GOVERNMENT OF INDIA

MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP

DIRECTORATE GENERAL OF TRAINING

NATIONAL SKILL TRAINING INSTITUTE

NSTI (W) , Saltlake , Kolkata -700091

<u>CERTIFICATE</u>

This is to certify that following trainee have completed her project titled

"DATA VISUALIZATION USING

MICROSOFT POWER -BI"

For IBM Program – IT, Networking and Cloud (Technical Diploma)

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We extremely grateful to EDUNET FOUNDATION for their extreme help throughout our project.
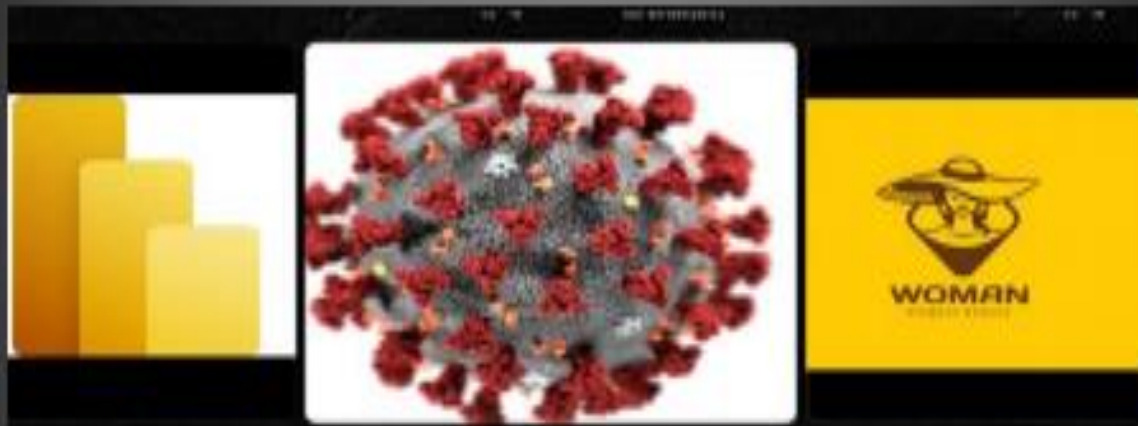
Project Associates:

Soma Santra

Roll No: ADIT-19AU01653

NSTI(W), Saltlake, Kolkata

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CHAPTER 1

INTRODUCTION

1.1 ABSTRACT

The purpose of the project entitled as "PROJECT CREATED ON BASIS OF HOW CORONA VIRUS AFFECTS INDIAN WOMEN IN 2020" is to computerize with the help of Power BI Desktop is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Your data may be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses. Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want. The main function of the project is it shows how much corona impacts on the women in India in different aspects. Example- Death and total cases in corona, effects on the pregnant women, how education got hampered, Women entrepreneur's impacts, etc. In This project workflow in Power BI begins by connecting to data sources in Power BI Desktop and building a report. Then publish that report from Power BI Desktop.

1.2 AIMS AND OBJECTIVES OF THE PROJECT

Our objective of the completion of this Project on "How does corona impact on Women in India during Covid-2020" because Microsoft Power BI (business intelligence) is a powerful analytics tool that helps companies of all sizes analyze data and share insights. With this technology, enterprises can monitor their business more closely and get instant answers with rich dashboards available for every device. And it is necessary to practice and create effective visualization. it is to collect data about the organization from various data sources on corona virus, pregnant woman, women entrepreneurs, etc. and connect them to Power BI Desktop to create some rich reports and after that create dashboards. The purpose of the project is to create and share real time insights of the dataset. so that decision maker will find it easy to understand the status of the situation on the basis of time. Real time Dash boards help management to take accurate decision as and when required. Management / Administration also plan for future initiatives on the present trends.

1.3 CHALLENGES

The challenge of this project is that our team members worked very hard to collect data from different sources for completion of the project, we have used Power BI free version so many options were enabled. Some time we have faced so many technical issues with our devices, but our team members are very supportive and hardworking so we have successful to overcome the problematic situation effectively. Our team spirit is the fuel that allows us to accomplish our project.

1.4 SCOPE OF THE PROJECT

1.Understand Information requirements in BI context and design data models to transform raw data into meaningful insights

2.Create dashboards and interactive visual reports using Power BI.

3. Identify key performance indicators (KPIs) with clear objectives and consistently monitor those, e.g.-Death and total cases by location worldwide in 2020,Effect on pregnant women –month wise and state wise in 2020 in India, How girls and women education is affected in India –state wise in the year 2020,Impact on Women entrepreneurs in 2020 state wise in India., Scenario of health women worker in India month wise and state wise-2020.,How was women mental health status on covid-20 in India month and state wise(top twelve).

4. Convert business requirements into technical specifications and decide timeline to accomplish.

5.Create relationships between data and develop tabular and other multidimensional data models.

6.Design, develop, test, and deploy Power BI scripts and perform detailed analytics.

7.Analyze current ETL process, define and design new systems.

8.Create customize charts and custom calculations as per requirements.

1.5 MODULES:

The entire project mainly consists of 7 modules, which are

❖ Power BI Dashboard.

❖ Death and total cases by location worldwide in 2020,

❖ Effect on pregnant women –month wise and state wise in 2020 in India,

❖ How girls and women education is affected in India –state wise in the year 2020.

❖ Impact on Women entrepreneurs in 2020 state wise in India., Scenario of health women worker in India month wise and state wise-2020

❖ How was women mental health status on covid-20 in India month and state wise (top twelve).

CHAPTER 2

REQUIREMENT SPECIFICATION

2.1 INTRODUCTION:

To be used efficiently, all computer software needs certain hardware components or the other software resources to be present on a computer. These pre-requisites are known as(computer) system requirements and are often used as a guideline as opposed to an absolute rule. Most software defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and resources in newer versions of software, system requirements tend to increase over time. Industry analysts suggest that this trend plays a bigger part in driving upgrades to existing computer systems than technological advancements.

2.2 HARDWARE REQUIREMENTS:

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware. A hardware requirements list is often accompanied by a hardware compatibility list (HCL), especially in case of operating systems. An HCL lists tested, compatibility and sometimes incompatible hardware devices for a particular operating system or application. The following sub-sections discuss the various aspects of hardware requirements.

2.3 SOFTWARE REQUIREMENTS:

Software Requirements deal with defining software resource requirements and pre-requisites that need to be installed on a computer to provide optimal functioning of an application. These requirements or pre-requisites are generally not included in the software installation package and need to be installed separately before the software is installed.

2.4 MINIMUM REQUIREMENTS

Windows 8.1 / Windows Server 2012 R2, or later

.NET 4.6.2 or later

Internet Explorer 11 or later

Memory (RAM): At least 2 GB available, 4 GB or more recommended.

Display: At least 1440x900 or 1600x900 (16:9) required. Lower resolutions such as 1024x768 or 1280x800 aren't supported, as certain controls (such as closing the startup screen) display beyond those resolutions.

Windows display settings: If you set your display settings to change the size of text, apps, and other items to more than 100%, you may not be able to see certain dialogs that you must interact with to continue using Power BI Desktop. If you encounter this issue, check your display settings in Windows by going to Settings > System > Display, and use the slider to return display settings to 100%.

CPU: 1 gigahertz (GHz) 64-bit (x64) processor or better recommended.

PROCESSOR   :   Intel dual Core ,i3

RAM   :   1 GB

HARD DISK   :   80 GB

CHAPTER 3
ANALYSIS

3.1 EXISTING SYSTEM:

Traditional data systems, such as relational databases and data warehouses, have been the primary way businesses and organizations have stored and analyzed their data for the past 30 to 40 years. Although other data stores and technologies exist, the major percentage of business data can be found in these traditional systems. Traditional systems are designed from the ground up to work with data that has primarily been structured data.

3.2 PROPOSED SYSTEM:

Power BI is a cloud-based analysis service that provides rapid insight and is used to extract and visualize data. Power BI brings together data from multiple sources to give you a comprehensive view of your company's information assets.

This means that with Power BI you can see all your data through a single pane of glass and quickly create an analytical environment for monitoring data and sharing reports. Live dashboards and reports show metrics and performance indicators based on data that resides both locally and in the cloud. This gives you a consolidated view of your entire business, regardless of architectural concepts and where you are located.

It will help us to know:

- ✓ An end-to-end view of what is happening.
- ✓ Management of multiple data sources.
- ✓ Provide the right data to the right users at the right time

3.3 FEASIBILITY STUDY

Feasibility Study Power BI is developed by Microsoft in September 2013 and it was first released to the general public on July 24, 2015. Power BI (Business intelligence) is a cloud-based data analysis, from wide range of data sources, which can be used for data analysis and reporting. Power BI is user friendly and simple that power users and business analysts can work with it. Power BI is a powerful tool that can be used by BI developers in enterprise systems for modeling scenarios and complex data mash-up.

3.4 SOFTWARE SPECIFICATION

What is Power BI?

Microsoft Power BI is a data visualization tool that allows you to quickly connect your data, prepare it, and model it as you like. It gives you the power to transform all your data into live interactive visuals, create customized real time business view dashboards, thus extracting business intelligence for enhanced decision making. You can visualize data and share insights. This tool allows you to embed your custom visualizations into your app or website, connect to hundreds of data sources like excel, google analytics, IoT devices for real time data etc. It amalgamates everything conveniently with your existing professional environment allowing

you to acquire analytics and reporting capabilities. You can publish these reports, therefore allowing all the users to avail the latest information.

Get Power BI Desktop:

Supported Operating Systems

• Windows 10, Windows 7, Windows 8, Windows 8.1, Windows Server 2008 R2,

Windows Server 2012, Windows Server 2012 R2

• Microsoft Power BI Desktop requires Internet Explorer 9 or higher

• Microsoft Power BI Desktop is available for 32-bit (x86) and 64-bit (x64)

Platforms.

<u>Benefits</u>

Integrates seamlessly with existing applications.

• Rich personalized dashboards.

• Publish reports securely.

• No memory and speed constraints.

• No specialized technical support required.

• Extracting business intelligence rapidly and accurately.

• Balanced simplicity and performance.

• Supports Advanced Data services

• Uses natural language intuitive data exploration.

Users can select a language in which they want to install Power BI and following files are available for download.
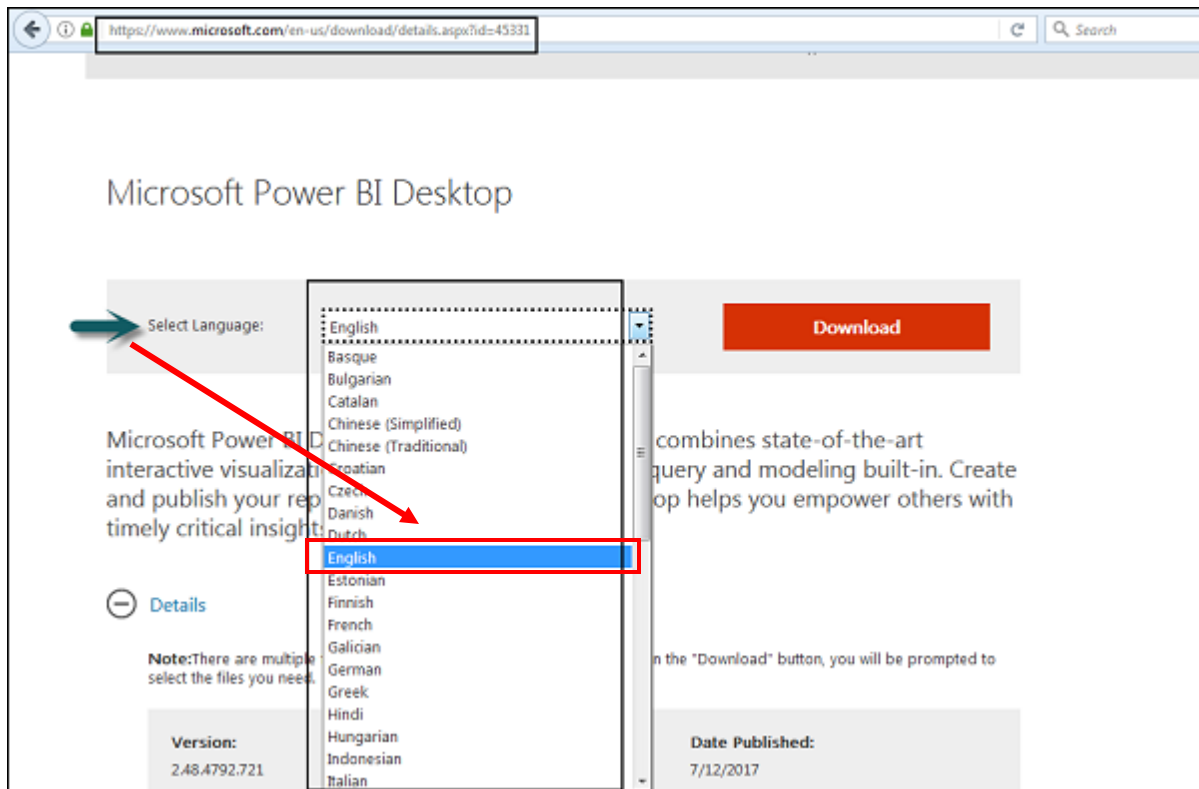
This is the link to directly download Power BI files −

https://www.microsoft.com/en-us/download/details.aspx?id=45331

Version:	Date Published:
2.48.4792.721	7/12/2017
File Name:	**File Size:**
PBIDesktop.msi	136.6 MB
PBIDesktop_x64.msi	155.4 MB
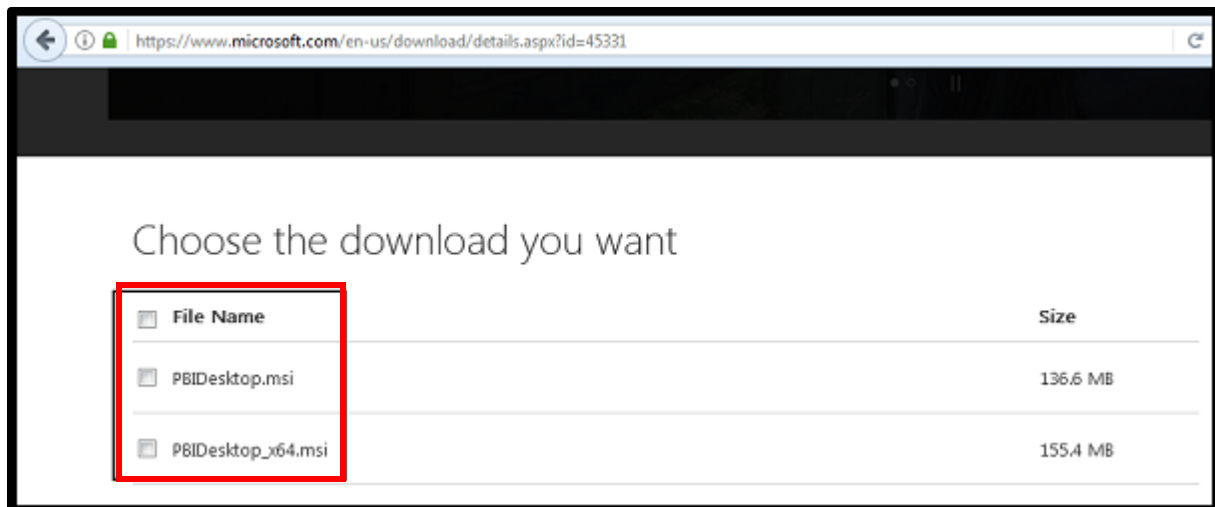
PBIDesktop_x64.msi shows a 64-bit OS file. Select the file you want to install as per OS type and click Next. Save the installation file on the local drive.
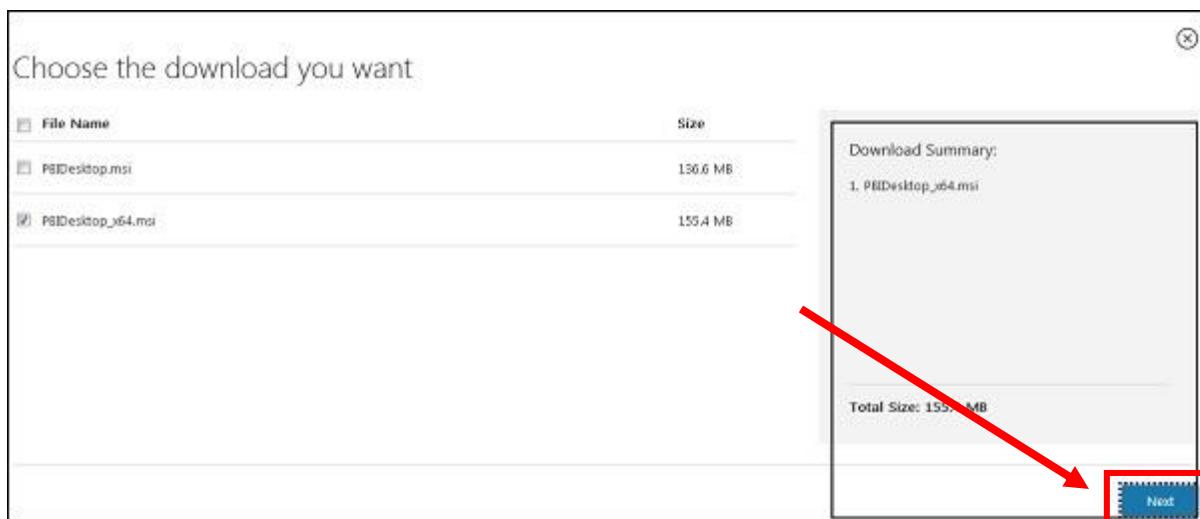
When you run the installation file, following screen is displayed.
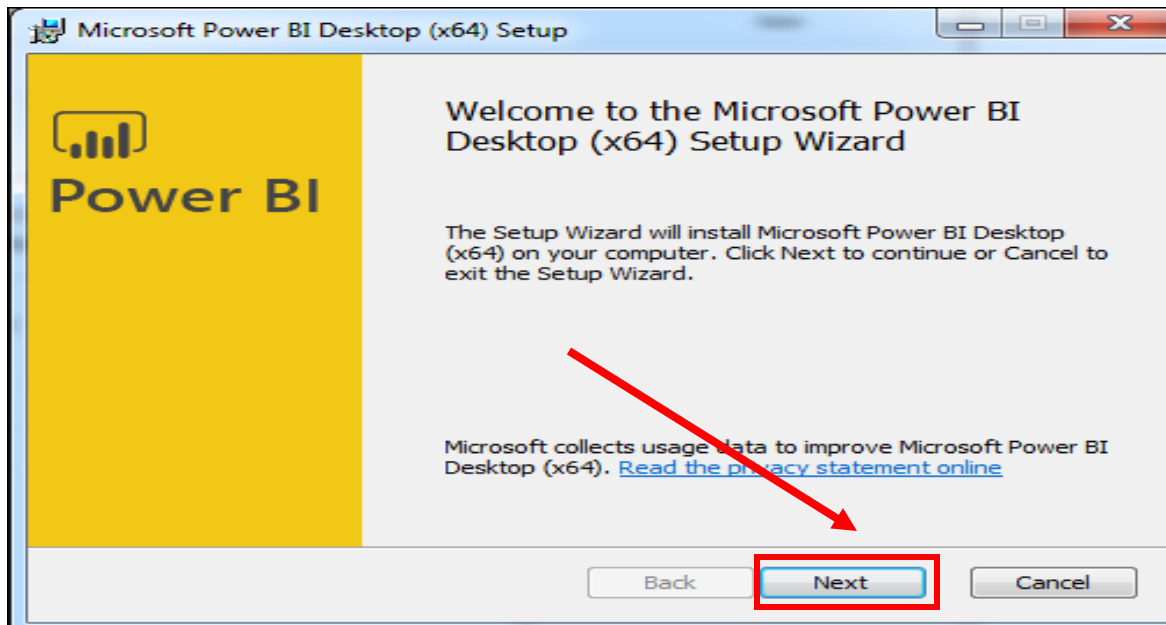
Accept the license agreement and follow the instructions on the screen to finish the installation.
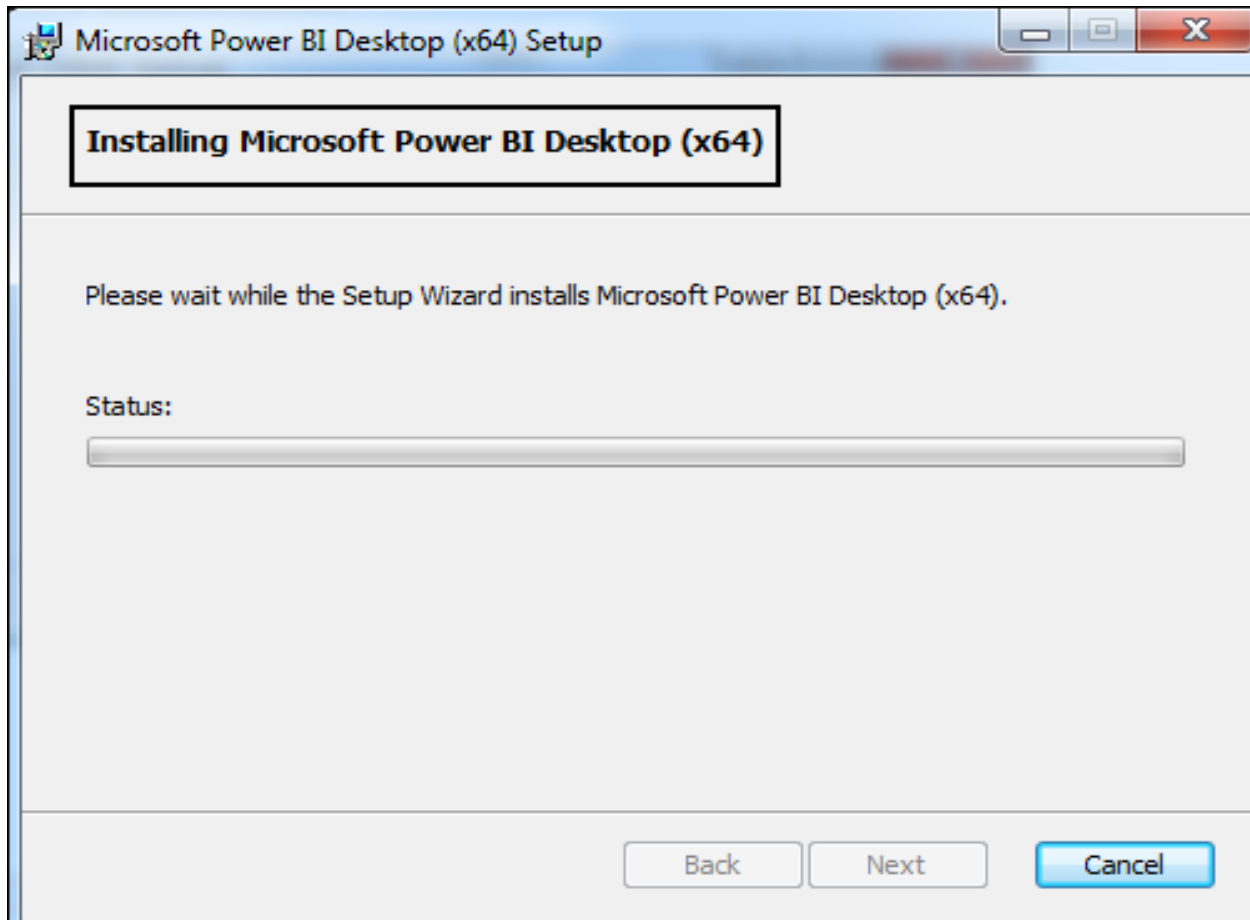
When Power BI is installed, it launches a welcome screen. This screen is used to launch different options related to get data, enrich the existing data models, create reports as well as publish and share reports.

POWER BI WELCOME SCREEN

Power BI- The Key Features:

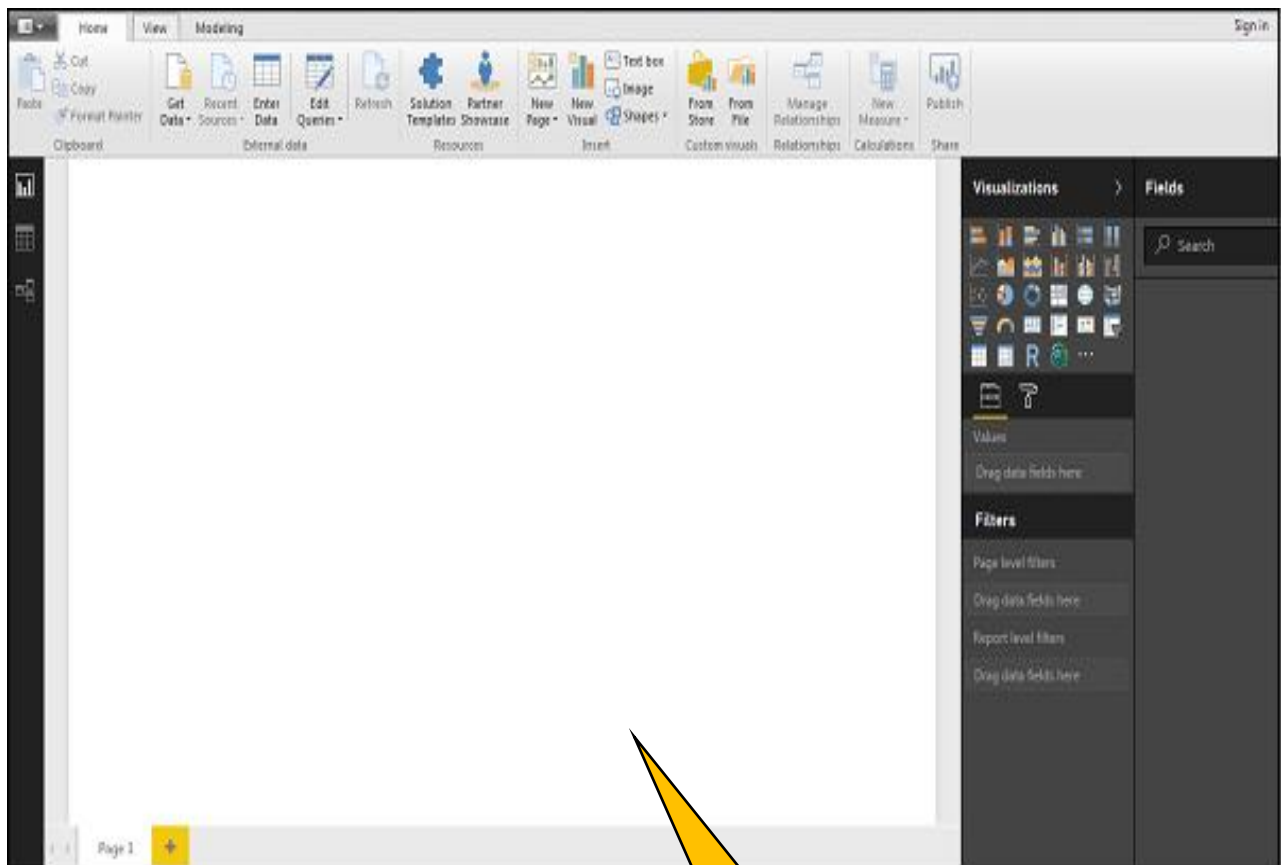**1.Interactive Power BI desktop:** This interactive Power BI desktop tool allows you to build reports by accessing the data quickly. One doesn't need to have advanced skills to create a report with this powerful tool, it is quick and easy to learn to use. Also, the best thing about his tool is that it is free to download tool, allowing you to create reports without possessing any technical knowledge.

2. Customized Visualization: Every organization functions differently, and they have their own way of getting things done. There are times when the right way to go is the standard way. Well, the same applies in the case of visualization. The Power Bi tool has a default standard, which sometimes is not sufficient for the organizations due to complex data. Under such circumstances, organizations can easily access the custom library of visualization and design yourself a visualization that serves your needs well

3. Visibility: The center of all businesses is data, and the main challenge that organizations face today is manipulating the data with other datasets to derive useful information. Well, an effective way to do that is by collecting various datasets and organizing them visually for the purpose of better understanding. This form helps in delivering a deeper Power BI- The Key Features, understanding of the data using which organizations can enjoy a competitive advantage over their competitors. So these were a few features of Power BI. Now, let's move forward and have a look at what empowers the Power BI to deliver actionable insights. When it comes to Power BI, it is one tool that allows the process of data analysis to be quick, agile, and user-generated. It not only simplifies the task of data collaboration, analysis, and sharing but also makes takes the same to the next level. Here is a list of top three components that empower the performance of the BI solution at every step of the analysis.

Power BI- Top Three Components

1. Power Pivot: This component imports and integrates different datasets from different sources to develop in-memory data models. Such integration makes it easy for any functional user to improve the overall value by combining various data sources. The most classic examples of such integrations are when corporate sales/demographic/weather data is analyzed by using the tool Power BI. This component also supports complex calculations, key performance, and indicators, which can further be used by data analysts for prototyping and doing analysis of different business situations.

 2. Power Query: Power BI- Top Three Components This component searches for data in various corporate data sources or online, and the picked dataset is then seamlessly imported into an Excel table, which serves to be a game-changing feature for many analysts. The native data connectivity feature offered by this component enables quicker and simpler access to the data. Power query does the tasks like renaming a column, replacing the values, merging the data, and other critical data modifications. This component is a big deal since it allows data cleansing and shaping hassle-free.

3. Power View: When it comes to visualizing the data and making it even more interactive, Power View is the go-to component. It is supposed to cross-filter and highlight the data. Working with the data in the Power view component feels almost the same as working with Excel and PowerPoint tools. Apart from the graphs, tabular data, and charts, Power view supports different maps that have zoom and pan capabilities.

Power BI- Revolutionizing Business Intelligence Landscape

If a business fails to deliver critical insights, it will lose the competitive edge and start to experience sales at a slower pace. And when it is about the most actionable business insight, there is nothing better than Power BI. Power BI- Revolutionizing Business Intelligence Landscape: This tool holds the power to change big data into visualizations and reports that are easy to understand. Now, the following are how Power BI has revolutionized the world of business intelligence

1.Robust Security: To set up access to the control panel, Power BI uses Active Directory, and it is only through this panel that the organization will use different Microsoft solutions. Well, besides creating a traditional security layer, the Power BI is designed for developing security that allows the team to grant access in a very controlled manner.

2. Organized and Accessible Data: Power BI was engineered to integrate a variety of Microsoft Tech, such as SharePoint and SQL databases. Currently, it is even taking data from non-Microsoft resources. Power BI can easily connect and integrate big data, streaming data, onpremise data sources, excel spreadsheets, and cloud data. So, it does not matter where the data is lying down; Power BI can merge and analyze it from any source as it is known to connect hundreds of sources of data seamlessly.

3. Easy Implementation Process: The process of implementing Power BI across an organization is pretty easy as it calls for very few IT resources and engineering abilities. In fact, there are a few instances when it doesn't even require any technical knowledge on part of the end-users. All those managers have to do is develop an API key and plug the same inside the software. Using Power BI is even more straightforward for an enterprise using Microsoft systems such as Office 365 since BI solutions easily integrate with Office 365 and other Microsoft systems

Power BI – Architecture

Power BI includes the following components −

Power BI Desktop − This is used to create reports and data visualizations on the dataset.

Power BI Gateway − You can use Power BI on-premises gateway to keep your data fresh by connecting to your on-premises data sources without the need to move the data. It allows you to query large datasets and benefit from the existing investments.

Power BI Mobile Apps − Using Power BI mobile apps, you can stay connected to their data from anywhere. Power BI apps are available for Windows, iOS, and Android platform.

Power BI Service − This is a cloud service and is used to publish Power BI reports and data visualizations.

Working of Power BI Architecture

Legend:
- Direct Query Data Connection
- Refreshed Data Connection
- Data Connection
- WorkFlow

Authenticated Users:
1. Excel
2. 3rd Party Tools
3. iOS, Android Windows Apps
4. Web Browser

Power BI
- Dashboards
- Reports
- Datasetes
- Dataflows
- Premium
- Embedded

Embed Teams
Custom Apps etc.

SharePoint Online

In The Cloud

One Drive | WWW | Azure

On Premises

Data Gateway

Databases | Sql Server Analysis Services | Sharepoint Lists

CHAPTER 4

DESIGN OF THE PROJECT

4.1 SYSTEM DESIGN:

4.1.1 INTRODUCTION TO UML:

UML Design

The Unified Modeling Language (UML) is a standard language for specifying, visualizing, constructing, and documenting the software system and its components. It is a graphical language, which provides a vocabulary and set of semantics and rules. The UML focuses on the conceptual and physical representation of the system. It captures the decisions and understandings about systems that must be constructed. It is used to understand, design, configure, maintain, and control information about the systems.

The UML is a language for:
- Visualizing
- Specifying
- Constructing
- Documenting

Visualizing

Through UML we see or visualize an existing system and ultimately, we visualize how the system is going to be after implementation. Unless we think, we cannot implement. UML helps to visualize, how the components of the system communicate and interact with each other.

Specifying

Specifying means building, models that are precise, unambiguous and complete UML addresses the specification of all the important analysis design, implementation decisions that must be made in developing and deploying a software system.

Constructing

UML models can be directly connected to a variety of programming language through mapping a model from UML to a programming language like JAVA or C++ or VB. Forward Engineering and Reverse Engineering is possible through UML.

Documenting

The Deliverables of a project apart from coding are some Artifacts, which are critical in controlling, measuring and communicating about a system during its developing requirements, architecture, desire, source code, project plans, tests, prototypes releasers, etc...

4.2 UML Approach

UML Diagram

A diagram is the graphical presentation of a set of elements, most often rendered as a connected graph of vertices and arcs. you draw diagram to visualize a system from different perspective, so a diagram is a projection into a system. For all but most trivial systems, a diagram represents an elided view of the elements that make up a system. The same element may appear in all diagrams, only a few diagrams, or in no diagrams at all. In theory, a diagram may contain any combination of things and relationships. In practice, however, a small number of common combinations arise, which are consistent with the five most useful views that comprise the architecture of a software-intensive system. For this reason, the UML includes nine such diagrams:

1. Class diagram
2. Use case diagram
3. Deployment diagram

USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases.

Use case diagrams are formally included in two modeling languages defined by the OMG: the unified modeling language (UML) and the systems modeling language(sysML)
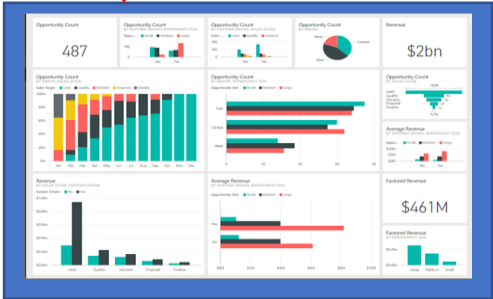
Use case diagram of our project:

User

Creating report for data visualizations
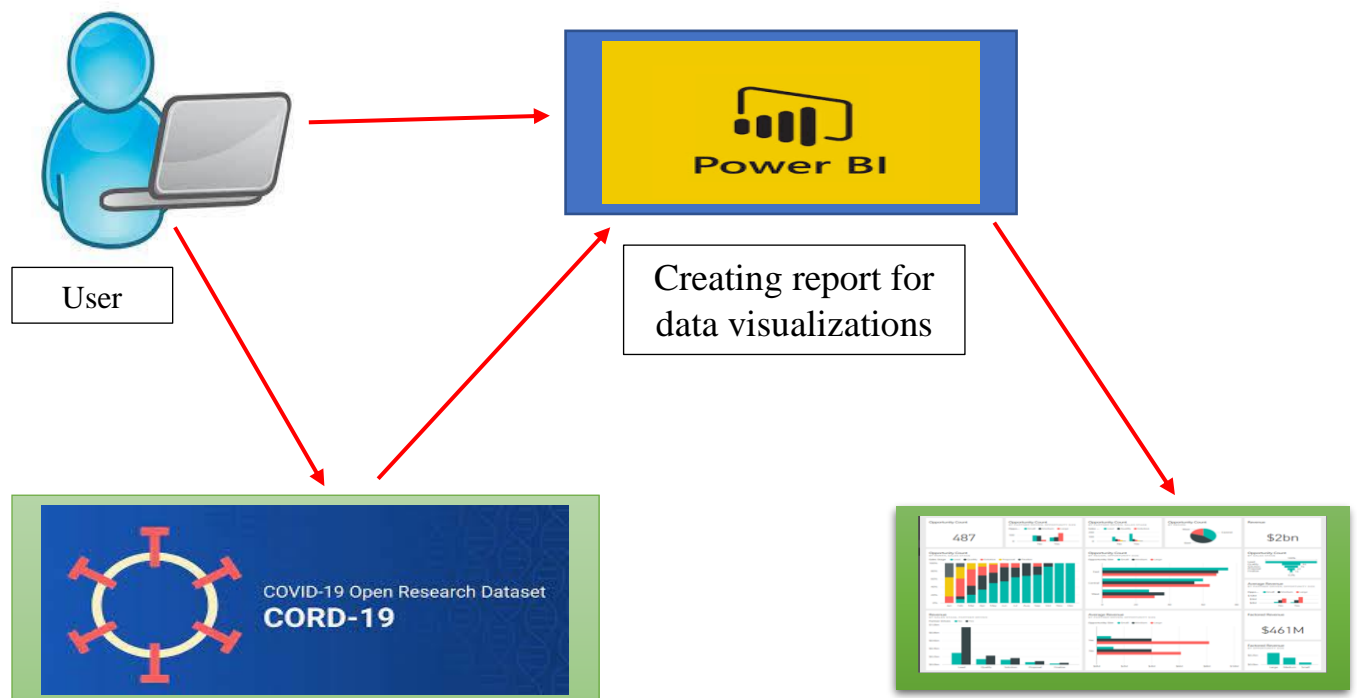
Open-source data

Using Power BI Desktop for Report Sharing

ER Diagram

Death and total case worldwide.

Effects on pregnant woman

Impact on Women entrepreneurs

**How girls and women education is affected in India**

How was women mental health status on covid-20

Scenario of health women worker

Deployment diagram:

A **Deployment Diagram** shows the configuration of run-time processing nodes and the components that live on them. Deployment diagrams address the static deployment view of architecture. They are related to component diagrams in that a node typically encloses one or more components.

Deployment diagram of the project

Printer

DATABASE

Dashboard
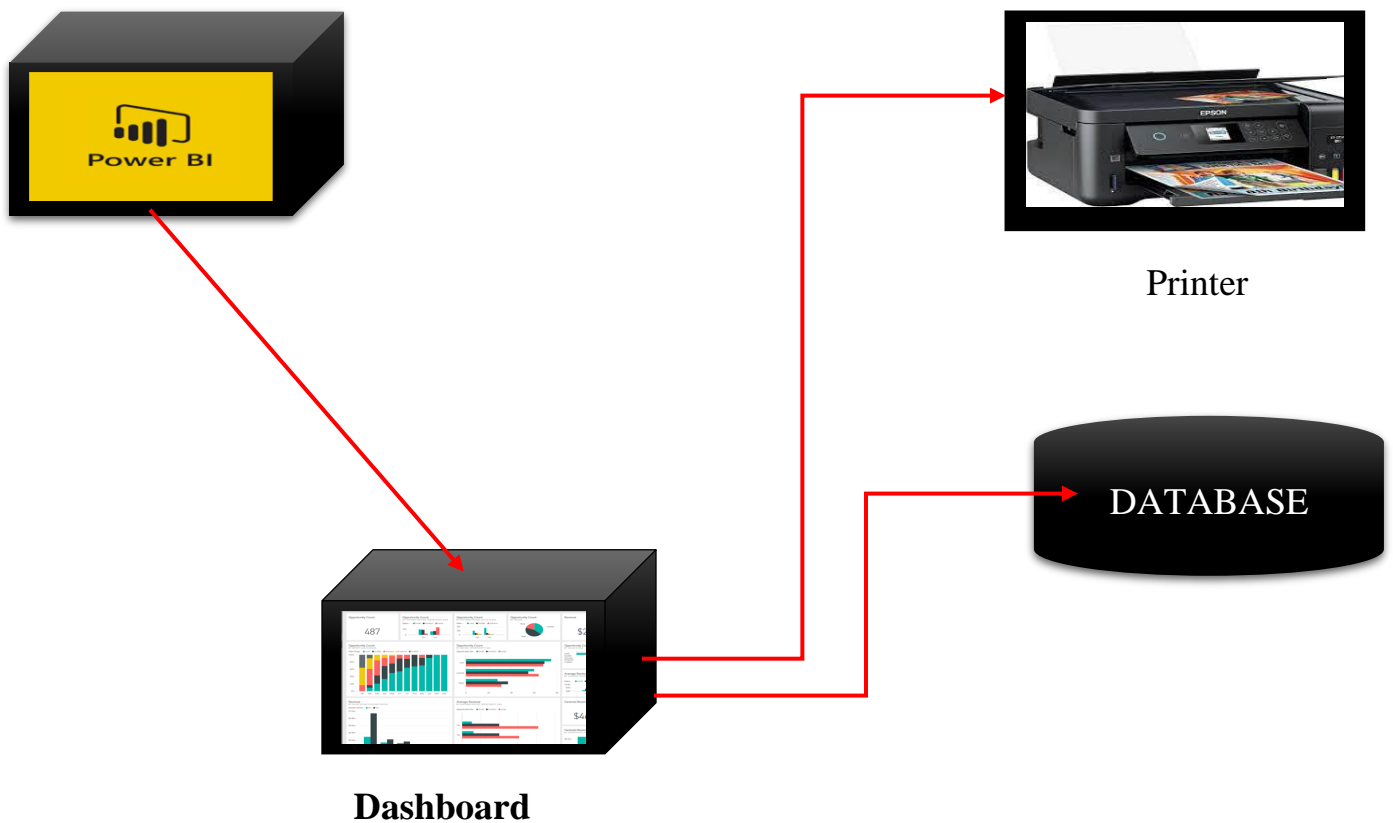
CHAPTER 5

SYSTEM IMPLEMENTATION

5. IMPLEMENTATION:

5.1 Introduction:

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus, it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective.

The implementation stage involves careful planning, investigation of the existing system and its constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods.

5.2 What is Data Visualization?

With the technological revolution, data went from expensive, difficult to find and collect to abundant, cheap, but incomprehensible. It is arduous to store, understand and analyze increasingly larger volumes of data with traditional software's. However, as individuals or an organization, all of this data is only as good as what we can make out of it. This is where Big data comes into play. Big data is used for predictive analytics, analyzing user behavior or other data analytics processes to bring value to data. Yet, the raw details about this can remain uncertain due to lack of knowledge. Data Visualization helps tackle this issue. Data Visualization is the process of transforming data into charts, images, graphs and even videos that explain the numbers and allow us to gain insights from it. Technology used: Power BI Desktop version is used on windows 10 platform to create real time reports and efficient dashboards after connecting the data form excel to Power BI.

5.3 How to visualize data using Power BI?

create a web-based data science model in our project we collect our necessary data from different data sources e.g., Kaggle, GitHub.etc.

CHAPTER 6

PROJECT REPORT WITH SCREENSHOTS

REPORT CREATED WITH DESCRIPTION WITH POWER BI ON THE DATASET OF HOW COVID 2020 IMPACTS ON WOMEN IN INDIA:

Important KPI on which reports are made:

1. Total % of death and total cases by location worldwide in 2020.

2. %of pregnant women –month wise and state wise in 2020 in India

3. Total % of girl's education rates in India –state wise in the year 2020.

4. % of Women entrepreneurs in 2020 month wise in India.

5. % of health women workers in India month wise and state wise-2020.

6. % of women mental health data during covid-19 in India month and state wise (top twelve)

VISUAL REPRESENTATION OF THE ABOVE KPIS IS GIVEN BELOW WITH DESCRIPTION

**Dash board created with power-Bi on the dataset of covid-19 impacts on Indian women:**

This is a power BI dashboard, containing a single page, it is also known as canvas, we are using this canvas to present our project most important elements. This dashboard is as an entryway into the underlying reports and datasets. Selecting a visualization takes you to the report that was used to create it.

# DEATH AND TOTAL CASES BY LOCATION WORLDWIDE IN 2020

As per the map the US, India and Brazil have seen the highest number of confirmed cases, followed by the UK, Russia and a number of European countries. 107,826,873cases2,369,734 deaths. (Red circle are represent the highly effected area.

Total deaths location
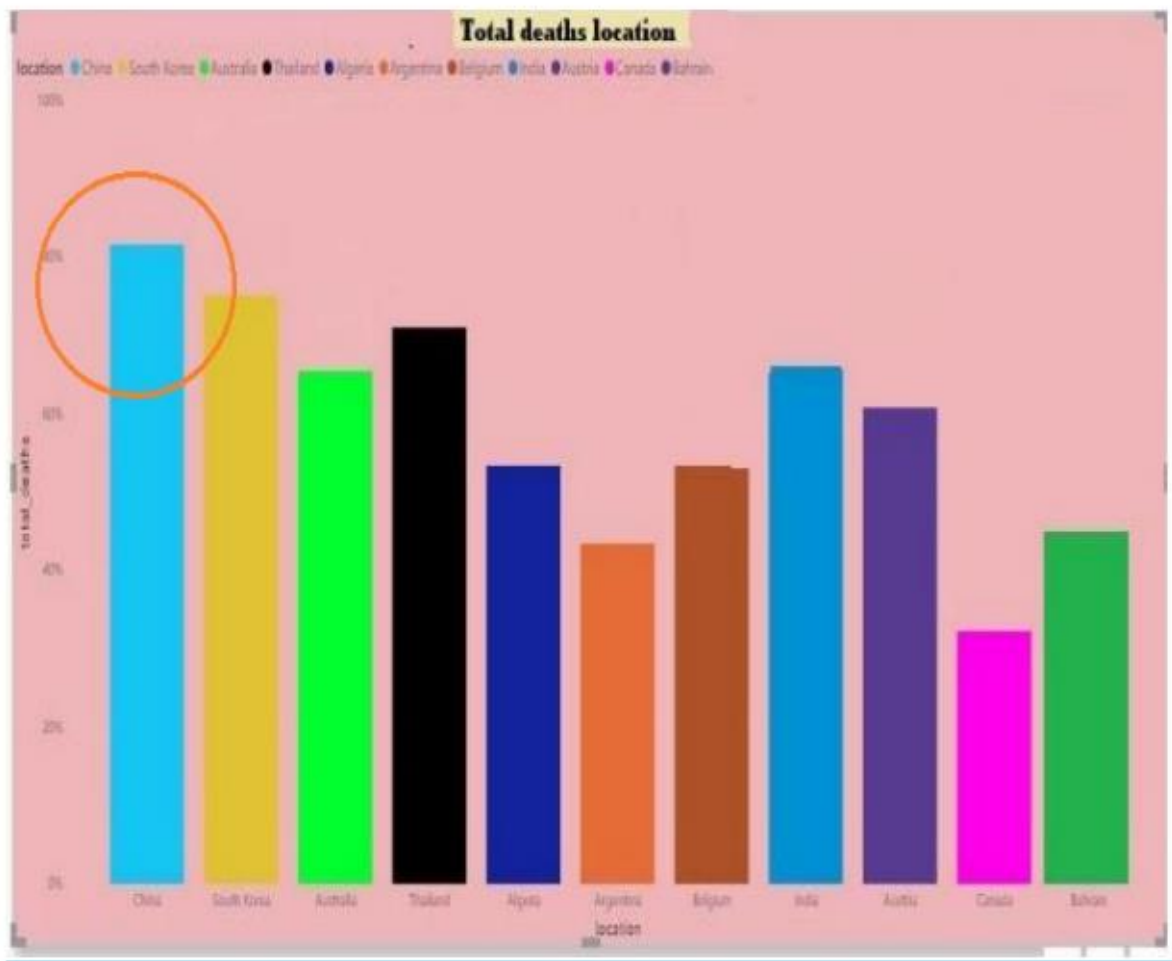
According to this graph different color of column representing different countries. with the graph we can see that China is highly affected by the corona virus. However, INDIA also not in good position. As per the data set and the graph India's total confirmed cases 10,880,603 and total death is155, 447 and death rate is 11.5(100,000 people)

Effect on pregnant women –month wise and state wise in 2020 in India
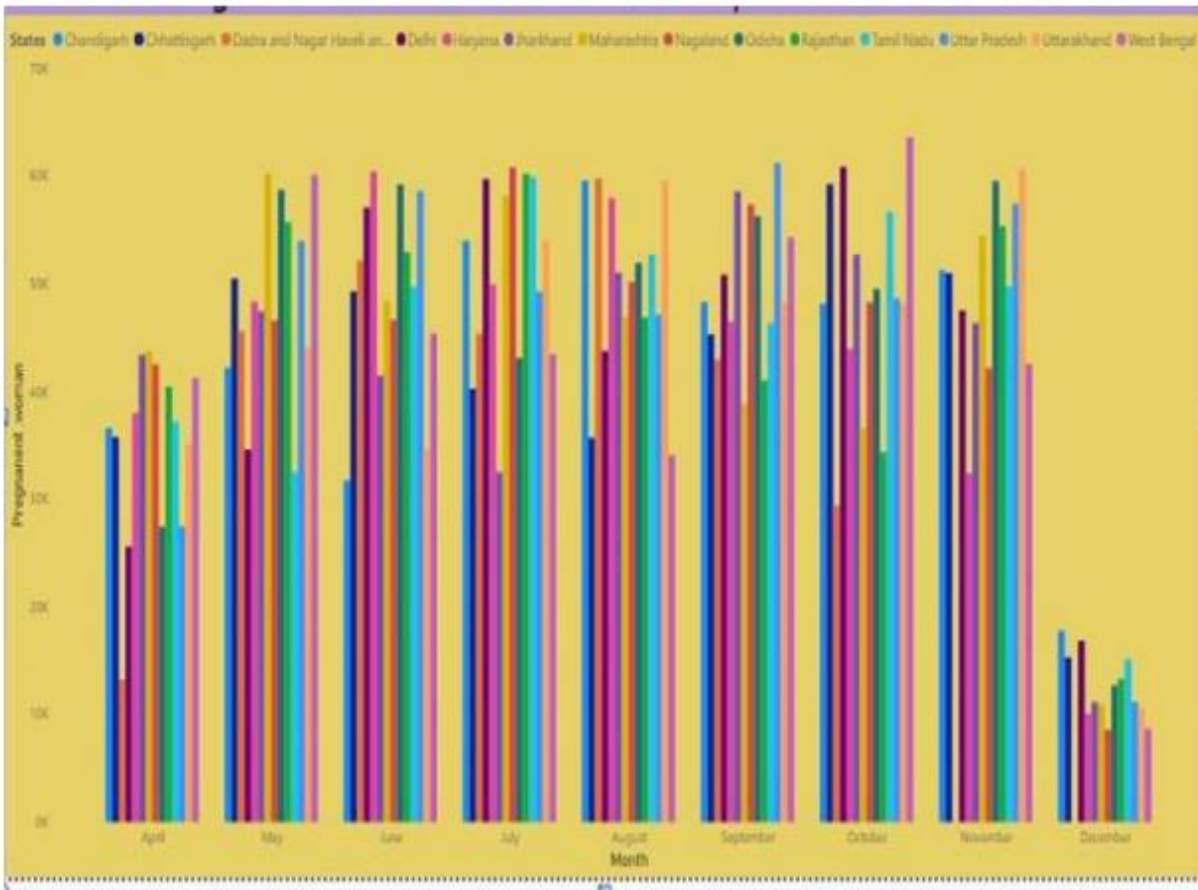
According to the graph gradually pregnant women numbers has increased from April to December 2020 in corona period. in the month of October west Bengal pregnant women rate was very high it was around 63,658 and in the month of December 2020 Nagaland holding the lowest number of pregnant women around 8563

How girls and women education is affected in India –state wise in the year 2020

This Area chart shows information about girls and women's education status in the year 2020 state wise in India. As per the data women literacy rate was high in Himachal Pradesh around 8.67 % in Ladakh around 5.56 %, Delhi-8.04, Goa-7.81%, west Bengal-8.20, Maharashtra8.19, Kerla-8.29, Bihar-8.43

Impact on Women entrepreneurs in 2020 state wise in India.
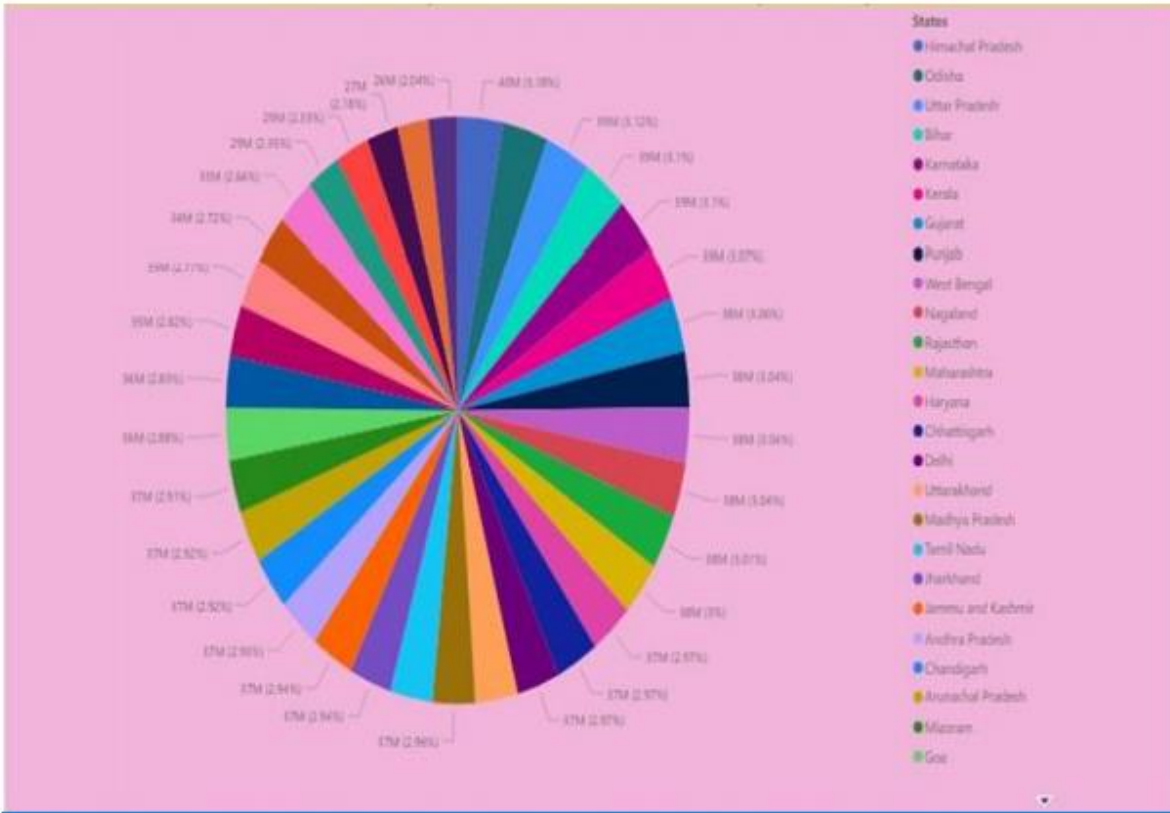
This pie chart we have created by using power bI and through this chart in the year of 2020 how much corona impacts on women entrepreneurs in India. Asper the graph Himachal Pradesh's women entrepreneurs around 3.18% whereas Odisha 3.15%, Ladakh standing with 2.04%, Telangana with 2.18%., Chandigarh with 2.92%, Delhi-2.97%, Mdhyapradesh-2.96%West Bengal-3.04%, Assam-2.77%, Tamilnadu-2.96%, Rajasthan3.01%, Chattisgadh-2.97, Meghalaya-2.35, Bihar -3.10

Scenario of health women worker in India month wise and state wise-2020.
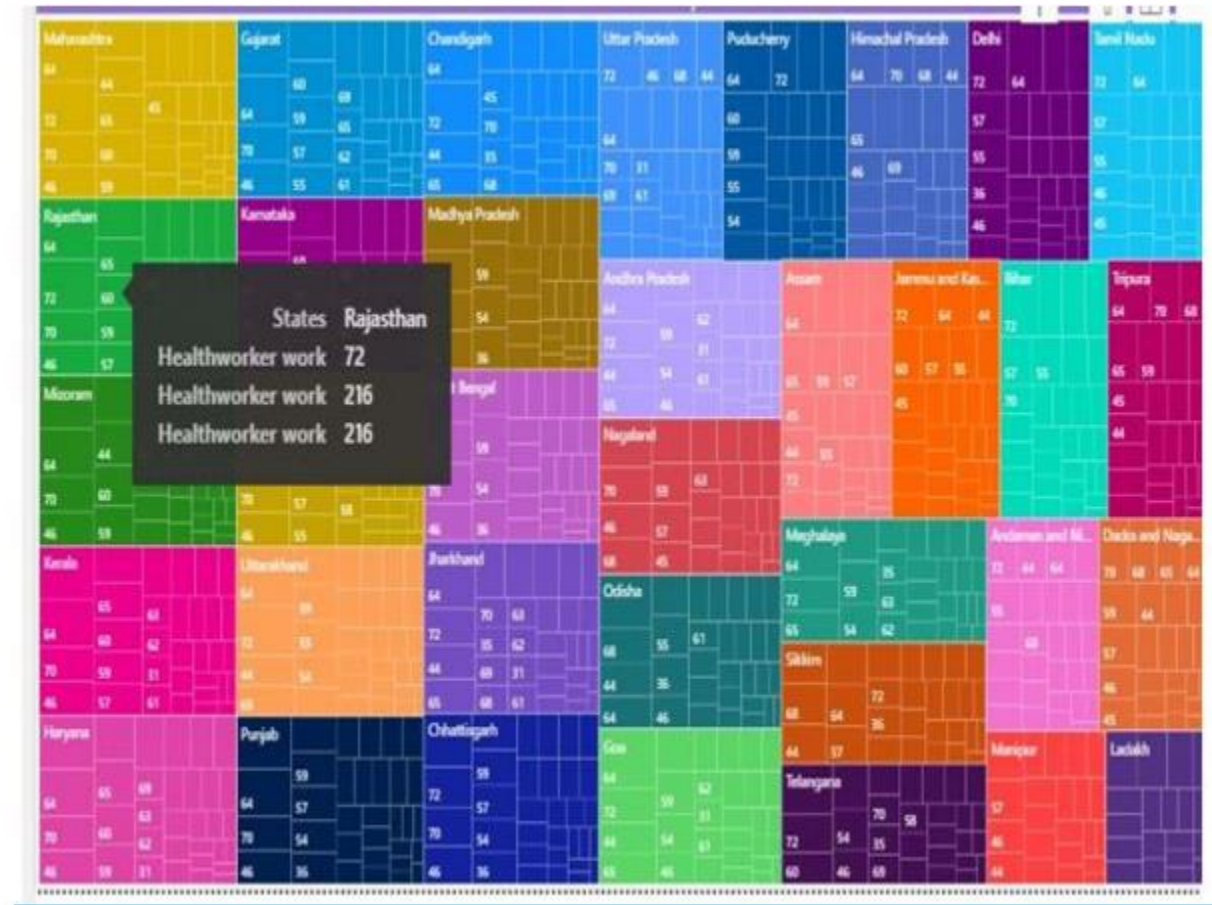
As per this tree map it is beautifully shows about the status of the health women worker in India in 2020 state wise, asper the graph and data Kerala's highest working women 251(per 1000 people) and lowest is 65 and Rajasthan Highest number of working women is 216(1,000 people) and lowest is 72, Maharashtra highest 256 and lowest 45,Delhi 216 and lowest 36,west Bengal 144 and lowest 36.

How was women mental health status on covid-19 in India month and state wise (top twelve)
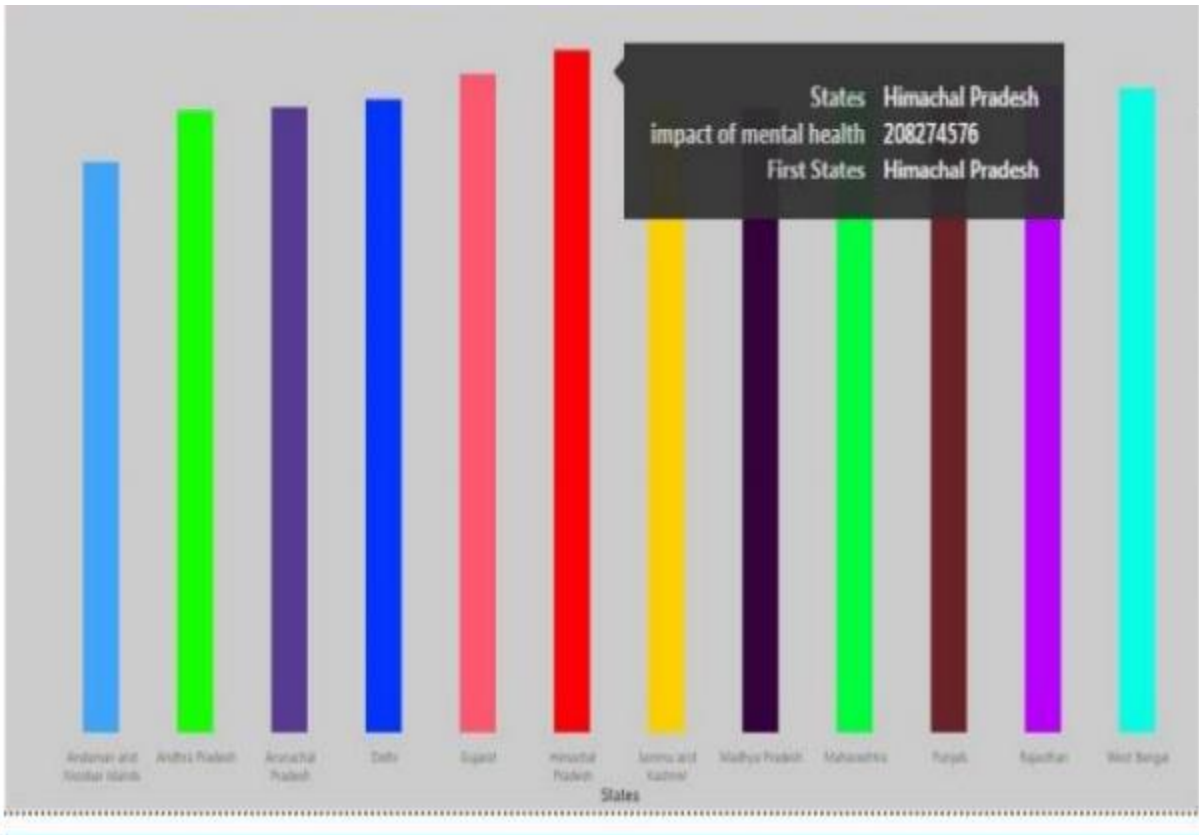
Above column chart, top twelve states are shown in India in the year 2020,different colored column representing each state ,according to this graph Himachal Pradesh standing with the highest position with 208M,Gujrat-200M, Maharashtra -196M,Delhi-195M,Punjab-194M,Rajsthan-193m,West Bengal191,Andrapradesh-190,Arunachal Pradesh-192,Andaman Nicober -175

CHAPTER 7

PROJECT BUDGET

Sr. No	Cloud Services and Coding Cost	Single Price (Rs)	Total
		Total	N. A

CONCLUSION

Power BI is an excellent and robust business intelligence tool, and it is going to stay in the world of data visualization for a really long time. It helps hundreds of data sources to connect quickly, infusing life in the data through comprehensive reports.so if we hold expertise in the field, that will be beneficial for our carrier. The ever-growing set of tools that Power BI contain holds the potential to provide with real, compelling and actionable insights from data, via dashboard-style reports. Power BI has various benefits that can help we and our organization improve on our business intelligence. With this, after completion of this project now we have a clear picture of various working ways of Power BI, which will help you execute the same.

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7. **https://www.kaggle.com/sudalairajkumar/covid19-in-india**

8. **https://www.who.int/data/gho**