The study of cause of AIDS mainly focuses on prediction of the disease using R programming	1.R programming

# Data analytics for hospital healthcare

Predictive Data analytics to detect and prevent diseases

Reduction in  
the risk of  
disease

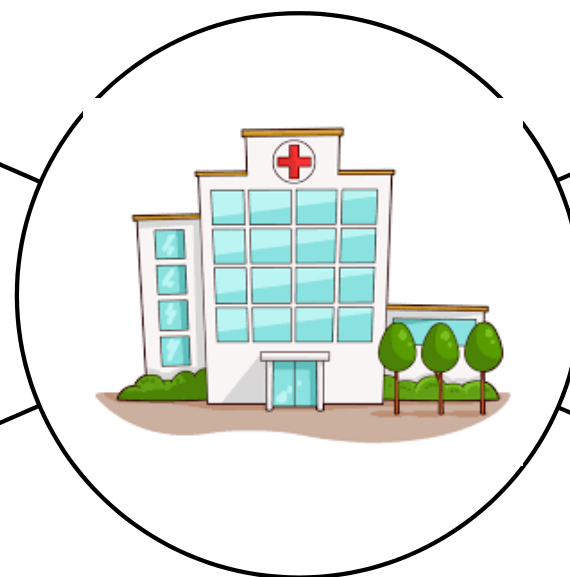
The patients can  
feel secured  
and confident  
about their  
health

*What do they*  
**THINK AND FEEL?**  
what really counts  
major preoccupations  
worries & aspirations

Enables doctors  
and other  
medical staff to  
be proactive  
rather than  
reactive

Reduction in  
healthcare cost  
and death rate  
in that  
organization

*What do they*  
**HEAR?**  
what friends say  
what boss say  
what influencers say



*What do they*  
**SEE?**  
environment  
friends  
what the market offers

Increase in  
population and  
an efficient  
human resource

Reduces the  
prevalence of  
disease and  
help people  
live healthier

*What do they*  
**SAY AND DO?**  
attitude in public  
appearance  
behavior towards others

Investment on  
this predictive  
analysis causes  
reduction of cost  
in treatment

Patients are  
satisfied with  
their health  
being contingent  
on the hospitals

Barriers in the  
advancement  
of hardware  
and software

**PAIN**  
fears  
frustrations  
obstacles



Minor  
distortion in  
the data leads  
to wrong  
predictions

Reduces  
health care  
cost and  
Increases  
the efficiency

**GAIN**  
"wants" / needs  
measures of success  
obstacles



Enables the  
doctors to  
take right  
decisions at  
the right time.

1

Define your problem statement

What problem are you trying to solve. Frame your problem as a how might we statement. This will bethe focus of you brainstorm.

🕒 5 minutes

PROBLEM

How might we analyze the patient records in order to predict the diseases.



Key rules of brainstorming

To run an smooth and productive session

- 🗣️ Stay in topic.
- 💡 Encourage wild ideas.
- ⏸️ Defer judgment.
- 👂 Listen to others.
- 🗣️ Go for volume.
- 👁️ If possible, be visual.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

Jailakshmi

A graph should be created with the disownes that were emerged in the past and their respective year of emergence.

A pin chart should be made with the percentage of people affected by various diseases till the past year.

Madhumitha

All the personal health care data of each patient of the hospitals should be recorded

The pie chart and the graph created should be merged to get a deeper analysation.

Number of patients who recover from the medical facilities should be noted.

Abhirami

Medicines that are sold so far should be recorded in a pie chart with respect to their sold percentage.

The number of frequent cases in the hospital should be noted down

Janani

The developed medicines for the past pandemic and endemic outbreaks should be noted

Number of patient's death due to lack of medical treatment should be noted

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

🕒 20 minutes

To be noted down

Medicines that are sold so far should be recorded in a pie chart with respect to their sold percentage.

The developed medicines for the past pandemic and endemic outbreaks should be noted



Graphs,trends

A graph should be created with the disownes that were emerged in the past and their respective year of emergence.

All the personal health care data of each patient of the hospitals should be recorded



Piecharts

The pie chart and the graph created should be merged to get a deeper analysation.

A pie chart should be made with the percentage of people affected by various diseases till the past year.



Birth and death scale

Number of patient's death due to lack of medical treatment should be noted

Number of patients who recover from the medical facilities should be noted.

The number of frequent cases in the hospital should be noted down

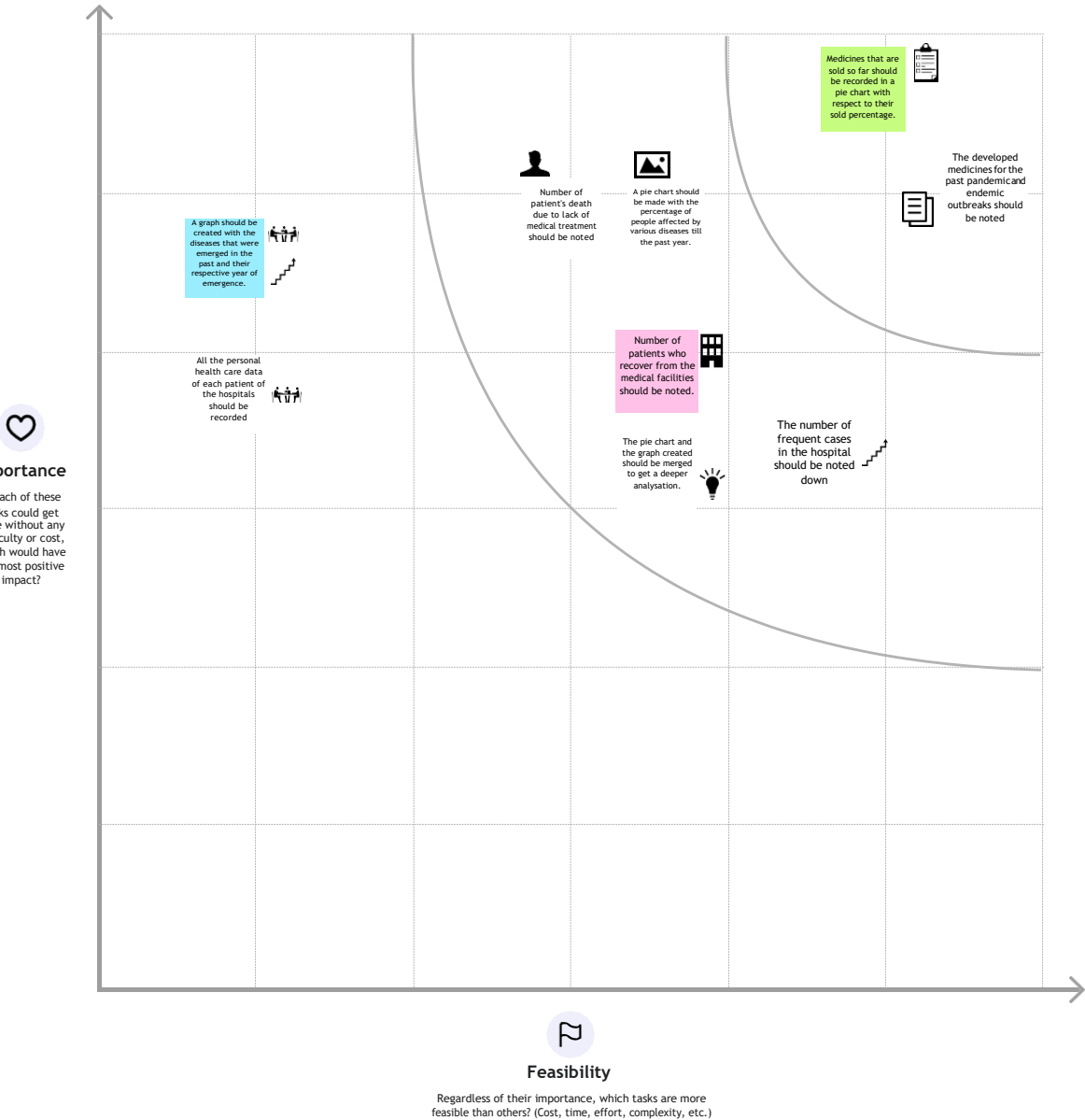


4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

🕒 20 minutes



## Ideation Phase

### Define the Problem Statements

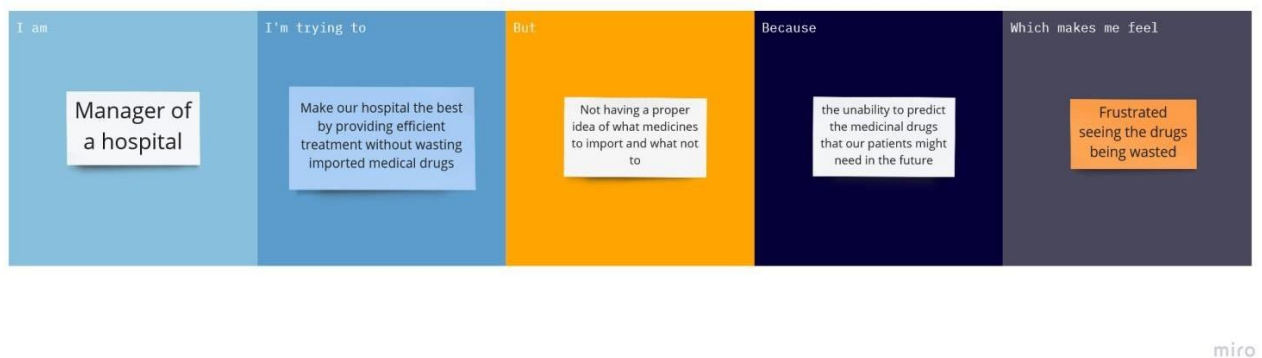
Date	23 September 2022
Team ID	PNT2022TMID01016
Project Name	Project – Analytics for hospital health care data
Maximum Marks	2 Marks

### Customer Problem Statement

Customer 1:



Customer 2:



# Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into CC	<p><b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span></p> <p>Who is your customer?</p> <p>The health care centers who want to provide accurate and efficient output should implement our data analysis system to satisfy their customers (patients).</p>	<p><b>6. CUSTOMER</b> <span>CC</span></p> <p>What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.</p> <p>Lack of right data, incomplete data, shallow integration and underlined transaction system, not affordable by some of the centres</p>	<p><b>5. AVAILABLE SOLUTIONS</b> <span>AS</span></p> <p>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros &amp; cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking</p> <p>Data collection and storage should be done in a proper and efficient manner by using an efficient platform like excel or python. A database should be maintained for every patient</p>	Explore AS, differentiate
	Focus on J&P, tap into BE, understand RC	<p><b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span>J&amp;P</span></p> <p>Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</p> <p>Predictive modeling to lower attrition and produce a leaner, faster, more targeted R &amp; D pipeline in drugs and devices. Analyzing clinical trials and patient records to identify follow-on indications and discover adverse effects before products reach the market.</p>	<p><b>9. PROBLEM ROOT CAUSE</b> <span>RC</span></p> <p>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.</p> <p>Prolonged patient wait times, lack of options to patients when scheduling appointments and receiving treatment, and high readmission rates which shows patients are at greatest risk.</p>	
Identify strong TR & EM		<p><b>3. TRIGGERS</b> <span>TR</span></p> <p>What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.</p> <p>Other health care centers functioning better than them by implementing our analysis, reduced patient satisfaction, low star rating by patients, people recommending some other centers as a better option.</p>	<p><b>10. YOUR SOLUTION</b> <span>SL</span></p> <p>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.</p> <p>Customers do want an affordable as well as an effective analysis, which can be done by our analysis if the data is collected systematically by the centers.</p>	<p><b>8. CHANNELS of BEHAVIOUR</b> <span>CH</span></p> <p><b>8.1 ONLINE</b> What kind of actions do customers take online? Extract online channels from #7</p> <p>By using cloud computing the patient's data can be sent for the analysis and get a predictive output</p> <p><b>8.2 OFFLINE</b> What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</p> <p>The health care centers can perform the analysis from their place using our software and the stored patient's data</p>

#### 4. EMOTIONS: BEFORE / AFTER

EM

How do customers feel when they face a problem or a job and afterwards?

i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

Before: Patients are insecure about their health and feel helpless about it without any trustworthy health care organization.

After : Patients can experience reduced expenditure, more efficient way of handling health issues by the organization can build trust among their patients.

**Project Design Phase-I**  
**Proposed Solution Template**

Date	19 September 2022
Team ID	PNT2022TMID01016
Project Name	Project–Analyticsforhospitalhealth-caredata
Maximum Marks	2 Marks

**Proposed Solution Template:**

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	High medical expenditure, increased number of deaths, arising pandemics
2.	Idea / Solution description	A detailed data analysis to predict and prevent the future health complications, and reduce the medical expenditures
3.	Novelty / Uniqueness	The data analysis can predict the pandemics and endemics before
4.	Social Impact / Customer Satisfaction	People experiencing less medical expenditure, a healthy life by taking medicines prior to the emergence of any pandemic, personal health prediction.
5.	Business Model (Revenue Model)	The analysis can create an overall reduction in medical expenditure, create more people to approach this health care service provider
6.	Scalability of the Solution	This analysis can yield maximum benefits as it is done by the computer using Python



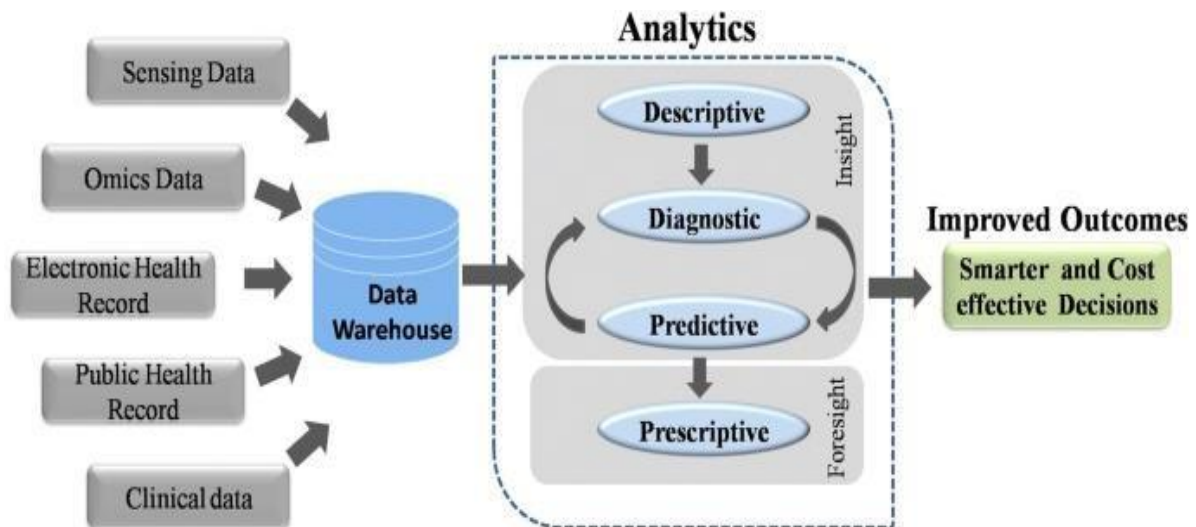
## Project Design Phase-I Solution Architecture

Date	8 October 2022
Team ID	PNT2022TMID01016
Project Name	Project – Analytics for hospital health care data
Maximum Marks	4 Marks

### Solution Architecture:

The project aims in analysing the health care data of the patients to bring conclusions like what are the health compliments that the future is going to face, and a reduced the expenditure, from which the health care centres can import the right medicinal drugs at the right time, and treatment can be effective.

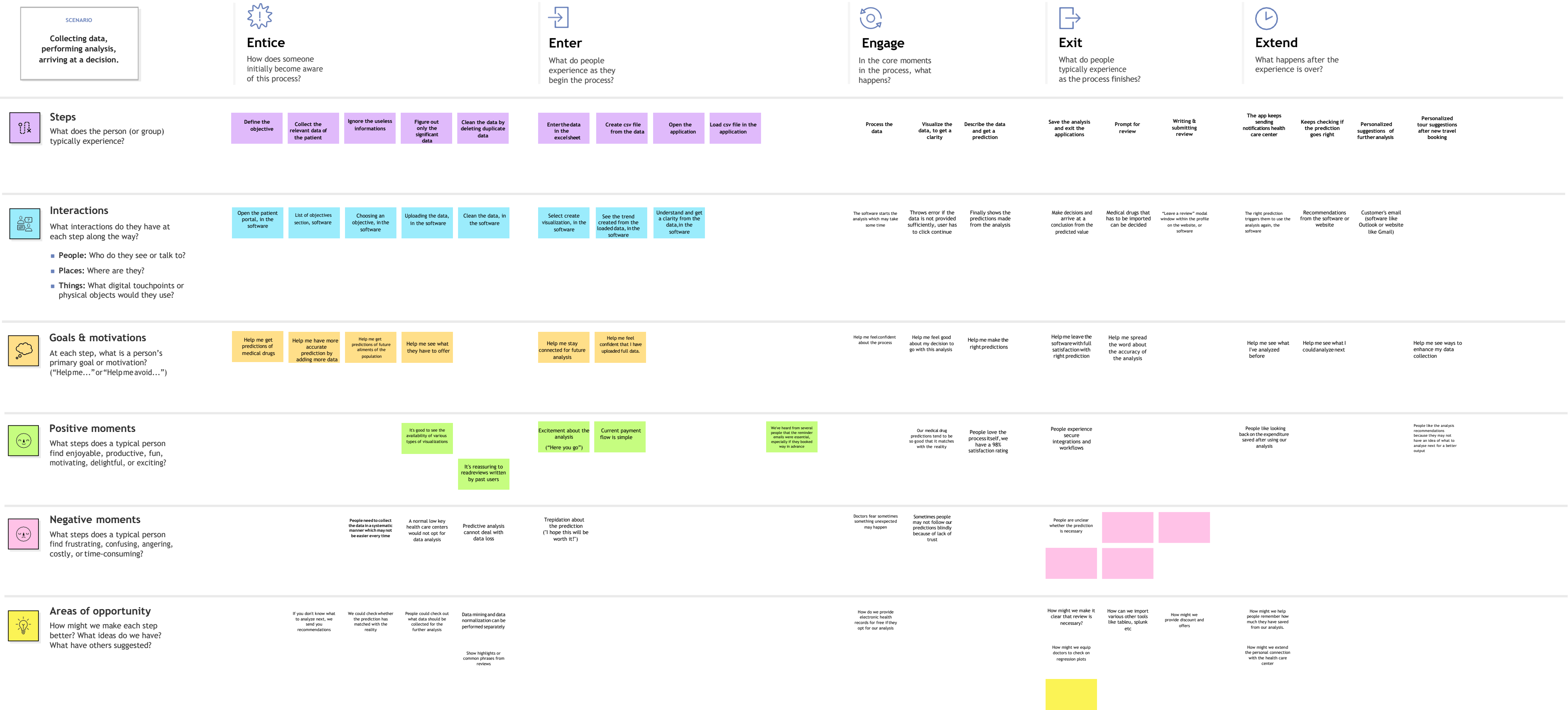
### Solution Architecture Diagram:





Analytics of hospital health-care data

Based on ten customer interviews and observations from the Fairplane Guided City Tours team

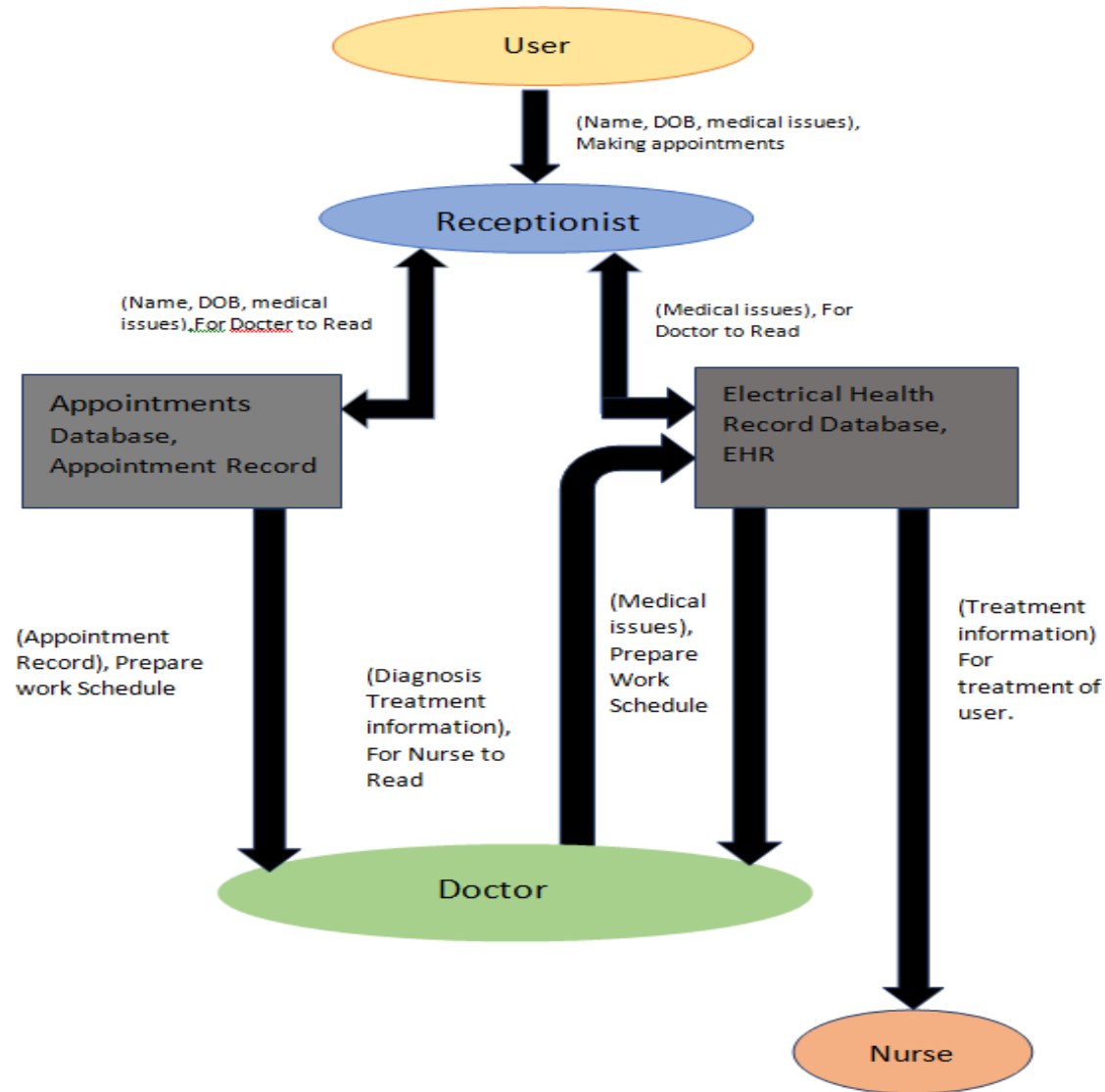


**Project Design Phase-II**  
**Data Flow Diagram & User Stories**

Date	03 October 2022
Team ID	PNT2022TMID01016
Project Name	Project – Analytics for hospitals health-care data
Maximum Marks	4 Marks

**Data Flow Diagrams:**

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



## User Stories

Use the below template to list all the user stories for our analytics.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (any health care center)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can log into the application by entering email & password	I can register & access the dashboard with Facebook Login	Low	Sprint-2

**Project Design Phase-II**  
**Solution Requirements (Functional & Non-functional)**

Date	16 October 2022
Team ID	PNT2022TMID01016
Project Name	Project - Analytics for Hospitals Health-Care Data
Maximum Marks	4 Marks

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form
FR-2	User Confirmation	Confirmation via OTP
FR-3	Database	Every patient has some necessary data like phone number, their first and last name, personal health number, postal code, country, address, city, 'patient's ID number, etc
FR-4	Report Generation	The Hospital Management System generates a report on every patient regarding various information like patients name, Phone number, bed number, the doctor's name whom its assigns, ward name, and more. The Hospital Management system also helps in generating reports on the availability of the bed regarding information like bed numbers unoccupied or occupied, ward name, and more.
	Check Out	The staff in the administration section of the ward can delete the patient ID from the system when the patient checkout from the hospital. The Staff in the administration section of the ward can put the bed empty in the list of beds available.
	Adding Patients	The Hospital Management enables the staff at the front desk to include new patients in the system.

### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	The effectiveness, efficiency and satisfaction with which specific users can achieve a specific set of tasks in a particular environment.
NFR-2	<b>Security</b>	This process of protecting data from unauthorized access and data corruption throughout its lifecycle
NFR-3	<b>Reliability</b>	A highly reliable system has a lower risk of errors and process failures that can cause patients harm
NFR-4	<b>Performance</b>	performance measurements include: <ul style="list-style-type: none"><li>• Quality and efficiency of patient care</li><li>• Cost of healthcare services</li><li>• Disparities in performance Care outcomes</li></ul>
NFR-5	<b>Availability</b>	inpatient, outpatient, pharmacy, and enrolment
NFR-6	<b>Scalability</b>	The ability of a health intervention shown to be efficacious on a small scale and/or under controlled conditions to be expanded under real world conditions to reach a greater proportion of the eligible population, while retaining effectiveness

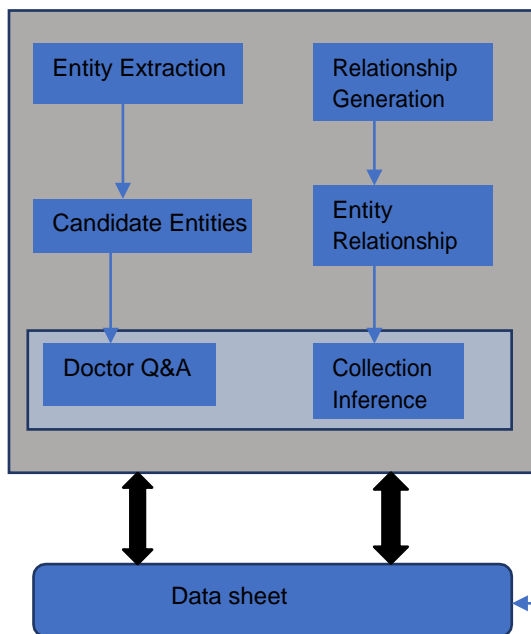
# Project Design Phase-II

## Technology Stack (Architecture & Stack)

Date	23 October 2022
Team Id	PNT2022TMID01016
Project Name	Analytics of Hospital Health-care data
Maximum Marks	4 Marks

### Technology Architecture:

**User**



**Cloud Service**

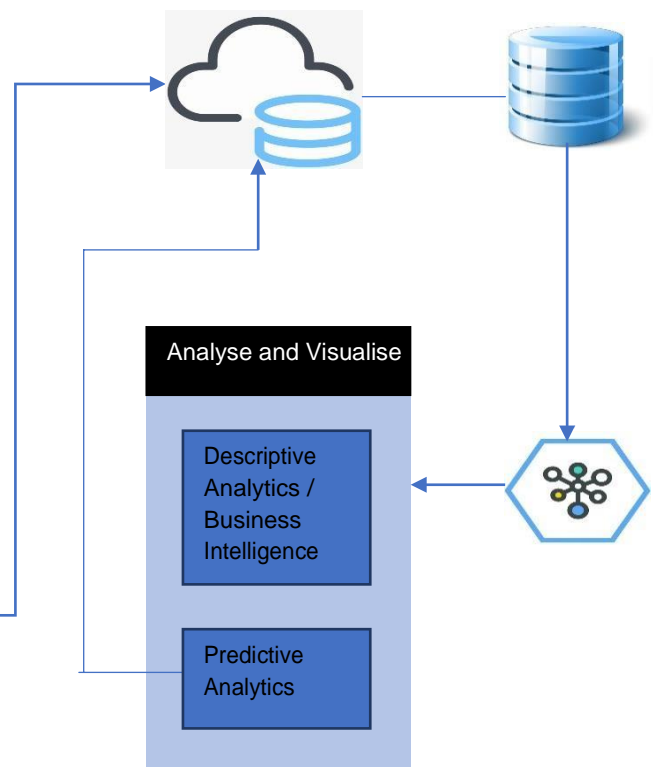




Table 1: Components and Technologies

S.No	Components	Description	Technology
1	Data Source	The User data which is collected in the hospital will be stored in the data sheet	Microsoft Excel
2	Application Logic	The data which is collected in the hospital is stored in the cloud and it is stored in the cloud for analysis	IBM Cognos,python
3	Database	Data to be segregated and secured in the IBM CLOUD	IBM Cloud

Table 2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Predictive Analytics	The data which is collected and stored in the cloud will be used for the predictive analysis of diseases.	Data Analytics
2	Availability	The analysed data will be available in the cloud, we can access at any time	IBM Cloud
3	Prescriptive Analysis	By examine the collected data, determine an optimal course of action	Data Analytics

Analytics of hospital h.  
Software project

Projects / Analytics of hospital health care data

project

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TO DO

INPROGRESS

DOhIE4ISSUES



Assignments

@ AHHCD-4 ✓

Data visualizations

@ AHHCD- 5 ✓

Predevelopment phase

@ AHHCD- 6 ✓

Project development phase

@ AHHCD-7 ✓

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