ANALYTICS FOR HOSPITAL HEALTH CARE DATA

IBM PROJECT REPORT

submitted by

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CHAPTER 1
INTRODUCTION

INTRODUCTION

1.1 PROJECT OVERVIEW

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. Suppose you have been hired as Data Scientist of Health Man – a not for profit organization dedicated to manage the functioning of Hospitals in a professional and optimal manner.

1.2 PURPOSE

a. This type of analysis is used to investigate why an event happened.

b. This form of analysis is used to forecast something that will happen in the future. For example, a hospital might predict, based on trends observed over the past decade, that incoming cardiac patients will most likely increase by 20% this year.

c. This is possibly the most important form of analysis in healthcare and the trend that is growing quickest. This form of analysis takes pre-existing data and implements treatment plans. For example, a healthcare provider might use a smart device to automatically analyze a patient's vital signs, preemptively alert them that they're at risk for developing a medical condition, and instruct them to visit their healthcare provider.

d. While healthcare data analytics is highly advantageous, it can get pretty complicated, too. Whether the data was collected by assessing important real-time signs or through electronic health records (EHR), it needs to be derived from various sources by following proper government regulations, thus making the process precarious and complex.

e. Anything from clinical data to patient behaviour, medical expenses, healthcare, or pharmaceuticals data analytics can be employed at the micro and macro level to evidently enhance operations, boost patient care, and even tackle the expenses.

CHAPTER 2
LITERATURE SURVEY

LITERATURE SURVEY

2.1 EXISTING PROBLEM

Big Data Analytics in Healthcare at Maharaja Yeshwantrao Hospital

Author: Mimoh Ojha , Dr.Kirti Mathur

Year:2016

This paper focuses on utilizing the big data characteristics to keep track and make use of the Hospital data of every patients and to improve the healthcare domain. It was done at the Maharaja Yeshwantrao hospital which is located at the Maharastra. It is central india one of the largest Government hospital. It is intended to digitalize the patient record and make it into the EHR [Electronic Health Record]. The hospital generates enormous amount of data in the form structures, semi-structured and unstructured. It makes use of Hadoop distributed system to process and analyse the data. By analysing the incoming data such as patient's health records, laboratory test result, electronic medical equipment, health insurance data, social media, drug research, genome research, clinical outcome, transaction and from Mahatma Gandhi Memorial medical college which is under MY hospital.

Advantages:

It is used to convert the paperwork and tedious task into paperless digital-format. Data analytics at the hospital will provide insights and benefits in terms of money saving and doctor's time as well. It can resist up to high level of data storage.

Disadvantages:

The main disadvantage of this system is, that it does not have a cloud storing facility, irrespective of the data collected and stored in it, it could not be processed from anywhere at time of need, so as of now it is just stored in the single system. systems do nothing more than merely replicate the manual process inventory management Inefficiency and redundancy are some of the symptoms of poor inventory management.

BIG DATA ANALYTICS IN HEALTHCARE

Author: Nkemakolam Chinenye Onyemachi, Ogwueleka Francsiska Nonyelum

Year: 2019

The amount of data being generated in the healthcare industry is growing at a very fast rate. This has generated immense interest in leveraging the availability of healthcare data to improve health outcomes and reduce costs. Big data analytics has earned a remarkable interest in the health sector as it could be used in the diagnosis and prediction of diseases. The goal is to predict the epidemic weeks in advance using the geo-map to outburst the plague or virus in the environment. The second method is using a tool called Resistance Open which is used to discover the immunities that has been present in the patients naturally. The third method is to monitor the ratio and spreaders of the disease among the surroundings. Data mining can help health care insurance organizations to detect hypocrisy and misuse, health care institutions to make decisions of customer relationship management, providers to identify effective treatments and best practices and patients now receive enhanced and more economical health care services.

Advantages:

Different kinds of methods were presented and explained to do the classification, prediction and analysis on the big-data. It states the role of data analytics in the healthcare sector by make use of the Big data tool and Classification techniques.

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A REVIEW OF ANALYTICS AND CLINICAL INFORMATICS IN HEALTH CARE

Author: Allan F Simpao,Luis M Ahumada,Jorge Galvez,Mohamed A Rehman

YEAR: 2014

Federal investment in health information technology has incentivized the adoption of electronic health record systems by physicians and health care organizations; the result has been a massive rise in the collection of patient data in electronic form (i.e. "Big Data"). Health care systems have leveraged Big Data for quality and performance improvements using analytics-the systematic use of data combined with quantitative as well as qualitative analysis to make decisions. Analytics have been utilized in various aspects of health care including predictive risk assessment, clinical decision support, home health monitoring, finance, and resource allocation. Visual analytics is one example of an analytics technique with an array of health care and research applications that are well described in the literature. The proliferation of Big Data and analytics in health care has spawned a growing demand for clinical informatics professionals who can bridge the gap between the medical and information sciences.

DEVELOPMENT OF THE HEALTH INFORMATION ANALYTICS DASHBOARD USING BIG DATA ANALYTICS

Author: Anisatul Afifah, Krisostomus Nova Rahmanto

Year: 2020

This paper states about the development of digital technology that has an impact on healthcare facilities in Indonesia, one of which is the digitization of medical records. This will generate abundant clinical data from various sources including electronic medical records. Therefore, a large infrastructure is needed to store data from various sources that can facilitate the process of data aggregation to then be processed into information. Health Information Analytics Dashboard is the solution to get accurate, complete, and real-time insight from big data in healthcare. Data collection is carried out from various sources of health service facilities in Indonesia that are integrated into the system. With a userfriendly display, the analytic dashboard can be used to create monitoring reports with just one click. The method of this study uses big data analytics. The data analysis results are visualized through display charts/graphs that make it easier for users to understand the data analysis results and interpretation. This dashboard is useful to facilitate decision making so that stakeholders can find out more quickly to be able to respond appropriately and also improve the quality of health services so as to improve the degree of public health.

2.2 REFERENCES

1. The Prosperity Index Team, The Legatum Prosperity IndexTM A tool for transformation Overview 2019 Thirteenth Edition, United Kingdom: Legatum Institute, 2019.

2. Kementerian Kesehatan Republik Indonesia, Peraturan Menteri Kesehatan Republik Indonesia Nomor 71 Tahun 2013 Tentang Pelayanan Kesehatan pada Jaminan Kesehatan Nasional, Jakarta: Kementerian Kesehatan Republik Indonesia, 2013.

3. D. M. Womack, R. Kennedy, and B. Bria, “Current practices in clinical analytics: a hospital survey report,” in: Nursing Informatics Proceedings of the International Congress on Nursing Informatics. Bethesda, MD: American Medical Informatics Association, 2012, pp. 458.

4. M. Torvati, R. Hill, A. Anjum, S. Y. Zhu, and L. Liu, Big-Data Analytics and Cloud Computing: Theory Algorithms and Applications, Switzerland: Springer International Publishing, 2015.

5. S. Misra, S.K. Saha, and C. Mazumdar, “Performance Comparison of Hadoop Based Tools with Commercial ETL Tools-A Case Study,” in: Big Data Analytics. Proceedings of the Second International Conference, BDA, 2013, pp. 176-184.

6. A. F. Simpao, L. M. AhUmada, J. A. Galvez, M. A. Rehman, “A Review of Analytics and Clinical Informatics in Health Care,” J Med Syst, 2014, pp. 38-45.

7. C. Lee, Belajar Microsoft Excel Step- By-Step, Jakarta: PT Elex Media Komputindo, 2016.

8. I. Murenin and E. Novikova, “Visualisations-Driven Approach to Anomaly Detection in the Movement of Critical Infrastructure. In Computer Network Security,” in Proceeding of 7. International Conference on Mathematical Methods, Models, and Architectures for Computer Network Security, MMM-ACNS, 2017, pp. 50-61.

9. SAS Institute, Using JMP Student Edition 14, North Carolina: SAS Institute, 2018.

10. Tableau, Build a Treemap. Accessed on 27 February 2020 from Tableau: https:// help.tableau.com/current/pro/desktop/enus/build examples_treemap.htm, 2020.

11. A. F. Simpao, L. M. Ahumada, and M. A. Rahmen, “Big Data and Visual Analytics in Anaesthesia and Healthcare,” British Journal of Anaesthesia, 2015, pp. 350- 356.

2.3 PROBLEM STATEMENT DEFINITION

Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love.

A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you’ll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

I am	Describe customer with 3-4 key characteristics - *who are they?*	a Healthcare Analyst
I'm trying to	*List their outcome or "job" the care about - what are they trying to achieve?*	explore healthcare dataset
but	Describe what problems or barriers stand in the way – *what bothers them most?*	it is a teadious process to vizualize the datas
because	Enter the "root cause" of why the problem or barrier exists – *what needs to be solved?*	the data are huge and complex
which makes me feel	Describe the emotions from the customer's point of view – *how does it impact them emotionally?*	frustrated

EXAMPLE

Problem Statement (PS)	**I am (Customer)**	**I'm trying to**	**But**	**Because**	**Which makes Me feel**
PS-1	A health care analyst	Explore health care dataset	It is tedious to visualize	Huge data and complex to analyze and get the result	frustrated
PS-2	Healthcare agent	Analyze the health care to generate report	The data is complicated	More usage of biological terminologies	Sluggish to grasp.

CHAPTER 3

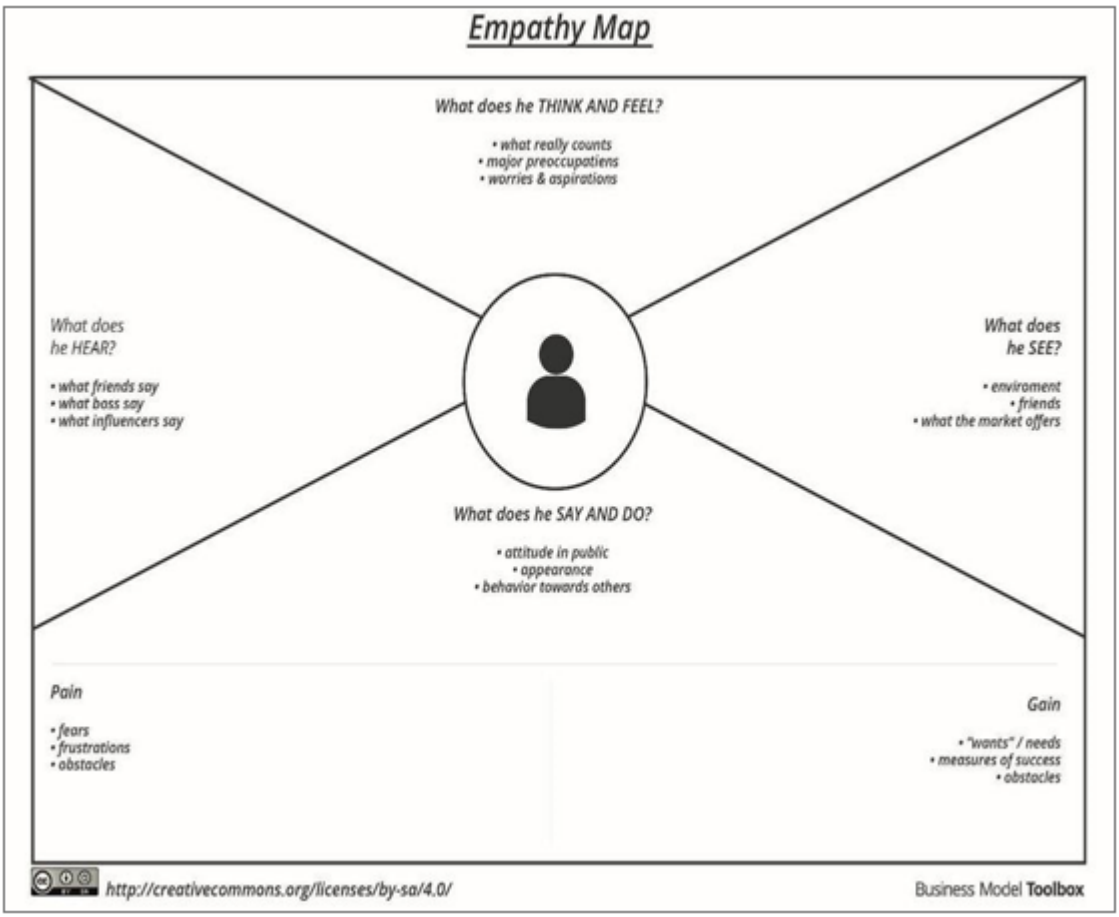
IDEATION & PROPOSED SOLUTION

IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

EXAMPLE

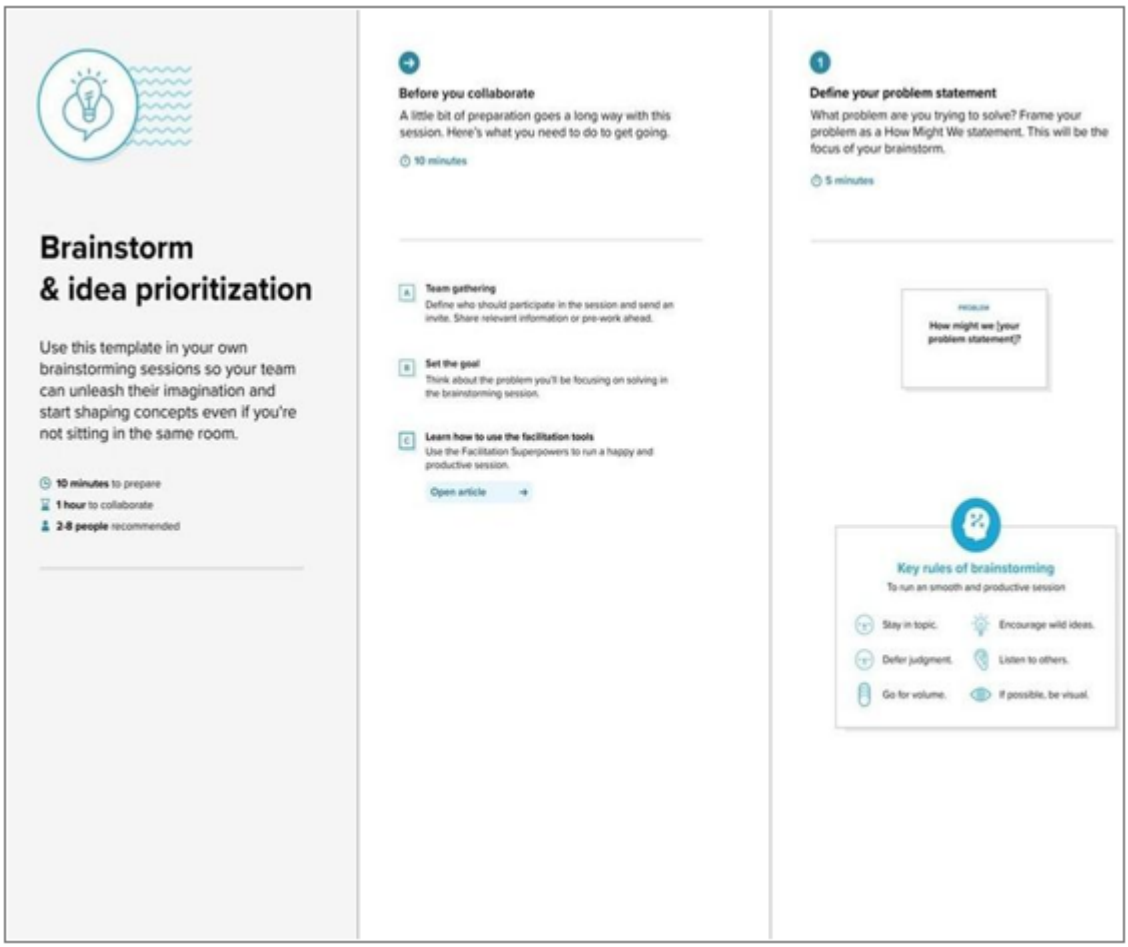


3.2 IDEATION AND BRAINSTORMING

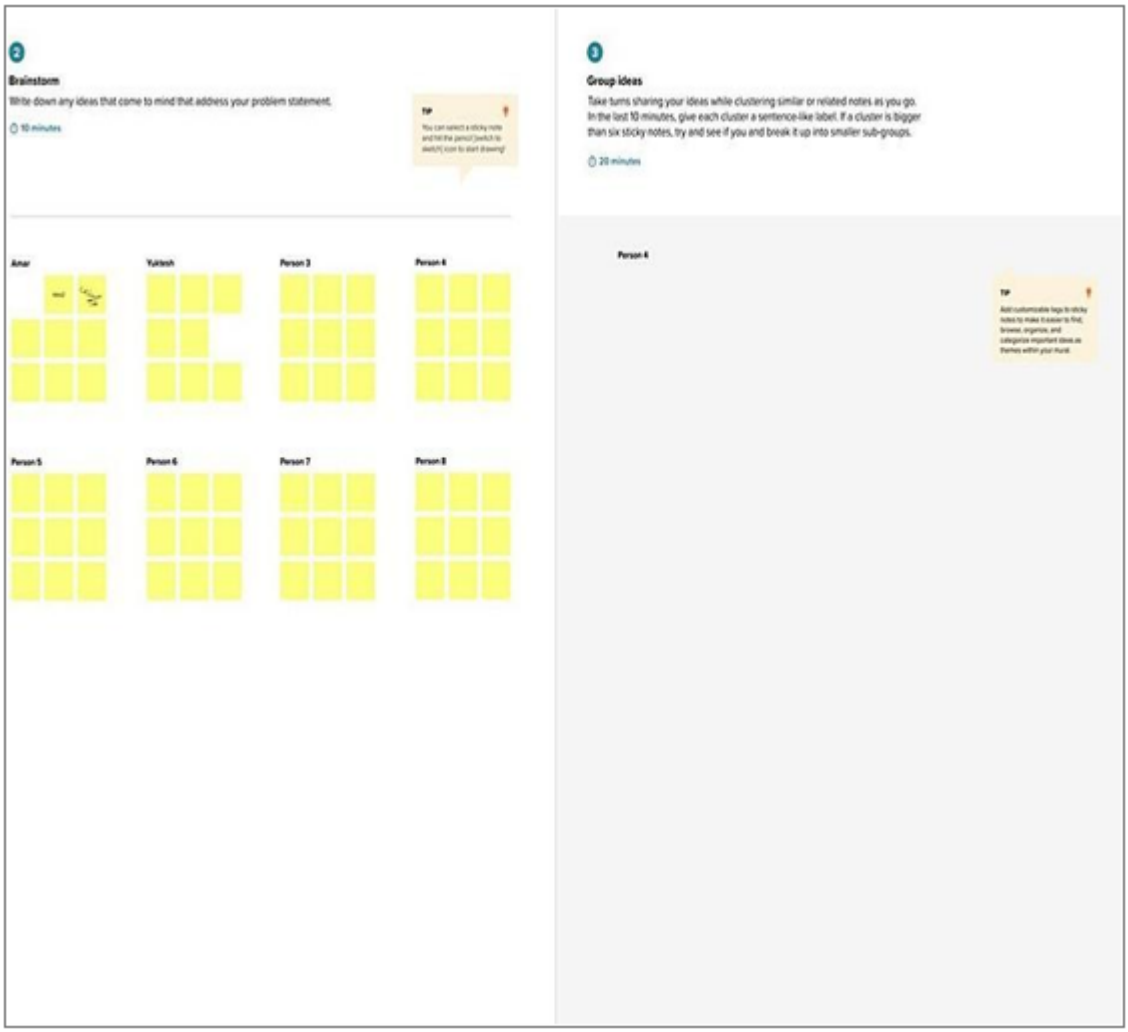
Brainstorming provides a free and open environment that encourages everyonewithin a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and startshaping concepts even if you'renot sitting in the same room.

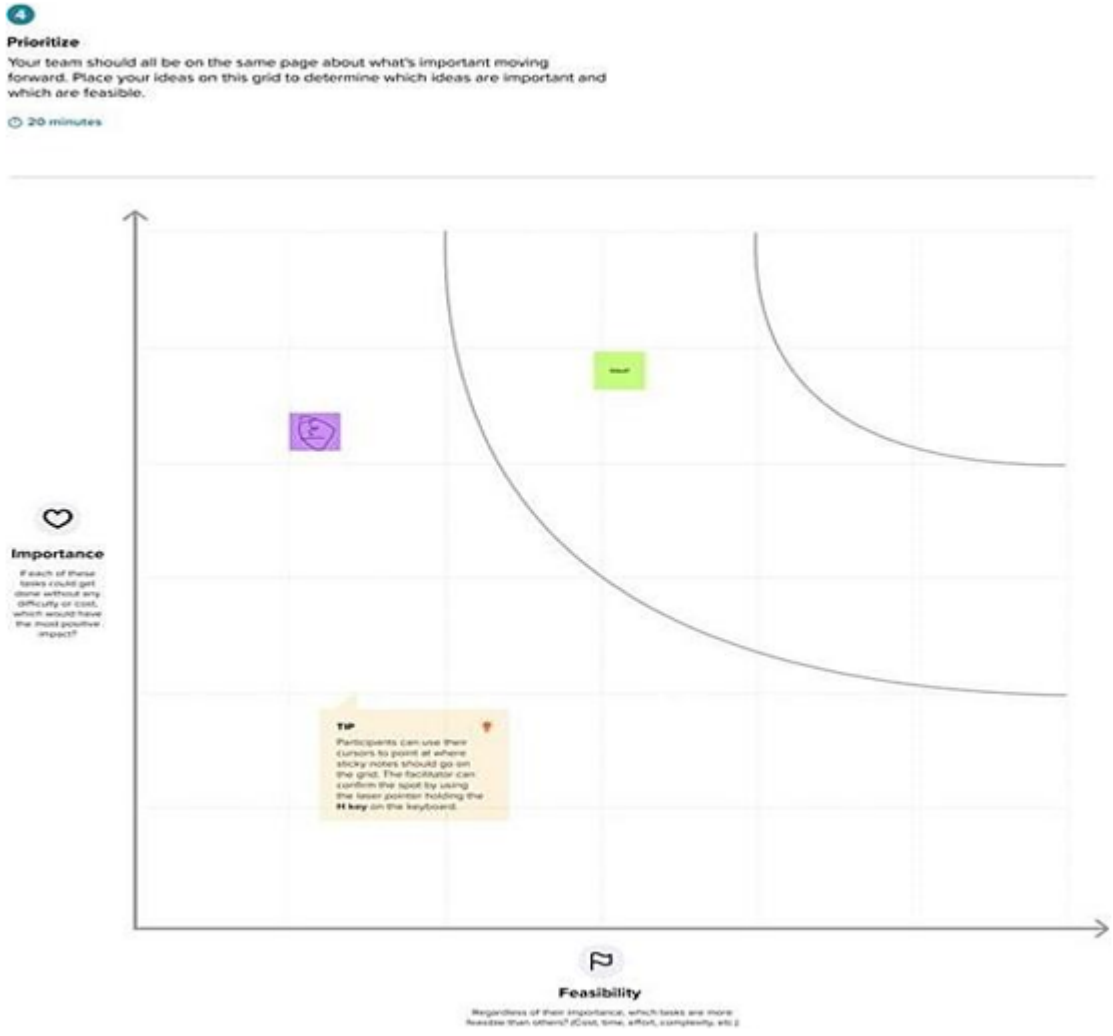
Step-1: Team Gathering, Collaboration and Select the ProblemStatement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



2

Brainstorm

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

10 minutes

Devesh

- Recognize and evaluate the data
- Combine and display all of the pertinent info at once.
- Analyze and comprehend the outcomes.
- Display every combination of the dataset that is feasible.
- Understand the inputs and required output

Bhuvanesh Kumar

- Selecting the best representation on every group of attributes
- Ensure to select right qualities for visualization, such as colour.
- Filtering and data processing
- Envisioning each set of features in relevant charts
- Utilize various options, like screening, to improve visualisation.

Daniel Ebenezer

- Obtain suggestions and repeat
- evaluating the need for additional processing
- Finding trends with benefits and drawbacks
- develop a prototype
- interpreting performance metrics' evaluation

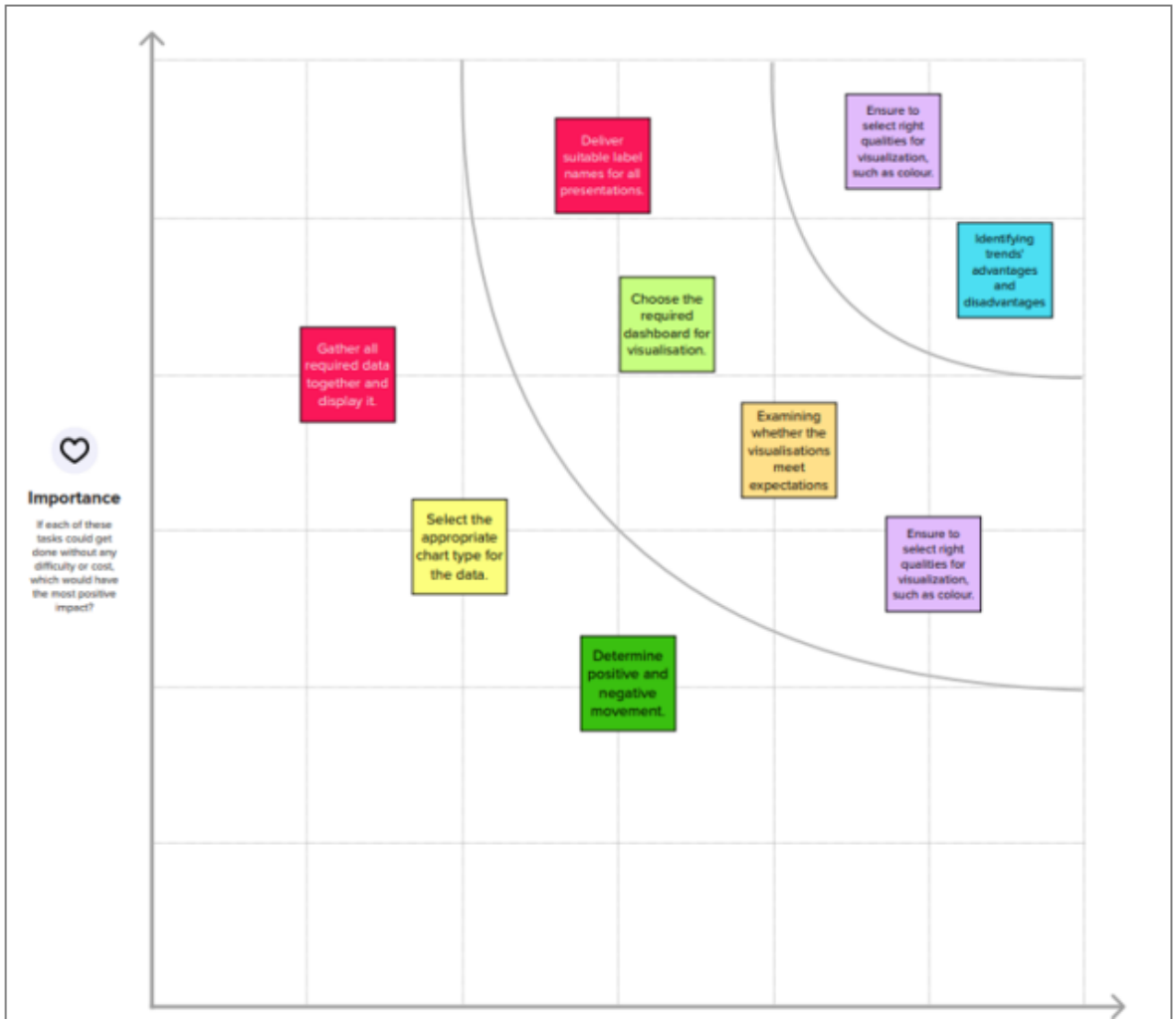
Dinesh Kumar

- checking whether the visualizations are upto expectations
- Select the required dashboard needed for visualization
- Icons are managed in the way they supports
- Compare the results of all the visualizations
- Provide relavant label names for all the visualizations

GROUP IDEA:


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
ASSESMENT OF METRICS
USER PRIORITY
TIREND ANALYSIS
Identifying pros and cons trends
VISUALIZATION
DATASET ANALYSIS

IDEA PRIORITIZATION:



3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	There are many healthcare dataset, but the datasets have large and complex biological terminologies to visualize
2.	Idea / Solution description	Divide and Conquer - Fortunately, clustering algorithms can be used to automatically figure out good ways to split a dataset. A clustering algorithm groups a set of objects such that the objects in the same group are more similar to each other than to the objects in other groups.
3.	Novelty / Uniqueness	The data is complex. It is also structured and unstructured
4.	Social Impact/ Customer Satisfaction	Reach Out and Read, Medical Legal Partnership, The Food Pantry/Rooftop Farm/Teaching Kitchen, Housing.
5.	Business Model (Revenue Model)	Create a revenue model that can aid in your search for suitable investors. Specify an acceptable timeline for projections.
6.	Scalability of the Solution	9 out of 10

3.4 PROBLEM SOLUTION FIT

Project Title: Analytics for Hospitals Health Care Data | **Project Design Phase-I - Solution Fit Template** | **Team ID:** PNT2022TMID00874

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

- Hospital
- Management
- Patients

6. CUSTOMER CONSTRAINTS CC

- Please enter enough text to summarize.

5. AVAILABLE SOLUTIONS AS

- Please enter enough text to summarize.

Explore AS, differentiate

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

2. JOBS-TO-BE-DONE / PROBLEMS J&P

- Proper allocation of resources
- Estimating COVID patients' length of stay
- Adequate patient care and use

9. PROBLEM ROOT CAUSE RC

- Effective less calculator and scenario prediction

7. BEHAVIOUR BE

- The use of text mining and information retrieval techniques to track data

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

Identify strong TR & EM

3. TRIGGERS

current emergency problems and the Pandemic era when users received proper information about the system and understood the hotline.

4. EMOTIONS: BEFORE / AFTER

Before - To recover from the epidemic period's tense and puzzled mindset.
After - simple to handle

10. YOUR SOLUTION

Using predictive analysis enabled by AI in analytics technology

8.CHANNELS of BEHAVIOR

8.1 ONLINE

Customers can be kept up to date.

8.2 OFFLINE

They may see their report and amend their basic information at any time.

Identify strong TR & EM

CHAPTER 4
REQUIREMENT ANALYSIS

REQUIREMENT ANALYSIS

4.1 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 Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Business regulations	Many needs may fit underthis category
FR-4	Product management	Easily track product information Quickly produce reports for single or multiple soldproducts
FR-5	Audit Monitoring	The technique of tracking crucial data is known as audit tracking
FR-6	Historical Data	Specify the amount of storage you needto handle this expansion

4.2 NON-FUNCTIONAL REQUIREMENTS

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

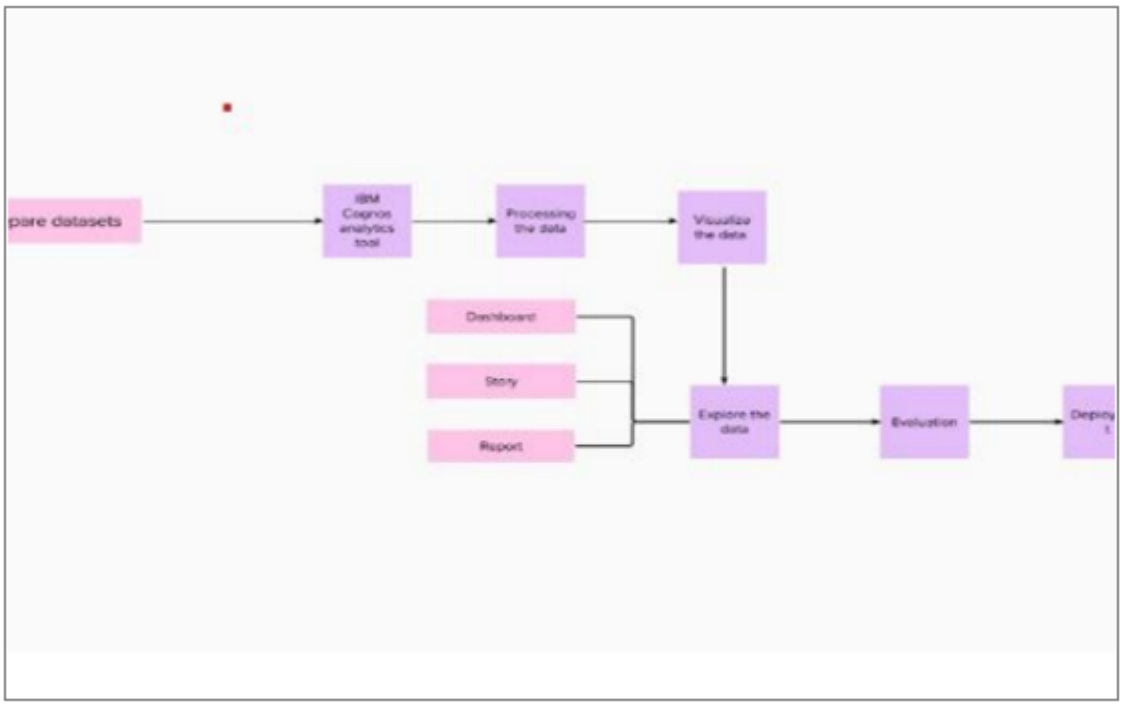
FR No.	Non-FunctionalRequirement	Description
NFR-1	**Usability**	Backups for database areavailable
NFR-2	**Security**	The security requirements deal with the primary security. only authorized users can access the system with username and password of administrator
NFR-3	**Reliability**	The software will not be able to connect to the database in the event of the server being down due to a hardware or software failure
NFR-4	**Performance**	Easy tracking of records and updating can be done .
NFR-5	**Availability**	The software will be available only to administrator of the organization and the product as well as customer details will be recorded by him. He can add customers, Update and delete them as well as add new products and manage them
NFR-6	**Scalability**	The ability of a system to handle a growing amountof work

CHAPTER 5
PROJECT DESIGN

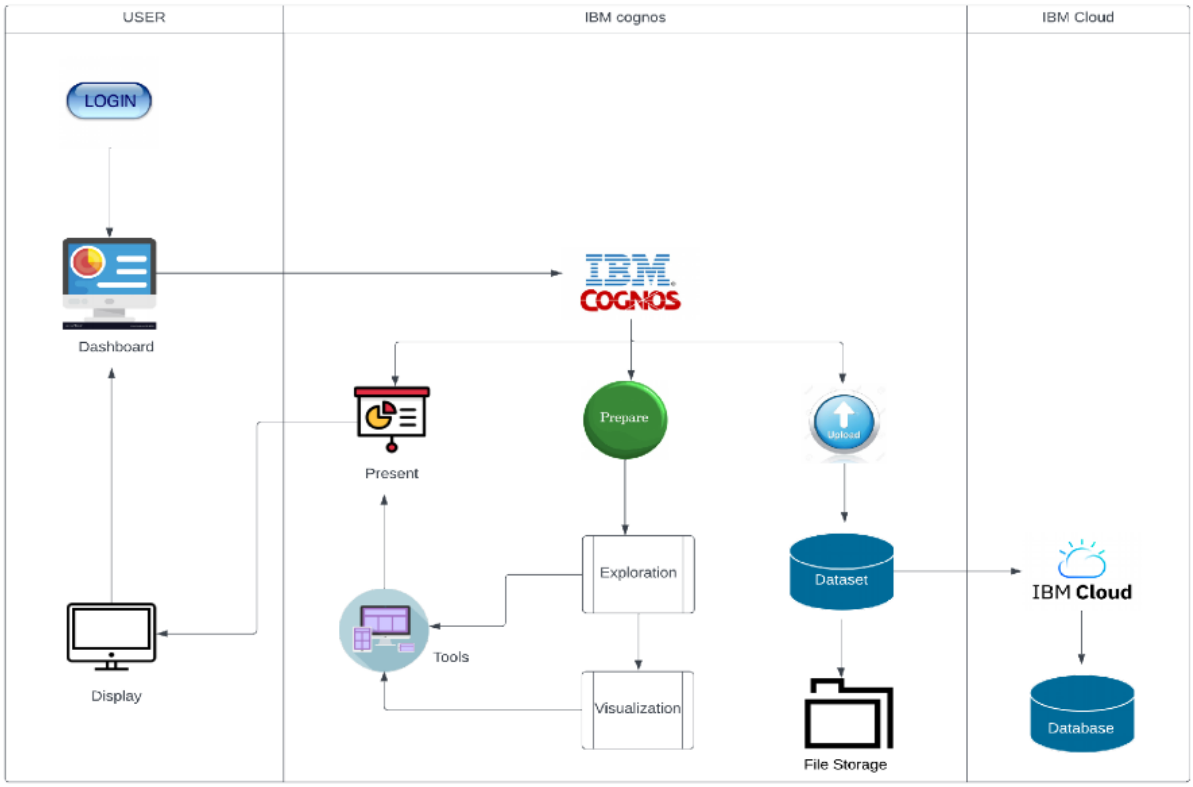
PROJECT DESIGN

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 rightamount of the system requirement graphically. It showshow data enters and leaves the system,what changes the information, and where data is stored.



5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	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 register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register & application Through Gmail	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access my account	High	Sprint-1
	Dashboard	USN-6	As a user, I can log into my account for the mobile	I can access my account /Dashboard	High	Sprint-1
Customer (Web user)	Registration	USN-7	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-8	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-9	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-10	As a user ,I can upload a Profile photo and add my name to my account	I can upload my Profile photo/Name in my account	Medium	Sprint-1
Customer Care Executive	Customer Support	USN-11	As a user, I can support for customers to handle queries and complaints from their customers	I can support for customers to clear complaints	High	Sprint-1
Administrator	Responsibility	USN-12	As a system administrator I want to be able to add new users when required so that	I Can add new users	High	Sprint-1

CHAPTER 6

PROJECT PLANNING & SCHEDULING

PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application byentering my email, password, and confirmingmy password.	2	High	Dinesh Kumar M, Devesh R
Sprint-1	Login	USN-2	As a user, I need valid credentials to login to my application.	1	High	Dinesh Kumar M, Devesh R
Sprint-1	Data Collection	USN-3	As a user, I need to gather the data in the formofCSV/XLS and clean thedata	2	High	Dinesh Kumar M, Devesh R
Sprint-2	Upload dataset	USN-4	As a user,I can view the dataof the Patients inHospital.	1	Low	Bhuvanesh Kumar S,Devesh R
Sprint-2	Data Preparation	USN-5	As a user,I need to filter it for Datavisualization.	3	High	Bhuvanesh Kumar S,Devesh R
Sprint-2	Data visualization	USN-6	As a user, I can easilyvisualize the data in theform of charts.	4	Medium	BhuvaneshKumarS, Devesh R
Sprint-3	Dashboard	USN-7	As a user, I can viewthe summary of thepatent id and ward facility code by the help of dashboard.	2	Medium	DineshKumarM, DeveshR
Sprint-3	Dashboard	USN-8	As a user, I must plan visualizations in a way that I'm able to gain insights regardingthe no of patients in each department	4	High	Dinesh KumarM, DeveshR

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Dashboard	USN-9	As a user, I must be able to gain insights from the charts/graphs through a variety of relationships established in the dashboard.	4	Medium	Dinesh KumarM, DeveshR
Sprint- 4	Report	USN-10	As a user, I can view the extra beds in each department and hospital and theirdetails as a report.	5	High	Daniel Ebenezer,Devesh R
Sprint-4	Story	USN-11	As a user, I can view severity of illness andmore additional information as a story.	5	High	Daniel Ebenezer,Devesh R

6.2 SPRINT DELIVERY SCHEDULE

Sprint	**Total Story Points**	**Duration**	**Sprint Start Date**	**Sprint End Date (Planned)**	**Story Points Completed (as on Planned EndDate)**	**Sprint Release Date(Actual)**
Sprint-1	11	6 Days	24 Oct 2022	29 Oct 2022	11	29 Oct 2022
Sprint-2	7	6 Days	31 Oct 2022	05 Nov 2022	7	05 Nov 2022

Sprint-3	6	6 Days	07 Nov 2022	12 Nov 2022	6	12 Nov 2022
Sprint-4	7	6 Days	14 Nov 2022	19 Nov 2022	7	19 Nov 2022

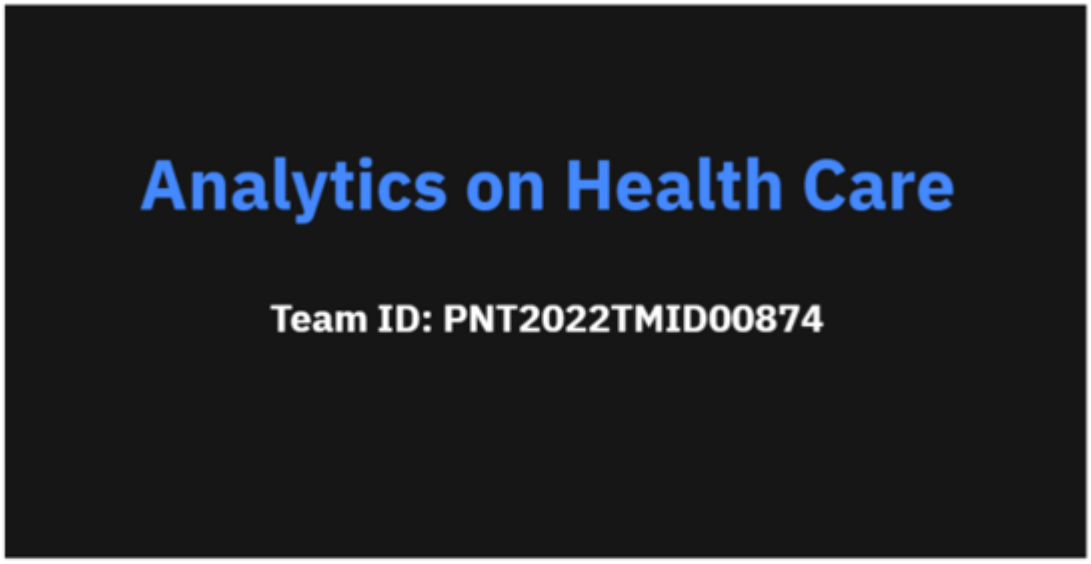
CHAPTER 7

CODING & SOLUTIONING

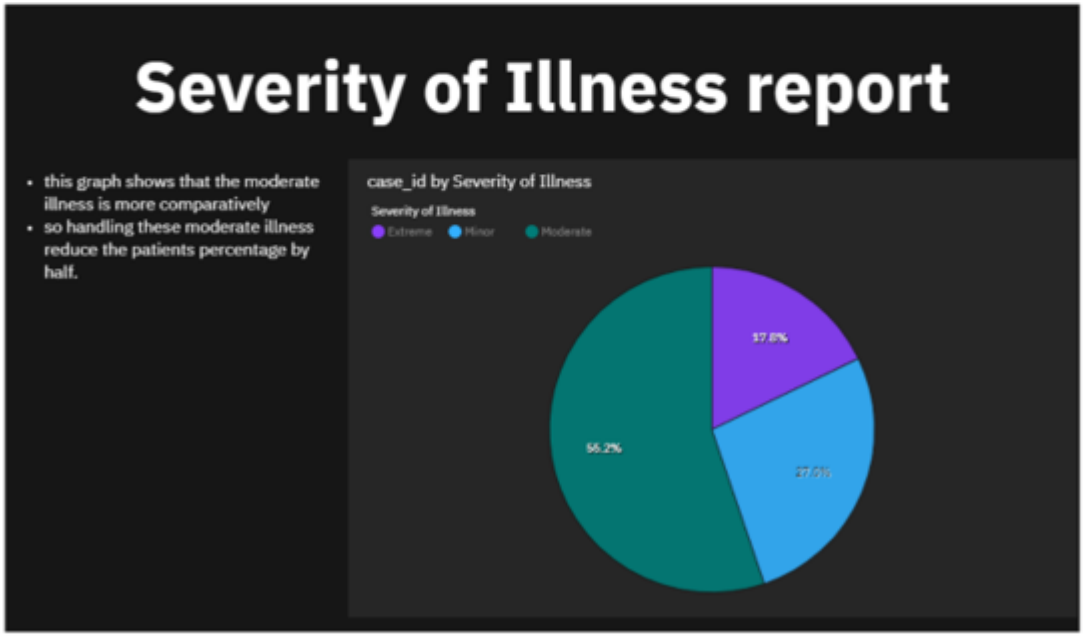
CODING & SOLUTIONING

7.1 Story

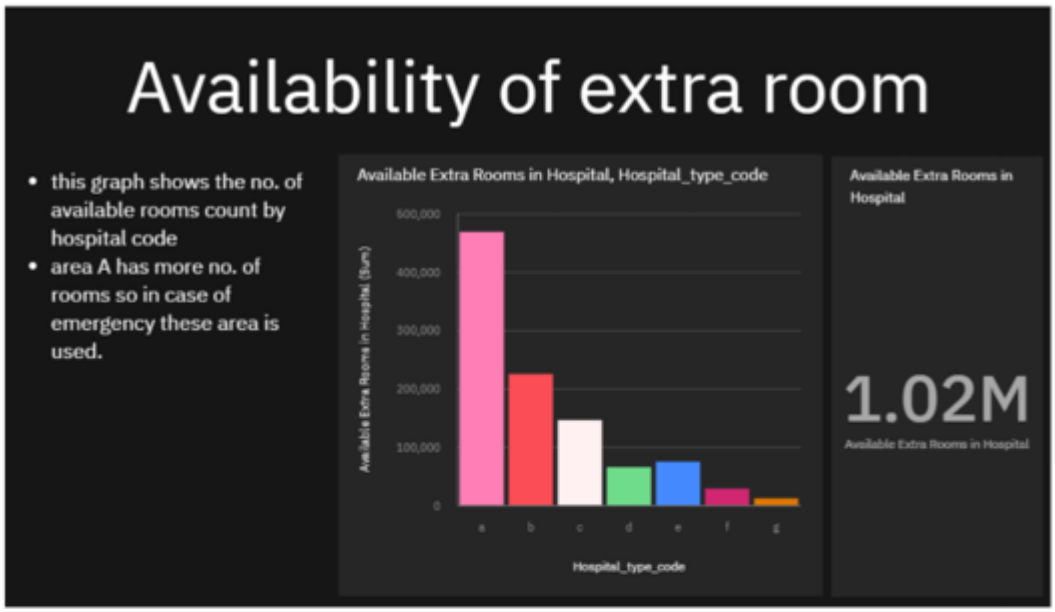
Scene 01: Intro



Scene 02: Severity of Illness report

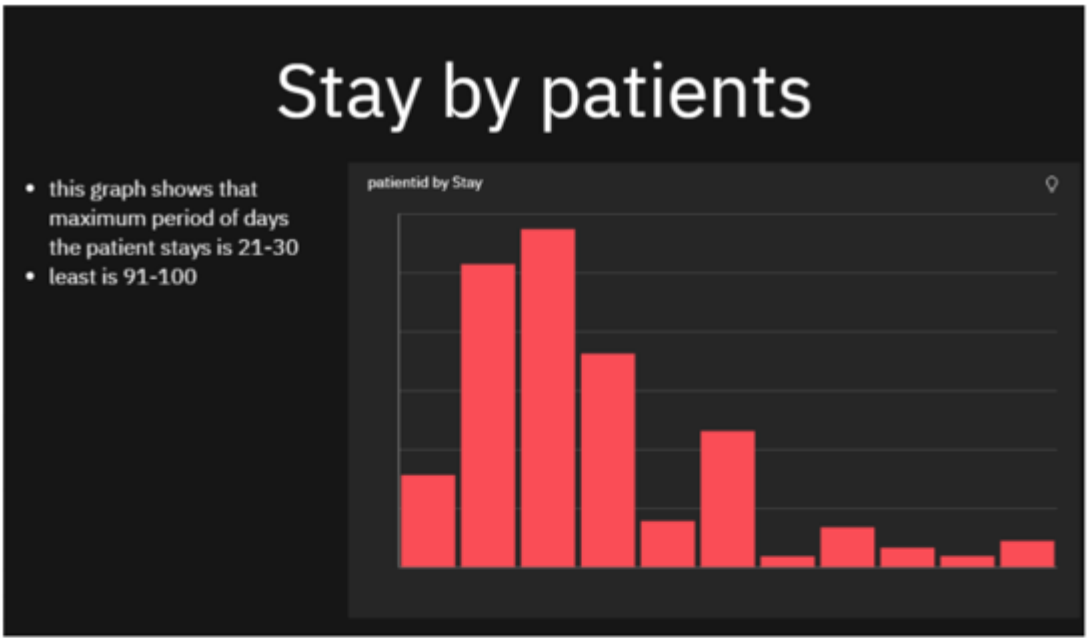


Scene 03: Availability of extra room

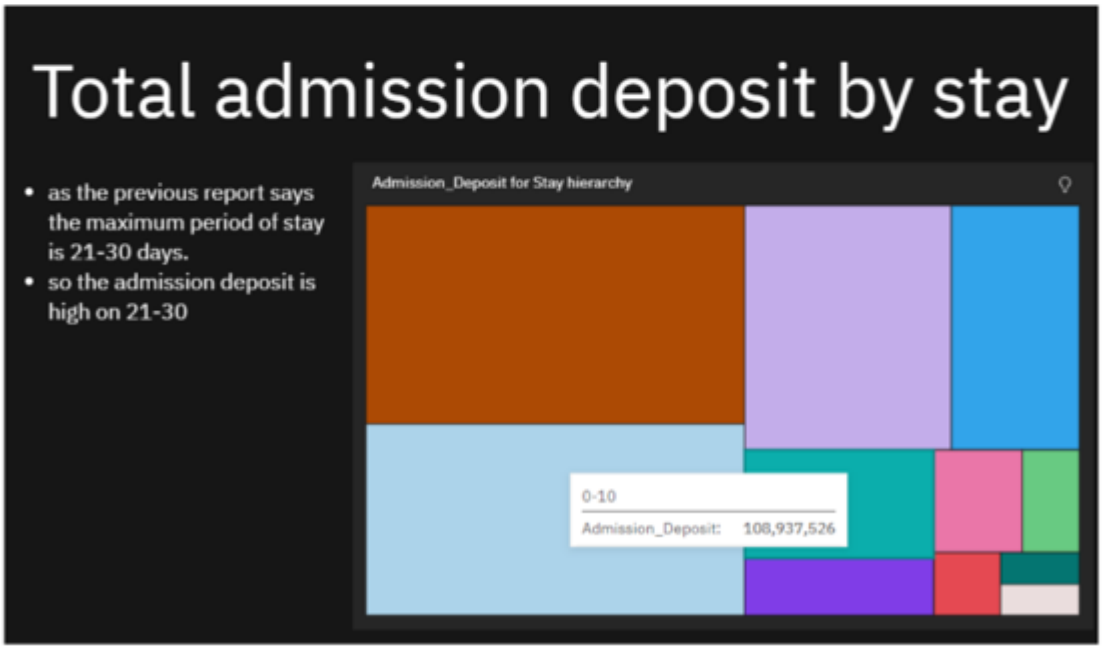


Scene 04: Case report age wise

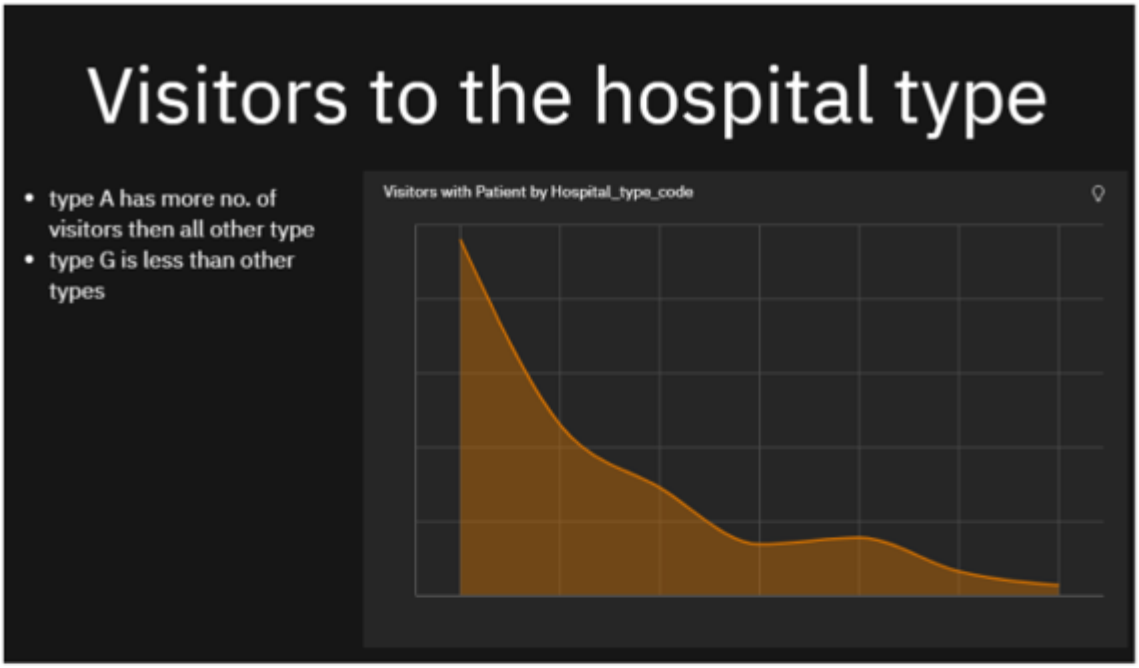
Scene 05: Stay of patients



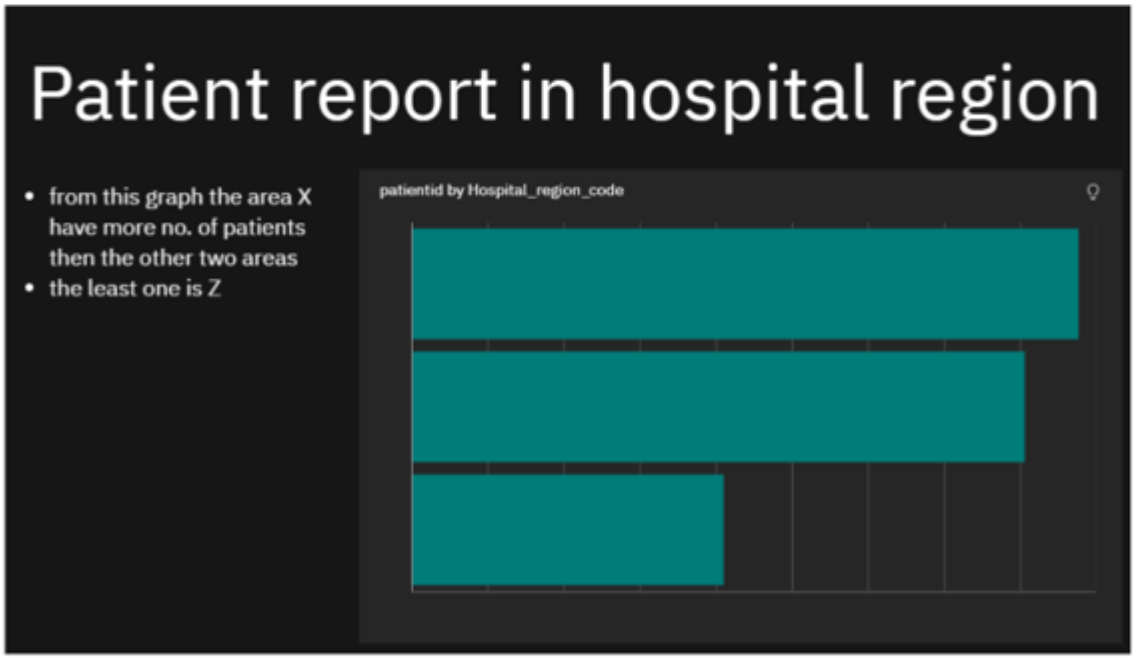
Scene 06: Total admission deposit by stay



Scene 07: Visitors to the hospital type

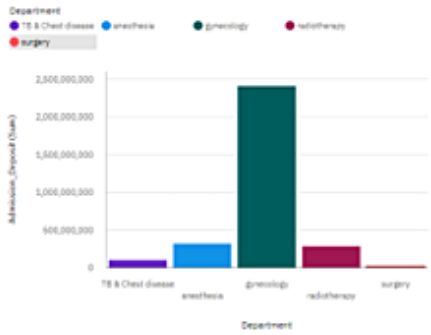


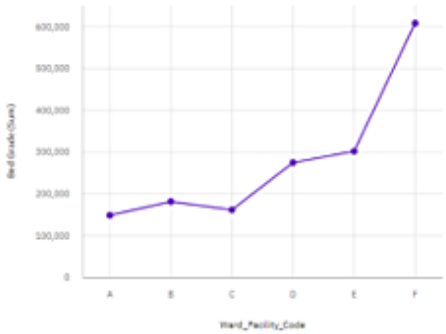
Scene 08: Patient report in hospital region



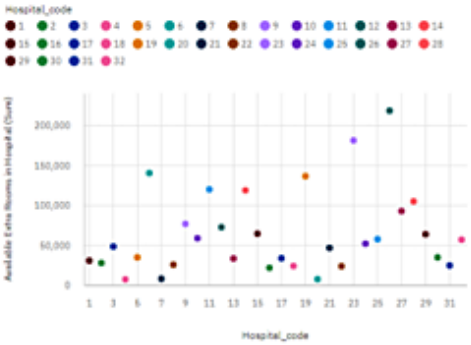
7.2 Report

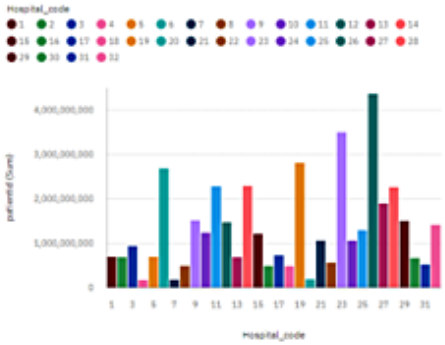
Report 01: Admission deposit and bed grade



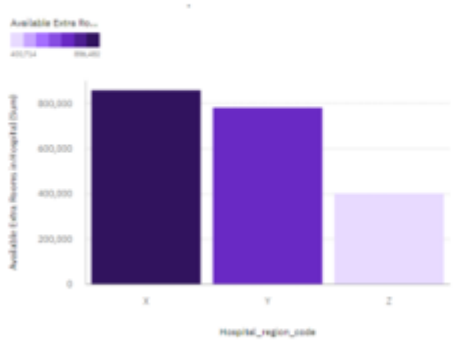


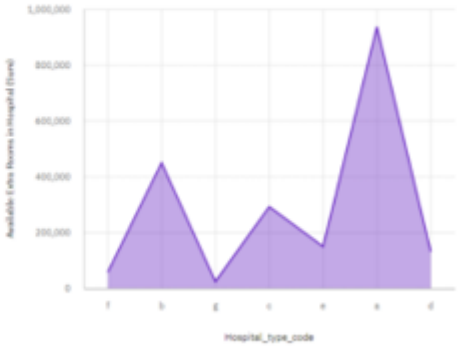
Report 02: Availability of extra rooms in hospital





Report 03: Severity of Illness and admission of patient





CHAPTER 8
ADVANTAGES AND DISADVANTAGES

ADVANTAGES AND DISADVANTAGES

8.1 ADVANTAGES

- As the internet reaches the far ends of our world, so does digital health. With a simple internet connection, anyone can access patient health records online without visiting the medical center.
- Gone are those days of securely storing all the handwritten prescriptions and test reports. With electronic health record apps, you can store all the relevant health data in one place without worrying about losing one.
- Personal digital health tools like fitness bands let you know your health-related data on a real-time basis.
- Those technological marvels constantly track your vitals and auto-dial emergency numbers in case anything wrong happens to you.

8.2 DISADVANTAGES

- Adapting to new technologies has always been a challenge for senior citizens.
- Adapting to new technologies has always been a challenge for senior citizens. Some of them prefer the old-school treatment methods instead of getting used to digital health facilitators.
- If not done properly, these apps can often crash, resulting in an inconvenience.

CHAPTER 9

CONCLUSION

CONCLUSION

This research demonstrates Analytics for hospital and health care data with data visualization and anlaytics.This information is gathered from a series of health information systems (HIS) and other technological tools utilized by health care professionals, insurance companies and government organizations. Consider the impact this has had on the COVID-19 pandemic. The data being collected is analyzed in real time to understand the effects of the virus better and predict future trends so we may slow the spread and prevent future outbreaks. Health care data management has the potential to lead to better care if used properly.

Healthcare analytics can be understood as the gathering and analysis of healthcare sector data with the purpose of deriving insights and prompting decision-making. Ranging from main areas like medical expenses, clinical data, patient behavior, or pharmaceuticals, healthcare data analytics can be employed at both the macro and micro level to sufficiently boost operations, enhance patient care, and curtail overall expenses.

Nevertheless this data, while being highly advantageous is also pretty complicated. Be it the data from electronic health records (EHR) or the data gained by assessing real-time vital signs, the data is not only derived from a number of varying sources, but it is also required to follow government regulations, making it a complex and precarious process.

CHAPTER 10

FUTURE SCOPE

FUTURE SCOPE

The data analytics market in the healthcare space has only increased over the last few years. Considering the rising costs of medical treatments globally, a proper body of knowledge was needed to reduce the costs at the business-level as well as the professional-level. McKinsey, in one of its reports, states that healthcare expenses constitute 17.6 percent of the GDP in the USA, which is approximately US$600 billion, more than what is the set benchmark for the ideal size of population in the country. This is a serious indicator of bigger trouble. Hence, the usage of healthcare data analytics is being promoted these days.

To some, the domain of healthcare data analytics may look new, but it has a lot of potential, especially if you wish to engage in challenging job roles and build a strong data analytics profile in the upcoming years. In this blog, we have covered some of the major topics such as what is healthcare data analytics, its applications, scope, and benefits, etc. We hope it helps you in your decision-making as a healthcare data analytics professional.

GITHUB & PROJECT DEMO LINK

https://github.com/IBM-EPBL/IBM-Project-3418-1658560496