PROJECT REPORT

ANAYTICS FOR HOSPITALS HEALTH -CARE DATA

- **TEAM ID : PNT2022TMID41073**
- **PROJECT NAME : ANAYTICS FOR HOSPITALS HEALTH -CARE DATA**
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• CHAPTER 01

01.INTRODUCTION

1. Introduction:

• This project deals with the analytics for hospital's health care data using data analytics. Data analytics (DA) is the process of examining data sets in order to find trends and draw conclusions about the information they contain. Increasingly, data analytics is done with the aid of specialized systems and software. Data analytics technologies and techniques are widely used in commercial industries to enable organizations to make more-informed business decisions.

The healthcare industry is multidimensional, with multiple data sources involving healthcare systems, health insurers, clinical researchers, social media, and government , generating different types and massive amounts of data. It is impossible to handle this big data with traditional software and hardware and the existing storage methods and tools. Data analytics is the process of the analysis of data to identify trends and patterns to gain valuable insights. The data generated in the health industry are characterized by the four Vs of big data, namely volume, velocity, variety, and veracity, which play crucial roles in health data analytics. Also, evidence-based decision making has gained importance, which involves the sharing of data among various data repositories.This is due to the increased importance of personalized medicine, the use of advanced technologies, the demand for new payment models, improvement and expansion of care delivery sites, and competition. Various research attempts, based on big data, have provided strong evidence that the efficiency of healthcare applications is dependent upon the basic architecture, techniques, and tools used. Statistical data and reports can be generated with the use of patient records, aiding in knowledge discovery, and thereby influencing value added services to the patients, improving healthcare quality, the making of timely decisions, and minimizing the costs

incurred. Hence, there is a need to incorporate and integrate big data analytics into existing healthcare systems. Despite healthcare analytics having massive potential for value-added change, there are many technological, social, organizational, economic, and policy barriers associated with its application.

1.1 Project Overview:

- Recent Covid-19 Pandemic has raised alarms over one of the most overlooked areas to focus on, which is absolutely Healthcare Data 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. The goal is to accurately predict the Length of Stay for each patient on a 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 tools that we are using for data analytics is Cognos Analytics from IBM.

1.2 PURPOSE:

- Data analytics in health care is vital. It helps health care organizations to evaluate and develop practitioners, detect anomalies in scans and predict outbreaks in illness, per the Harvard Business School. Data analytic s can also lower costs for health care organizations and boost business intelligence. Hospital data analytics can look over patient data and any prescribed medication to alert doctors and patients of incorrect dosages or wrong prescriptions, which lessens human error and the cost to your hospital. This in turn helps in gaining better insights and

also enables healthcare practitioners to make well-informed decisions.
This is the purpose of healthcare data analysis: using data-driven findings 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.

• CHAPTER 2

02. LITERATURE SURVEY

2.Literature Survey:

- 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 some of guidelines and gaps. This study has used seven popular databases and selected most relevant papers, in order to conduct this paper. The paper has listed some data analytics tools and techniques that have been used to improve healthcare performance in many areas such as: medical operations, reports, decision making, and prediction and prevention system. Moreover, the systematic review has showed an interesting demographic of fields of publication, research approaches, as well as outlined some of the possible reasons and issues associated with healthcare data analytics, based on geographical distribution theme[1].

- This part deals with the advanced analytical methods focused on healthcare. This includes the clinical prediction models, temporal data mining methods, and visual analytics. Integrating heterogeneous data such as clinical and genomic data is essential for improving the predictive power of the data that will also be discussed. Information retrieval techniques that can enhance the quality of biomedical search will be presented. Data privacy is an extremely important concern in healthcare. Privacy-preserving data publishing techniques will

therefore be presented.[2].

- One of the promises of the growing critical mass of clinical data accumulating in electronic health record (EHR) systems is secondary use (or re-use) of the data for other purposes, such as quality improvement and clinical research.1 The growth of such data has increased dramatically in recent years due to incentives for EHR adoption in the US funded by the Health Information Technology for Economic and Clinical Health (HITECH) Act.2-3 In the meantime, there has also seen substantial growth in other kinds of health-related data, most notably through efforts to sequence genomes and other biological structures and functions.4 The analysis of this data is usually called analytics (or data analytics). This chapter will define the terminology of this field, provide an overview of its promise, describe what work has been accomplished, and list the challenges and opportunities going forward[3].

- Clinicians, healthcare providers-suppliers, policy makers and patients are experiencing exciting opportunities in light of new information deriving from the analysis of big data sets, a capability that has emerged in the last decades. Due to the rapid increase of publications in the healthcare industry, we have conducted a structured review regarding healthcare big data analytics. With reference to the resource-based view theory we focus on how big data resources are utilised to create organization values/capabilities, and through content analysis of the selected publications we discuss: the classification of big data types related to healthcare, the associate analysis techniques, the created value for stakeholders, the platforms and tools for handling big health data and future aspects in the field. We present a number of pragmatic examples to show how the advances in healthcare were made possible. We believe that the findings of this review are stimulating and provide valuable information to practitioners, policy makers and researchers while presenting them with certain paths for future research[4].

- In this modern techno-world, the term data is unavoidable and certainly, nothing

possible without its usage. The trends about how to analyse the data are the need of the hour. Data analytics is becoming a future escalating tool of all industries including medicine, robotics, etc. This article briefly explains how data analytics is used in healthcare systems. Health care is the process of maintaining and improving the health of an individual by preventing, diagnosing and treating the diseases, illness and other physical and mental imbalances in people. Data analytics is classified into four types and they are descriptive, diagnostic, predictive and prescriptive analysis. Health care makes use of prescriptive analysis to arrive at the best results and make better decisions. Big data plays a major role in data analytics. It helps the data analysts to collect data from thepatients and store them efficiently. After the completion of this whole article, the reader will be able to get the collective idea about health care analytics.[5

2.1 EXISTING PROBLEM :

- The already existing model is trained with minimal parameters
- Low accuracy in prediction
- No feature extraction done
- High complexity

2.2 REFERENCES :

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[4]. Panagiota Galetsia , Korina Katsaliakia , Sameer Kumarb,∗ a School of Economics, Business Administration & Legal Studies, International Hellenic University, 14th km Thessaloniki-N. Moudania, Thessaloniki, 57001, Greece b Opus College of Business, University of St. Thomas Minneapolis Campus, 1000 LaSalle Avenue, Schulze Hall 435, Minneapolis, MN 55403, USA
[5]. from"n book: Innovative Data Communication Technologies and Application (pp.83-96)" P. Nagaraj-Professor (Assistant) at Kalasalingam University

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[14]. J. King, V. Patel, and M. F. Furukawa, “Physician adoption of electronic health record technology to meet meaningful use objectives: 2009–2012,” The Office of the National Coordinator for Health Information Technology, Tech. Rep., Dec. 2012.

[15]. V. Mayer-Schönberger and K. Cukier, Big Data: A Revolution That Will Transform How We Live, Work, and Think. Eamon Dolan, 2014.
[16]. J. Rapoport, D. Teres, Y. Zhao, S. Lemeshow Length of stay data as a guide to hospital economic performance for icu patients Med Care, 41 (3) (2003), pp. 386-397

2.3 Problem Statement Definition:

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

- he aim 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.

• CHAPTER 3

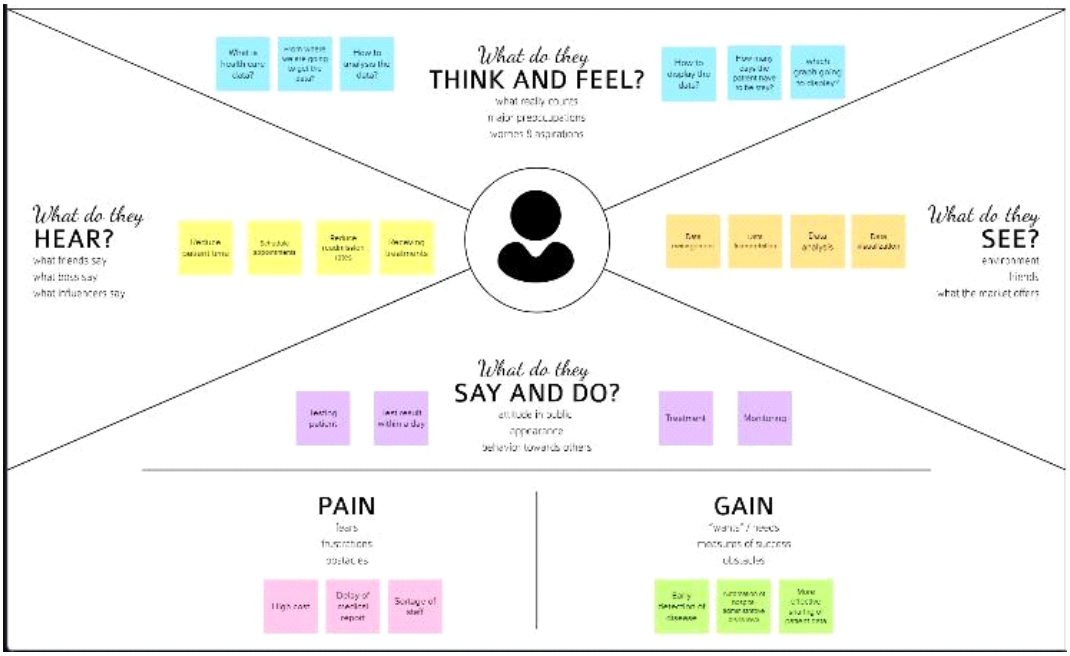
03.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CAMPUS:

- An empathy map is a tool which aids in understanding another person's perspective.

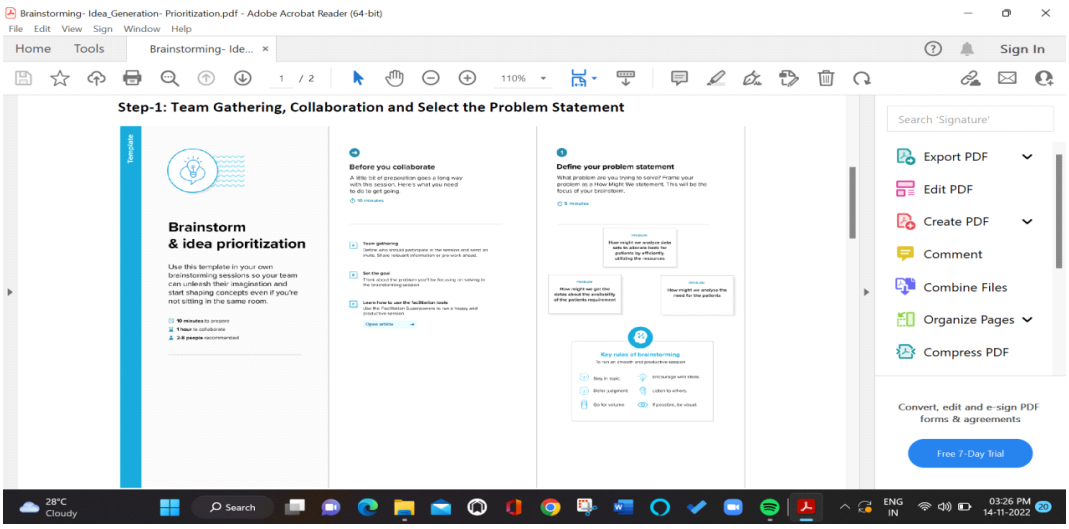
- Empathy maps have up until now not been used in a medical education setting.

- **Objective:** To assess the attitudes towards, applicability and usefulness ofempathy maps as part of medicalstudent's communication skills training

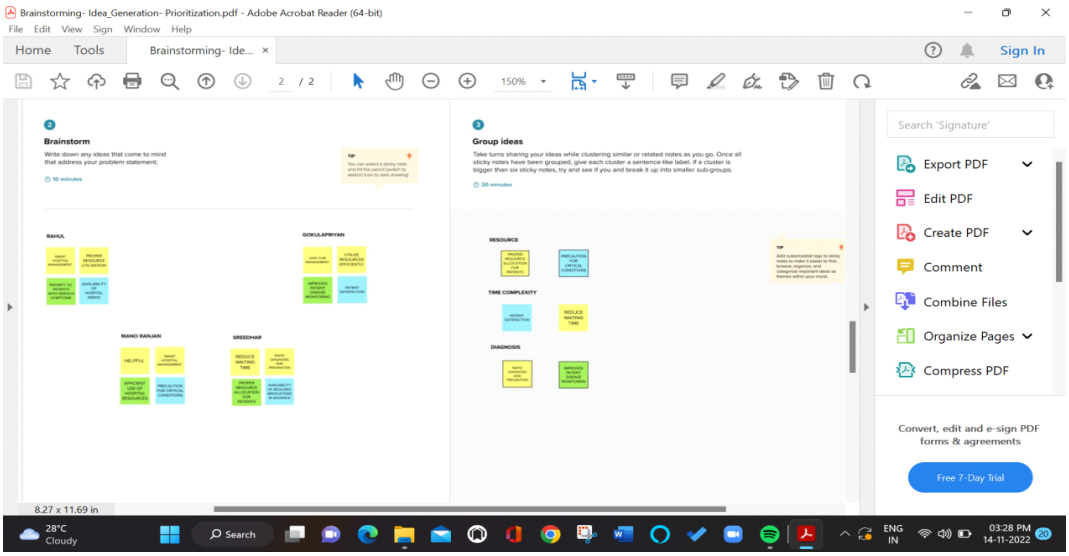


3.2 Ideation & Brainstorming:

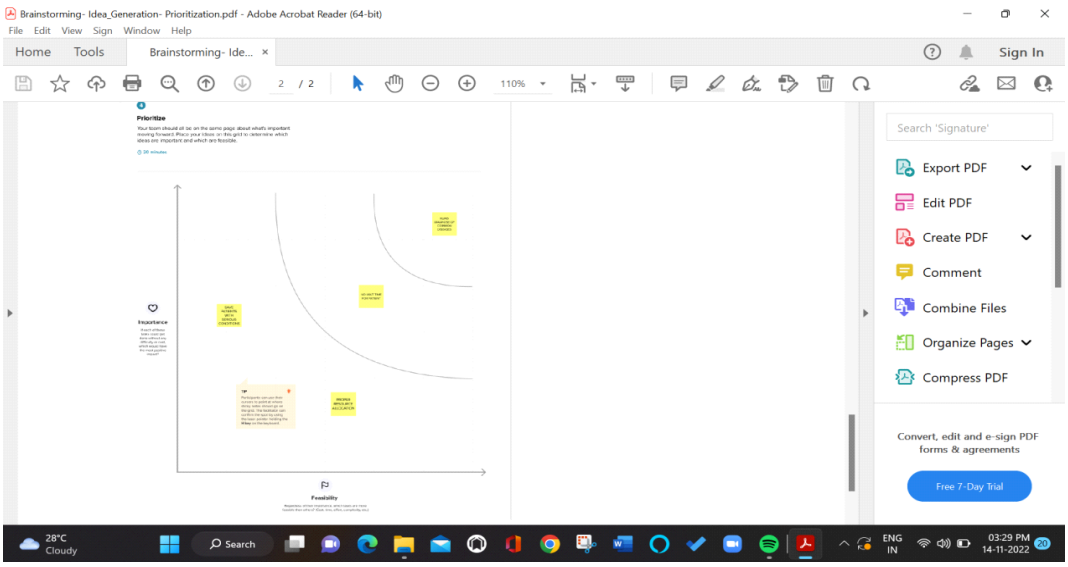
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



3.3 Proposed Solution :

- Predictive analytics can create patient journey dashboards and disease trajectories that helps us to know about the patient's period of stay. It improves effective allocation of beds and other resources, treatment delivery, improves efficiencies, and so on. Healthcare data frequently resides in several locations. The Collected data should be stored in a central system(like centralized storage). This data becomes accessible and usable when it is combined into a single, central system, such as an enterprise data warehouse (EDW). Uniqueness of this project is that it is able to use data for different things such as which medicine is more effective and for understanding behavioural pattern of particular disease.With the gathered data, redirecting the patients to particular hospital based on the vacancy, leading retailers used methods like market-basket analysis to discover insights about consumer purchase behavior and used these insights to optimize the physical store experience, target relevant ads and streamline the supply chain, among other strategic initiatives. A variety of institutions must store, evaluate, and take action on the massive amounts of data being produced by the health care sector as it expands

quickly. India is a vast, culturally varied nation with a sizable population that is increasingly able to access centralized healthcare services.

3.4 Problem Solution fit:

1. CUSTOMER SEGMENTS

❖ Patients

❖ Hospital Management

2. PROBLEMS:

❖ Effective resource allocation

❖ Reduce waiting time for patients in hospital

1. TRIGGERS TO ACT:

❖ Covid pandemic

❖ Emergency situations

4. EMOTIONS :

❖ BEFORE: feeling bad & frustrated

❖ AFTER: feeling better & relaxed

5. AVAILABLE SOLUTIONS:

❖ Tableau cloud

❖ Text mining

❖ Information retrieval

6. CUSTOMER STATE LIMITATIONS:

❖ Inadequate information about availability of required resources

7. BEHAVIOR :

❖ Tracking the information with available technologies

8. CHANNELS OF BEHAVIOR:

❖ ONLINE: use of data from all region (data exploration)

❖ OFFLINE: use of data collected from nearby facilities

9. CAUSE OF EVERY PROBLEM:

❖ No proper system or less effective prediction system

10. SOLUTION :

❖ EXISTING: ratio of discharges in given period of time to no of beds in

hospital during the time period

❖ PROPOSED: using predictive analysis powered by AI

• CHAPTER 4

04. REQUIREMENT ANALYSIS

4. REQUIREMENT ANALYSIS:

- This part of this document contains the functional and the non-functional requirements of this project.

4.1 Functional requirement:

- Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail.
FR-2	User Confirmation	Confirmation via Email Confirmation via Message
FR-3	Interoperability	Dashboard helps to share the patient's information interoperable to the hospitals in timely manner.
FR-4	Accuracy	Dashboard helps predict the patient's Health risks accurately based on LOS (Length of Stay).
FR-5	Compliance	The compliance of a dashboard is like to use very interactively in real time by the hospitals.
FR-6	Concise	These dashboards are clear, intuitive, and customizable and interactive in manner.

4.2 Non-Functional requirements:

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

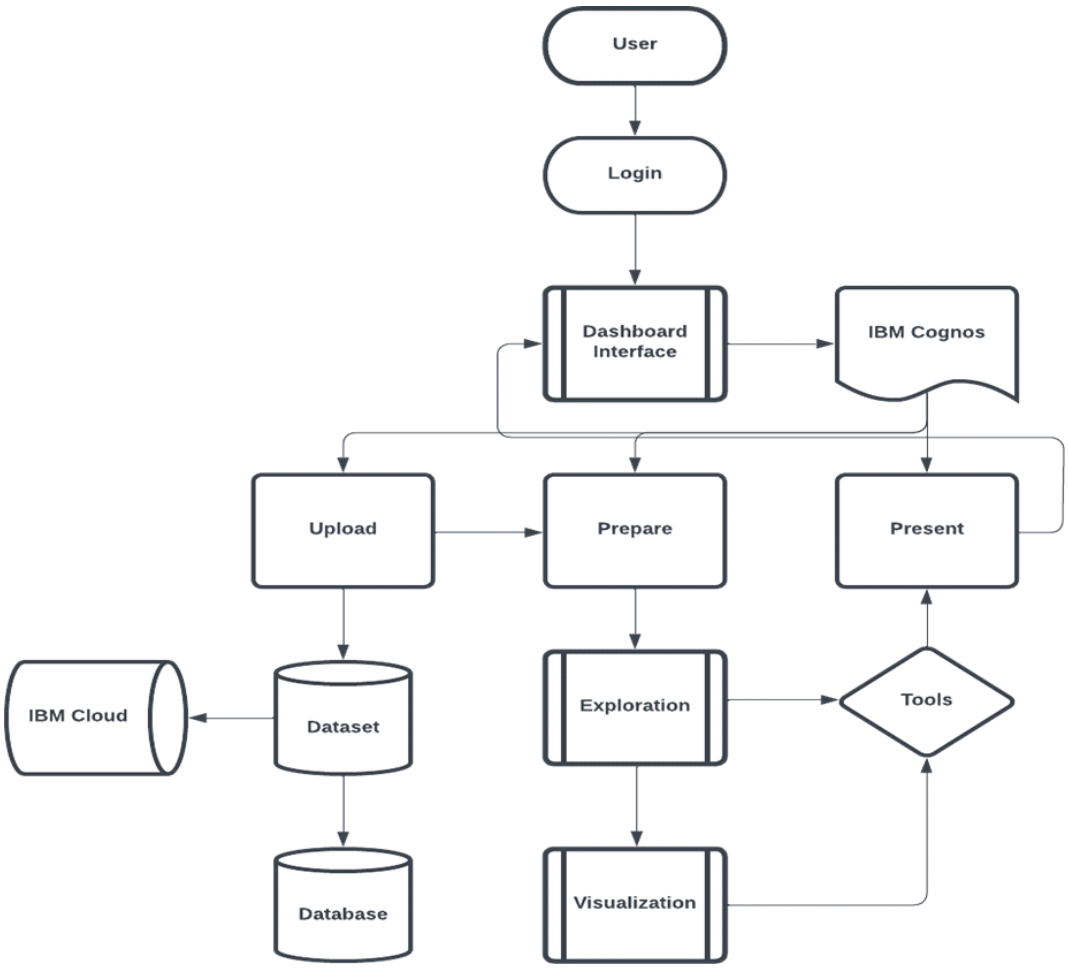
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	This Dashboards are designed to offer a comprehensive overview of patient's LOS, and do sothrough the use of data visualization tools like chartsand graphs.
NFR-2	**Security**	The Dashboard helps to indicate the current threat level to the Hospitals; an indication of events and incidents that have occurred; a record of authentication errors; unauthorized access
NFR-3	**Reliability**	This dashboard will be consistent and reliable to the users and helps the user to use in effective, efficientand reliable manner.
NFR-4	**Performance**	This dashboard can scan the backend users and analyzing the frequency in which they visit the dashboard helps understand how useful and helpful the data displayed is for tasks.

- **CHAPTER 5**

05.PROJECT DESIGN

5.1 Data Flow Diagrams:

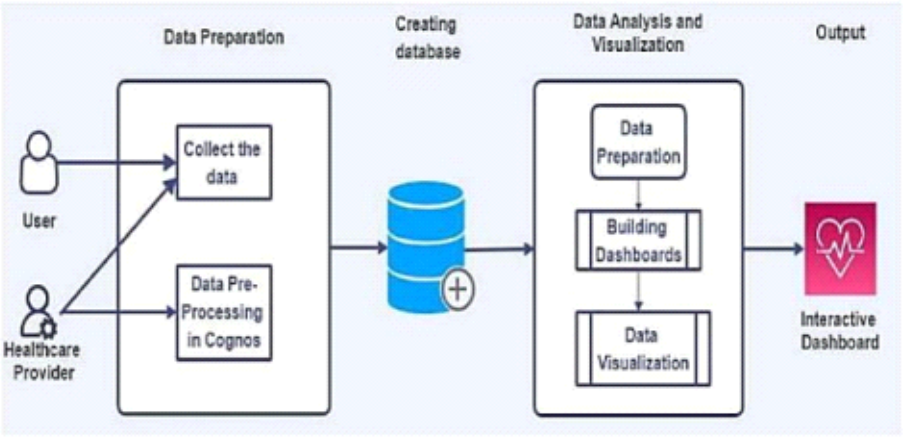
- A Data Flow Diagram (DFD) is a traditional visual representation of the information
- flows within a system. A neat and clear DFD can depict the right amount of the system
- requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



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 new application.



Components & Technology

S.NO	Components	Description	Technology
1	Dataset	Gathering dataset from Internet	Kaagle API
2	Data PrePocessing	Cleaning the gathered data	Cognos
3	Visualization	Visualize the data	Cognos Exploration
4	Dashboard	Create intractive Dashboard	Cognos Dashboard
5	Reports	Create intractive Report	Cognos Report
6	Story	Creating various Story	Cognos Story
7	Web Appliction	Creating embedded web application	Cognos ,Bootstrap,HTML
8	Database	Uploading data in DB2	IBM DB2

Application Characteristics

Cognos	It is a Plateform used to create ,display data in graphical format
DB2	It is a database used to store the data (MYSQL)

5.3 User Stories:

S.NO	Funnctional Requirements	User Story Number	Tasks	Acceptance Criteria	Priority	Release
1	Data Gathering	1	Gathering Data	Using API	High	Sprint1
2	Pre-processing	2	Cleaning the data in proper format	Cleaned Data	High	Sprint 1
3	Data Exploration	3	Explore the data	Display data in graph	High	Sprint1
4	Dashboard	4	Creating various chart	Intractive Dashboard	High	Sprint 2
5	Reports	5	Creating report for various field	Intractive Report	High	Sprint 3
6	Story	6	Creating Animation Using picture	Various animation and slides	High	Sprint 4
7	Web Application	7	Cognos Embeded Web	Intractive Web Application	High	Sprint 4

- **CHAPTER 6**

06.PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation:

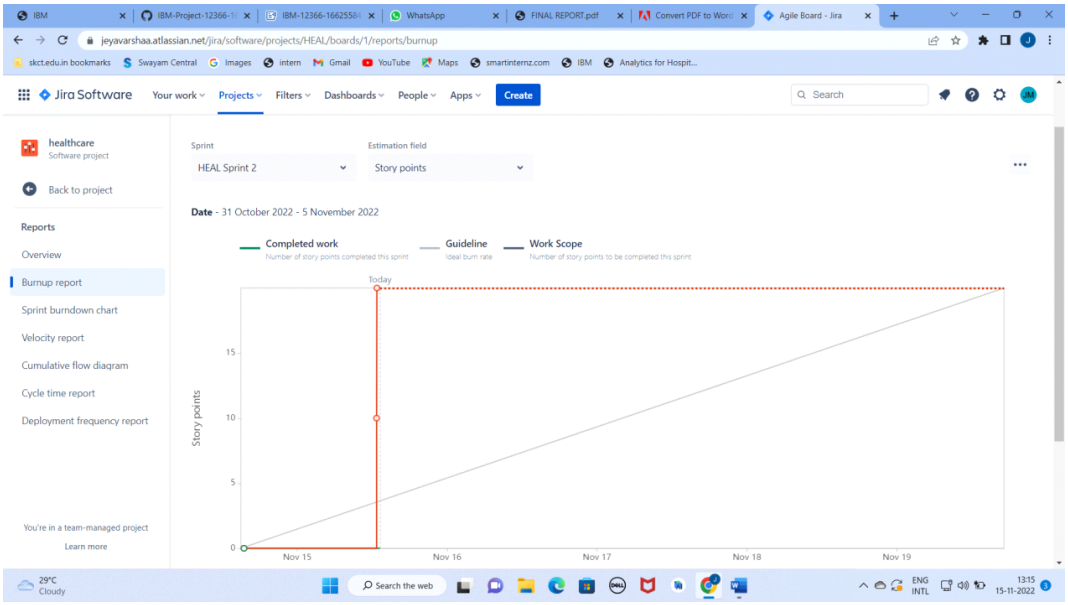
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-1	Registration	USN-1	As a health care provider I can create account in IBM cloud and the data arecollected.	20	High
Sprint-2	Analyze	USN-2	As a health care provider all the data that are collected is cleaned and uploaded in the database or IBM cloud.	20	Medium
Sprint-3	Dashboard	USN-3	As a health care provider I can use my account in my dashboard for uploading dataset.	10	Medium
Sprint-3	Visualization	USN-4	As a health care provider I can prepare data for Visualization.	10	High
Sprint-4	Visualization	USN-5	As a health care provider I canpresent data in my dashboard.	10	High

6.2 Sprint Delivery Schedule:

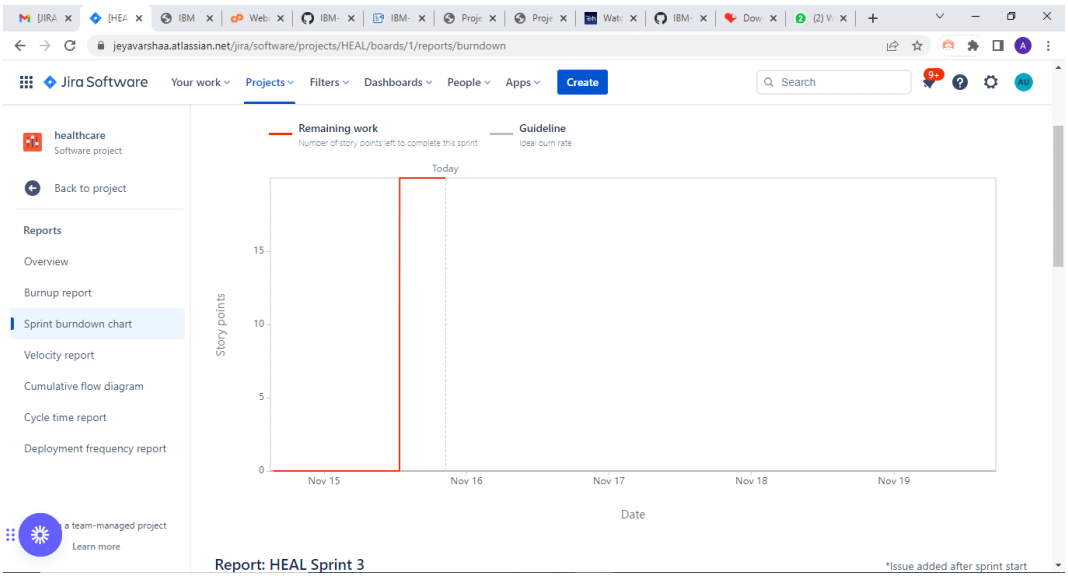
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date(Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022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

6.3 REPORTS FROM JIRA :

Burnup chart :



Burn down chart:



• CHAPTER 7

07.CODING & SOLUTIONING

7.1 Feature 1:

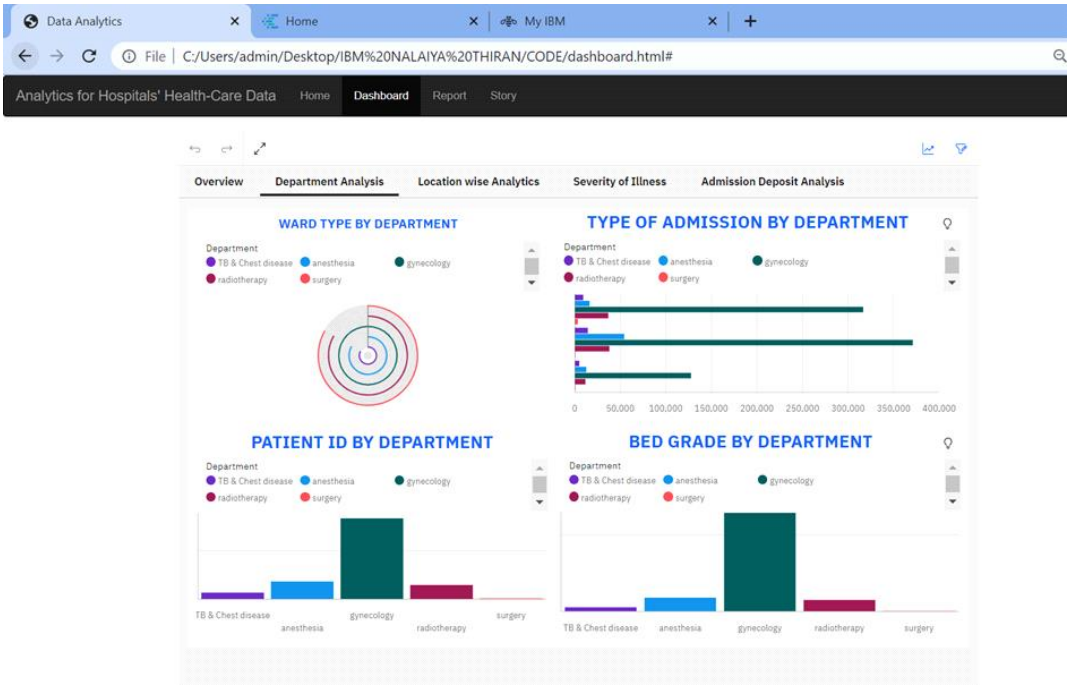
● Fetched the data from DB2 database.

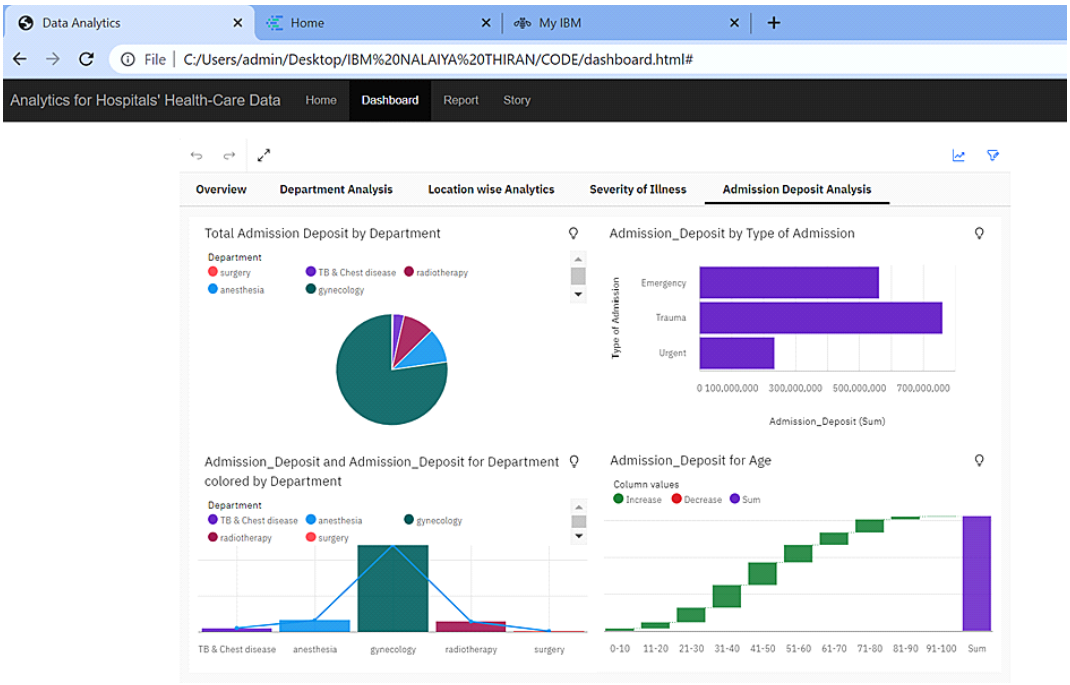
● Creating responsive dashboard.

● Inserting fifilter for each chart

● Creating report

● Created reports using multiple graphs and charts




Data Analytics
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Analytics for Hospitals' Health-Care Data
Home
Dashboard
Report
Story
Overview
Department Analysis
Location wise Analytics
Severity of Illness
Admission Deposit Analysis
Total Admission Deposit by Department
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surgery
TB & Chest disease
radiotherapy
anesthesia
gynecology
Admission_Deposit by Type of Admission
Type of Admission
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Trauma
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Admission_Deposit and Admission_Deposit for Department colored by Department
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radiotherapy
surgery
Admission_Deposit for Age
Column values
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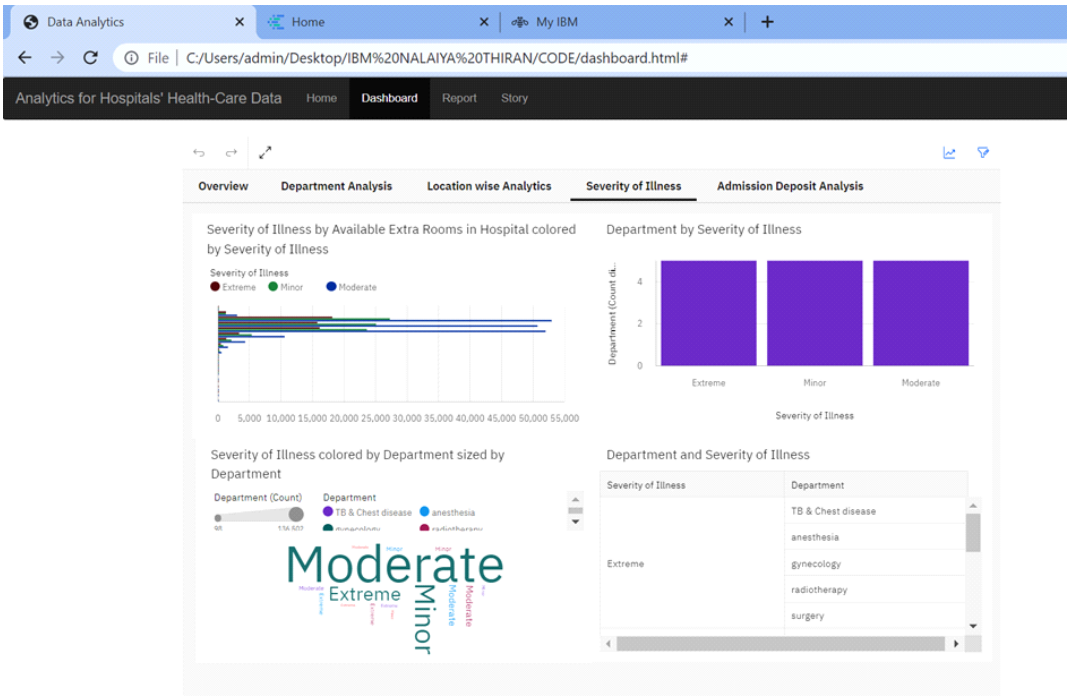
91-100
Sum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Analytics for Hospitals' Health-Care Data
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Report
Story
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Department Analysis
Location wise Analytics
Severity of Illness
Admission Deposit Analysis
Severity of Illness by Available Extra Rooms in Hospital colored by Severity of Illness
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Moderate
Severity of Illness
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anesthesia
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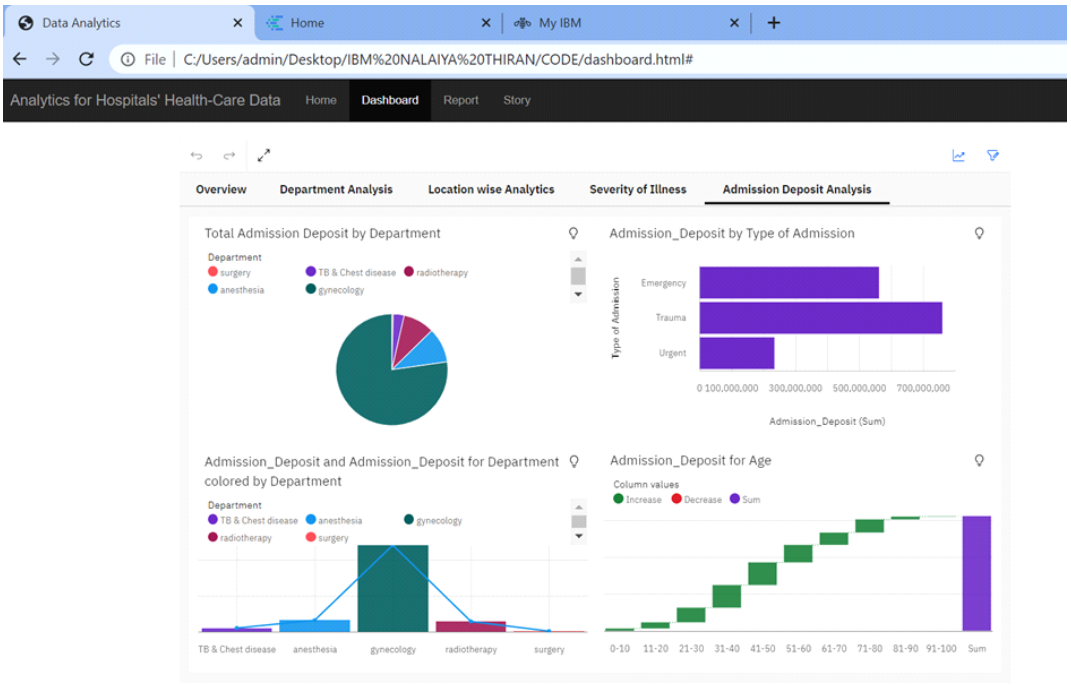
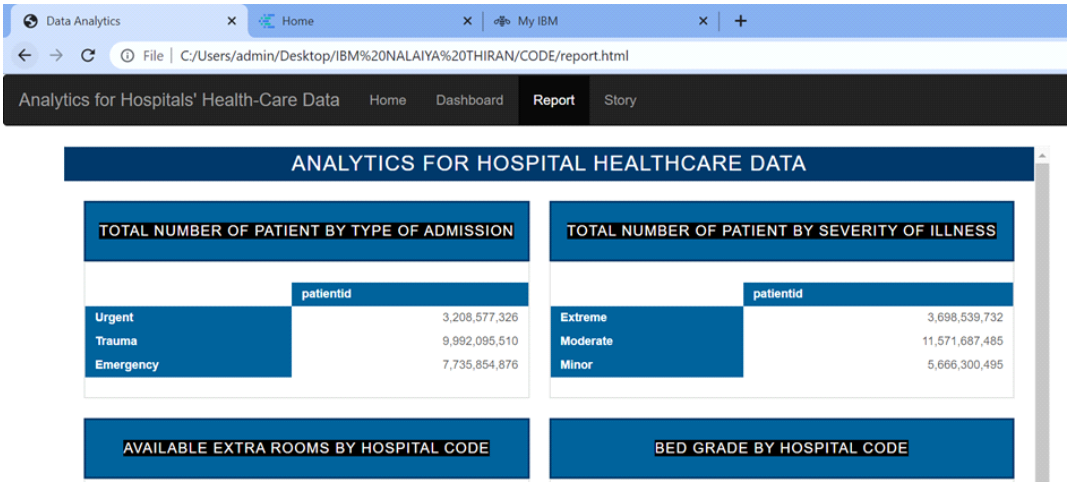
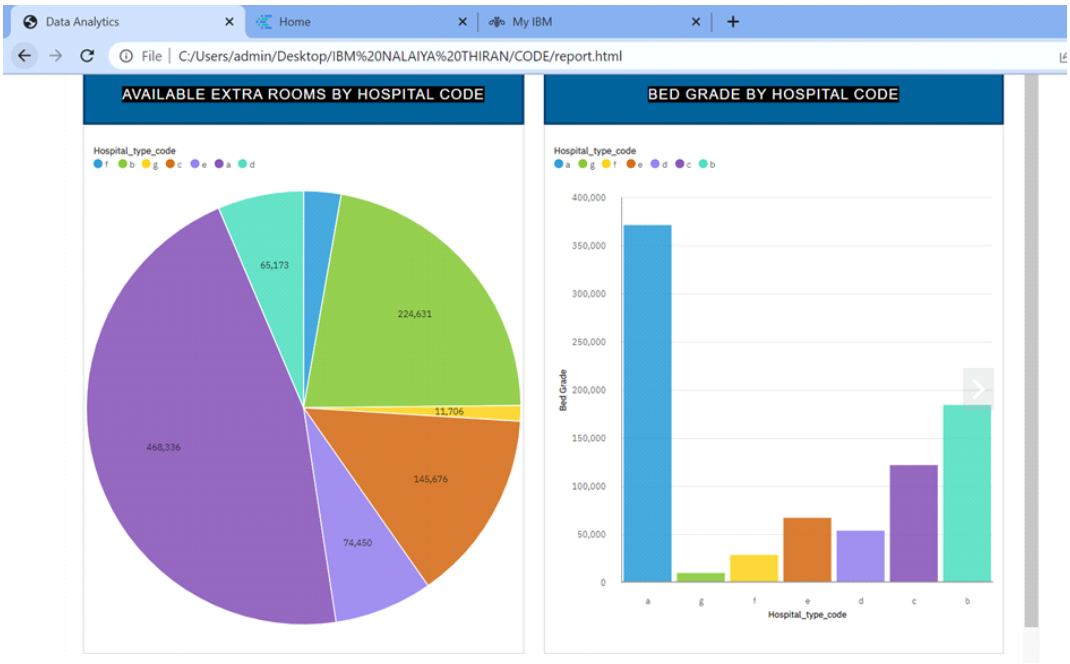
anesthesia
Extreme
gynecology
radiotherapy
surgery



7.1 Feature 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.

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BED GRADE BY HOSPITAL CODE
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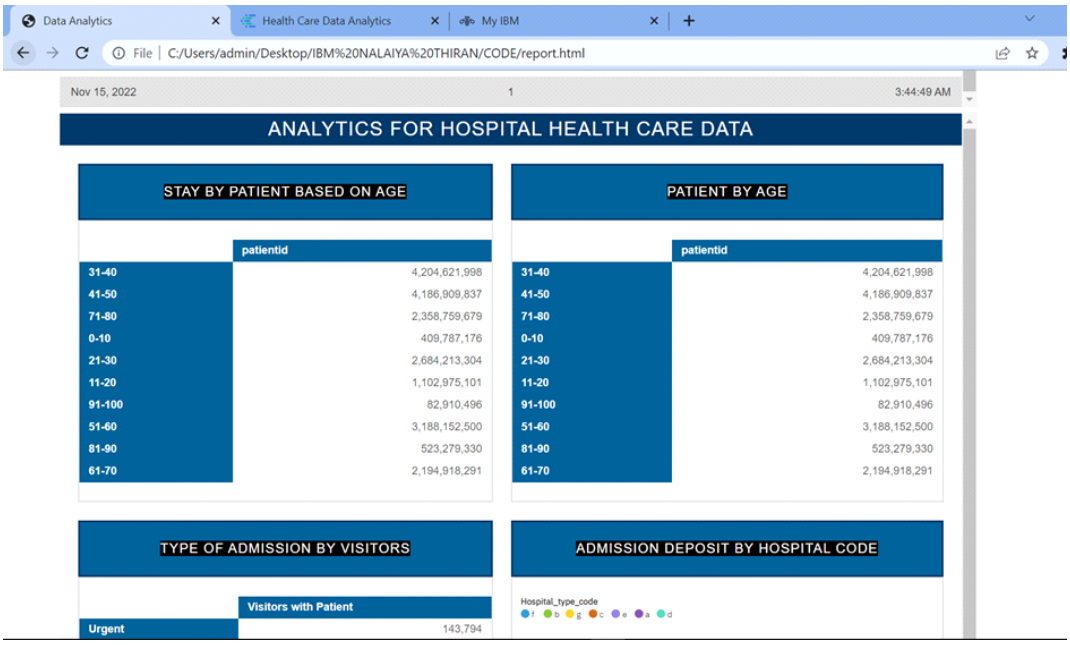
Data Analytics
Health Care Data Analytics
My IBM
File | C:/Users/admin/Desktop/IBM%20NALAIYA%20THIRAN/CODE/report.html
Nov 15, 2022
1
3:44:49 AM
ANALYTICS FOR HOSPITAL HEALTH CARE DATA
STAY BY PATIENT BASED ON AGE
patientid
31-40 4,204,621,998
41-50 4,186,909,837
71-80 2,358,759,679
0-10 409,787,176
21-30 2,684,213,304
11-20 1,102,975,101
91-100 82,910,496
51-60 3,188,152,500
81-90 523,279,330
61-70 2,194,918,291
PATIENT BY AGE
patientid
31-40 4,204,621,998
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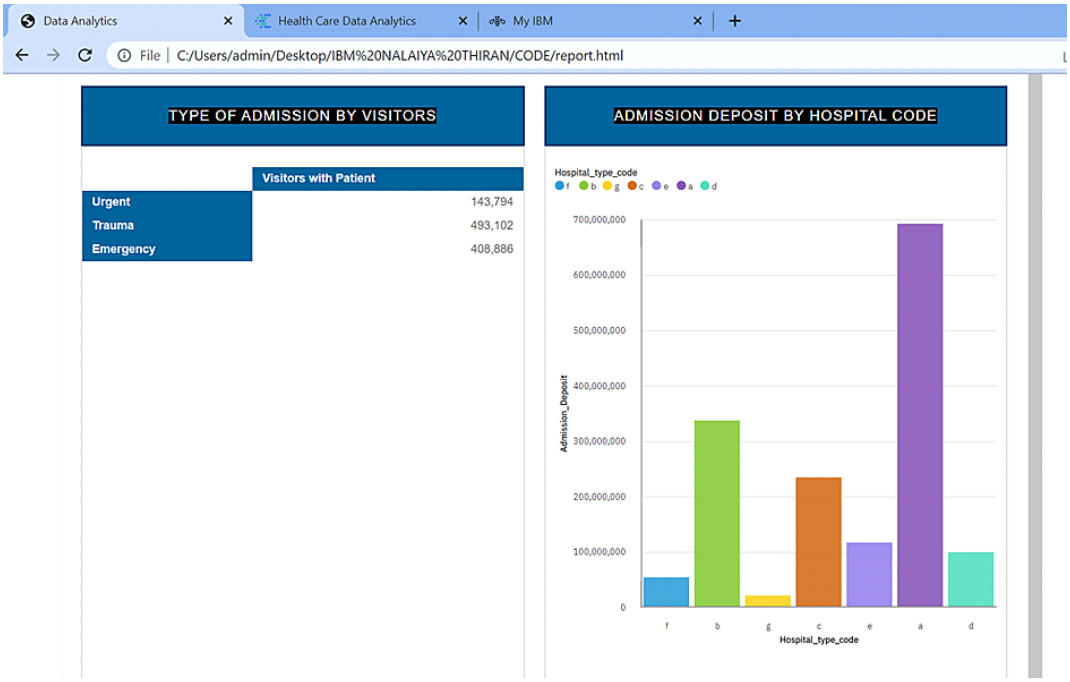
11-20 1,102,975,101
91-100 82,910,496
51-60 3,188,152,500
81-90 523,279,330
61-70 2,194,918,291
TYPE OF ADMISSION BY VISITORS
Visitors with Patient
Urgent 143,794
ADMISSION DEPOSIT BY HOSPITAL CODE
Hospital_type_code
f b g c e a d



7.3 Database 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

• CHAPTER 8

08.TESTING

8.1 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 story page

● verify filters are working

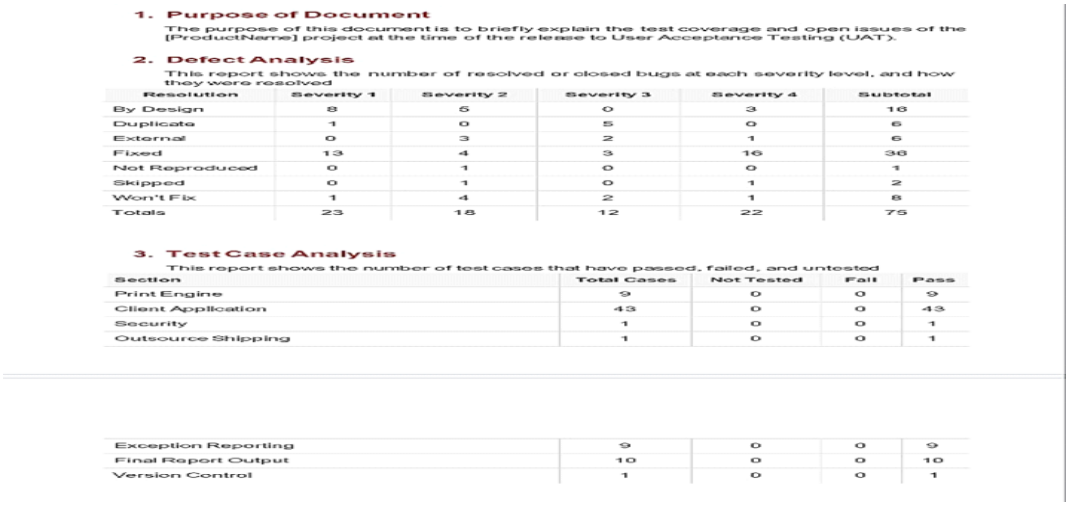
8.1 USER ACCEPTANCE TESTING:

1.Purpose of Document:

The purpose of this document is to briefly explain the test coverage and open issues of the (Product name) 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 resolve



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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

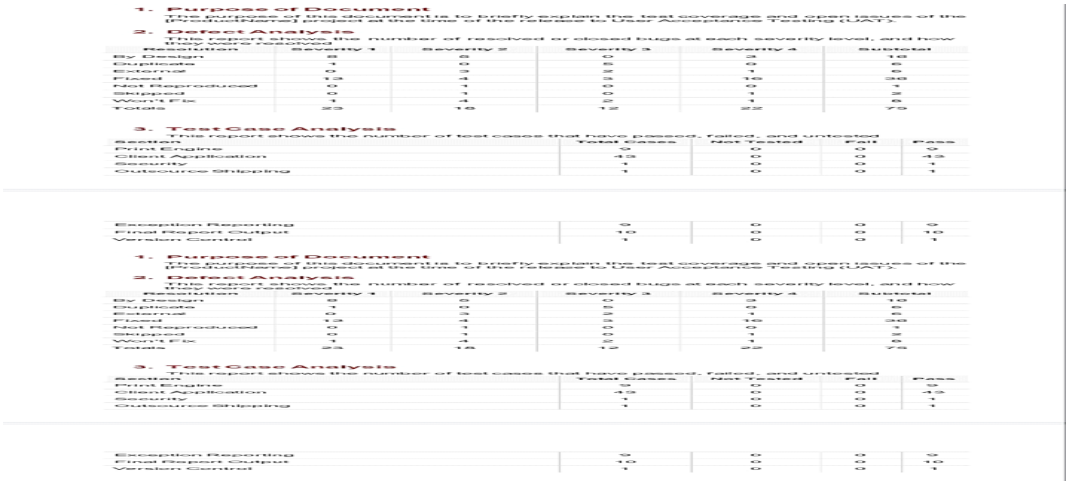
3. Test Case Analysis

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

3.Test case Analysis:

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



1. Purpose of Document
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Print Engine	0	0	0	0
Client Application	43	0	0	43
Security	1	0	0	1
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Exception Reporting	3	0	0	3
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Version Control	1	0	0	1

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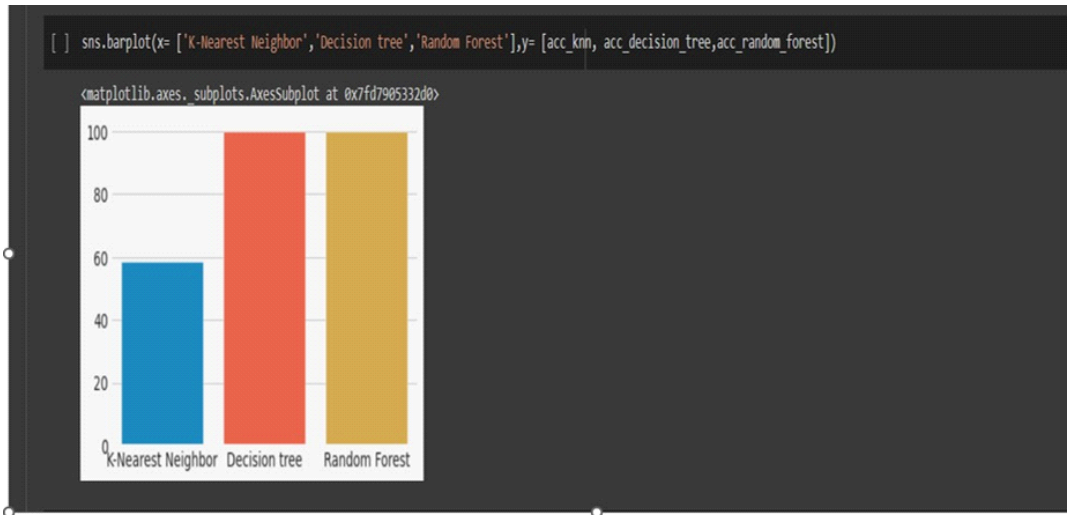
Version Control	1	0	0	1

- **CHAPTER 9**

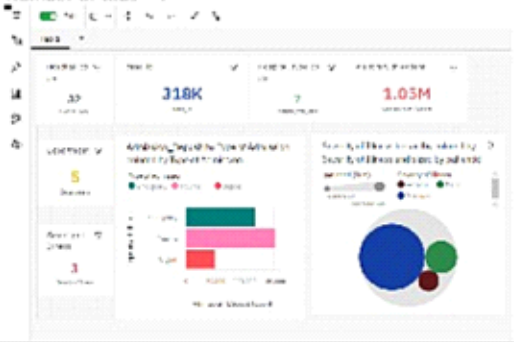
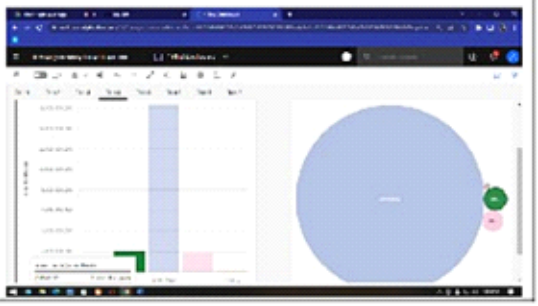
09.RESULTS

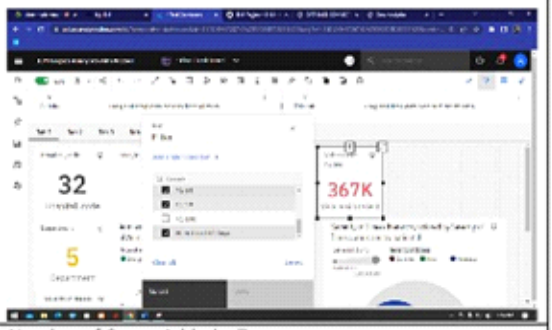
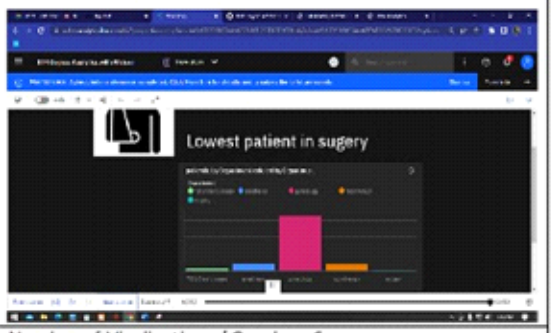
9.1 PERFORMANCE METRICS

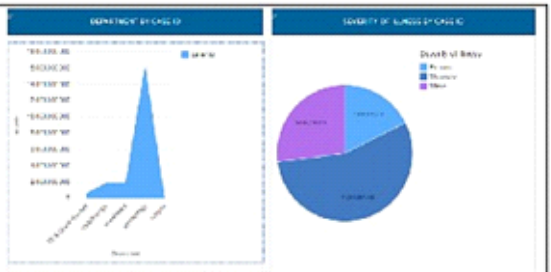


Model Performance Testing:

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

• CHAPTER 10

10. ADVANTAGES & DISADVANTAGES

• Advantages :

● Analyzing clinical data to improve medical research
● Using patient data to improve health outcomes
● Gaining operational insights from healthcare provider data
● Improved staffing through health business management analytic
● Research and prediction of disease.
● Automation of hospital administrative processes.
● Early detection of disease.
● Prevention of unnecessary doctor's visits.
● Discovery of new drugs.
● More accurate calculation of health insurance rates.
● More effective sharing of patient data.

• Disadvantages:

Replacing Medical Personnel:

Application of technology in every sphere of human life is improving the way things are done. These technologies are are also posing some threat to world of works. Robotics are replacing human labour.

Data Safety :

Data security is another challenge in applying big data in healthcare. Big data storage is usually targets of hackers. This endangers the safety of medical data. Healthcare organisations are very much concerned about the safety of patients' sensitive personal data. For this, all healthcare applications must meet the requirement for data security and be HIPAA compliant before they can be deployed for healthcare services.

Privacy :

One of the major drawbacks in the application of big data in healthcare industry is the issue of lack of privacy. Application of big data technologies involves monitoring of patient's data, tracking of medical inventory and assets, organizing collected data, and visualization of data on the dashboard and the reports. So visualization of sensitive medical data especially that of the patients creates negative impression of big data as it violets privacy

Man Power :

Applying big data solutions in healthcare requires special skills, and such kills are scarce. Handling of big data requires the combination of medical, technological and statistical knowledge.

• CHAPTER 11

11.CONCLUSION

• The impact of data analytic in healthcare has already made a substantial difference in the ability of healthcare providers to offer patients high-quality care in an efficient, cost-effective manner. However, the role of data analytic s in improving patient outcomes and healthcare processes continues to grow and expand as more types of data become available and new tools are developed that make the results of the analytic clear and easy for healthcare professionals to access.

Realizing the potential of data analytic to transform the healthcare industry begins by understanding how the technology can be applied to address healthcare providers' challenges, including staff recruitment and utilization, operational efficiencies, and enhanced patient experiences. Patient-centered healthcare depends on knowing what patients want and need. Data analytic holds the key to unlocking this vital information.

• CHAPTER 12

FUTURE SCOPE:

- **Improved Decision Making**: Data Analytic s eliminates guesswork and manual tasks.

Be it choosing the right content, planning marketing campaigns, or developing products.

Organizations can use the insights they gain from data analytic to make informed decisions. Thus, leading to better outcomes and customer satisfaction Data analytic to achieve business goals of pharmaceutical companies, payers,insurance companies, physicians, hospitals, medical equipment companies, sales reps,

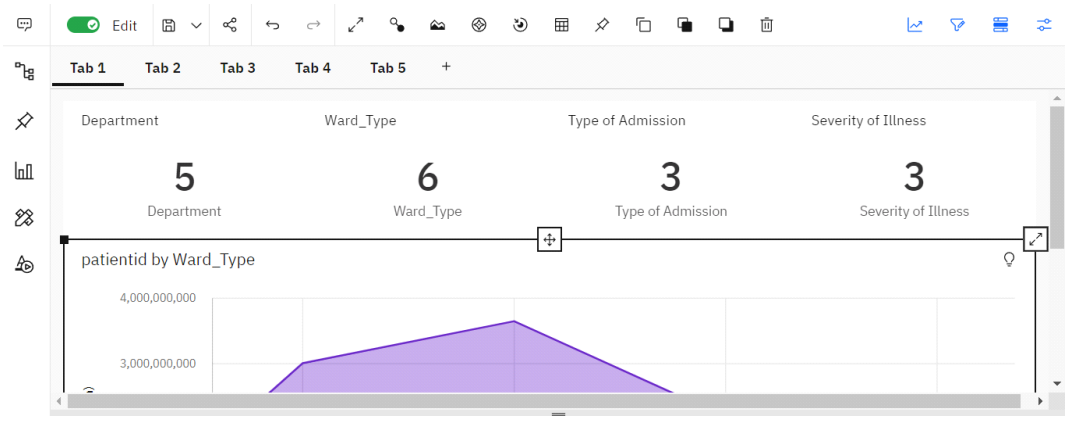
and other stakeholders in the healthcare business, need for this have only increased after the Affordable Act came into being.

- **CHAPTER 13**

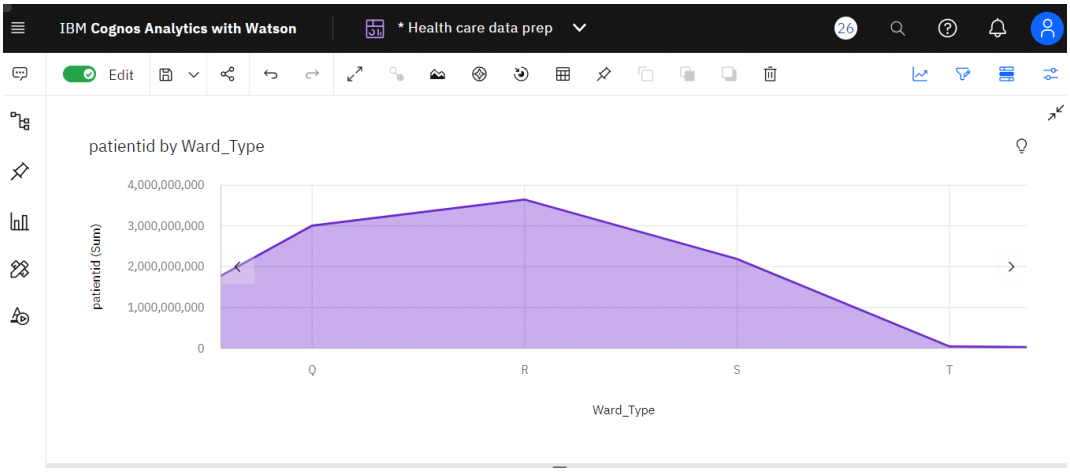
1. APPENDIX

Tap-01

Screenshot-01

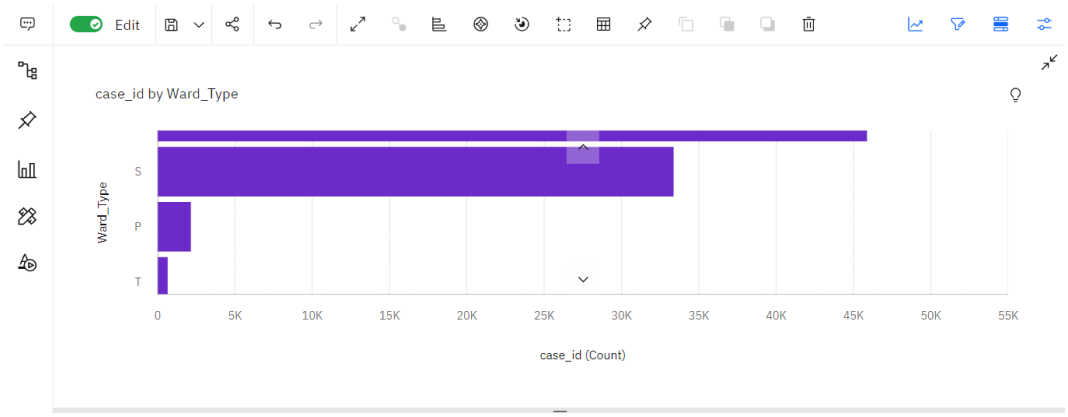


Screenshot-02

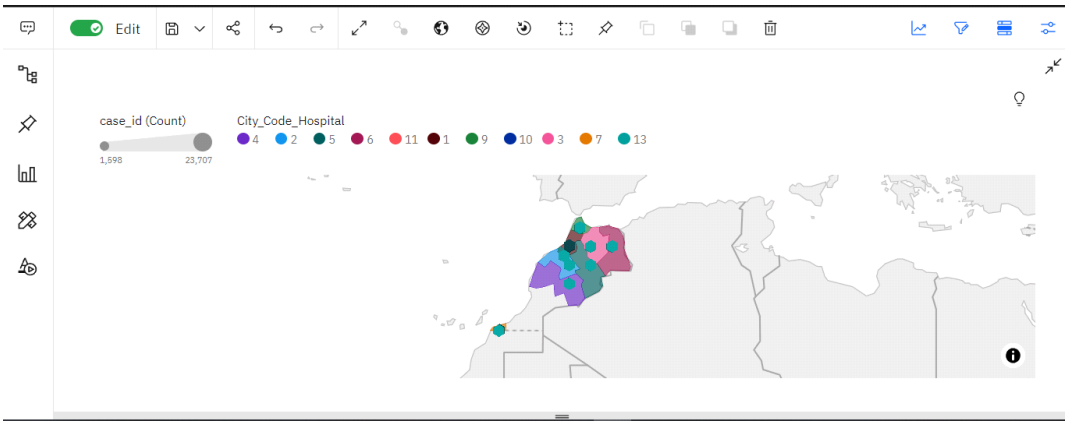


Tap-02

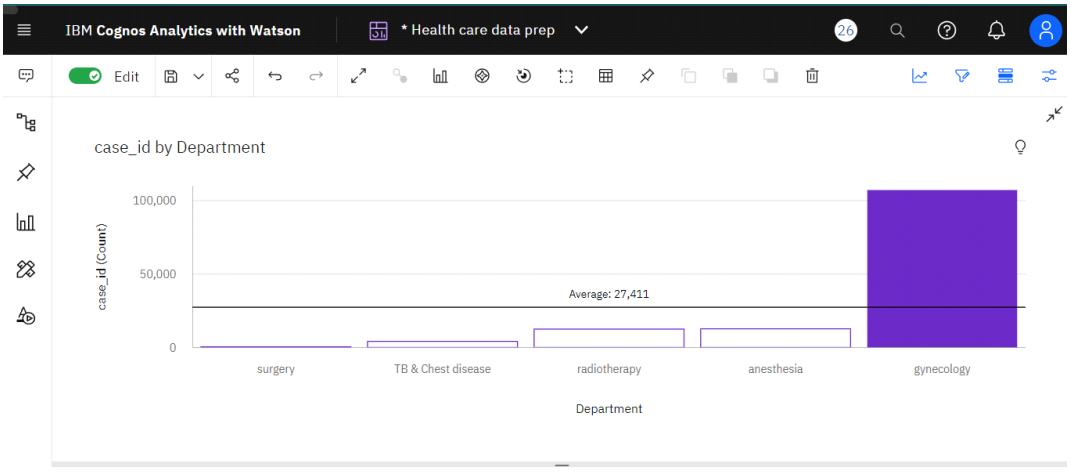
Screenshot-01



Screenshot-02

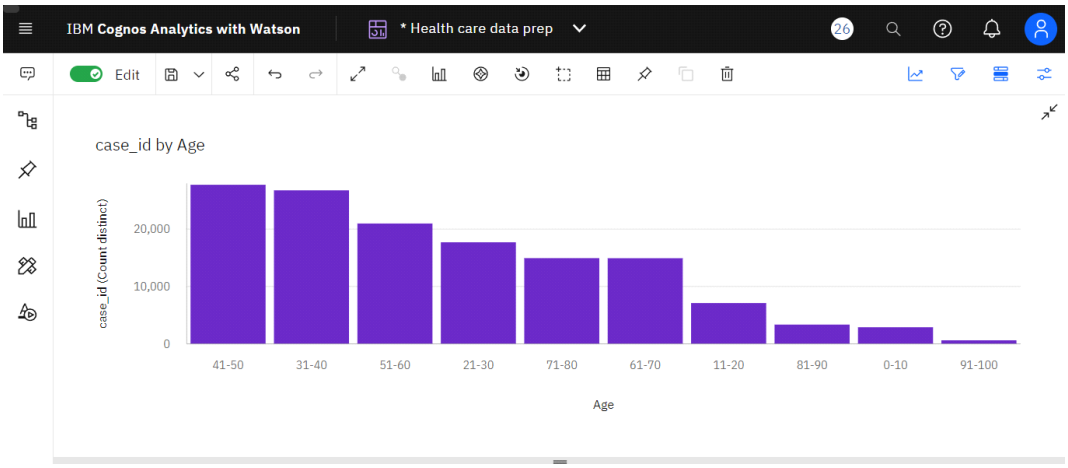


Screenshot-03



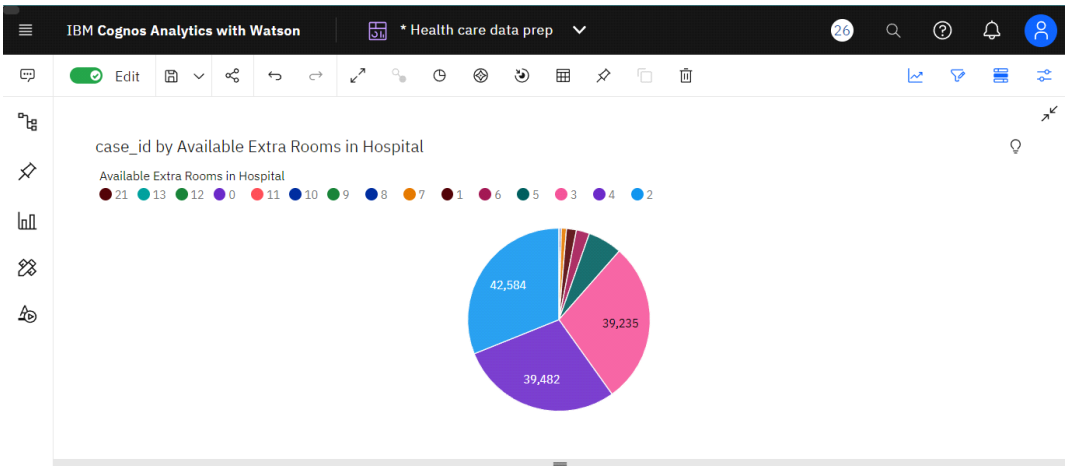
Tap-03

Screenshot-01



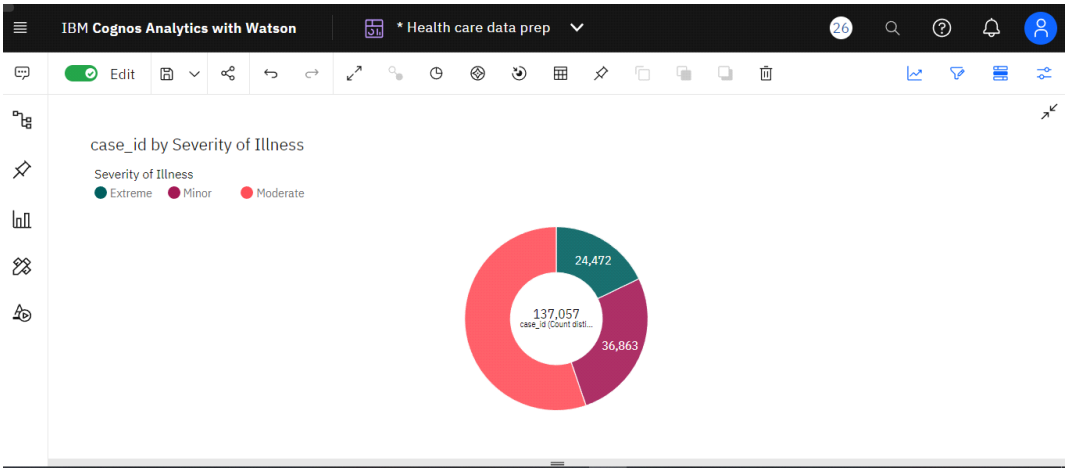
Tap-04

Screenshot-01

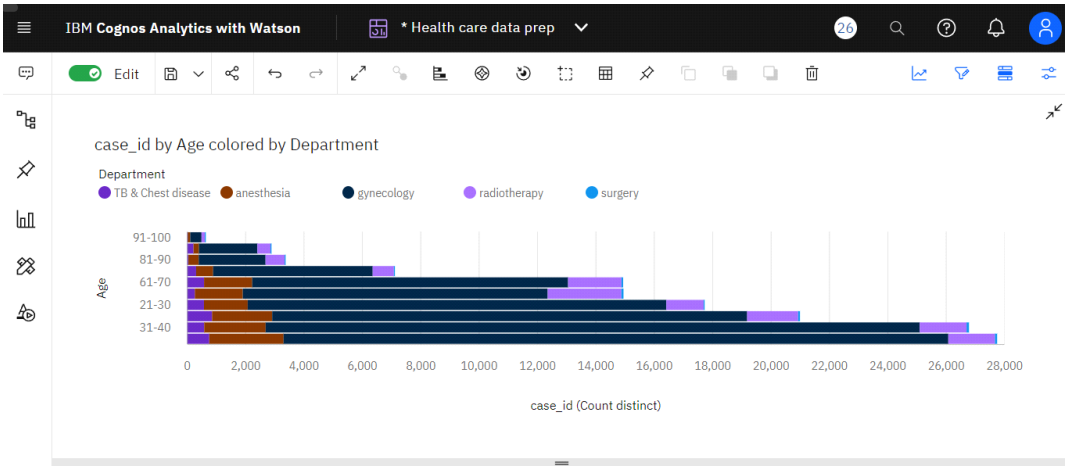


Tap-05

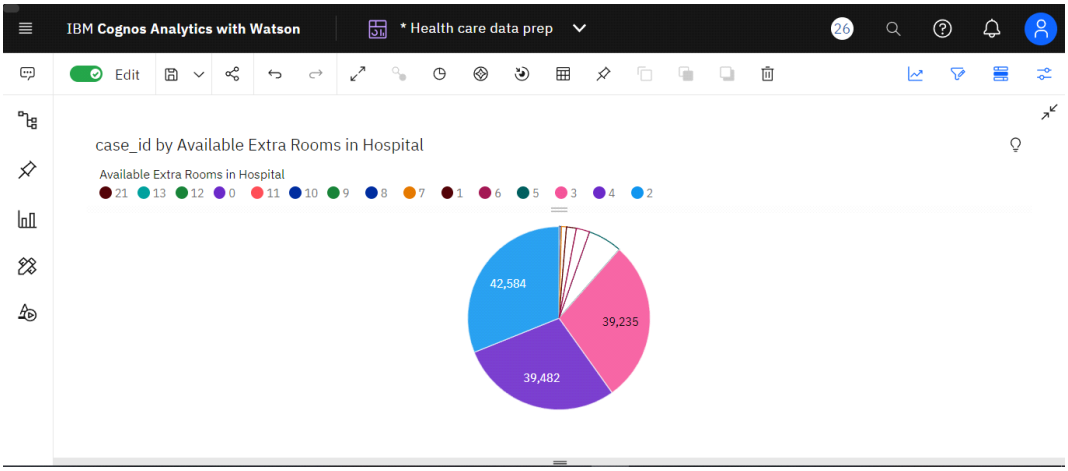
Screenshot-01



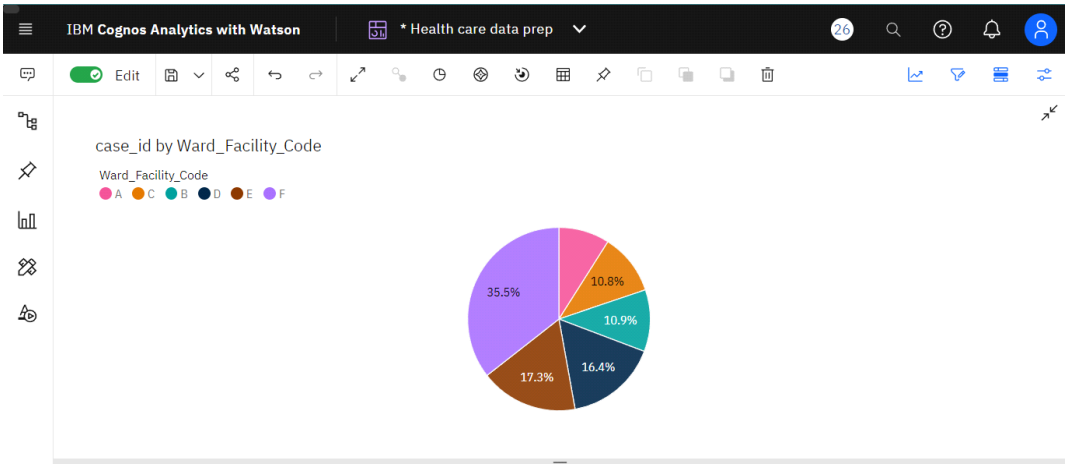
Screenshot-02



Screenshot-03



Screenshot-04



GitHub Link:
https://github.com/IBM-EPBL/IBM-Project-55188-1667276598

Project Demo Link:

https://github.com/IBM-EPBL/IBM-Project-55188-1667276598/blob/main/Final%20Deliverable/Demo%20Video.mp4