PROJECT REPORT

HOSPITAL HEALTH CARE DATA ANALYTICS

TECHNOLOGY DOMAIN:DATA ANALYTICS

TEAM ID: PNT2022TMID42544

BATCH : B1-1M3E

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1.INTRODUCTION

Data Analytics is the process of examining raw datasets to find trends, draw conclusions and identify the potential for improvement. Health care analytics uses current and historical data to gain insights, macro and micro, and support decision-making at both the patient and business level.

The use of health data analytics allows for improvements to patient care, faster and more accurate diagnoses, preventive measures, more personalized treatment and more informed decision-making. At the business level, it can lower costs, simplify internal operations and more.

1.1 PROJECT OVERVIEW

Healthcare data are the most voluminous and complex data out of all other forms of data available in the world.

While the health care management has various use case for using data science, patient length of stay in one critical parameter to observe and predict one wants to improve the efficiency of the health care management in a hospital.

2.LITERATURE SURVEY:

TITLE: Analysis of Research in Healthcare Data Analytics
AUTHOR: Mohammad Alkhatib's , Amir Hossein Ghapanchi's
YEAR:2016

ABSTRACT:

The main aim of this paper is to provide a deep analysis on the research field of healthcare data analytics. This paper is analyzing the previous studies and works in this research area, as well as highlighting and gaps. This study has used seven popular databases and selected most relevant papers, in order to conduct this paper. tools and techniques that have been used to improve healthcare .

2.1 PROBLEM STATEMENT:

Problem statement:1

Problem statement:2

Problem statement:4

Ptobelm statement:5

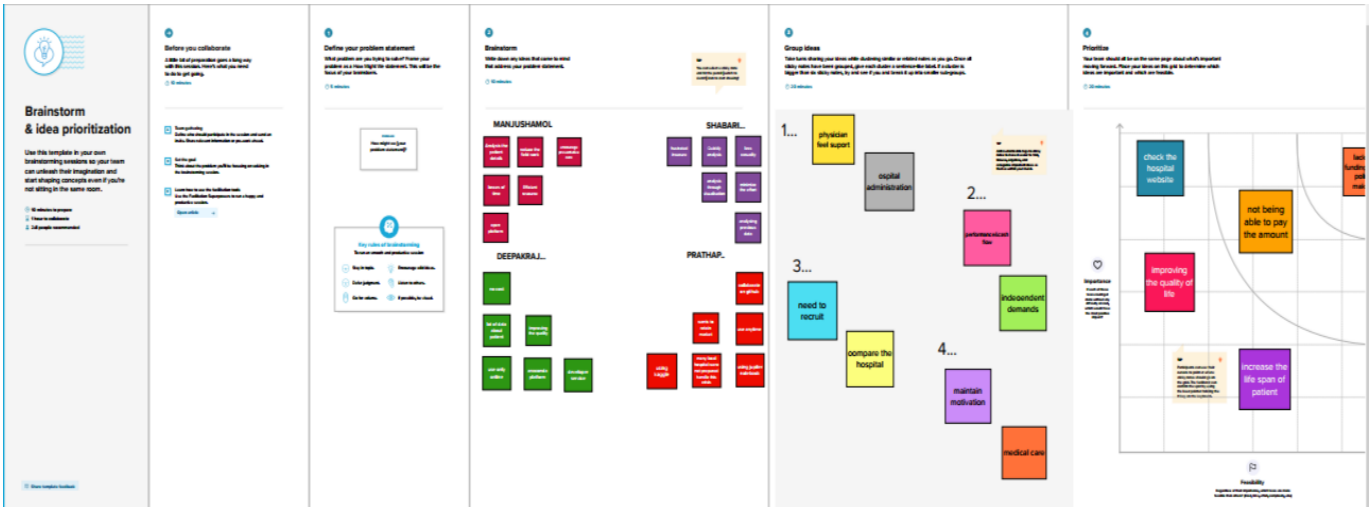
3.IDEATION:

a)Set the goal and time table to work and finish the project.

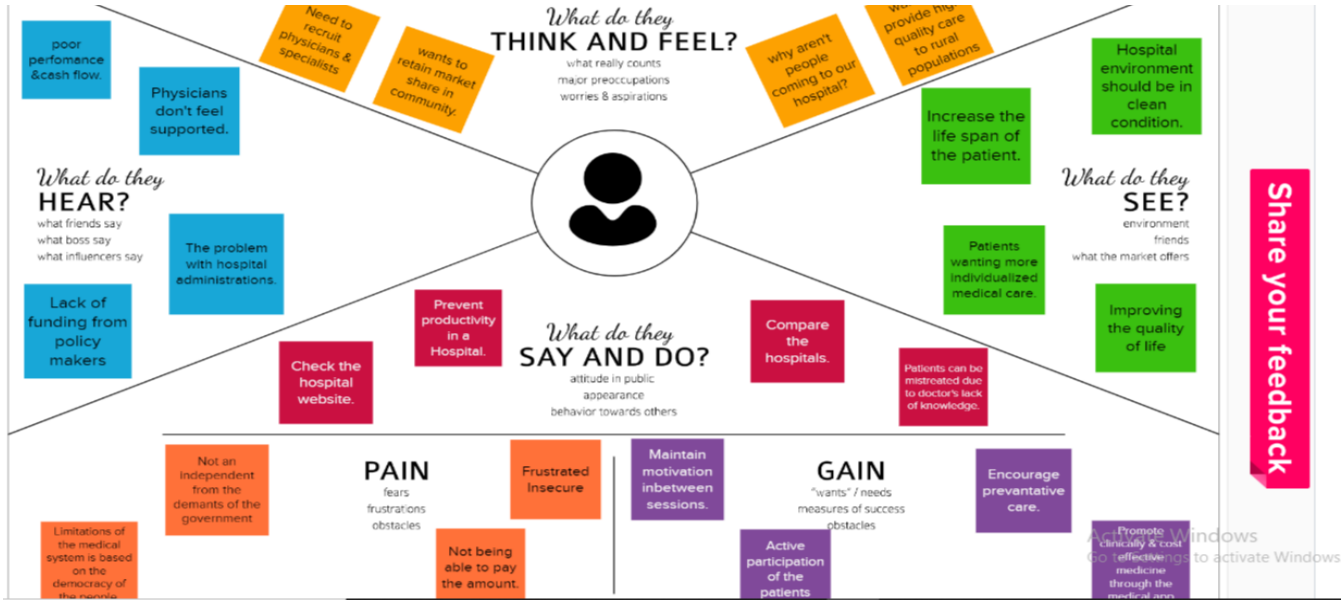
b)Everyone should listen to other ideas and finalize the solution

3.1 BRAINSTORM:

Gathering everyone in team and invite brainstorming session and collect everyone's opinion about the idea.



3.2 EMPATHY MAP:



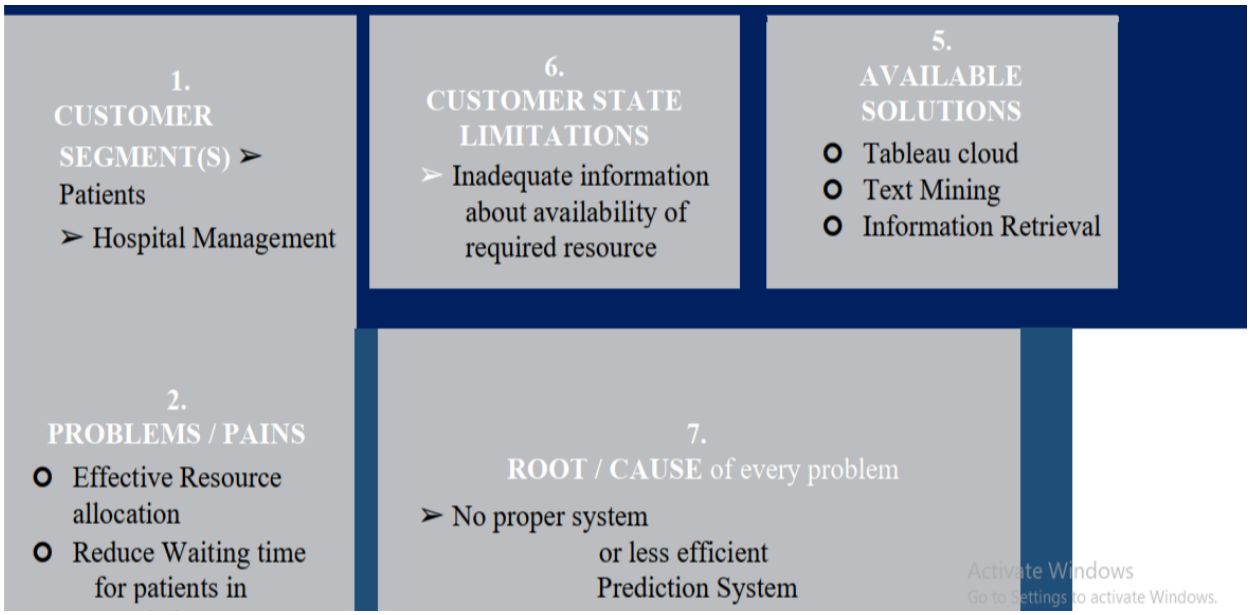
3.3 PROPOSED SOLUTION:

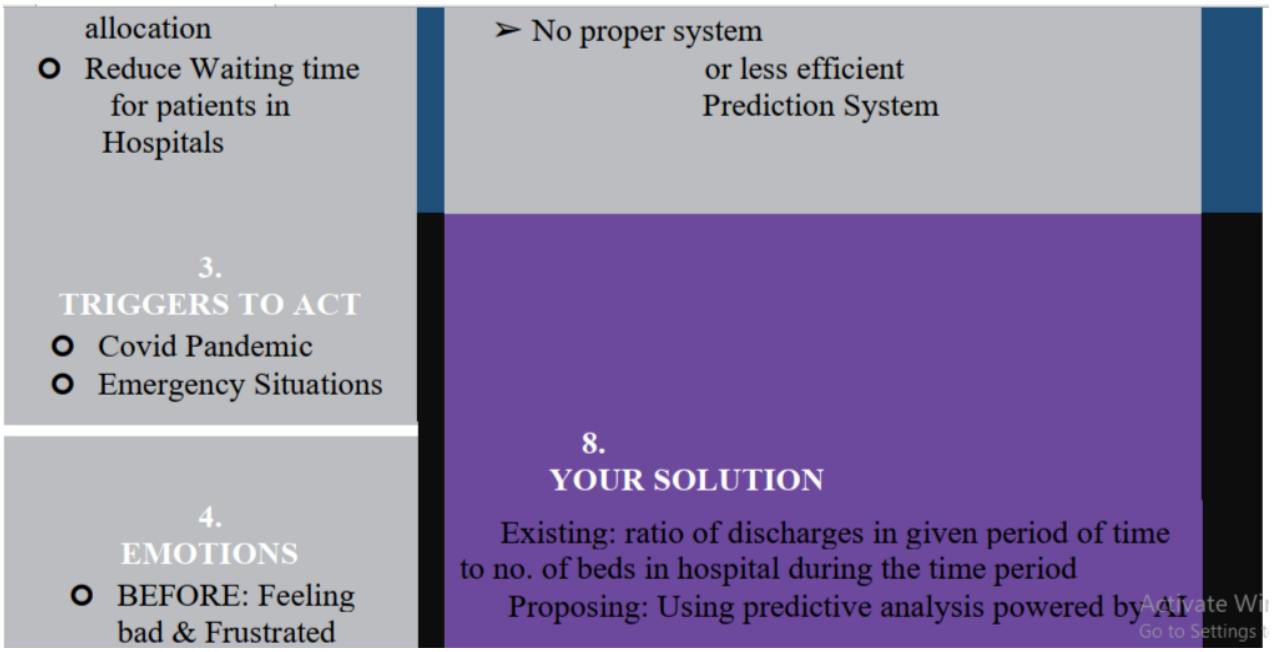
It is develop interactive web application to maintain the hospital database automation of hospital administration using the IBM cognos analytics tool, create interactive dashboard, story and report of the hospital data base

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To Predict the Length of the stay for each patient on case by case basis so that the hospital can use the information for optimal resource allocation and better functioning.
2.	Idea / Solution description	The solution is to collect data such as the beneficiary's history and ailments, beneficiary's drug, and allergy history, family history, and beneficiary's demographics and predict the length of the stay by analyzing the data and build a prediction model
3.	Novelty / Uniqueness	Healthcare data frequently resides in several locations. The Collected data should be stored in central system(like centralized storage). This data becomes accessible and usable when it
4.	Social Impact / Customer Satisfaction	The application has a Drug Information System which accounts for the drug history of the beneficiaries. The system provides up-to-date, accurate medication profiles for improved health planning, evaluation, and research. It also includes a comprehensive Drug Utilization Review (DUR) and flags potential interactions with a patient's medication profile.
5.	Business Model (Revenue Model)	While using this dashboard the hospitals can easily get regular updates on the patients and this was widely applicable in all departments of the hospitals. The Hospital staff can easily login into the dashboard and view the risk rate of the patients according to the length of stay in the

3.4 PROBLEM SOLUTION FIT:

The proposed solution is suitable for main goal of this project and also future scope for this project.





4.REQUIREMENT ANALYSIS:

Hospital database and understand the usage of the tools like IBM cognos for data analytics, visualization techniques to understand clearly about the dataset.

4.1FUNCTIONAL REQUIREMENT:

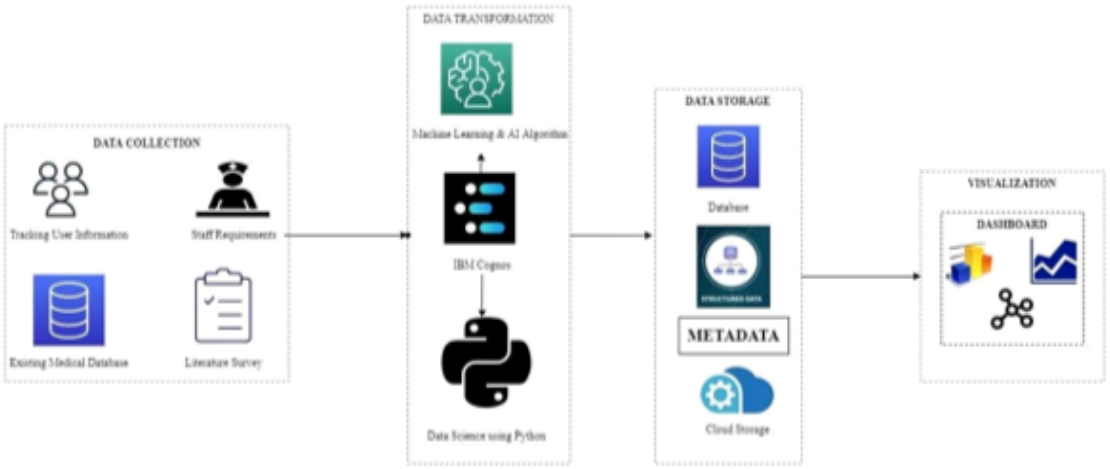
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form
FR-2	User Confirmation	Confirmation via OTP
FR-3	Database	Every patient has some necessary data like phone number, their first and last name, personal health number, postal code, country, 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.
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.

4.2 NON-FUNCTIONAL REQUIREMENTS:

Easy to access the tools given for data analytics and data visualization.

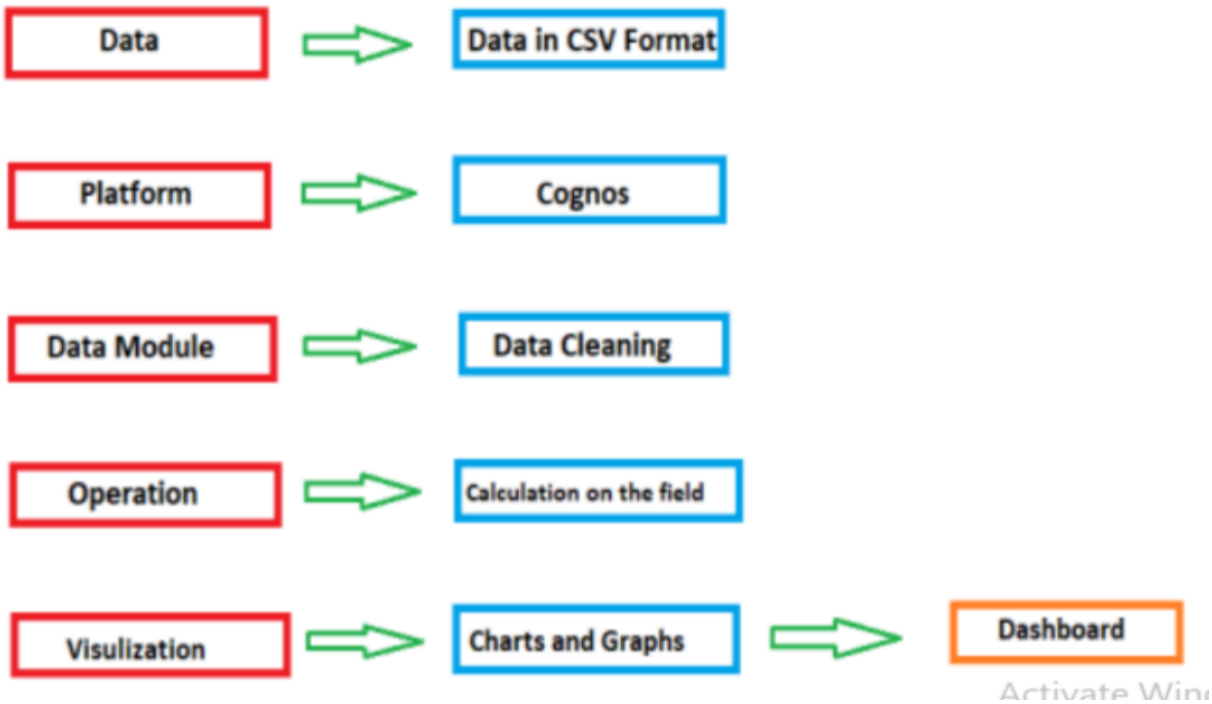
5.PROJECT DESIGN:

5.1 DATA FLOW DIAGRAM:



5.2 SOLUTION ARCHITECTURE:

The data set cleared loaded in the IBM cognos tool and then the data is explored and create a useful visualization to administrate the hospital is done.



6.PROJECT PLANNING:

●There are totally four sprint for planning and scheduling the work to the team members.
●Each sprint takes six days to complete the work.

6.1 SPRINT DELIVERY PLAN:

Sprint	Total Story Point	Duration	Sprint Start Date	Sprint End Date(Planned)	Story Point Completed(as on planned end data)	Sprint Release Date(Actual)
Sprint-1	20	4 Days	28 Oct 2022	31 Oct 2022	20	31Oct 2022
Sprint-2	20	6 Days	02 Nov 2022	07 Nov 2022	20	07 Nov 2022
Sprint-3	20	6 Days	08 Nov 2022	13 Nov 2022	20	13 Nov 2022
Sprint-4	20	8 Days	14 Nov 2022	21 Nov 2022	20	21 Nov 2022

7.CODING :

7.1 FEATUREAS-1:

```
@import
url('https://fonts.googleapis.com/css2?family=Poppins:wght@100;200;300
;400;500;600;700&display=swap');

:root{
   --green:#16a085;
   --black:rgb(65, 64, 64);
   --light-color:#464646;
   --box-shadow:.5rem .5rem 0 rgba(22, 160, 133, .2);
   --text-shadow:.4rem .4rem 0 rgba(0, 0, 0, .2);
   --border:.2rem solid var(--green);
```

```
}

*{
    font-family: 'Poppins', sans-serif;
    margin:0; padding: 0;
    box-sizing: border-box;
    outline: none; border: none;
    text-transform: capitalize;
    text-decoration: none;
}

html{
    font-size: 62.5%;
    overflow-x: hidden;
    scroll-padding-top: 7rem;
    scroll-behavior: smooth;
}

section{
    padding:2rem 9%;
}

section:nth-child(even){
    background: #f5f5f5;
}

.heading{
    text-align: center;
    padding-bottom: 2rem;
    text-shadow: var(--text-shadow);
    text-transform: uppercase;
    color:var(--black);
```

```
    font-size: 5rem;
    letter-spacing: .4rem;
}

.heading span{
    text-transform: uppercase;
    color:var(--green);
}

.btn{
    display: inline-block;
    margin-top: 3rem;
    padding: auto;
    padding-left: 1rem;
    border:var(--border);
    border-radius: 2rem;
    box-shadow: var(--box-shadow);
    margin-left: 22rem;
    color:var(--green);
    cursor: pointer;
    font-size: 1.7rem;
    background: #fff;
    margin-right: 5% ;

}

.btn span{
    padding:.7rem 1rem;
    border-radius: .5rem;
    background: var(--green);
    color:#fff;
    margin-left: .5rem;
```

```
}

.btn:hover{
   background: var(--green);
   color:#fff;
}

.btn:hover span{
   color: var(--green);
   background:#fff;
   margin-left: 1rem;
}



.header{
   padding:2rem 9%;
   position: fixed;
   top:0; left: 0; right: 0;
   z-index: 1000;
   box-shadow: 0 .5rem 1.5rem rgba(0, 0, 0, .1);
   display: flex;
   align-items: center;
   justify-content: space-between;
   background: #fff;
}

.header .logo{
   font-size: 2.5rem;
   color: var(--black);
}
```

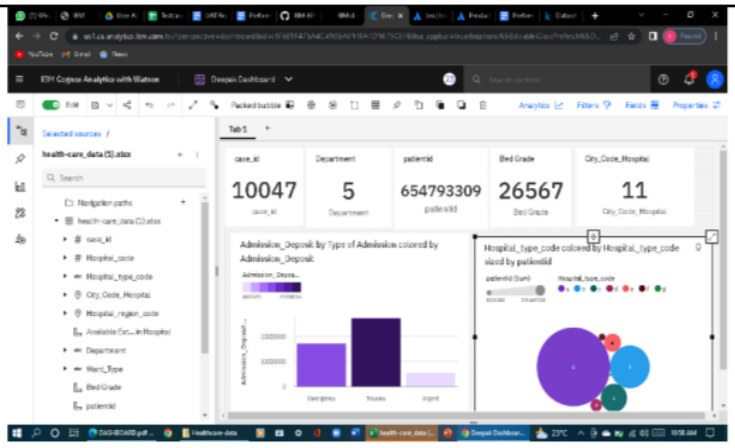
```
.header .logo i{
   color: var(--green);
}

.header .navbar a{
   font-size: 1.7rem;
   color: var(--light-color);
   margin-left: 2rem;
}

.header .navbar a:hover{
   color: var(--green);
}

#menu-btn{
   font-size: 2.5rem;
   border-radius: .5rem;
   background: #eee;
   color:var(--green);
   padding: 1rem 1.5rem;
   cursor: pointer;
   display: none;
}

.log{
   display: flex;
   align-items: center;
   flex-wrap: wrap;
   gap:1.5rem;
   padding-top: 10rem;
}
```

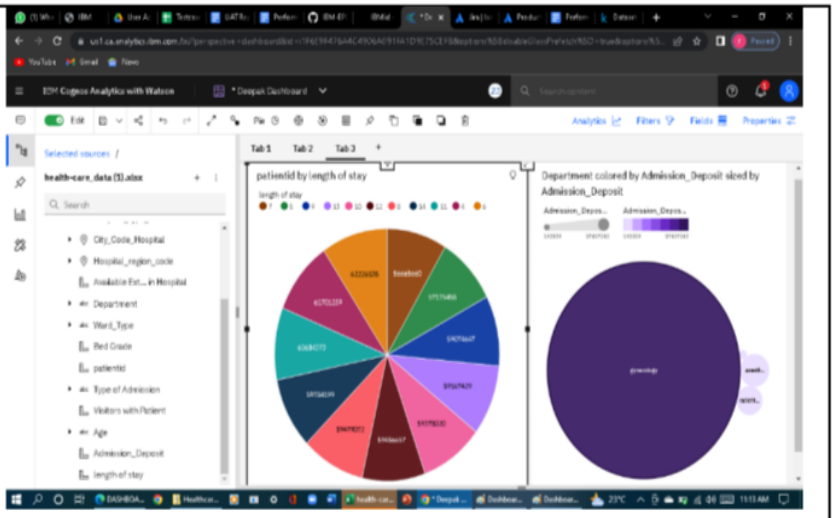
```
.log .image{
    flex:1 1 45rem;
}

.log .image img{
    width: 100%;
}

.log .content{
    flex:1 1 45rem;
}

.log .content h3{
    font-size: 4.5rem;
    color:var(--black);
    line-height: 1.8;
    text-shadow: var(--text-shadow);
}

.log .content p{
    font-size: 1.7rem;
    color:var(--light-color);
    line-height: 1.8;
    padding: 1rem 0;
}


form{
    width: 35rem;
    height: 45rem;
    display: flex;
    flex-direction: column;
```

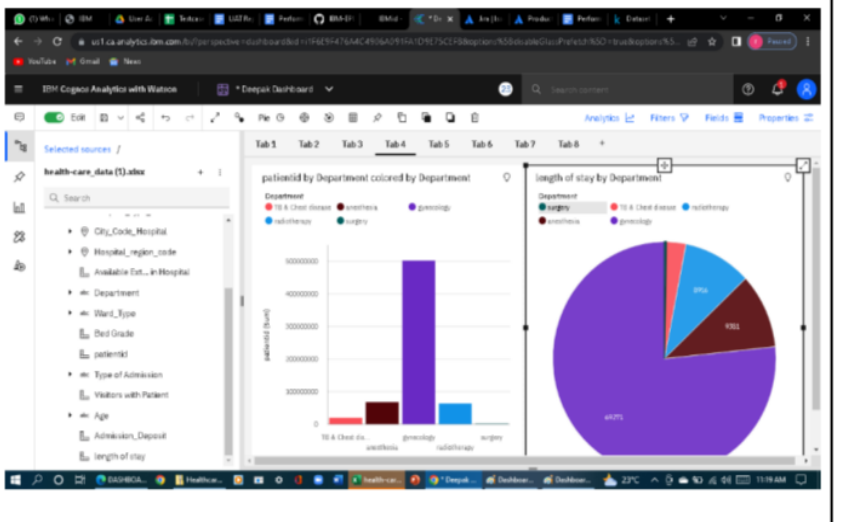
```
    background:#16a0843b;
    font-size: x-large;
    text-align: -123px;
    box-shadow: 0 25px 50px 0 rgba(22, 160, 132, 0.575);
    border-radius: 15px;
}

.Login{
    font-size: x-large;
    text-align: center;
    text-shadow: var(--text-shadow);
}

label{
    margin-left: 5%;
}

input{
    margin: 0.5% auto;
    width: 60%;
    border: black;
    outline: none;
    background: transparent;
    color: rgb(0, 0, 0);
    border-bottom: 1px solid rgb(0, 0, 0);
}
```

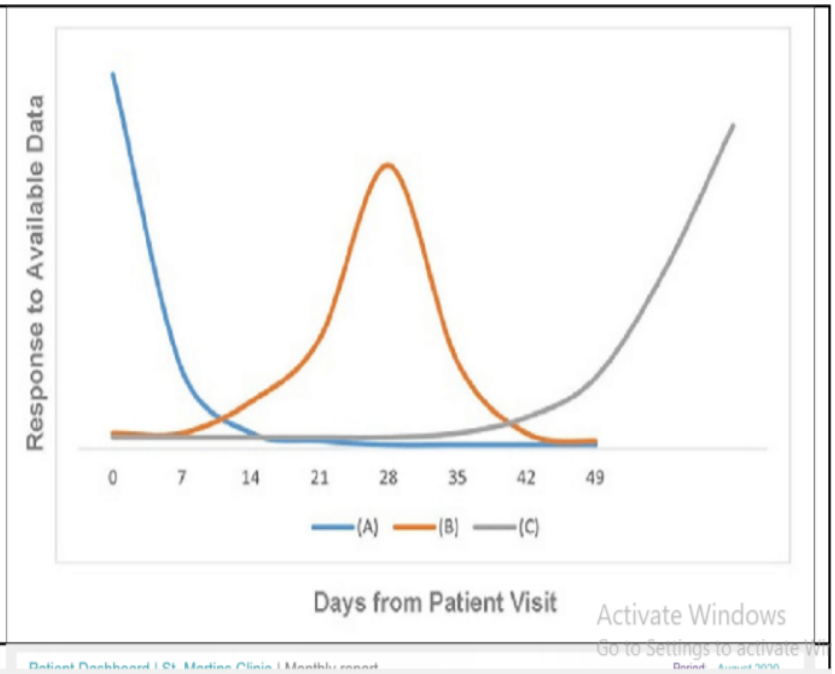
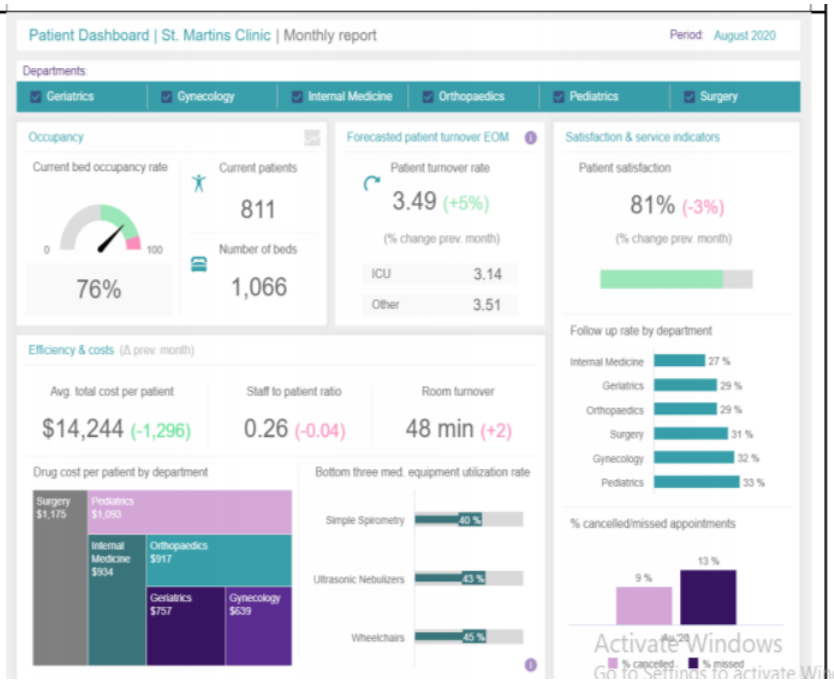
8.TESTING:

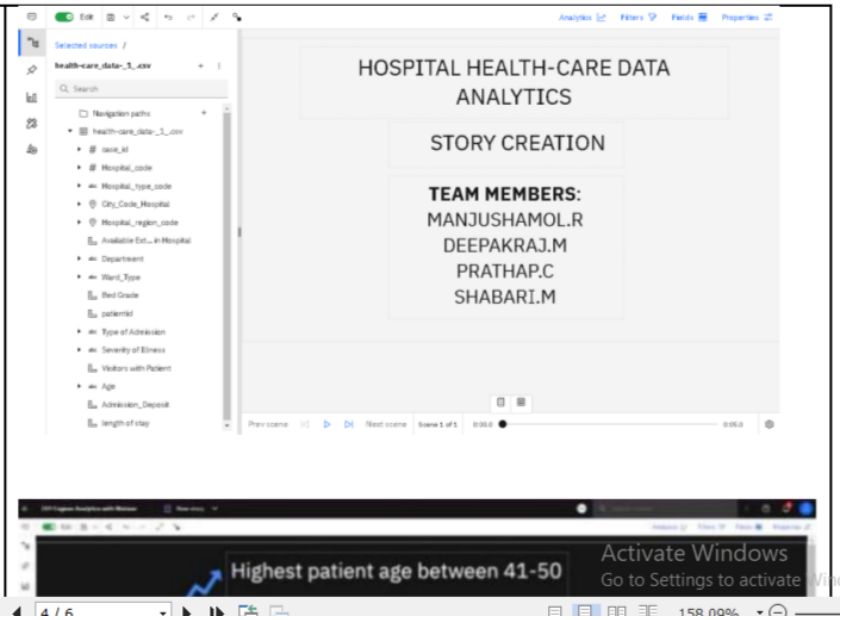
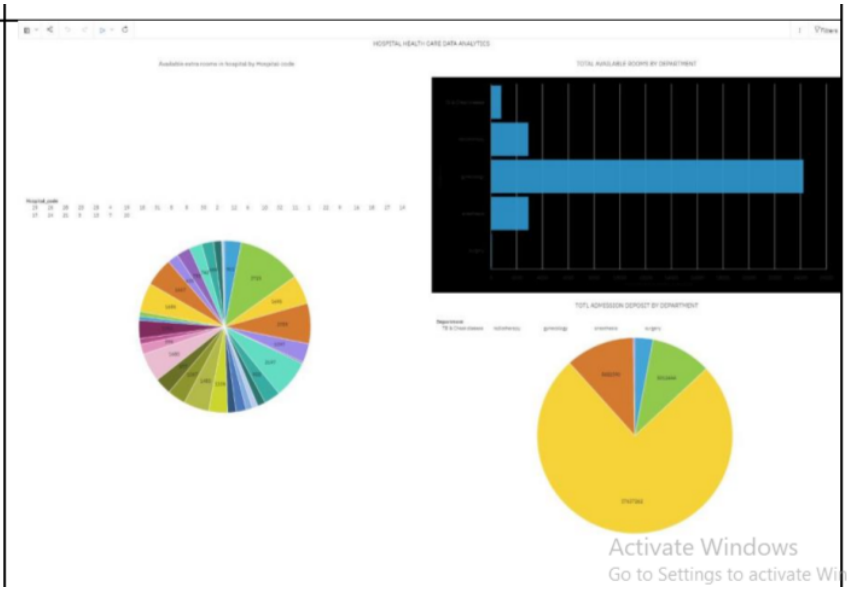
- Performance test, endurance test, scalability test, load test and efficiency test.
- All the test are done and increase its efficiency of web application.
- Thus we can predict the length of stay in the hospital.

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	


IBM Cognos Analytics with Watson
* Deepak Dashboard
Tab 1
Tab 2
Tab 3
patientid by length of stay
Department colored by Admission_Deposit sized by Admission_Deposit
health-care_data (1).xlsx
Activate Windows
Go to Settings to activate Windows


IBM Cognos Analytics with Watson
* Deepak Dashboard
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 7
Tab 8
patientid by Department colored by Department
length of stay by Department
health-care_data (1).xlsx
Activate Windows
Go to Settings to activate Windows

2.	Data Responsiveness	
3.	Amount Data to Rendered (DB2 Metrics)	

4.	Utilization of Data Filters	
5.	Story Creation	
6.	Report Designed	

9.CONCLUSION:

Thus expected is output is achieved using this web application and predicted the length of stay patients admitting in the hospital.

10.FUTURE SCOPE:

a) Easy to predict the length of stay of each patient admitted in the hospital.

b)We can visualize the data set and know availability of beds in the hospital accurately.

LINK:

https://github.com/IBM-EPBL/IBM-Project-4651-1658737048