

PROFESSIONAL TRAINING REPORT

AT

Sathyabama Institute of Science and Technology

(Deemed to be University)

Submitted in partial fulfillment of the requirements for the award
Of Bachelor of Technology Degree in Information Technology By

VISHVASHWARRAN V B

40120107



DEPARTMENT OF INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with Grade "A" by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI,

CHENNAI - 600 119.TAMILNADU

APRIL-2023



SATHYABAMA

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the Bonafide work of **VISHVASHWARRAN V B 40120107** who carried out the project entitled "**PATIENT COUNT (COVID 19)**" under my supervision from January 2023 to April 2023.

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Submitted for Viva voce Examination held on 29/04/23

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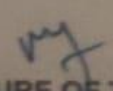
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DECLARATION

I Vishvashwarran V B hereby declare that the Project Report entitled "**PATIENT COUNT (COVID 19)**" in power bi done by me under the guidance of **MR.SENDURU SRINIVASULU** At Sathyabama Institute of Science and Technology (Deemed to be University), JeppiaarNagar, Rajiv Gandhi Salai, Chennai – 600119 is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE: 29/04/23

PLACE: Chennai


SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr.T. SASIKALA M.E., Ph.D., Dean**, School of Computing **Dr.R. Subhashini** Head of the Department of Information Technology for providing me necessary support and details at the right time during the progressive reviews.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE

No. : 34361



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N S I C

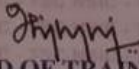
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09.03.2023 to 14.03.2023.




HEAD OF TRAINING


HEAD OF CENTRE

ABSTRACT

The Covid-19 pandemic has shaken the world completely. No one knew what was coming and everyone was running helter-skelter. The governments were paralyzed and the infrastructure required to deal with this problem was absent completely. The genome sequence was out. But what the disease entailed and what it will lead out was just anyone's imagination. Till today as we write there are multiple dimensions of it that lay unexplored and need a deep exploration to be found out. Our Project seeks to uncover them story using the application of data sciences to solve it. We seek to use data sciences to help authorities and also to give the medical field the insight that data can provide to them to deal with the pandemic better. Data science is the application of data science algorithms and machine learning to train the models to find patterns. Patterns reveal what the common issues are and common symptoms and everything that is common comes out in a visual representation. It's these representations which make complex things easy and digestible to people from non tech backgrounds. The coronavirus is an infection caused by severe acute respiratory syndrome (SARS) coronavirus, known as SARS-CoV-2. It was first determined in Wuhan, China in December 2019. WHO named this virus as COVID-19. Virologist says that COVID-19 is similar to SARS and MARS virus. This deadly disease affected worldwide economically, hammering people lifestyle and also the environmental condition. After a few months, there is no vaccine to build the barricade between this virus and life. Many countries have tried to improve the methodology to control the disease and also the actual vaccine for coronavirus but not yet successful. Rapid testing, quarantine and social distancing slow down the social and economic movement. Although India, as one of the largest populated countries, takes some respectable initiative after the pandemic of the novel coronavirus. According to WHO 24th May 2020 report, total 131,868 confirmed cases and killed over 3867 people by this COVID-19 pandemic. Indian government takes the initiative like Janta curfew, lockdown all over the country. The main focus or aim of this study is to find the mortality rate and the recovered people at the fourth phase of lockdown, but the infected graph is daily increased in India. In the relation between active cases and the death cases, the R^2 value is 0.8754.

The relation between active cases and the recoveries, the R^2 value is 0.9246.

TABLE OF CONTENT

CHAPTER	TITLE	PAGE NO
	ABSTRACT	
	LIST OF FIGURES	
	LIST OF ABBREVIATIONS	
1	INTRODUCTION	1
2	AIM AND SCOPE	2
2.1	AIM	2
2.2	SCOPE	3
3	SYSTEM REQUIREMENTS	4
4	METHODOLOGY	5
4.1	Data collection	5
4.2	Data mining	6
4.3	Data analysis	7
4.4	Types of analysis	8
4.4.1	Descriptive analysis	8
4.4.2	Diagnostic analysis	9
4.4.3	Predictive analysis	10
4.4.4	Prescriptive analysis	11
4.5	Power bi	12
4.5.1	Power bi uses	12
4.5.2	Power bi features	13

4.6	Architecture	14
4.7	Project implementation	15
5	RESULT AND DISCUSSION	17
5.1	Prediction	17

5.2	Q&A	18
5.3	Smart narrative	19
5.4	Spatial analysis	20
5.5	Temporal Employment Analysis	21
5.6	Hourly Posts with Facemask	22
5.7	Daily Mobility Analysis	23
5.8	Overall Analysis	24
6	CONCLUSION	25
7	REFERENCE	26

LIST OF FIGURES

FIGURE NO	FIGURE NAME	PAGE NO
4.1	Data mining	6
4.2	System Architecture	14
4.3	Dataset 1	16
4.4	Dataset 2	16
5.1	Prediction table	17
5.2	Q&A	18
5.3	Smart narrative	19
5.4	Spatial Analysis	20
5.5	Temporal Employment Analysis	21
5.6	Hourly Posts with Facemask	22
5.7	Daily Mobility Analysis	23
5.8	Overall Analysis	24

1. INTRODUCTION

As you know, Coronavirus is a pandemic disease. It is spreading in almost every country, and people are locked down in their houses. Recently, India entered in 21 days total lockdown due to an increase in Coronavirus cases. In the article, Visualize Coronavirus impact using a Power BI Dashboard, we visualized the impact of Coronavirus using Power BI Desktop. In this article, we will explore a few other ways to represent data in Power BI and focus on the trend of coronavirus cases in India. We will also look at how social distancing can help in reducing the cases Before we start, let have a quick comparison between COVID-19, FLU, and Cold using the following useful graphics. Image reference: De Ze e n You can look at the symptoms and visit a doctor in case of any issues. Covid-19 cases are increasing day by day in and all over the world, millions of people are dying and the economy is experiencing free-fall. It has been spreading like water in the open ocean and it seems like there is no stopping it, but thankfully since the inception of this epidemic many countries have properly managed the databases of each and every patient and their health history. We today have advanced computational infrastructure and data science algorithms through which we can analyse these data sets and gain insight-full information so that we can help the society. People have proposed many interesting models and trend prediction methods. The project will help us in recognizing the insights that will be gained by using data science algorithms on the data. Several vaccines have been developed and widely distributed since December 2020. Several vaccines have been developed and widely distributed since December 2020. Current treatments focus on addressing symptoms, but work is underway to develop therapeutic drugs that inhibit the virus. The pandemic has resulted in significant global social and economic disruption, including the largest global recession since the Great Depression inhibit the virus. The pandemic has resulted in significant global social and economic disruption, including the largest global recession since the Great Depression Numerous educational institutions and public areas

have been partially or fully closed, and many events have been cancelled or postponed.

2. AIM AND SCOPE

2.1 AIM

Physical distancing is key to avoid or slow down the spread of viruses. Each country has taken different policies and actions to restrict human mobility. In this project, we investigate how policies and actions affect human mobility in certain cities and countries. By referencing our analysis of policy and secondary impacts, we hope that decision makers can make effective and appropriate actions. Furthermore, by analyzing human mobility, we also aim to develop a physical distancing risk index to monitor the risk on areas with high population densities and probability of contraction. Due to physical distancing and lockdown policies, people have begun relying on video conferencing tools for meetings, lectures, and conversations among friends more frequently than usual. Children are especially affected by the quarantine since many must refrain from going to their classrooms and take classes online. By leveraging various data sources, we will analyze how daily behavior has been affected by this pandemic, and also compare behaviors among different countries and cities. We will also measure online e-commerce and consumer behavior by analyzing sites such as Amazon. For health, we have focused on emotion changes that people have experienced during this pandemic. Emotion changes have stemmed from various reasons such as unemployment, implementation of stay-at-home policies, fear of the virus, etc. We quantify emotion changes by using social media data, including Twitter and Instagram. Since the breakout of COVID-19, we have seen an increase in online discussions that use hashtags such as #COVID-19 and #depression. We believe it is vital to visualize and analyze the differences in people's perceptions of COVID-19. We also hope to analyze overall responses to the pandemic by sentiment: sadness, depression, isolation, happiness, etc. A further detailed analysis will also look into specific keywords and corresponding trends.

2.2 SCOPE

Maps can show the locations where patients 65 years of age are concentrated, and where patients are located who require medical assistance at home and, finally, the

location of hospitals and pharmacies. Geospatial big data refers to spatial data sets exceeding the capacity of current computing systems. Having information on human mobility patterns from mobile phones, or the registration of global flight networks, is fundamental to epidemiological modelling. Using big data could help us to understand the pandemic's behavior in terms of outbreak tracking, disease treatment, and future vaccine manufacture and distribution. With the rapid spread of COVID-19, many hospitals and health systems were faced with the possibility of sudden surges in patient volume, stressing limited resources and increasing the burden on staff. To better plan for these potential surges, organizations have implemented predictive tools that can help allocate resources. From the business perspective of the Healthcare organization, the spatial analysis of the data of COVID-19 helps in decision-making and planning. It also helps to improve the locating of health services and controls, and points of care. It facilitates patient access, which translates into an improvement in patient outcomes, time, and material resources. It helps in deciding the number of ICU units required per hospital, emergency service providers, lab supplies, pharmacy supplies, and ventilators needed, as well as to make decisions on logistics and supply as the pandemic evolves, predictive spatial analytics with ArcGIS tools will continue to play a significant role in monitoring the impact of the virus, ranging from locating patient outcomes to identifying areas of increased disease spread. The global health crisis has only further highlighted the importance of GIS and spatial analytics in healthcare and could accelerate the use of these tools in standard care going forward.

3. SYSTEM REQUIREMENTS

Windows

- Microsoft® Windows® 7/8/10 64-bit
- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum,
- 4 GB Recommended 500 MB for IDE + 1.5 GB for Android SDK and emulator system image
- 1280 x 800 minimum screen resolution

Mac

- Mac® OS X® 10.10 Yosemite or higher, up to 10.14 macOS Mojave
- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum,
- 4 GB Recommended 500 MB for IDE + 1.5 GB for Android SDK and emulator system image
- 1280 x 800 minimum screen resolution

Linux

- GNOME or KDE desktop - Tested on Linux based on Debian.
- 64-bit distribution capable of running 32-bit applications
- GNU C Library glibc 2.19 or later 17
- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum

4 METHODOLOGY

4.1 DATA COLLECTION

Once the project undertaking is completely comprehended, our subsequent stage is to gather the information that is required for future model building. The information accumulation was an issue as data was not situated at a single source. The data was kept in unique information design. To achieve the end goal, it requires a clear understanding of the correct location of the data. As we can see the currency exchange bureau Statistics gives detailed information on every single currency exchange rate, which incorporates their current high, current low, current price, current exchange rates at the particular time interval usually months. We consolidated a portion of the information properties with currency exchange bureaus to shape a join data set.

Since the datasets for every year are very massive, we decrease our concentration to one-year, i.e., 2018, which as of now contains 365 days records for

the most significant currencies in the world. In this venture, we have taken 2022 as our preparation set and 2023 as our test set. There are also various factors affecting the exchange rates of the currencies such as inflation, interest rates, government debt/public, potential stability, economic recession, terms of trade, current account deficit, confidence and speculation, government intervention, the stock markets and etc., the datasets are taken based on the above factors that affect the exchange rates.

Regardless of the field of study or preference for defining data (quantitative, qualitative), accurate data collection is essential to maintaining the integrity of research. Both the selection of appropriate data collection instruments (existing, modified, or newly developed) and clearly delineated instructions for their correct use reduce the likelihood of errors occurring. inability to answer research questions accurately, inability to repeat and validate the study, distorted findings resulting in wasted resources, misleading other researchers to pursue fruitless avenues of investigation, compromising decisions for public policy causing harm to human participants and animal subjects

4.2 DATA MINING

In this section, there is an overview of the process of data mining and data modeling, collecting the data, through the data preparation and finally the data modeling. Data cleaning and formatting can be considered as the most critical part of the whole project according to several data scientists. Figure shows how the process of data mining works to extract knowledge using algorithms.

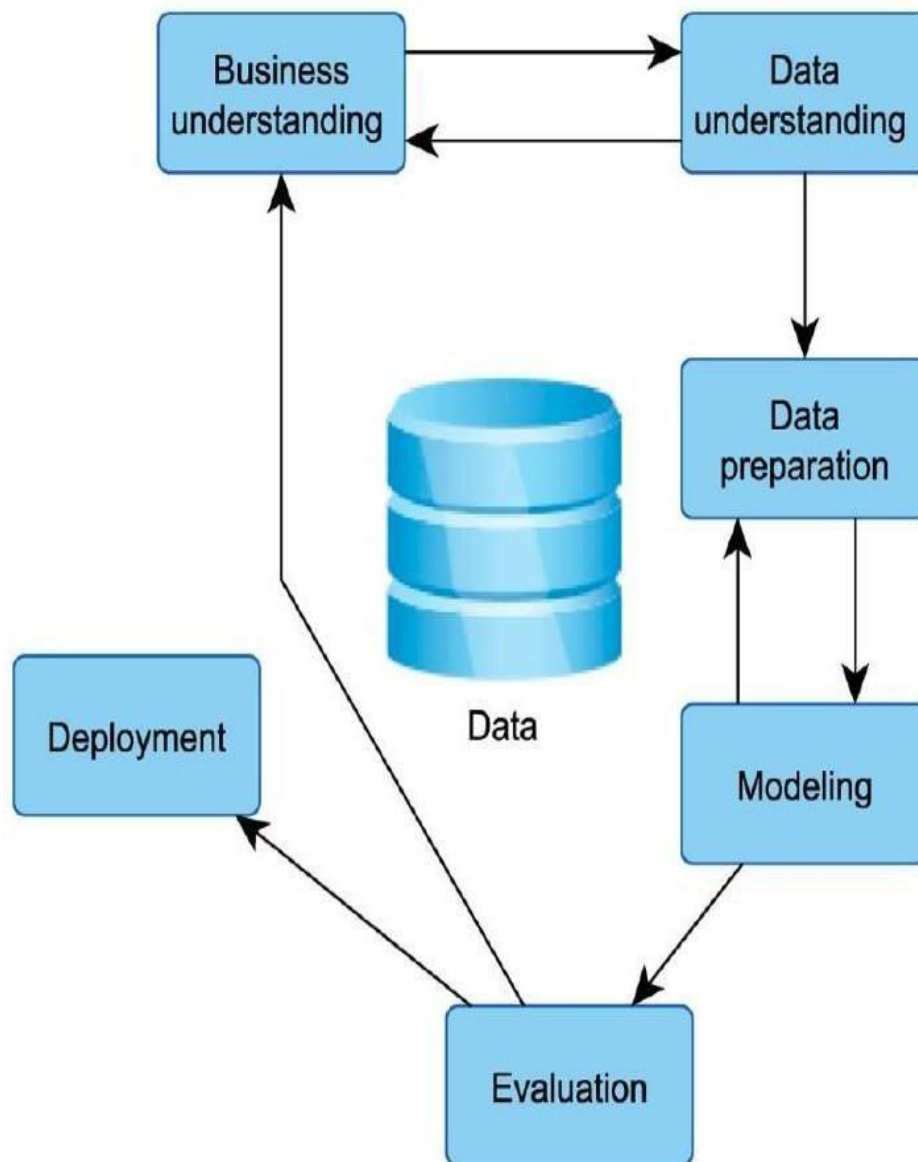


FIGURE 4.1: DATA MINING

4.3 DATA ANALYSIS

The process of data analysis, or alternately, data analysis steps, involves gathering all the information, processing it, exploring the data, and using it to find patterns and other insights. The process of data analysis consists of: Data Requirement Gathering: Ask yourself why you're doing this analysis, what type of data you want to use, and what data you plan to analyze.

Data Collection: Guided by your identified requirements, it's time to collect the data from your sources. Sources include case studies, surveys, interviews, questionnaires, direct observation, and focus groups. Make sure to organize the collected data for analysis. **Data Cleaning:** Not all the data you collect will be useful, so it's time to clean it up. This process is where you remove white spaces, duplicate records, and basic errors. Data cleaning is mandatory before sending the information on for analysis.

Data Analysis: Here is where you use data analysis software and other tools to help you interpret and understand the data and arrive at conclusions. Data analysis tools include Excel, Python, R, Looker, Rapid Miner, Charito, Meta base, Rehash, and Microsoft Power BI. **Data Interpretation:** Now that you have your results, you need to interpret them and come up with the best courses of action based on your findings.

Data Visualization: Data visualization is a fancy way of saying, “graphically show your information in a way that people can read and understand it.” You can use charts, graphs, maps, bullet points, or a host of other methods. Visualization helps you derive valuable insights by helping you compare datasets and observe relationships.

If you want to make informed decisions, you need data, but there's more to it. The data in question must be accurate. Data analysis helps businesses acquire relevant, accurate information, suitable for developing future marketing strategies, business plans, and realigning the company's vision or mission. A simple example of data analysis can be seen whenever we make a decision in our daily lives by evaluating what has happened in the past or what will happen if we make that decision. Basically, this is the process of analyzing the past or future and making a decision based on that analysis.

4.4 TYPES OF DATA ANALYSIS

The four types of data analysis are:

- Descriptive Analysis
- Diagnostic Analysis
- Predictive Analysis
- Prescriptive Analysis

4.4.1. DESCRIPTIVE ANALYSIS

Descriptive analytics answer the question, “What happened?”. This type of analytics is by far the most commonly used by customers, providing reporting and analysis centered on past events. It helps companies understand things such as:

- How much did we sell as a company?
- What was our overall productivity?
- How many customers churned in the last quarter?

Descriptive analytics is used to understand the overall performance at an aggregate level and is by far the easiest place for a company to start as data tends to be readily available to build reports and applications. It’s extremely important to build core competencies first in descriptive analytics before attempting to advance upward in the data analytics maturity model. Core competencies include things such as data modeling fundamentals, communicating data with right visualization and basic dashboard skills.

It’s likely you’ve adopted some form of descriptive analytics internally, whether that be static P&L statements, PDF reports, or reporting within an analytics tool. For a true descriptive analytics program to be implemented, the concepts of repeatability and automation of tasks must be top of mind. Repeatability in that a data process is standardized and can be regularly applied with minimal effort (think a weekly sales report), and automation in that complex task (VLOOKUPS, merging of excel spreadsheets, etc.) are automated—requiring little to no manual intervention.

4.4.2.DIAGNOSTIC ANALYSIS

Diagnostic analytics, just like descriptive analytics, uses historical data to answer a question. But instead of focusing on “what”, diagnostic analytics addresses the critical question of why an occurrence or anomaly occurred within your data. Diagnostic analytics also happens to be the most overlooked and skipped step within the analytics maturity model. Anecdotally, I see most customers attempting to go from “what happened” to “what will happen” without ever taking the time to address the “why did it happen” step. This type of analytics helps companies answer questions such as:

- Why did our company sales decrease in the previous quarter?

- Why are we seeing an increase in customer churn?
- Why is a specific basket of products vastly outperforming their prior year sales figures?

Diagnostic analytics tends to be more accessible and fit a wider range of use cases than machine learning/predictive analytics. You might even find that it solves some business problems you earmarked for predictive analytics use cases. Being at the diagnostic analytics phase likely means you've adopted a modern analytics tool. Most modern analytics tools contain a variety of search-based, or lightweight artificial intelligence capabilities.

These features allow for detailed insights a layer deeper (for example: the Key Drivers visualization in Power BI, or Qlik's search-based insight functionality). To be clear, these are an effective lightweight means to address diagnostic analytics use cases but are not a means to a full-scale implementation. Software vendors like Sisu have built their core business around addressing diagnostic analytics use cases (what they call "augmented analytics") and are a great bet. Diagnostic analytics is an important step in the maturity model that unfortunately tends to get skipped or obscured. If you cannot infer why your sales decreased 20% in 2020, then jumping to predictive analytics and trying to answer "what will happen to sales in 2021" is a stretch in advancing upward in the analytics maturity model.

4.4.3.PREDICTIVE ANALYSIS

Predictive analytics is a form of advanced analytics that determines what is likely to happen based on historical data using machine learning. Historical data that comprises the bulk of descriptive and diagnostic analytics is used as the basis of building predictive analytics models. Predictive analytics helps companies address use cases such as:

- Predicting maintenance issues and part breakdown in machines.
- Determining credit risk and identifying potential fraud.

- Predict and avoid customer churn by identifying signs of customer dissatisfaction.

At the outset of any predictive analytics build, three core elements need to be established:

- Identify a problem to solve,
- Define what is you want to predict, and
- State what you will achieve by doing so.

To start you should collect existing data, organize data in a useful way to allow for data modeling, cleanse your data and review overall quality, and finally determine your modeling objective.

While modeling takes up the spotlight in predictive analytics, data prep is a crucial step that needs to happen first. This is why organizations with a rock-solid foundation in descriptive and diagnostic analytics are better equipped to handle predictive analytics. Simply put, the time and effort to prep, transform, and ensure data quality for retrospective reporting has already taken place. The groundwork should be relatively well laid to quickly identify and leverage data for the modeling phase. I always encourage customers with well-defined KPIs and business logic in a specific business reporting area (think sales reporting for example) to use that as the first predictive analytics use case. The goal is to derive value quickly, and there is no better place to start than an area where you know data is well defined and of high quality.

4.4.4.PRESCRIPTIVE ANALYSIS

Prescriptive analytics is the fourth and final pillar of modern analytics. Prescriptive analytics pertains to true guided analytics where your analytics is prescribing or guiding you toward a specific action to take. It is effectively the merging of descriptive, diagnostic, and predictive analytics to drive decision making. Existing scenarios or conditions (think your current fleet of freight trains) and the ramifications of a decision or occurrence (parts breakdown on the freight trains) are applied to create a guided decision or action for the user to take (proactively buy more parts for preventative maintenance).

Prescriptive analytics requires strong competencies in descriptive, diagnostic, and predictive analytics which is why it tends to be found in highly specialized industries (oil and gas, clinical healthcare, finance, and insurance to name a few) where use cases are well defined. Prescriptive analytics help to address use cases such as:

- Automatic adjustment of product pricing based on anticipated customer demand and external factors.
- Flagging select employees for additional training based on incident reports in the field.

Prescriptive analytics' primary aim is to take the educated guess or assessment out of data analytics and streamline the decision-making process. Prescriptive analytics is commonly considered the merging of descriptive, diagnostic, and predictive analytics. Getting started isn't so much a step-by-step list but rather the time and effort up front to build your competencies within the analytics maturity curve.

Simply put, there is no starting point in prescriptive analytics without the requisite first three pillars of modern analytics being established first. If you're ready for prescriptive analytics, then quantifying your call to action and the underlying criteria will be the first requirement. For example: if the use case is to call corrective action for an employee (i.e. – additional training based on poor performance) then the factors that necessitate this action must be firmly established and the action itself must be clearly defined. Knowing how each kind of analytics helps you better understand your data and how to use it.

4.5 POWER BI

Microsoft Power BI is a business intelligence (BI) platform that provides nontechnical business users with tools for aggregating, analyzing, visualizing and sharing data. Power BI's user interface is fairly intuitive for users familiar with Excel, and its deep integration with other Microsoft products makes it a versatile self-service tool that requires little upfront training.

Users can download an application for Windows 10, called Power BI Desktop, and native mobile apps for Windows, Android and iOS devices. There is also Power BI Report Server for companies that must maintain their data and reports on premises. That version of Power BI requires a special version of the desktop app -- aptly called Power BI Desktop for Power BI Report Server.

4.5.1. USES OF POWER BI

Microsoft Power BI is used to find insights within an organization's data. Power BI can help connect disparate data sets, transform and clean the data into a data model and create charts or graphs to provide visuals of the data. All of this can be shared with other Power BI users within the organization.

The data models created from Power BI can be used in several ways for organizations, including the following:

- telling stories through charts and data visualizations;
- examining "what if" scenarios within the data; and
- creating reports that can answer questions in real time and help with forecasting to make sure departments meet business metrics.

Power BI can also provide executive dashboards for administrators or managers, giving management more insight into how departments are doing.

4.5.2. FEATURES OF POWER BI

Microsoft has added a number of data analytics features to Power BI since its inception and continues to do so. Some of the most important features are the following: Artificial intelligence. Users can access image recognition and text analytics in Power BI, create machine learning models using automated ML capabilities and integrate with Azure Machine Learning.

Hybrid deployment support. This feature provides built-in connectors that allow Power BI tools to connect with a number of different data sources from Microsoft, Salesforce and other vendors.

Quick Insights. This feature allows users to create subsets of data and automatically apply analytics to that information.

Common data model support. Power BI's support for the common data model allows the use of a standardized and extensible collection of data schemas (entities, attributes and relationships).

Cortana integration. This feature, which is especially popular on mobile devices, allows users to verbally query data using natural language and access results using Cortana, Microsoft's digital assistant.

Customization. This feature allows developers to change the appearance of default visualization and reporting tools and import new tools into the platform.

APIs for integration. This feature provides developers with sample code and application program interfaces (APIs) for embedding the Power BI dashboard in other software products.

Self-service data prep. Using Power Query, business analysts can ingest, transform, integrate and enrich big data into the Power BI web service. Ingested data can be shared across multiple Power BI models, reports and dashboards.

Modeling view. This allows users to divide complex data models by subject area into separate diagrams, multiselect objects and set common properties, view and modify properties in the properties pane, and set display folders for simpler consumption of complex data models.

4.6 ARCHITECTURE

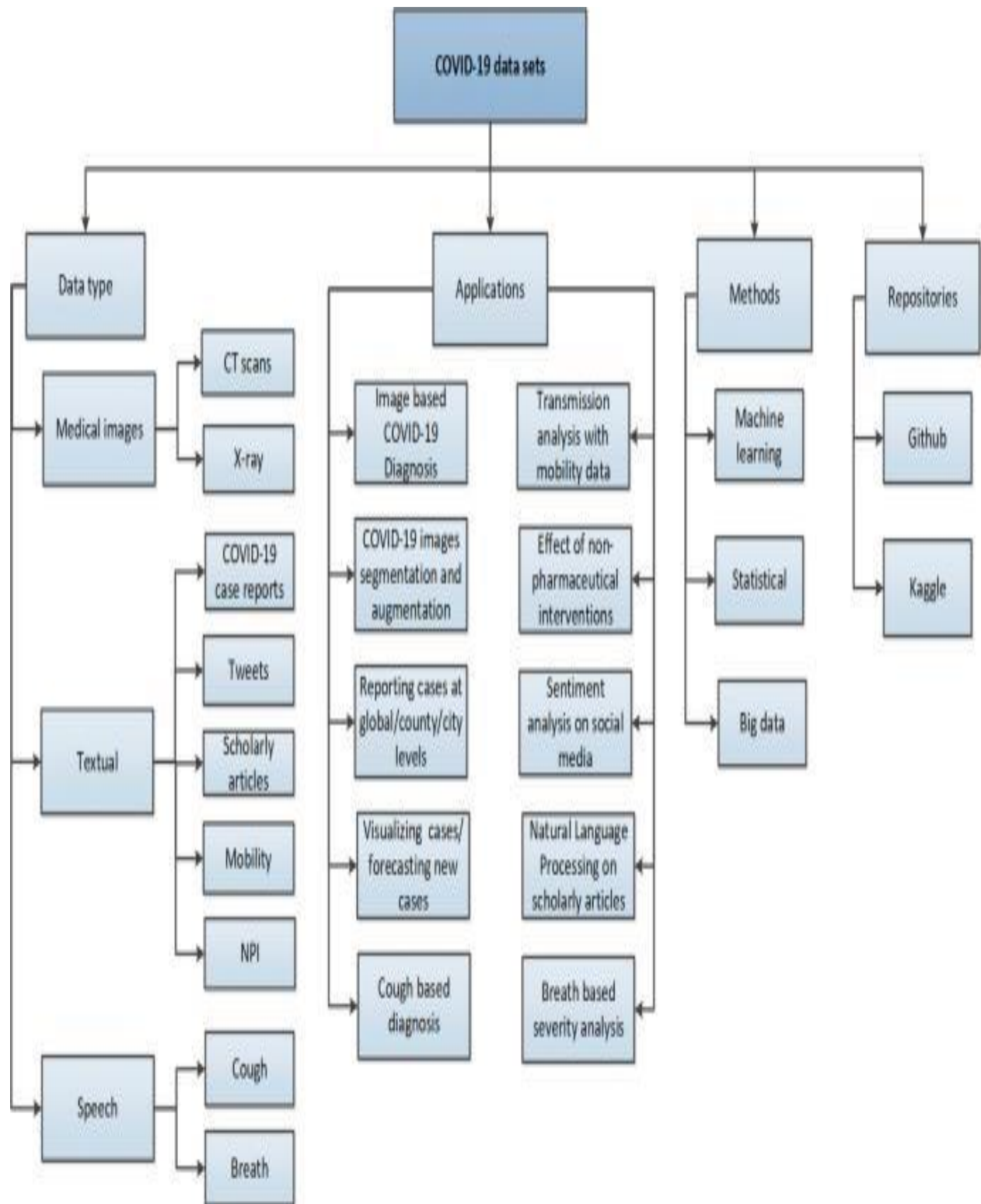


FIGURE 4.2: ARCHITECTURE
4.7 PROJECT IMPLEMENTATION

This change is one of the aspects of project management that had to be adjusted at the onset of the outbreak. More importantly, this aspect of communication is very key, especially during the project execution stage. In this phase of project management, communication is vital since it involves the one-on-one interaction of employees or teams in performing the actual tasks necessary for the project's completion. Communication in a project involves both internal and external communication. Most companies globally were less experienced in remote work. With the government's lockdown measures and social distancing policies, working from home was a revolution for most employees. However, these changes affected some global companies with pre-existing virtual teams less. On the positive side, it was easier to learn remote. There what communication and apply it to ensure the continuity of projects (Golchin & Constantin, 2021). The challenge faced with remote communication was the loss of a face-to-face form of communication. This shift had a huge blow on the creation process of the communication plan dealt with in the project planning stage that was to be utilized throughout the project's life cycle. Virtual communication also led to the loss of some bits of the informal communication structure. These included getting the context and insight on the project achieved in ordinary conversations in the office with the project team. Online communication also demands extra effort and concentration, which results in the project getting exhausted more quickly. In addition, it was challenging to reach a consensus on some aspects of projects and would usually take Longer.

The following diagram shows the datasets taken

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Date	Name	Age	Disease	Gender	TIMING	Doctors Plot	Insured/Notinsured	IP/OP	Cost of Medicine	Critical/Non-critical	Reference/Direct							
1	01-Jan-22	Ravi	15	corona	Male	10AM	10AM-7PM	Yes	IP	145	Non-critical	Reference							
2	02-Jan-22	Nayanthara	17	corona	Female	6PM	8PM-9AM	No	IP	200	Non-critical	Direct							
3	03-Jan-22	Surya	21	corona	Male	4AM	10AM-7PM	Yes	OP	333	Non-critical	Reference							
4	04-Jan-22	Jothika	25	corona	Female	5PM	8PM-9AM	No	OP	130	Non-critical	Reference							
5	05-Jan-22	Vishwa	29	corona	Male	8AM	10AM-7PM	Yes	IP	170	Non-critical	Direct							
6	06-Jan-22	Vasanth	32	corona	Male	7AM	8PM-9AM	No	OP	220	Critical	Reference							
7	07-Jan-22	Meera	37	corona	Female	10PM	10AM-7PM	No	OP	375	Critical	Direct							
8	08-Jan-22	Priya	42	corona	Female	12AM	8PM-9AM	Yes	IP	320	Critical	Direct							
9	09-Jan-22	Hansi	45	corona	Female	4PM	10AM-7PM	Yes	IP	563	Critical	Reference							
10	10-Jan-22	Ramasamy	50	corona	Male	6AM	8PM-9AM	No	OP	600	Critical								

FIGURE 4.3: DATASET 1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	Data reported	Month	Country	WHO region	New cases	Cumulative case	New deaths	Cumulative death									
1	01-01-2021	January	India	SEARO	20035	10286709	256	148994									
2	02-01-2021	January	India	SEARO	19079	10305788	224	149218									
3	03-01-2021	January	India	SEARO	18177	10323965	217	149435									
4	04-01-2021	January	India	SEARO	16504	10340469	214	149649									
5	05-01-2021	January	India	SEARO	16375	10356844	201	149850									
6	06-01-2021	January	India	SEARO	18088	10374932	264	150114									
7	07-01-2021	January	India	SEARO	20346	10395278	222	150336									
8	08-01-2021	January	India	SEARO	18139	10413417	234	150570									
9	09-01-2021	January	India	SEARO	18222	10431639	228	150798									
10	10-01-2021	January	India	SEARO	18645	10450284	201	150999									
11	11-01-2021	January	India	SEARO	16311	10466595	161	151160									
12	12-01-2021	January	India	SEARO	12584	10479179	167	151327									
13	13-01-2021	January	India	SEARO	15968	10495147	202	151529									
14	14-01-2021	January	India	SEARO	16946	10512093	198	151727									
15	15-01-2021	January	India	SEARO	15590	10527683	191	151918									
16	16-01-2021	January	India	SEARO	15158	10542841	175	152093									
17	17-01-2021	January	India	SEARO	15144	10557985	181	152274									
18	18-01-2021	January	India	SEARO	13788	10571773	145	152419									
19	19-01-2021	January	India	SEARO	10064	10581837	137	152556									
20	20-01-2021	January	India	SEARO	13823	10595660	162	152718									
21	21-01-2021	January	India	SEARO	15223	10610883	151	152869									
22	22-01-2021	January	India	SEARO	14545	10625428	163	153032									
23	23-01-2021	January	India	SEARO	14256	10639684	152	153184									
24	24-01-2021	January	India	SEARO	14849	10654533	155	153339									
25	25-01-2021	January	India	SEARO	13303	10667836	131	153470									

FIGURE 4.4. DATASET 2

5 RESULTS AND DISCUSSION

As a first exploratory examination, we consider the watched likelihood of deferral in minutes on the whole dataset. The best path is through a histogram and graphs.

5.1 PREDICTION

Although its primary purpose is data visualization, Power BI contains surprisingly powerful predictive forecasting options, specifically in the area of time series forecasting. Time series forecasting is defined as taking a model that is fit to historical data and using it to predict future observations. That is, predicting what a certain numerical value will be at a specific point in the future.

There are many different statistical models and methods that can be applied in this use case, but with Power BI, the end user doesn't have to worry about the behind-the-scenes math going on. Instead, they can use one of Power BI's preexisting visualization tools to quickly build a forecast model and visualize the results. If you'd like to learn more about the math behind the model, we recommend reading this blog post, which goes into detail on the math behind numerous different types of time series models.

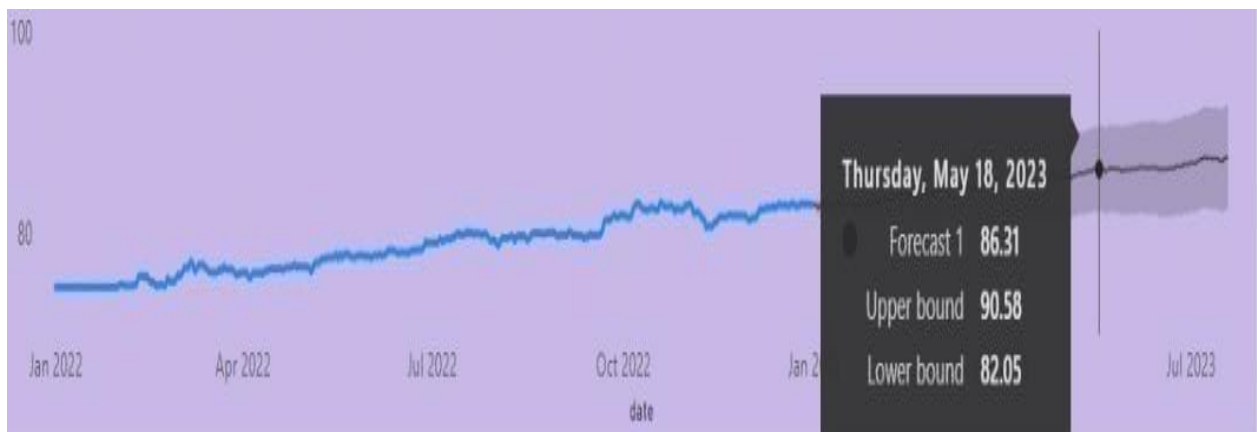


FIGURE 5.1: PREDICTION TABLE

5.2 Q & A:

A report designer can add a specific type of interactive visual called the Q&A visual. Power BI report end users can ask natural language questions and create a new report visual that represents the answer to the question. The Q&A visual behaves

like any other visual in a report. Cross-filter, cross-highlight, bookmarks, and comments are enabled.

Q&A visuals have a question box across the top of the visual. You type your question into the question box and Q&A responds with a visual. The Q&A visual can be used over and over again to ask questions about your data. When you leave the report, the Q&A visual resets to its default.



FIGURE 5.2: Q&A

- Q&A feature lets you explore your data or query your data in your own words
- The smart narrative visualization helps you provide a quick text summary of visuals & reports

The Q&A feature in Power BI lets you explore your data in your own words by using natural language. Q&A is interactive, even fun. Often, one question leads to others as the visualizations reveal interesting paths to pursue. Asking the question is just the beginning.

5.3 SMART NARRATIVE:

The smart narrative visualization helps you provide a quick text summary of visuals and reports. It provides relevant innovative insights that you can customize. Use smart narrative summaries in your reports to address key takeaways, to point out trends, and to edit the language and format for a specific audience

At 1076193394, December had the highest Sum of Cumulative_cases and was 252.12% higher than February, which had the lowest Sum of Cumulative_cases at 305629859.

Sum of Cumulative_cases and total Sum of Cumulative_deaths are positively correlated with each other.

December accounted for 11.71% of Sum of Cumulative_cases.

FIGURE 5.3: SMART NARRATIVE

- Q&A feature lets you explore your data or query your data in your own words
- The smart narrative visualization helps you provide a quick text summary of visuals & reports

You see a narrative that's based on all of the visuals on the page. For example, in the sample file, smart narratives can automatically generate a summary of the report's visuals that address revenue, website visits, and sales. Power BI automatically analyzes trends to show that revenue and visits have both grown. It even calculates growth, which in this case is 72 percent. Sometimes a hidden-summary symbol appears in the smart narrative. It indicates that current data and filters produce no result for the value. A summary is empty when no insights are available.

5.4. SPATIAL ANALYSIS

One of the most important properties of pandemics is their spatial spread, a characteristic which mainly depends on the dynamics of the pandemic, mobility of people and the approach to pandemic control. We can use GIS and spatial statistics to respond to this, and to help mitigate the pandemic through scientific information, find spatial correlations with other variables, and identify transmission dynamics. Medical geography specializes in the application of concepts, methods, and quantitative techniques to address spatial issues in disease and medicine. Within this, health geography focuses geographical concepts and categories on the population and demographic aspects concerning health. Health geography has a predominantly utilitarian perspective and analyses the territory technically, although it incorporates structuralist approaches, such as cultural and sociological vision of social welfare, a sense of 'place' for people, and a critical stance. The COVID-19 pandemic is full of unknowns, and many of them have a spatial dimension that led to understanding the phenomenon as geographical and potentially mappable. COVID-19 is characterized by a long incubation period, high infectivity, and difficulty in detection, which have contributed to the rapid outbreak and development of the epidemic. This situation has led to calls for GIS and big data technology to enable rapid responses and analysis, rapid provision of information on the dynamics of the epidemic and an understanding of the rules of its development to provide timely support for prevention and control decisions and interventions.

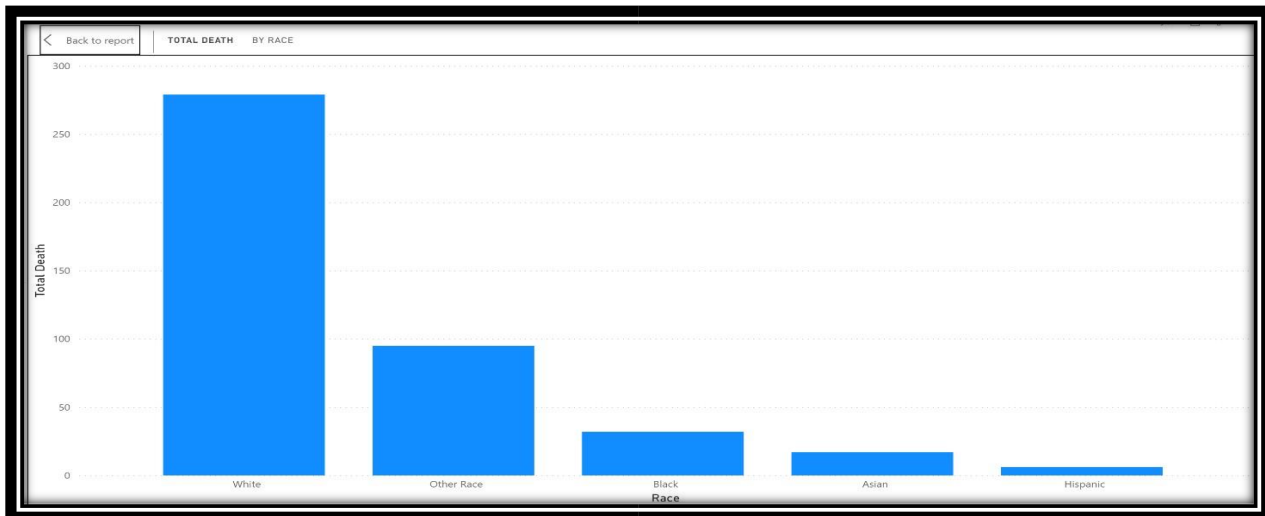


FIGURE 5.4: SPATIAL ANALYSIS

20

5.5. TEMPORAL UNEMPLOYMENTS ANALYSIS

During the lockdown, the Spanish government promoted a temporal unemployment fiscal figure (ERTE) under which companies can temporarily lay off workers. In this period, 70% of the worker's salary is paid by the government, and the company may complement the rest. The purpose of this measure is to maximize the number of workplaces which are restored after the economic lockdown. The success of this measure will have a great impact on the duration of the economic side-effects of the pandemic. We analysed the effect of this measure in Catalonia, one of the most populated Autonomous Communities of Spain. Catalonia includes the city of Barcelona and close to 3.4M workers. Industrial activity represents nearly 21% of the Catalan GDP, while tourism accounts for 12%. We plot the number of temporal unemployment's per day. That is number of affected workers on each day. For context, the Spanish Government announced a state of emergency, and implemented a lockdown for the whole population on March 14th. This lockdown was reinforced on March 29th to total mobility restrictions, with the only exception of essential services.

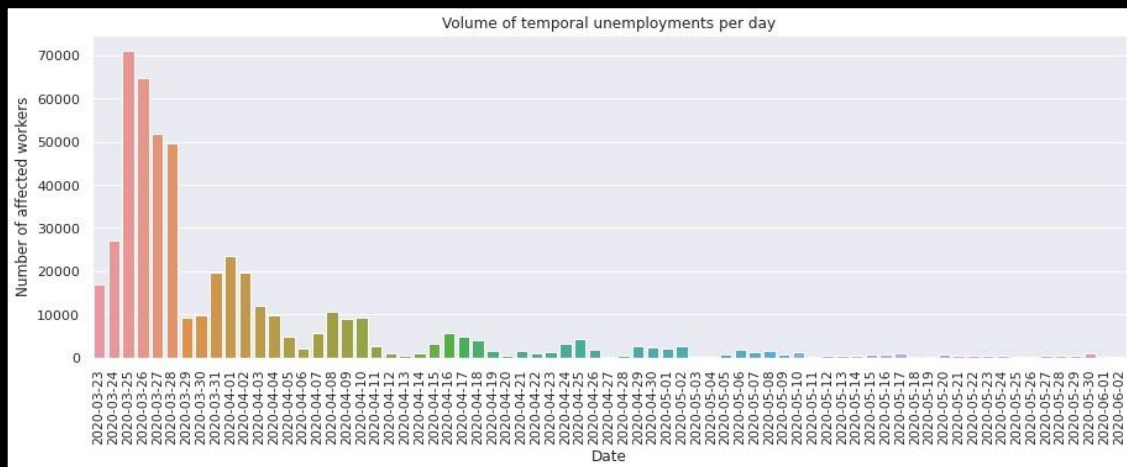


FIGURE 5.5:TEMPORAL UNEMPLOYMENT ANALYSIS

5.6. HOURLY POSTS WITH FACEMASK

We have collected 513,712 posts with #mask and 251,452 posts with #facemask since February 20, 2020. show that the two hashtags have been steadily increasing since around March 11, 2020, a few weeks earlier than some lockdown announcements in Europe and stay-at-home orders in the U.S. People might have considered how to protect themselves amid the pandemic before their governments imposed strict prohibitions on residents. In March 2020, #cough was posted 19,983 times, 4 times more than that in February. The peak was March 15 in the U.S., March 20 in the U.K., March 21 in India. These dates are a few days earlier than the dates of stay-at-home orders in those countries, such as shelter-in-place order at San Francisco on March 16, the announcement of lockdown by the U.K. prime minister on March 23 and the statement of a complete nationwide lockdown by the prime minister in India on March 24. This implies that citizens had started to recognize the symptom a few days before the governments announced official statements. The governments could take their initial response to the pandemic earlier based on the increase in the number of #cough around March 9

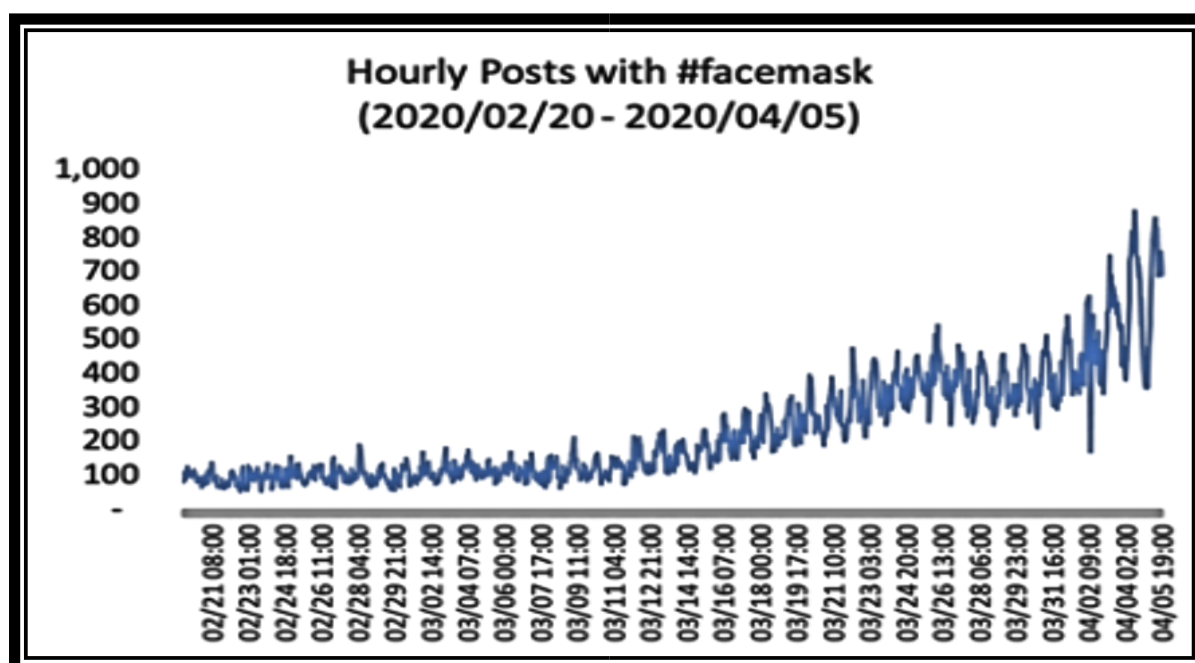


FIGURE 5.6: HOURLY POSTS WITH FACEMASKS

5.7. DAILY MOBILITY ANALYSIS

The change of mobility index by age groups. We observe the largest drop of mobility occurred around March 25th when the media started to discuss potential “capitol lockdown”. When the official state of emergency was declared on April 9th, the mobility had already dropped to less than half of that of the normal time. We also note that the senior groups, who are supposed to be at higher risk, responded to the epidemic initially, but later the younger groups were more willing to stay at home.

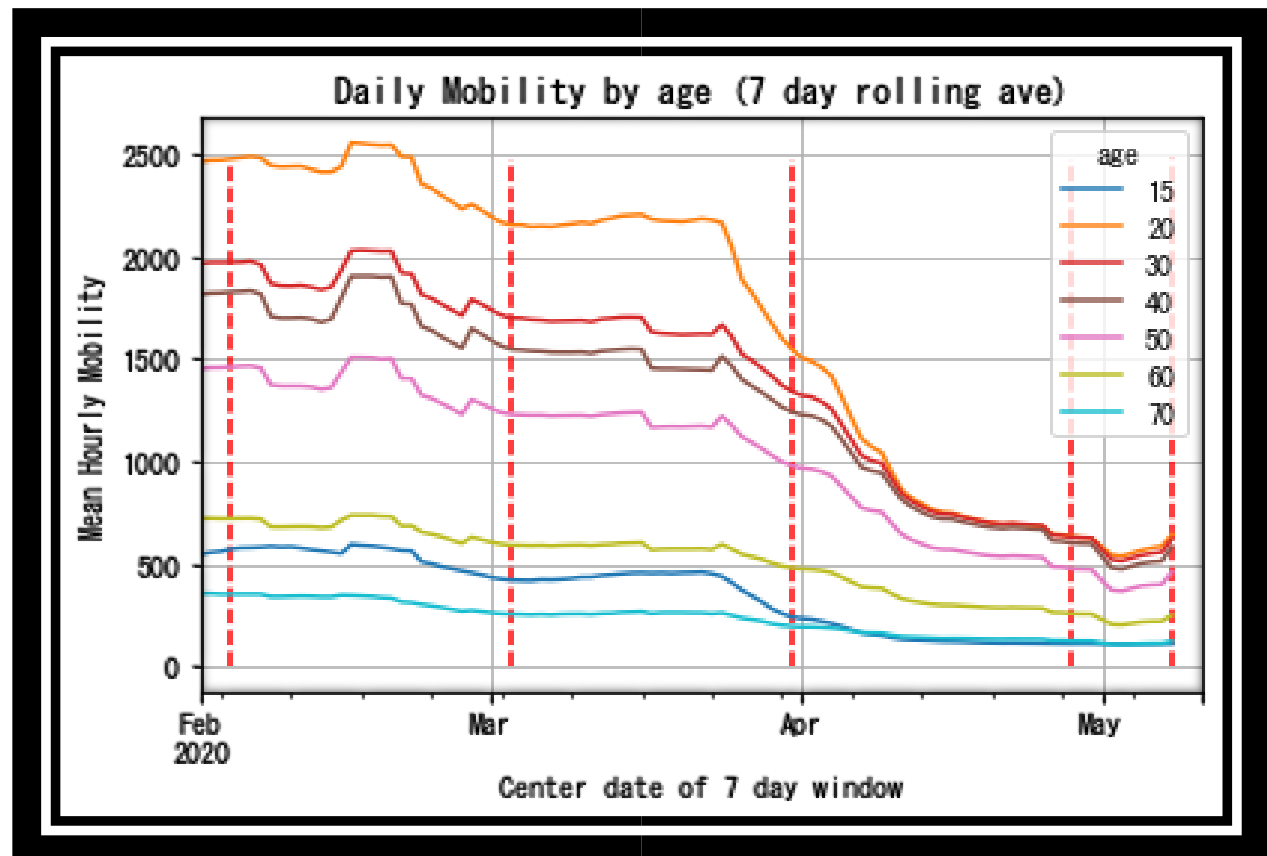


FIGURE.5.7: DAILY MOBILITY ANALYSIS

5.8. OVERALL ANALYSIS

A histogram is created for total number of COVID tests, total positive and total death by month from March 2020 to December 2020. This graph depicts the surge in total tests, total positive cases and total deaths in July and December of 2020. The spike in the number of cases in these months is due to the Independence Day long weekend in July and Holidays in

December. People travelling, gatherings and Holiday season can be the reason for increased cases and deaths.

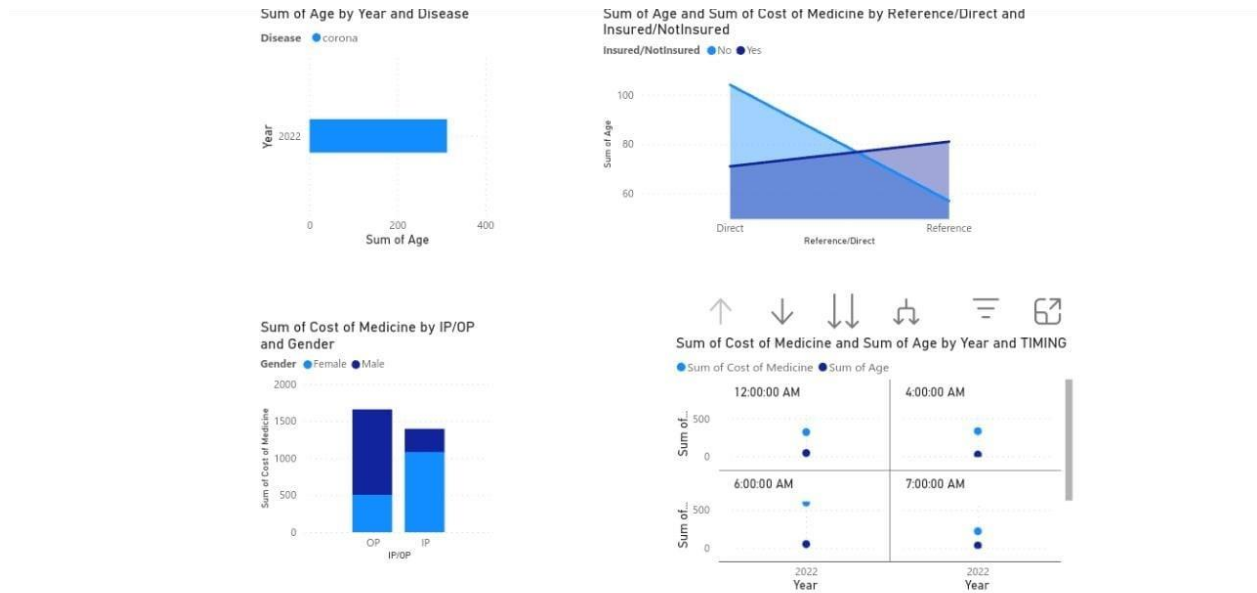


FIGURE.5.8: DAILY OVERALL ANALYSIS



FIGURE.5.9: DAILY OVERALL ANALYSIS

6. CONCLUSION

The Covid - 19 Pandemic is a huge struggle for all of us. The project we are making will seek to find the answers to the most pertinent questions as to what is it that makes the covid 19 such a tragedy and what all people are the ones who are most

affected by it. It will seek to find the appropriate response which can be mounted by the authorities concerned and we can reach to a place of proper discussion about the problem and solve it in the best possible manner out there. It will also lead to a solution to any medical condition we might encounter later on in our lives where we can apply data sciences for medical diagnostics. This project saves on the already limited resources that India has and prevents the spread as people can use it to get an idea that they should go and get tested. It also helps unhealthy and infected people to isolate themselves. Using this system, we can effectively and efficiently mitigate the burden on our healthcare system which is completely stressed out. As the pandemic continues, predictive spatial analytics with ArcGIS tools will continue to play a significant role in monitoring the impact of the virus, from patient outcomes to areas of increased disease spread. The global health crisis has only further highlighted the importance of GIS and spatial analytics in healthcare and could accelerate the use of these tools in standard care going forward. COVID-19 studies with GIS could be valuable tools in decisionmaking and, more importantly, social mobilization and community responses. Understanding the spatial-temporal dynamics of COVID-19 is critical to its mitigation, which is why such work is being done in all regions of the world. The future of increasing use of GIS in health and human services is extremely bright. The increasing focus on electronic health records, and the corresponding geographic information contained within them will open many new possibilities for population health analysis and planning.

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