PROJECT REPORT

Team ID	**PNT2022TMID40633**
Project name	**Analytics for Hospital Health Data**

1. INTRODUCTION

1.1 Project Overview

- Data analytics in clinical settings attempts to reduce patient wait times via improved scheduling and staffing, give patients more options.
- when scheduling appointments and receiving treatment, and reduce read mission rates byusing population health data to predict which patients are at greatest risk.

1.2 purpose

- This is the purpose of healthcare data analysis: using data-driven findings to predict and solve a problem before it is too late, but also assess methods and treatments faster, keep better track of inventory, involve patients more in their own health, and empower them with the tools to do so.

2. LITERATURE SURVEY

2.1 Existing problem

- **No remote access**
  - Healthcare is associated with in-person consultations. This problem obligates the patients to run to the nearest healthcare center for treatment.
  - The COVID outbreak and lockdowns made it even worse.
  - The contagion effect of the virus restrained people within the four walls oftheir homes.

- So, what do they do if they need to see a doctor and have an emergency? Theneed for remote access or virtual consultations is the need of the hour, whichneeds to be taken care of to stay one step ahead in the technology adoption race.

In sufficiency and errors in data sharing

- In an age where medical science has made noteworthy advancements, inefficiencies and healthcare errors are still persistent because of the healthcare industry's traditional technology for management.
- This is not just a hurdle in medical science; it causes regression because of the waste it generates.
- Not only do patients pay the price in the form of inconvenience and health, but we also see a rise in administrative expenses and litigation owing to these inefficiencies and errors.
- An incomplete or inefficient exchange of this data can be dangerous in patients needing urgent or complicated treatment

Absence of supply management system

- Traditional supply chain management is often wasteful and inefficient.
- It leads to money wasted on lost and damaged inventory, improper delivery of equipment or medication, and the damage caused to patients ,all of which amountto massive financial losses for healthcare services.
- Supply shortages, misplaced inventory, and less-than-stellar preventative measuresregarding shrinkage, all play into the reality that hospitals a receptions of wasteful operations without a proper supply management system.

Data security

- Another challenge mentioned by multiple respondents was data security. Between 2009 and 2020, 70% of the U.S. population was affected by healthcare data breaches—a trend that isn't likely to go away.
- Cigarillo believes the healthcare industry needs government funding to strengthen their IT resources.
- But there are also a number of best practices healthcare organizations can implement now that will help them more effectively secure valuable healthcare data, such as educating healthcare staff, restricting access to data and applications, implementing data usage controls, and more.

Lack of real time situation management

- True crises used to be few and far between, but the past year has

presented a perpetual state of crisis—a scenario that has posed an incredible challenge for healthcare organizations.

- According to Terry Zysk , CEO of Live Process, public health emergencies likeCOVID-19 require situation management: using real-time data analysis to understand how an event is unfolding, and reacting to it accordingly.
- It's the only way that critical healthcare resources can be delivered to the rightpeople at the right time during emergencies and natural disasters.
- A major problem with hospital management systems is they don't provide access to the kind of real-time metrics that could improve response times and outcomes—for example, how many beds are available at a facility at any given time or the location of critical supplies.

2.2 References

TITLE: Healthcare
AUTHOR:
Dr.leena V Gangloi
TITLE: Information System Healthcare Sectors
AUTHOR: Wager
TITLE: Data Analytics in Healthcare
AUTHOR: J. Archenaa
TITLE: Historical Review Of Health Policy Making
AUTHOR: Ravi Duggal

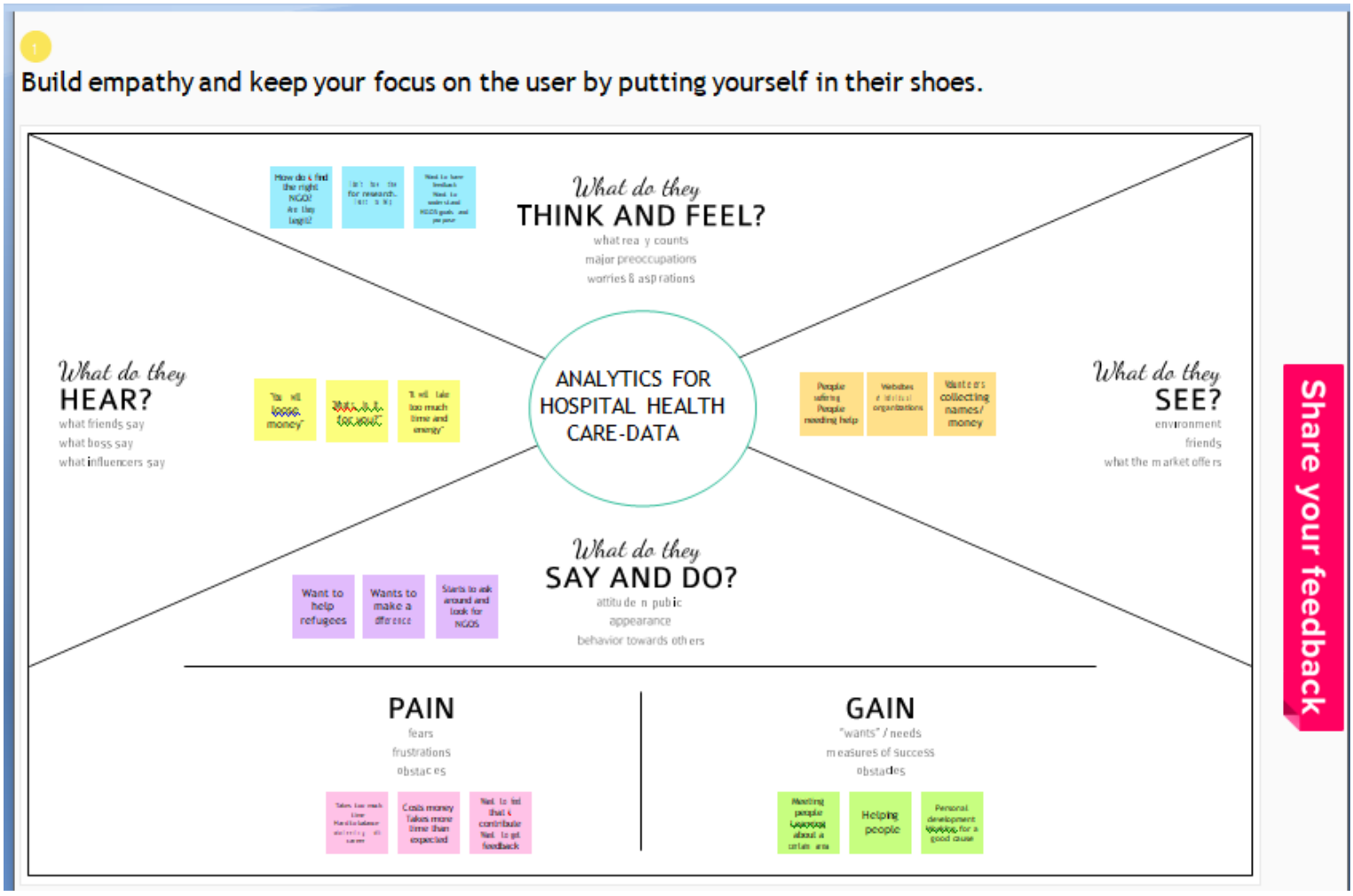
2.3 Problem Statement Definition

- Collection dataset.
- Upload the dataset into cognos . Open the
- properties->data module.
- If null value is present in character field use mode method.
- If the null value is present in continuous field use average or medium.Display
- the data in respective charts.
- Create conclusion using summary.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

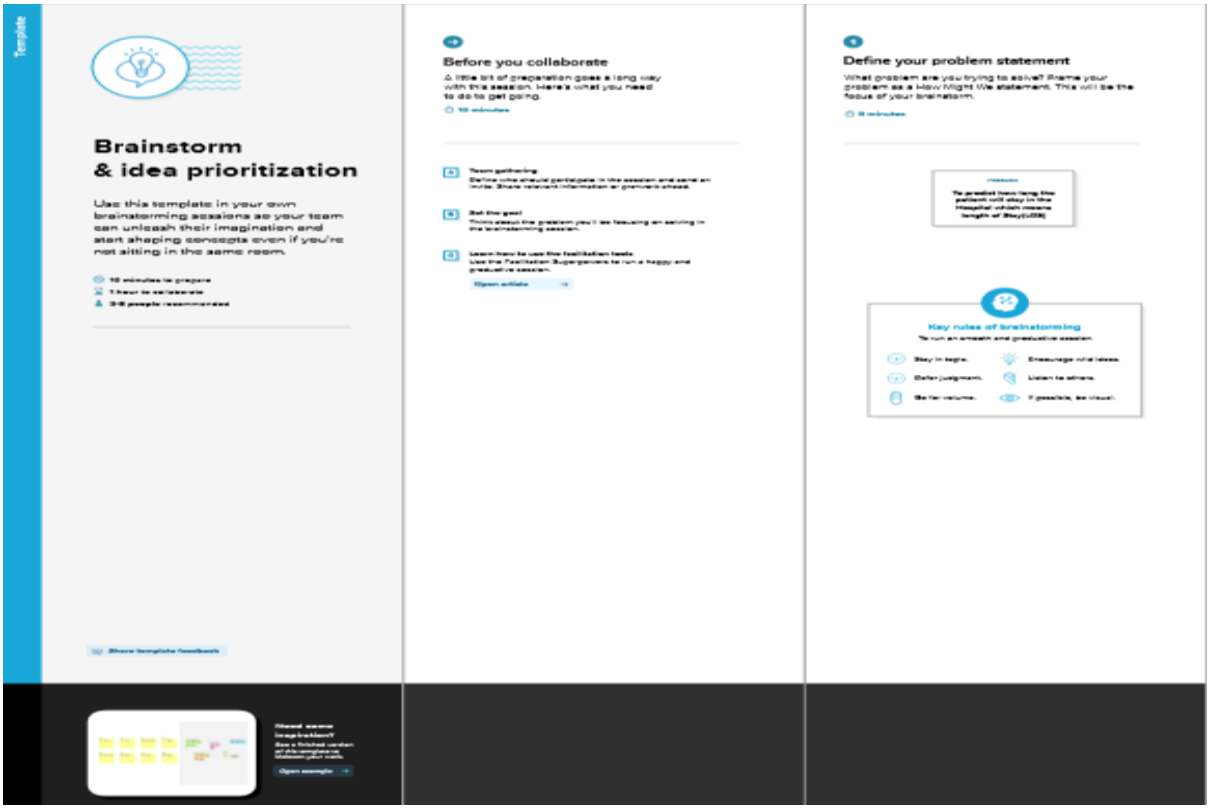
- An empathy map is a tool which aids in understanding another person's perspective.
- Empathy maps have up until now not been used in a medical education setting.
- Objective: To assess the attitudes towards, applicability and usefulness ofempathy maps as part of medical student's communication skills training.

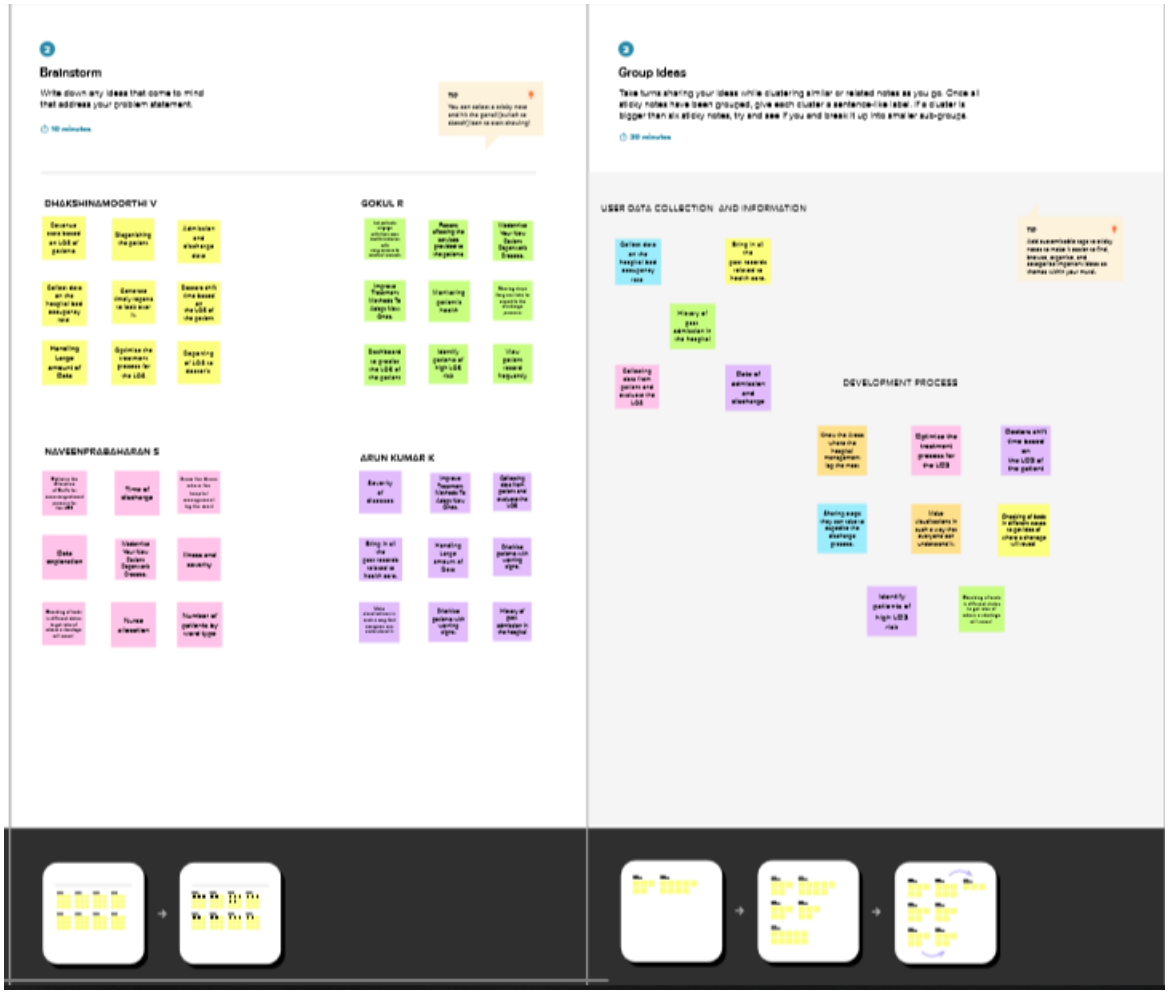


3.2 Ideation & Brainstorming

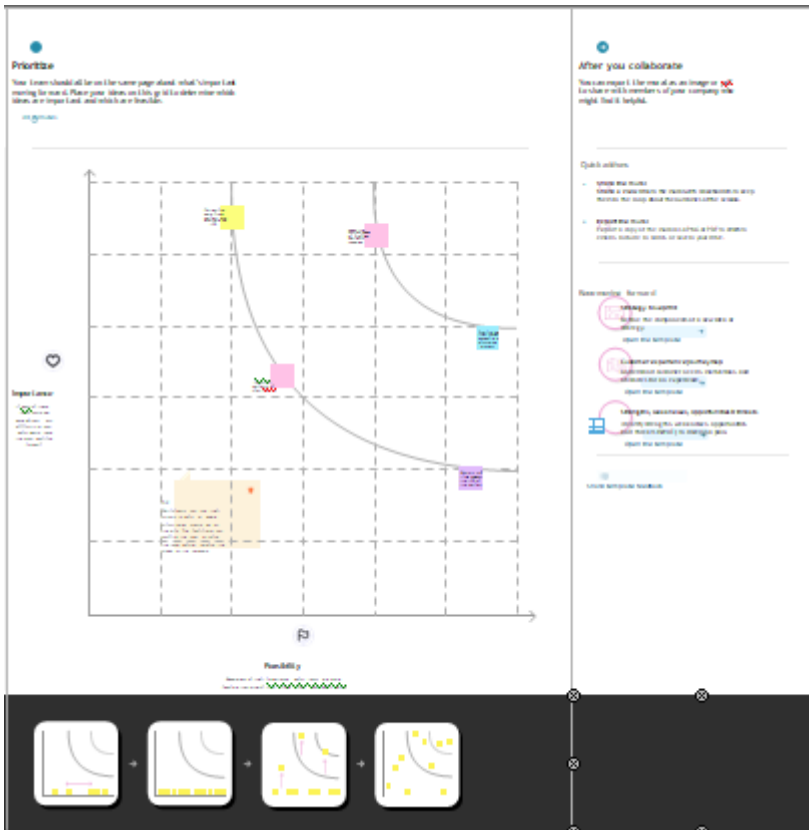
To try to solve a problem or come up with new ideas by having a discussionthat includes all members of a group : to discuss a problem or issue andsuggest solutions and ideas.

BrainstromFigure:1





BrainstromFigure:2



BrainstromFigure:3

3.3 Proposed Solution

- Identify key hurdles to healthcare sustainability in india and propose a set ofsolutions that mutually benefit and the pharmaceutical industry Pragmaticliterature review of 43 articles published by regional and international organizations.
- UNIVERSAL HEALTHCARE COVERAGE Attainment of UHC comes with the hurdle of having to provide care to a higher number of patients.
- EVOLVING DEMOGRAPHICS Population aging has resulted in a growing numberof elderly dependents at higher risk of disease and complications.
- RISING COST OF R&D Today, the cost of developing a medicine can exceed USD 2.6 B compared to USD 179 M in the 1970s.
- WIN-WIN SOLUTIONS ARE NEEDED TO ATTAIN SUSTAINABILITY Mutually beneficial solutions that allow for productive movement towards sustainablevalue-based healthcare systems should be explored.
- VALUE ADDED SERVICES The pharmaceutical industry should move 'beyond thepill' and collaborate with to design and offer programs aimed at improving healthcare sustainability (e.g., training, administrative support, etc.
- MULTI-STAKEHOLDER COALITIONS Multi-stakeholder coalitions can serve as a platform to discuss healthcare challenges and co-create healthcare solutions toachieve defined common goals..
- INTEGRATED HEALTHCARE MODEL Investment in integrated healthcare systems that focus on prevention and early diagnosis is key to move towards sustainability in the LA region.

S.NO	PARAMETER	DESCRIPTION
1.	**Problem Statement (Problem to besolved)**	The goal is to enhance **predict** the bed **availability** and improve efficiency in the health-care industry. ➢ Difficult to identify patients of high LOS-risk. ➢ Improper bed allocation planning. ➢ Poor scheduling in contagious diseases leads tothe mortality. ➢ Patients end up: Waiting too long for treatment Being diverted to another hospital To solve customer issues ,certain techniques need tobe adopted.

2.	**Idea / Solution description**	➢ Using data analytics tools to monitor patterns indata access, sharing, and utilization can give organizations an early warning when something changes ➢ Creating the interactive dashboard to know the bedavailability. ➢ Automatic update by using daily sync of the dailydatabase. ➢ Display the status of the bed to the hospitalmanagement.

3.	**Novelty / Uniqueness**	➢ Using web-based portals and advanced dashboardreporting, a flexible reporting system that measures ongoing performance and provides a real-time warning system of possible problems can be added. ➢ Responsive 24/7 Dashboard to get the bed availability and to know the high LOS riskpatients. ➢ Design dashboards and build interfaces to all databases - begin to monitor the process.
4.	**Social Impact / Customer Satisfaction**	➢ The ultimate goal of this project is to builddashboard and data analysis of the beds . ➢ Good coordination within the hospitalmanagement. ➢ Better accessibility of beds. ➢ Improved efficiency and accuracy of health care. ➢ Increased coordination resulting in better patienttransfer and better pre-planning. ➢ Designing and developing new models for bettermanagement of inventory.
5.	**Business Model (Revenue Model)**	➢ Relationship have 24/7 Support, Knowledge-based updated dashboard. ➢ The components provide immediate, highly focused improvements for maximum benefit. ➢ Cost Structure expresses maintenance of thendata.
6.	**Scalability of the Solution**	➢ Update the data periodically. ➢ Using flawless systems for accurately trackingthe available beds ➢ 'Flexing' bed capacity may be achievable forshort periods.

3.4 Problem Solution fit

- The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer'sproblem
- In an age where medical science has made noteworthy advancements, inefficiencies andhealthcare errors are still persistent because of the healthcareindustry’s traditional technology for management.
- One specific area of concern is the exchange of patient data in case of patient transfer from one department or hospital to another. Patient record sharing, whendone thetraditional way, is time-consuming and inefficient and exposes patient information to a breach.
- To deliver a holistic and satisfactory patient experience, different parties involvedinhealthcare – doctors, scheme providers, insurance providers, doctors, and patients – should be able to exchange information among themselves securely.

Project Title: Analytics for Hospital Health-Care Data | **Project Design Phase-I - Solution Fit Template** | **Team ID:** PNT2022TMID40633

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) — CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

Hospital management and patients.

6. CUSTOMER CONSTRAINTS — CC

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.

Not to able predict the patient LOS properly especially during the pandemic period

5. AVAILABLE SOLUTIONS — AS

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 & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

Effective hospital bed management using data mining technique

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Need the proper data analysis of allocation of beds and other needs of patients

9. PROBLEM ROOT CAUSE — RC

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.

Insufficient analysis in data, human error and poor scheduling.

7. BEHAVIOUR — BE

What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

Regularly monitoring the database of patients and measures to avoid error

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS — TR

Prevailing emergency situations and Pandemic period situations and Pandemic period

4. EMOTIONS: BEFORE / AFTER — EM

BEFORE: Unstable physical and psychological state during the pandemic period

AFTER: Physical and psychological comfort and security to the patients. Improved critical care bed allocation decisions.

10. YOUR SOLUTION — SL

Using **predictive analysis** powered by the AI which is used in analytics technique
Proper Data analysis and implementation in **Interactive dashboard**.

8. CHANNELS of BEHAVIOUR — CH

8.1 ONLINE

Secure login, Usage of data exploration.

8.2 OFFLINE

Preparing the data set on the patients occupancy period predicting the LOS with doctors

Identify strong TR & EM

4. REQUIREMENT ANALYSIS

4 .1 Functional requirement

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Appointments	➢ Recurrent appointments and scheduling theavailable time slots in a regular basis. ➢ Showing the number of appointments ongiven day. ➢ After sign in asking for a ID and phonenumber to avoid any issues. ➢ Generating appointment. ➢ Supporting group appointments and automatically creating a billing charge forcompleted appointments. ➢ Appointment Status: a. Pending b. Confirmed c. Cancelled; No Reschedule d. Cancelled; Reschedule e. No Show f. Completed
FR-2	Clinical Care	➢ The admission of the patient must be examined properly and patients who comes ina critical position should be given immediate treatment. ➢ Enhanced and improved reliability onreporting the data. ➢ Access medication history from externalsources (ex. Surescripts). ➢ Predict the length of stay of inpatients.

FR-3	Patient Records	➢ A Proper record or documentations need to be maintained regarding the patients who all consulted and detailed analysis of their health details. ➢ It should be easily accessible when required. ➢ Accessible as Standalone function, as well as easily accessible from Progress Note andEvaluation activities. ➢ Digital records will be more efficient and time saving.
FR-4	Bed requirements	➢ Analyzing and monitoring of beds which are required are the most important task. ➢ Using flawless systems for accurately tracking the availability of beds.
FR-5	Providing insights of dataset	➢ Raw data collection and sharing of data and systems are essential factors in hospital management. ➢ According to these data in appropriate measures can be taken. ➢ Providing data set without human error.

4.1 Non-Functional requirements

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	➢ Usable systems are straightforward to use by as many people as possible, both in caseof either end users or administrators to view the hospital records when needed.
NFR-2	**Security**	**Patient identification** : ➢ To recognize andanalyze the patient perfectly.
NFR-3	**Reliability**	➢ Understanding the current trend and working on to it to solve the problem in anefficient manner. ➢ Being software as a service, HMS is highlyresilient to any technology disruptions, downtime, or crashes experienced by other technology systems.
NFR-4	**Performance**	**Response time:** ➢ Providing acknowledgment in minimaltime about the patient information. **Comfortability:** ➢ To ensure that the guidelines andaccessibilities are followed.
NFR-5	**Availability**	➢ Better coordination with the hospital management to provide all its resourcesaccessible when needed. ➢ Accessibility of all medical facilities.
NFR-6	**Scalability**	➢ Make sure that the work is done in moreefficient way with the appropriate resources. ➢ Make complex decisions understandablewith proper data.

5 PROJECT DESIGN

5.1 Data Flow Diagrams

A data flow diagram shows the way information flows through a process or system. It includes data inputs and outputs, data stores, and the various subprocesses the data moves through. DFDs are built using standardized symbols and notation to describe various entities and their relationships.

Define the process you want to visualize, oruse a pre-existing one

Develop the data flow by using the shapes

Next

BRAINSTORMING AREA

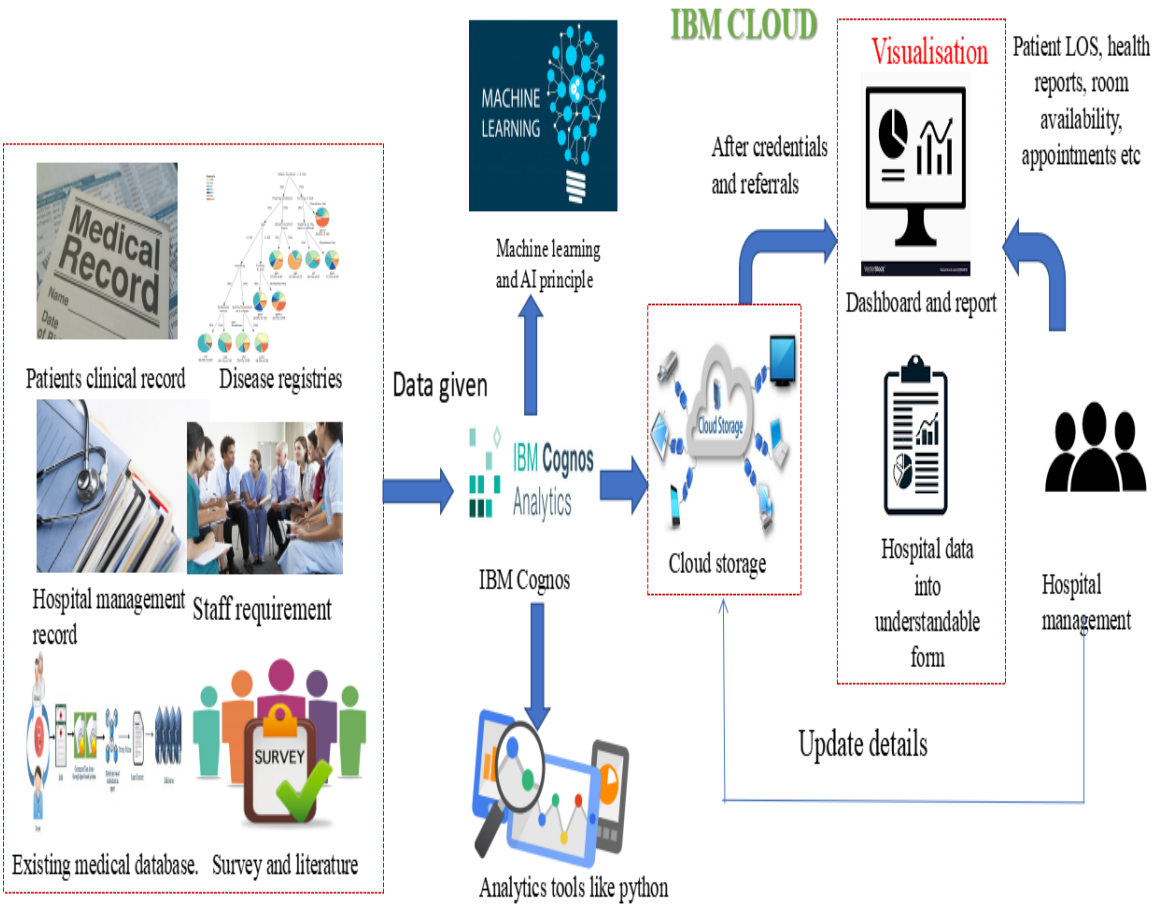
NEXT STEPS

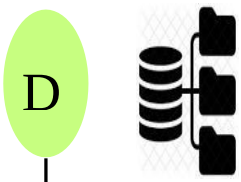
FLOW KEY

VISUAL KEY

You can also make your diagrams more engaging by using images

DATA FLOW DIAGRAM OF HOSPITAL HEALTH CARE DATA





5.2 Solution & Technical Architecture

- Solution Architects are most similar to project managers, ensuring that all parties, including stakeholders, are on the same page and moving in the rightdirection at all stages.
- Technical architects manage all activities leading to the successful implementation ofa newapplication

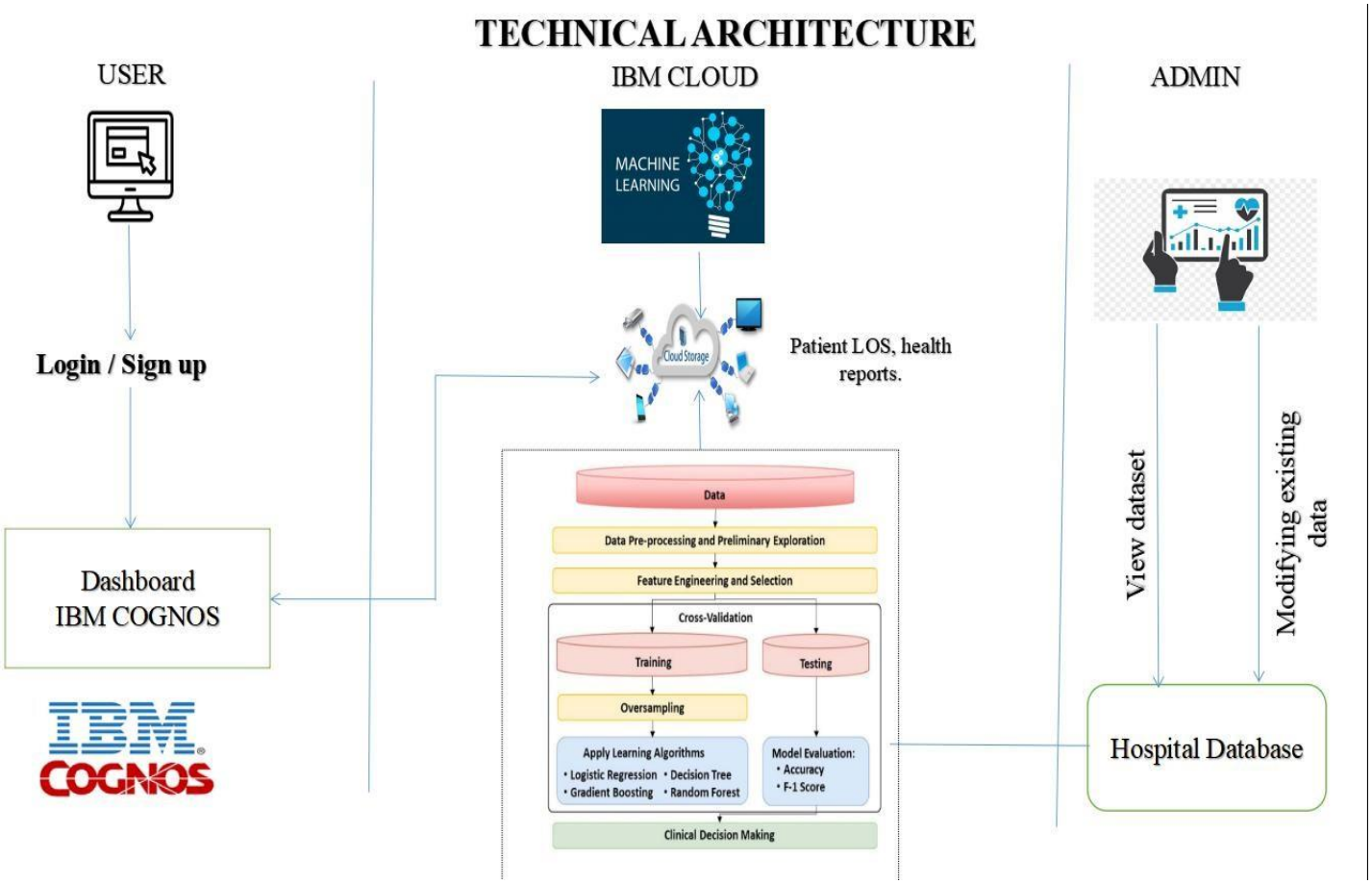


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson Assistant
4.	Database	Data Type, Configurations etc.	MySQL
5.	Cloud Database	Database Service on Cloud	IBM Cloud etc.
6.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
7.	External API-1	Purpose of External API used in the application	Aadhar API, etc.
8.	Machine Learning Model	Purpose of Machine Learning Model	Regression Model, etc.
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, etc.

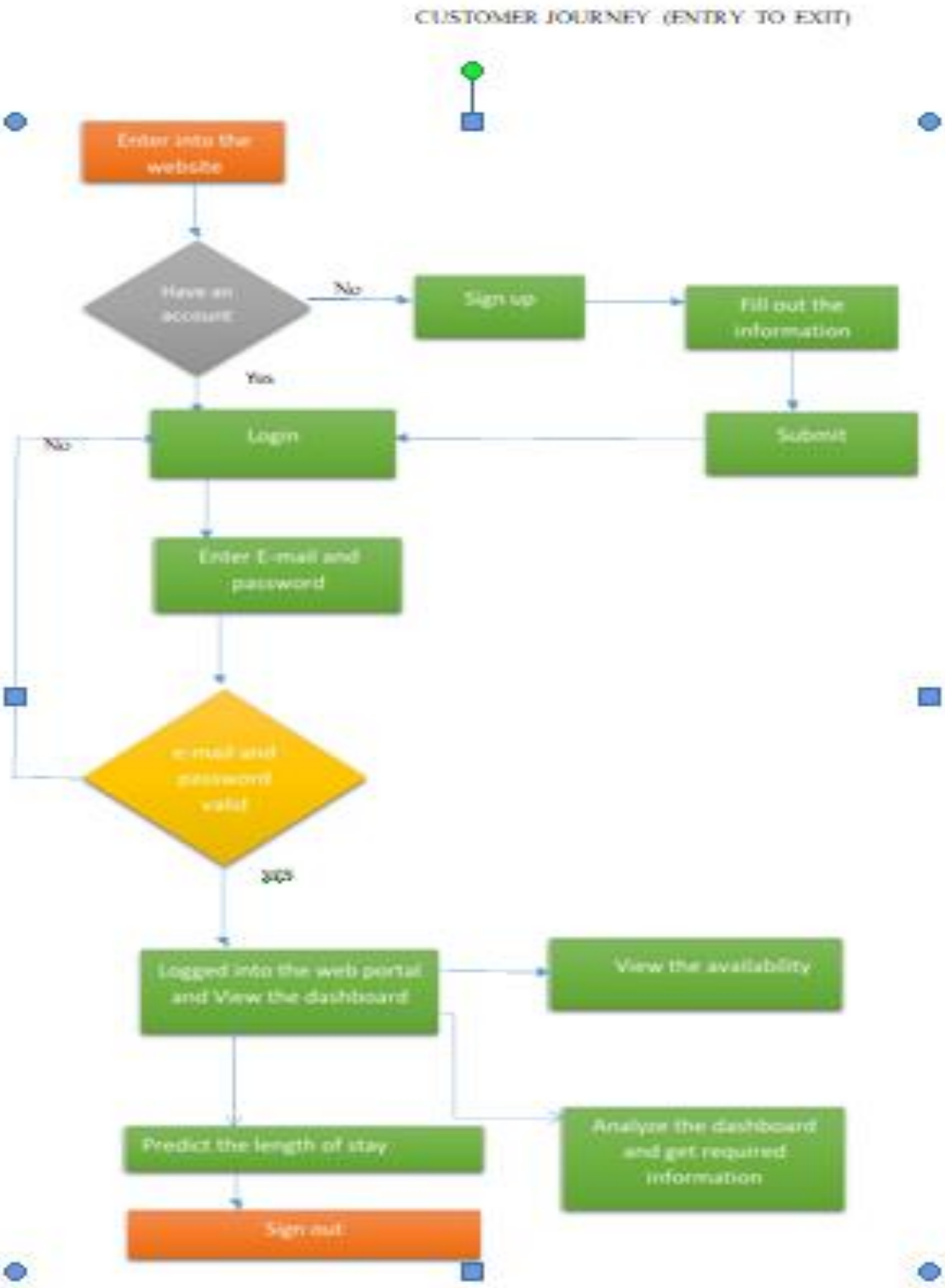
Table-2: Application Characteristics:

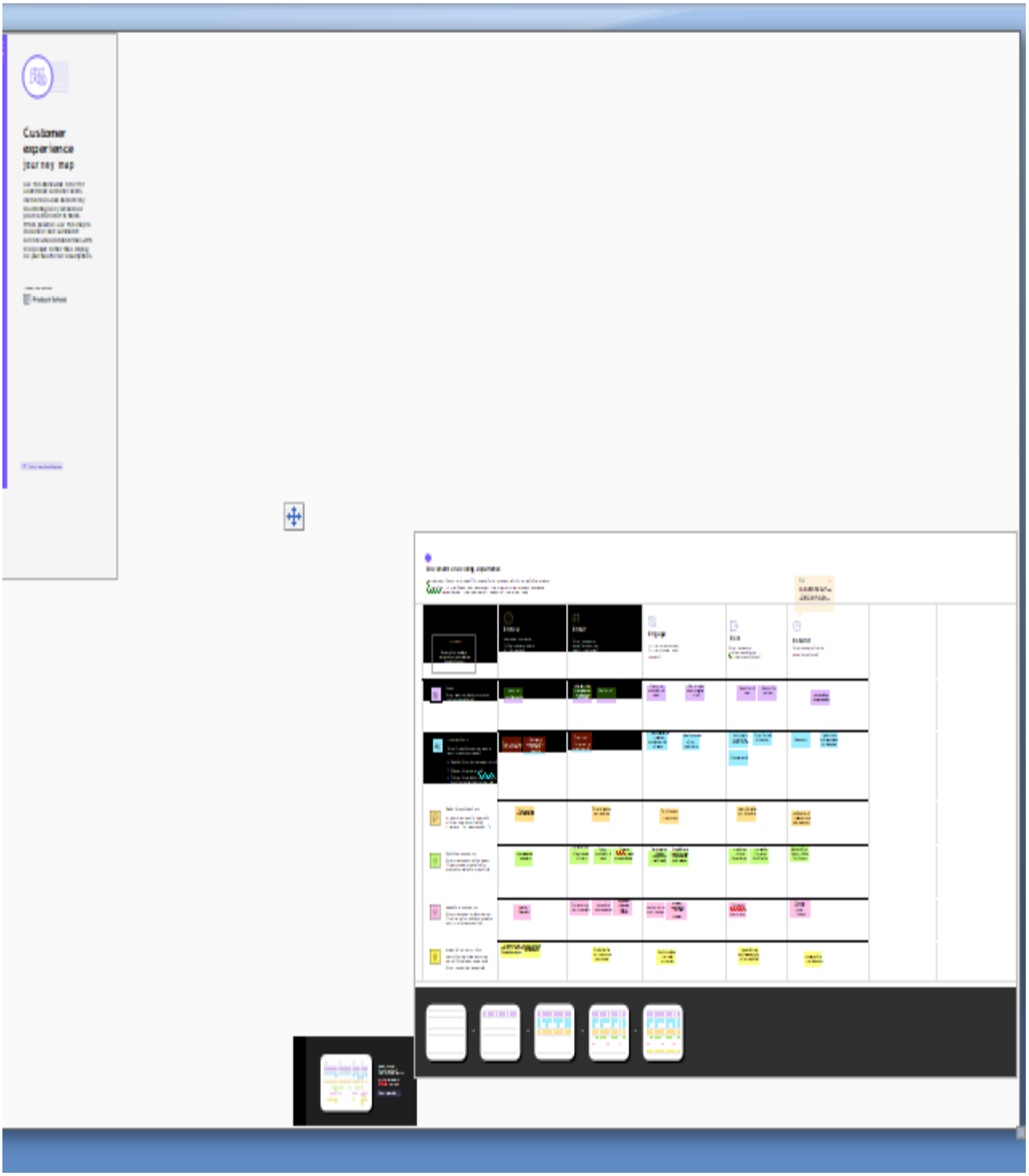
S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Python
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	Encryption,Firewall,Antivirus
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Supports higher workloads
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	High availability enables your IT infrastructure to continuefunctioning even when some of its components fail.
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	A field of practice thatuses various tools, processes, and ideas in a scientific manner to improve the desired outcomes of individuals and organizations.

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	HIV/AIDS Risk Smart Form forData Entry	User Number-1	As a Clinician, I want to review and update a HIV/AIDS Risk form. so that I can determine my patient's risk of HIV/AID (risk category), and ensure proper Remedy accordingly.	I can access patient record or data accurately.	High	Sprint-1
	BPA to Prompt Ordering HIV/AIDS on Admission	User Number-2	As an Inpatient ,I want to be prompted to Order HIV/AID on admission .so that I remember to place my patient on AIDS	Maintain the Record for correct preference	High	Sprint-1
	HIV/AIDS Dynamic Order Group in Admit Order Sets	User Number-3	As an Inpatient I want to view only risk-appropriate HIV/AID options in Admission Order Sets so that I can ensure my patient is getting optimal HIV/AID prophylaxis	For Admission purpose of patient to get solutions among their problem	High	Sprint-2
		User Number-4	As a user, I access the data in visualize mode		Medium	Sprint-1
	Dashboard	User Number-5	As a user, I can access the data from Queries, graph ,pie chart		High	Sprint-1
Customer (Web user)			Get the older information from the hospitals			
Customer Care Executive			Have data in graph modes		Medium	
Administrator			Access in Cloud Easily		Medium	

5.4 Customer Journey




Customer
experience
journey map

6.PROJECT PLANNING &SCHEDULING

6.1 Sprint Planning &Estimation

MILESTONES	ACTIVITY LIST
MILESTONE-1	Collecting the Data
MILESTONE-2	Uploading the collected data on the IBM COGNOS platform
MILESTONE-3	Data exploration in the IBM COGNOS platform
MILESTONE-4	Data visualization in the IBM COGNOS platform
MILESTONE-5	Creating an interactive dashboard
MILESTONE-6	Displaying the prepared dashboard
MILESTONE-7	Preparing a standard dataset and removing the unwanted data using the python programming
MILESTONE-8	By using the various machine learning algorithm and comparing the results of different algorithm and finding the accurate result for the defined problem.
MILESTONE-9	Displaying the result according to the required format for example displaying the Length of Stay of a patient
MILESTONE-10	To duplay in GitHub

6.2 Sprint Delivery schedule

Team ID: PNT2022TMID40633

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement(Epic)	User Story Number	User Story /Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	A user can register for the application through email and password	10	High	Manimaran.M Sathishkumar.M
	Data Uploading	USN-2	A user can upload the patient data into the IBM COGNOS analytics	10	High	Manimaran.M Sathishkumar. M Pazhanisami.R Sakthivel.T

Sprint-2	Data Visualization	USN-3	A user can visualize the data with various tools	5	High	Manimaran.M, Sakthivel.T Sathishkumar.M Pazhanisami.R
	Dashboard	USN-4	A user can create a interactive dashboard from the data	10	High	Manimaran.M, Sakthivel.T Sathishkumar.M Pazhanisami.R
Sprint-3	Data Analysis with ML algorithm	USN-5	A user can apply algorithms on the dataset for predicting	20	High	Manimaran.M, Sakthivel.T Sathishkumar.M Pazhanisami.R
Sprint-4	Report	USN-6	A user can make a report from the analysis and dashboards	20	High	Manimaran.M, Sakthivel.T Sathishkumar.M Pazhanisami.R

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

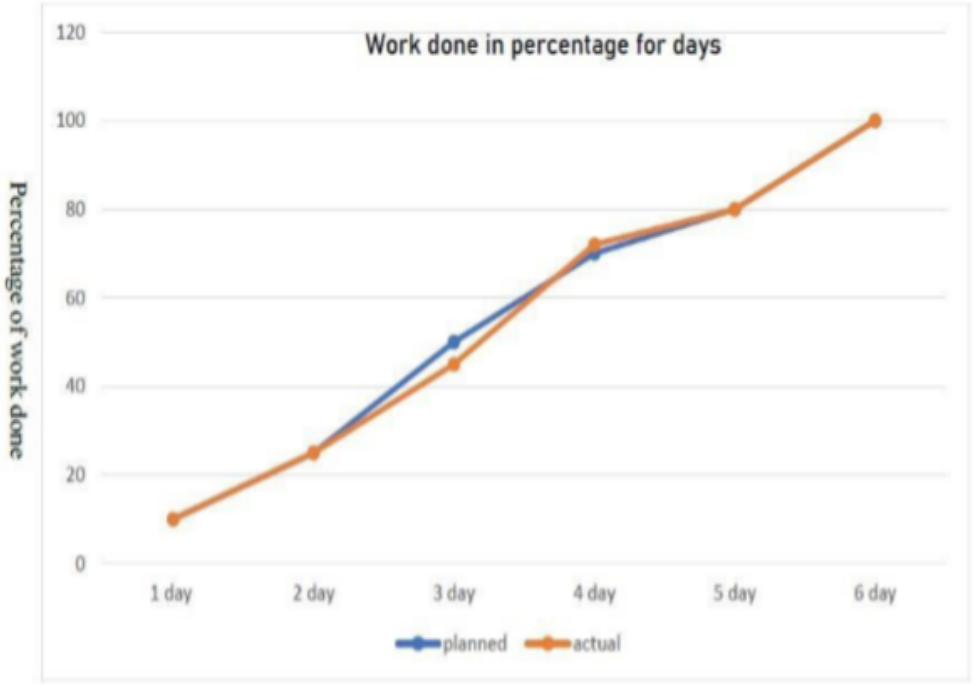
Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Burndown Chart

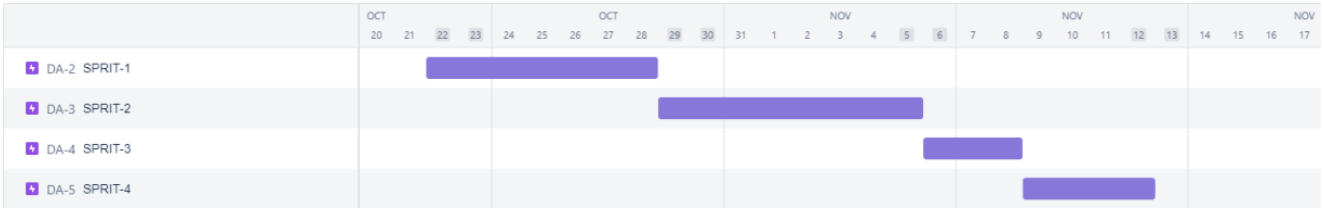
A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



6.3 Reports from JIRA

Road Map:

A roadmap is a strategic plan that defines a goal or desired outcome and includes the major steps or milestones needed to reach it. It also serves as a communication tool, a high-level document that helps articulate strategic thinking—thewhy—behind both the goal and the plan for getting there.

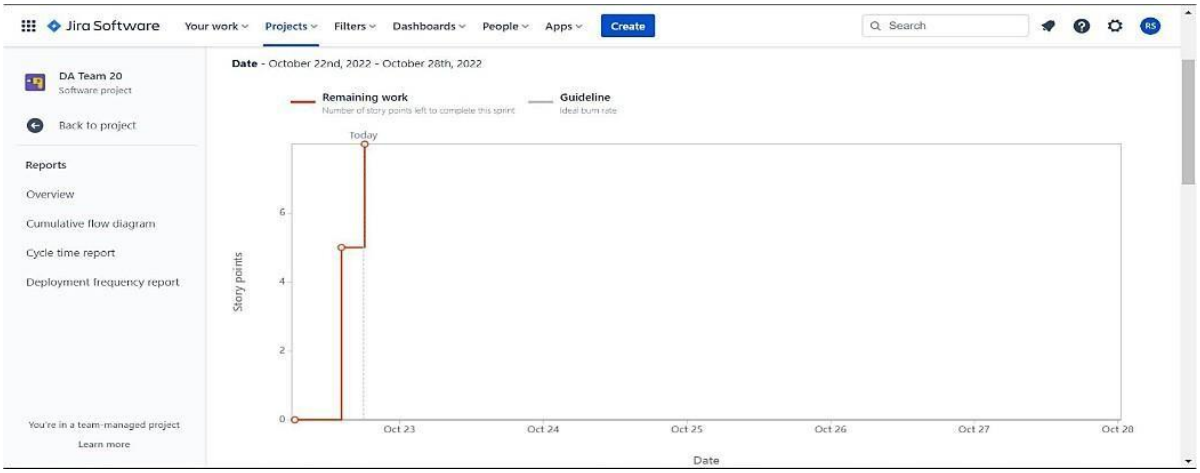


Kanban Board:

A kanban board is an agile project management tool designed to help visualize work, limit work-in-progress, and maximize efficiency (or flow). It can help both

agile and DevOps teams establish order in their daily work.

BURNDOWN CHART



VELOCITY

Average velocity for sprint - 1:

AV = 8/7 = 1.14

Average velocity for sprint - 2:

AV = 8/8 = 1

Average velocity for sprint - 3:

AV = 5/3 = 1.67

Average velocity for sprint - 4:

AV = 5/4 = 1.25

7 CODING & SOLUTIONING

7.1Feature 1

Fetched the data from DB2 database.
Creating responsive dashboard.
Inserting filter for each chart
Creating report
Created reports using multiple graphs and charts

7.2Feature 2

Creating stories and performed.
Perform animation render image from website.
Included graphs and charts.
Creating web application using bootstrap.
Embedded the cognos with web application.

7.3Database Schema

case_id
Hospital_code
Hospital_type_code
City_Code_Hospital
Hospital_region_code
Available Extra Rooms in Hospital
Department
Ward_Type
Ward_Facility_Code
Bed Grade
Patient id
City_Code_Patient
Type of Admission
Severity of Illness
Visitors with Patient
Age
Admission_Deposit
Stay

8 TESTING

Test Cases

- Verify user is able to see Home page.
- Verify user is able to see Dashboard page.

- Verify user is able to navigate to Report page.
- Verify user is able to navigate to story page.
- Verify filters are working

User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	8	5	0	3	16
Duplicate	1	0	5	0	6
External	0	3	2	1	6
Fixed	13	4	3	16	36
Not Reproduced	0	1	0	0	1
Skipped	0	1	0	1	2
Won't Fix	1	4	2	1	8
Totals	23	18	12	22	75

3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	9	0	0	9
Client Application	43	0	0	43
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	9	0	0	9
Final Report Output	10	0	0	10
Version Control	1	0	0	1

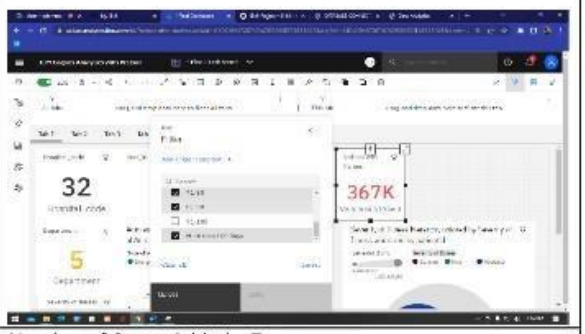
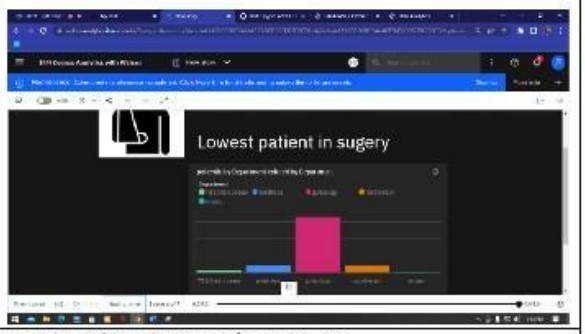
9 RESULTS

9.1Performance Metrics

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	Number of Visulizations / Graphs – 22 Number of tabs – 5 
2.	Data Responsiveness	Data's will dynamically changed and graph also changed. 
3.	Amount Data to Rendered (DB2 Metrics)	Number of rows read – 318438 Number of rows loaded – 318438 Number of rows rejected – 0 

4.	Utilization of Data Filters	We created filters for Dashboards which is perfectly working. 
5.	Effective User Story	Number of Scene Added – 7 Animations are perfectly displayed. Images are perfectly rendered. 
6.	Descriptive Reports	Number of Visulizations / Graphs – 6

10 ADVANTAGES

- Improved research efforts
- Improvedhealth
- outcomesObtain
- operational insightsImproved staffing
- Informed strategic planning
- *Higher-Quality Care*

DISADVANTAGES

- *Privacy*
- *Replacing Doctors*
- Frustration with poor
- implementation.

  Cybersecurity risks
- Healthcare Regulatory Changes.
- Healthcare Staffing Shortages

11.PROJECT OBJECTIVES

Project Goal:

Recent Covid-19 Pandemic has raised alarms over one of the most overlooked areas to focus:Healthcare Management. While healthcare management has various use cases for using data science, patient length of stay is one critical parameter to observe and predict if one wants to improve the efficiency of the healthcare management in a hospital.

This parameter helps hospitals to identify patients of high LOS-risk (patients who will stay longer) at the time of admission. Once identified, patients with high LOS risk can have their treatment plan optimized to minimize LOS and lower the chance of staff/visitor infection. In addition, prior knowledge of LOS can aid in logistics such as room and bed allocation planning.

What if I have been hired as Data Scientist of Health Man – a not for profit organization dedicated to manage the functioning of Hospitals in a professionaland optimal manner.

The goal is to accurately predict the Length of Stay for each patient on case-by- case basis so that the Hospitals can use this information for optimal resource allocation and better functioning. The length of stay is divided into 11 different classes ranging from 0-10 days to more than 100 days.

The Overall Objective:

- Know fundamental concepts and can work on IBM Cognos Analytics
- Gain a broad understanding of plotting different visualizations to providethe suitable solution
- Able to create meaningful Visualizations and the Dashboard(s).

Project Flow:

- Creating multiple analytical graphs/charts/Visualizations
- Using the Analytical Visualizations, build the required Dashboard(s)
- Saving and visualizing the final dashboard in the IBM Cognos Analytics

Build the following visualizations

- Length of Stay for each case of patients.
- Stay by Patient ID using Column Chart
- Severity of illness by Patient-Id using Tree Map
- Age, Department Wise Patient using Table
- Room Availability by Pie Chart o Dashboard Creation

Departm

- It also means describing how health plans, health care organizations, and clinicians should be accountable to patients and society and conversely.
- How individuals can take appropriate responsibility for their own health.
- Data analytics is the science of analyzing raw datasets in order to derive a conclusion regarding the information they hold.
- It enables us to discover patterns in the raw data and draw valuable information from them.

12FUTURE SCOPE

- **Improved Decision Making**: Data Analytics eliminates guesswork and manualtasks. Be it choosing the right content, planning marketing campaigns, or developing products.
- Organizations can use the insights they gain from data analytics to make informed decisions. Thus, leading to better outcomes and customer satisfactionData analytics to
- achieve business goals of pharmaceutical companies, payers,

insurance companies, physicians, hospitals, medical equipment companies, sales reps, and other stakeholders in the healthcare business, need for this haveonly increased after the Affordable Act came into being.

13 APPENDIX

Source Code

Dashborad

html

 # IBM-Project-52165-1660990119

Analytics for Hospitals' Health-Care Data

 # Analytics for Hospitals' Health-Care Data

Analytics For Hospitals' Health-Care Data

![image](https://user-images.githubusercontent.com/82984119/193977794-762c3653-43d0-490b-94ab-4e641cf42e13.png)

 # Introduction:

Recent Covid-19 Pandemic has raised alarms over one of the most overlooked areas to focus: Healthcare Management. While healthcare management has various use cases for using data science, patient length of stay is one critical parameter to observe and predict if one wants to improve the efficiency of the healthcare management in a hospital.

This parameter helps hospitals to identify patients of high LOS-risk (patients who will stay longer) at the time of admission. Once identified, patients with high LOS risk can have their treatment plan optimized to minimize LOS and lower the chance of staff/visitor infection. Also, prior knowledge of LOS can aid in logistics such as room and bed allocation planning.

 # Goal:

The goal is to accurately predict the Length of Stay for each patient on case by case basis so that the Hospitals can use this information for optimal resource allocation and better functioning. The length of stay is divided into 11 different classes ranging from 0-10 days to more than 100 days.

 # Technical Architecture:

![download](https://user-images.githubusercontent.com/82984119/190869831-2b7327c7-1629-4cc9-b8ec-a5a21fb1b0ec.png)

 # Beneficial Users:

***1.Hospital
***

2.Patients

 # Team :

***1.MANIMARAN.M TEAM LEADER
***

***2.SATHISH KUMAR.M TEAM MEMBER 1
***

***3.PAZHANISAMI.R TEAM MEMBER 2
***

***4.SAKTHIVEL.T TEAM MEMBER 3
***

```
</title>
 <meta charset="utf-8">
 <meta name="viewport" content="width=device-width, initial-scale=1">
 <link rel="stylesheet"
```

```
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
  <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.6.0/jquery.min.js"></script>
  <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></script>
</head>
<body>

<nav class="navbar navbar-inverse ">
  <div class="container-fluid">
    <div class="navbar-header">
      <a class="navbar-brand" href="#">Analytics for Hospitals' Health-Care Data</a>
    </div>
    <ul class="nav navbar-nav">
      <li><a href="index.html">Home</a></li>
      <li><a href="dashboard.html">Dashboard</a></li>
      <li class="active"><a href="#">Report</a></li>
      <li><a href="story.html">Story</a></li>
    </ul>
  </div>
</nav>

<div class="container">
  <iframe

src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FReport%2FFinal%2BRepor
t&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode
=embedded&amp;action=edit"
    width="1500" height="1000" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
</br>

</div>

</body>
</html>
```

Story html

```
<!D
OCT
YPE
htm
l>
        <html lang="en">
        <head>
          <title>Data  Analytics</title>
          <meta charset="utf-8">
          <meta  name="viewport"  content="width=device-width,  initial-scale=1">
          <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
          <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.6.0/jquery.min.js"></script>
          <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></script>
        </head>
        <body>

        <nav class="navbar navbar-inverse ">
          <div class="container-fluid">
            <div class="navbar-header">
              <a class="navbar-brand" href="#">Analytics for Hospitals' Health-Care Data</a>
            </div>
            <ul class="nav navbar-nav">
              <li><a  href="index.html">Home</a></li>
              <li><a href="dashboard.html">Dashboard</a></li>
              <li><a href="report.html">Report</a></li>
              <li  class="active"><a  href="#">Story</a></li>
            </ul>
          </div>
        </nav>

        <div class="container">
          <iframe

        src="https://us1.ca.analytics.ibm.com/bi/?perspective=story&amp;pathRef=.my_folders%2Fstory%2FNew%2Bstory&amp;clo
        seWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;sceneI
        d=model0000184574031b2_00000002&amp;sceneTime=0"
            width="1500" height="1000" frameborder="0" gesture="media" allow="encrypted-media"
        allowfullscreen=""></iframe>
        </div>


        </body>
        </ht
```

14. CONCLUSION

- It also means describing how health plans, health care organizations, and clinicians should be accountable to patients and society and conversely.
- How individuals can take appropriate responsibility for their own health.
- Data analytics is the science of analyzing raw datasets in order to derive a conclusion regarding the information they hold.
- It enables us to discover patterns in the raw data and draw valuable information from them.