

# **Major Port Traffic & Capacity using IBM Cognos Analytics**

## **A PROJECT REPORT**

**Submitted by**

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In Collaboration with



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**under the guidance of**

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## **PROJECT DESCRIPTION:**

Because of its dominance in the transportation of bulk freight and long-distance passenger traffic, the Indian Railways is sometimes referred to as the lifeline of the Indian economy, with a capital base of almost Rs. 100000 crores. The system crisscrosses the country, tying it together via freight and passenger ferries.across the country's length and breadth As India's economy progresses,As a result of their rapid growth, the railways have increased their development efforts.They are putting in extra work and preparing for a bigger role in the future.

## **PROBLEM STATEMENT:**

Because of its dominance in the transportation of bulk freight and long-distance passenger traffic, the Indian Railways is sometimes referred to as the lifeline of the Indian economy, with a capital base of almost Rs. 100000 crores. The network crisscrosses the country, connecting it by ferrying freight and passengers across the country's length and width. As the Indian economy continues to grow at a rapid pace, the railways have increased their development efforts and are preparing for a larger role in the future.

## **PROCEDURE :**

To accomplish the objective, we have to follow the activities and tasks listed below:

creating IBM Cloud Account

Login to Cognos Analytics

Working with the Dataset

Understanding the Dataset

Loading the Dataset

Data Prep - Conversion of Data and Calculations

Do required calculations in Dataset

Finally , create Data Visualizations Charts

Port-wise Traffic Distribution,

Port wise Capacity Distribution

Port-wise Traffic vs Capacity by Line Chart

Port-wise Traffic Projected vs Achieved by Column Chart

Port-wise Traffic Projected vs Achieve by Stacked Column Chart

Port-wise Total Capacity Projects vs Total Capacity Achieve by Line and Bar Chart

Port-wise Traffic Projects vs Total Projected by Area Chart

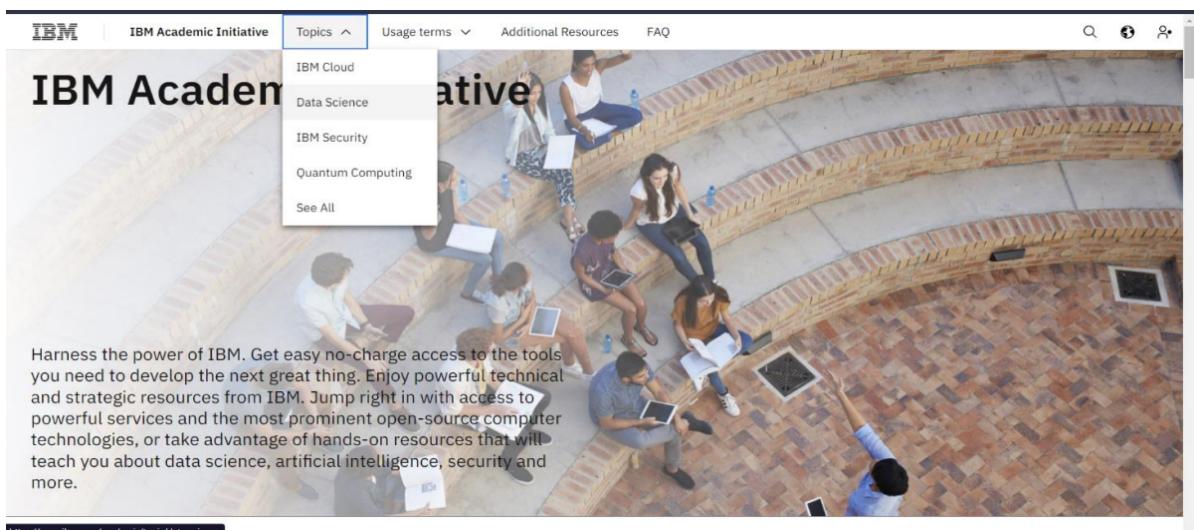
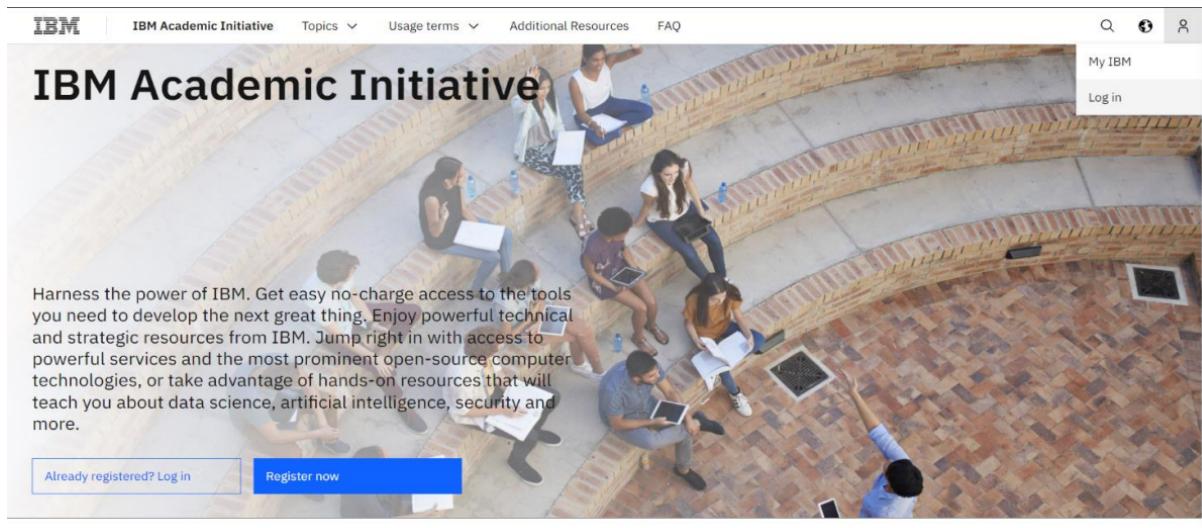
Port-wise Total Capacity Achieve, Traffic Achieved using Stacked Bar Filters

Port-wise Total Capacity Achieved using Map Summary

Cards and Visual using Total Capacity vs Actual Capacity Column Chart

## Step 1:

Firstly, we need to create an IBM Cloud Account:



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Courseware Software Resources

ILOG CPLEX Optimization Studio

SPSS Modeler Premium

Cognos Analytics on Cloud

Analytical decision support toolkit for rapid development and deployment of optimization models using mathematical and constraint programming. It combines an integrated development [...] →

SPSS Modeler provides an intuitive graphical interface to help visualize each step in the data mining process. Automatically transforms data into the best format for the most accurate predictive modeling. →

Cognos Analytics, helps enable you to: 1) Find answers, using AI and machine learning; 2) Unearth information that may not be obvious, using pattern detection; 3) Pose questions about your data [...] →

Cognos Analytics

View All

Cognos Analytics on premise, helps

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Cognos Analytics on Cloud

Cognos Analytics, helps enable you to: 1) Find answers, using AI and machine learning; 2) Unearth information that may not be obvious, using pattern detection; 3) Pose questions about your data and receive intelligent responses; 4) Reduce the time needed for data preparation.

Access now →

Cognos Analytics

View All

Cognos Analytics on premise, helps

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## Step 2: Loading the Dataset

The screenshot shows the IBM Cognos Analytics with Watson interface. At the top, there's a banner with the text "Hello. Welcome to Cognos Analytics with Watson." and two buttons: "Watch video" and "Take a product tour". To the right of the banner is a 3D isometric illustration of a central hexagonal cluster connected to various data sources like a laptop, a smartphone, and a server tower. Below the banner, there's a "Quick launch" section with four cards:

- Upload data**: "Upload or drag and drop spreadsheets, csv files, and other data sources."
- Prepare data**: "Use data modules to clean and connect data from multiple resources."
- Exploration**: "Quickly find unbiased answers by identifying trends in your data with data exploration."
- Present data**: "Create sophisticated, multi-page, multi-query dashboards, reports, or stories."

## Step 3: Data Prep – Conversion of Data and Calculations

The screenshot shows the IBM Cognos Analytics with Watson interface with a dataset titled "dataset\_mpfc.xlsx" selected. On the left, there's a sidebar with a tree view of the dataset structure, including "Data ...dule", "dataset\_mpfc.xlsx", and several tables like "Na...hs", "dat...sx", and "Tot...%". The main area is a data grid with the following columns: Row Id, Port, Traffic in E...11-12)Proj., Traffic in E...11-12) Ach., Traffic in ...-(2011-12) %, Total Capac...1-12) Proj., Total Capac...1-12) Ach., and Total C. The grid contains 13 rows of data.

Row Id	Port	Traffic in E...11-12)Proj.	Traffic in E...11-12) Ach.	Traffic in ...-(2011-12) %	Total Capac...1-12) Proj.	Total Capac...1-12) Ach.	Total C
1	Kolkata	1343	1223	9100	3145	1635	5100
2	Haldia	4450	3101	7000	6340	5070	7900
3	Paradeep	7640	5425	7100	10640	7650	7100
4	Visakhapatnam	8220	6742	8200	10810	7293	6700
5	Ennore	4700	1496	3200	6420	3100	4800
6	Chennai	5750	5571	9700	7230	7972	11000
7	Tuticorin	3172	2810	8900	6398	3334	5200
8	Cochin	3817	2010	5300	5475	4098	7400
9	NMPT	4881	3294	6800	6050	5097	8400
10	Mormugao	4455	3900	8800	6690	4190	6200
11	Mumbai	7105	5618	7900	9191	4453	4800
12	JNPT	6604	6575	10000	9560	6400	6600
13	Kandla	8672	8250	9500	12220	8691	7100

IBM Cognos Analytics with Watson

\* dataset\_mpptc.xlsx

Properties

Data module

dataset\_mpptc.xlsx

Navigation paths

dataset.xlsx

- # Row Id
- Port
- Traffic in Eleventh Plan (MT) (2011-12) Proj.
- Traffic in Eleventh Plan (MT) (2011-12) Ach.
- Traffic in Eleventh Plan (MT) (2011-12) %
- Total Capacity in Eleventh Plan (MT) (2011-12) Proj.
- Total Capacity in Eleventh Plan (MT) (2011-12) Ach.
- Total Capacity in Eleventh Plan (MT) (2011-12) %

Grid Relationships Custom tables

Row Id	Port	Traffic in E...11-12)Proj.	Traffic in E...11-12) Ach.	Traffic in ... (2011-12) %
1	Kolkata	1343	1223	9100
2	Haldia	4450	3101	7000
3	Paradeep	7640	5425	7100
4	Visakhapatnam	8220	6742	8200
5	Ennore	4700	1496	3200
6	Chennai	5750	5571	9700
7	Tuticorin	3172	2810	8900
8	Cochin	3817	2010	5300
9	NMPT	4881	3294	6800
10	Mormugao	4455	3900	8800
11	Mumbai	7105	5618	7900
12	JNPT	6604	6575	10000
13	Kandla	8672	8250	9500

IBM Cognos Analytics with Watson

\* dataset\_mpptc.xlsx

Properties

Data module

dataset\_mpptc.xlsx

Navigation paths

dataset.xlsx

- # Row Id
- Port
- Traffic Projection
- Traffic Achievement
- Traffic Percentage
- Total Capacity Projection
- Total Capacity Achievement
- Total Capacity Percentage

Grid Relationships Custom tables

Row Id	Port	Traffic Projection	Traffic Achievement	Traffic Percentage
1	Kolkata	1343	1223	9100
2	Haldia	4450	3101	7000
3	Paradeep	7640	5425	7100
4	Visakhapatnam	8220	6742	8200
5	Ennore	4700	1496	3200
6	Chennai	5750	5571	9700
7	Tuticorin	3172	2810	8900
8	Cochin	3817	2010	5300
9	NMPT	4881	3294	6800
10	Mormugao	4455	3900	8800
11	Mumbai	7105	5618	7900
12	JNPT	6604	6575	10000
13	Kandla	8672	8250	9500

## Step 4 : Do required calculations in Dataset

The screenshot shows the IBM Cognos Analytics with Watson interface. On the left, there's a navigation pane with a tree view of datasets and tables. A context menu is open over a row in the main grid, with 'Create calculation...' highlighted. The main grid displays data from a table with columns: Traffic Projection, Traffic Achievement, Traffic in ... (2011-12) %, Total Capacity..., Projection, and Total Capacity... achievement.

Traffic Projection	Traffic Achievement	Traffic in ... (2011-12) %	Total Capacity...	Projection	Total Capa...chivement
1343	1223	9100	3145	1635	
3101	7000	6340	5070		
5425	7100	10640	7650		
6742	8200	10810	7293		
1496	3200	6420	3100		
5571	9700	7230	7972		
2810	8900	6398	3334		
2010	5300	5475	4098		
3294	6800	6050	5097		
3900	8800	6690	4190		
5618	7900	9191	4453		
6575	10000	9560	6400		
8250	9500	12220	8691		

**Create calculation**

Name: Traffic Percentage

Components:

- dataset.xlsx
- # Row Id
- Port
- Traffic Projection
- Traffic Achievement
- Traffic i...011-12) %
- Total Capa...rojection
- Total Capa...vement
- Total Cap...11-12) %

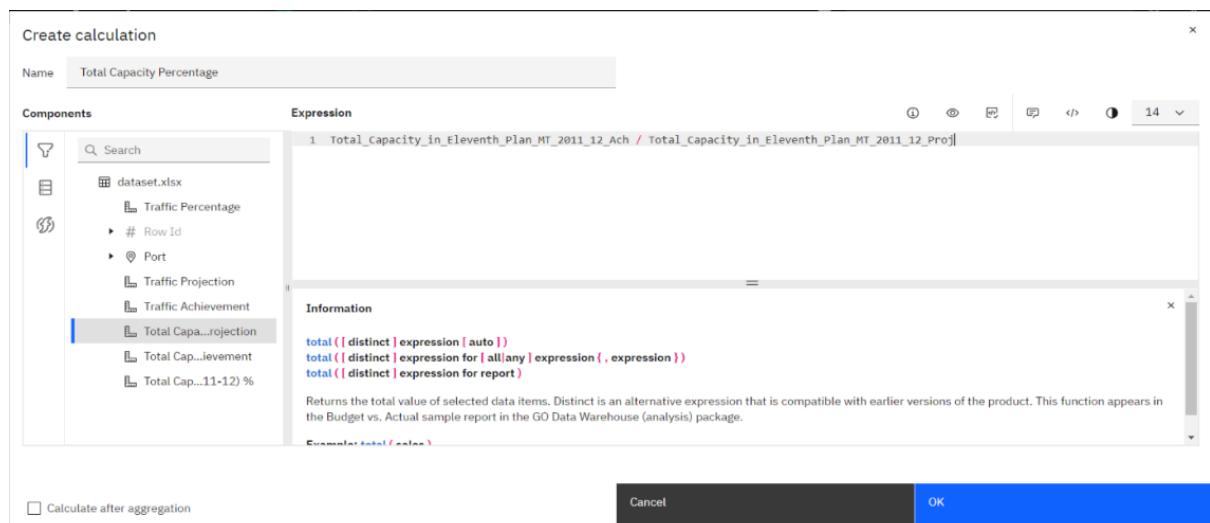
Expression:

```
1_Traffic_in_Eleventh_Plan_MT_2011_12_Ach / Traffic_in_Eleventh_Plan_MT_2011_12_Proj
```

Information:

Calculate after aggregation:

Buttons: Cancel, OK



IBM Cognos Analytics with Watson \* dataset\_mptc.xlsx

Data module

	Total Capa...Percentage	Traffic Percentage	Row Id	Port	Traffic Projection
0.519872813990461	0.9106478034251675	1	Kolkata	1343	
0.7996845425867508	0.6968539325842696	2	Haldia	4450	
0.7189649624060151	0.7100785340314136	3	Paradeep	7640	
0.6746530989824236	0.8201946472019465	4	Visakhapatnam	8220	
0.48286604361370716	0.31829787234042556	5	Ennore	4700	
1.102627939142462	0.9688695652173913	6	Chennai	5750	
0.5211003438574554	0.8858764186633039	7	Tuticorin	3172	
0.7484931506849315	0.526591564055541	8	Cochin	3817	
0.8424793388429752	0.6748617086662569	9	NMPT	4881	
0.6263079222720478	0.8754208754208754	10	Mormugao	4455	
0.4844957023174845	0.7907107670654469	11	Mumbai	7105	
0.6694560669456067	0.9956087219866747	12	JNPT	6604	
0.7112111292962356	0.9513376383763837	13	Kandla	8672	

IBM Cognos Analytics with Watson \* dataset\_mptc.xlsx

Data module

	Total Capa...Percentage	Traffic Percentage	Row Id	Port	Traffic Projection
0.519872813990461	0.9106478034251675	1	Kolkata	1343	
0.7996845425867508	0.6968539325842696	2	Haldia	4450	
0.7189649624060151	0.7100785340314136	3	Paradeep	7640	
0.6746530989824236	0.8201946472019465	4	Visakhapatnam	8220	
0.48286604361370716	0.31829787234042556	5	Ennore	4700	
1.102627939142462	0.9688695652173913	6	Chennai	5750	
0.5211003438574554	0.8858764186633039	7	Tuticorin	3172	
0.7484931506849315	0.526591564055541	8	Cochin	3817	
0.8424793388429752	0.6748617086662569	9	NMPT	4881	
0.6263079222720478	0.8754208754208754	10	Mormugao	4455	
0.4844957023174845	0.7907107670654469	11	Mumbai	7105	
0.6694560669456067	0.9956087219866747	12	JNPT	6604	
0.7112111292962356	0.9513376383763837	13	Kandla	8672	

Filter...

- Create calculation...
- Create data group...
- Edit calculation...
- Hide from users...
- Remove
- Refresh properties...
- Format data...
- Clean...
- Rename
- Cut
- Copy
- Properties

## Data format

**Column:** Traffic Percentage

**Format type:**

Unformatted

Unformatted

Text

Number

Percent

Currency

Percent

Date

Date/Time

Time

Time interval

Custom



**By default, this data is unformatted.**

You can select a different format type and specify its properties.

[Advanced options](#)

[Reset properties](#)

Cancel

OK

## Data format

x

**Column:** Traffic Percentage

**Format type:** \*

Percent

v

① Number of decimal places

Default

^

① Use thousands separator

0

▲

① Missing value characters

1

▼

2

3

4

5

Advanced options

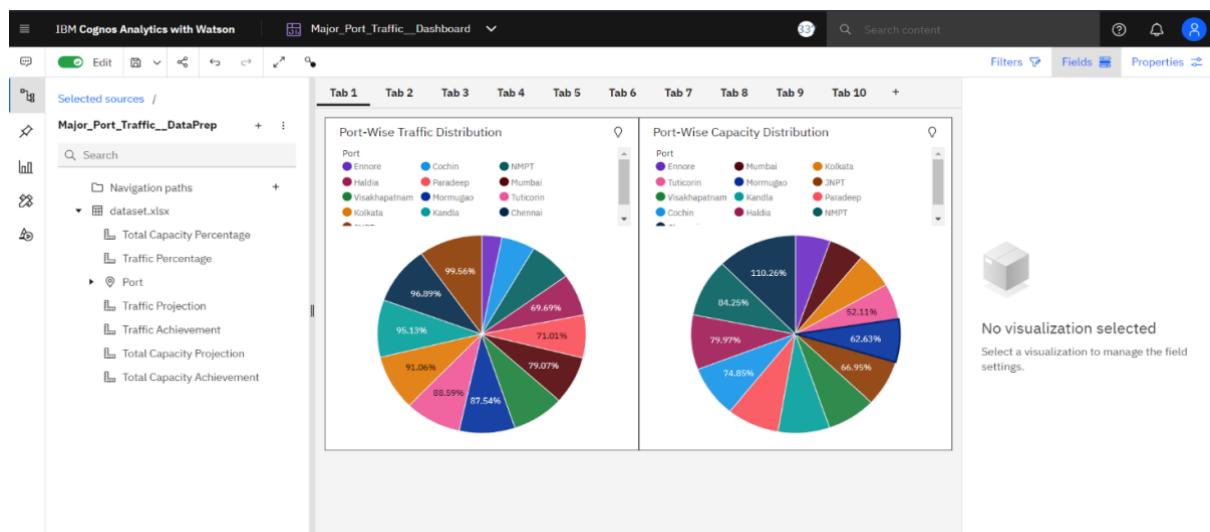
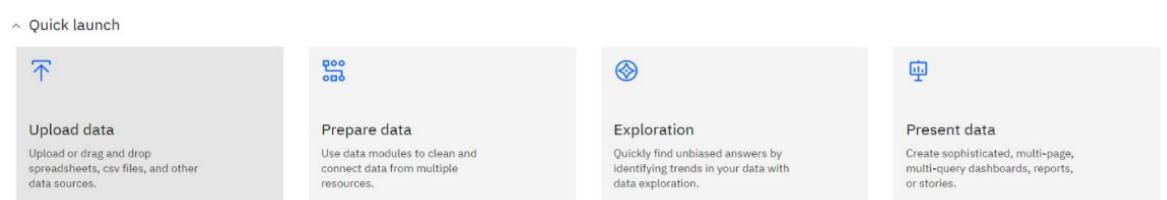
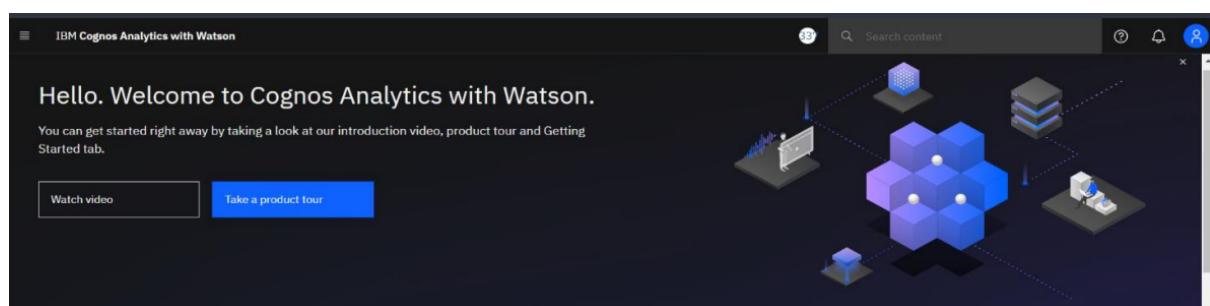
Reset properties

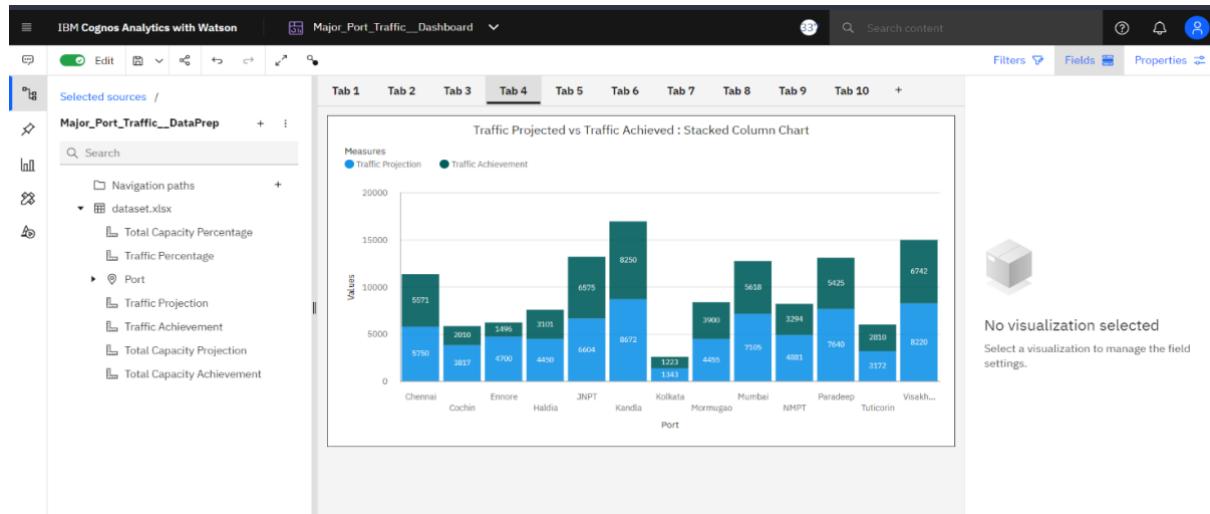
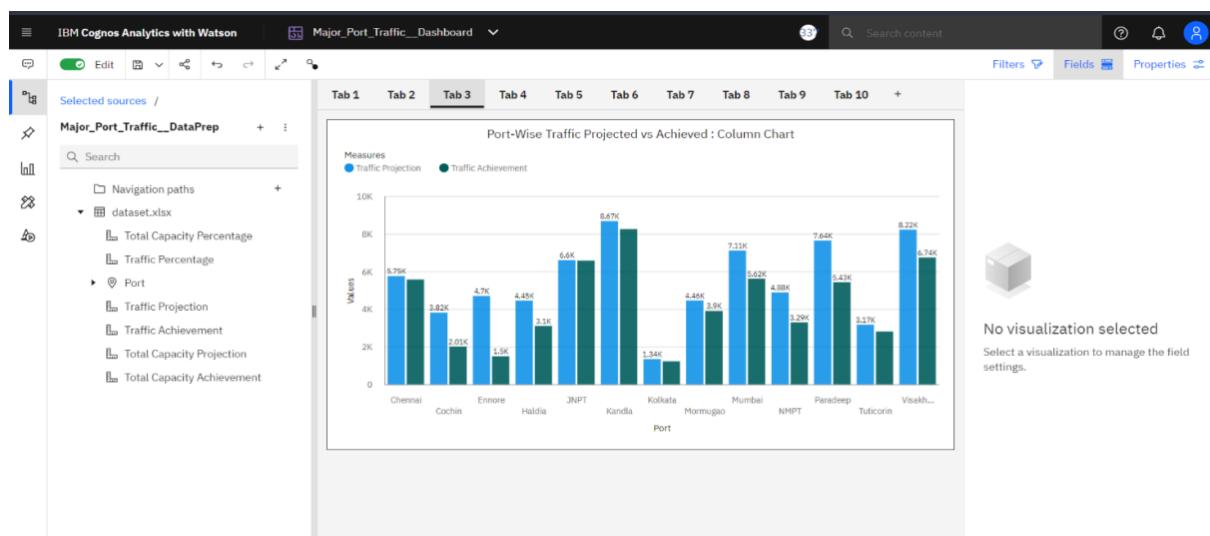
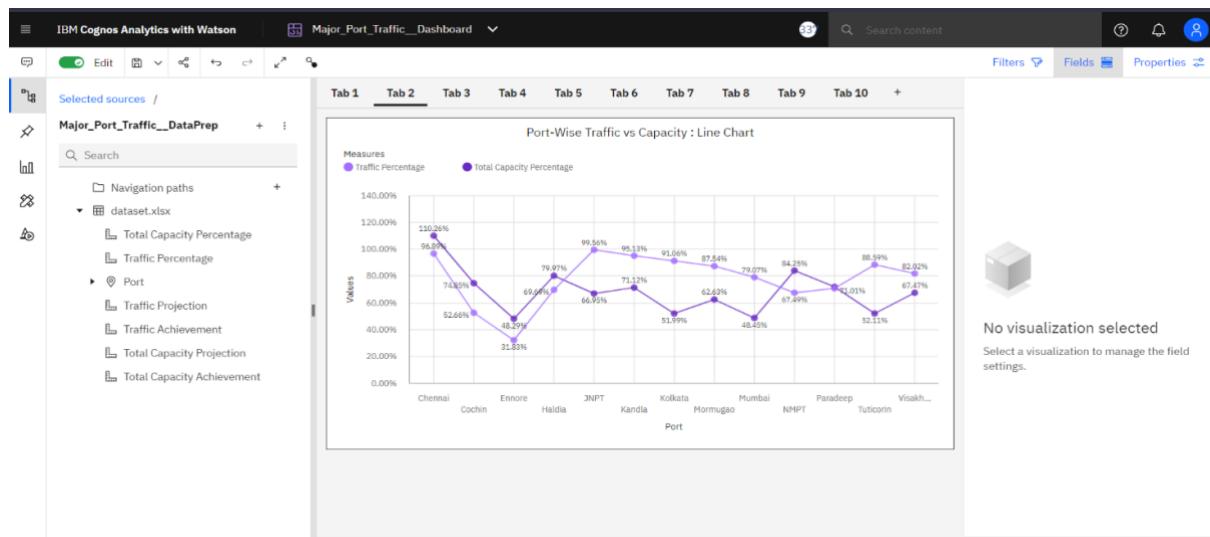


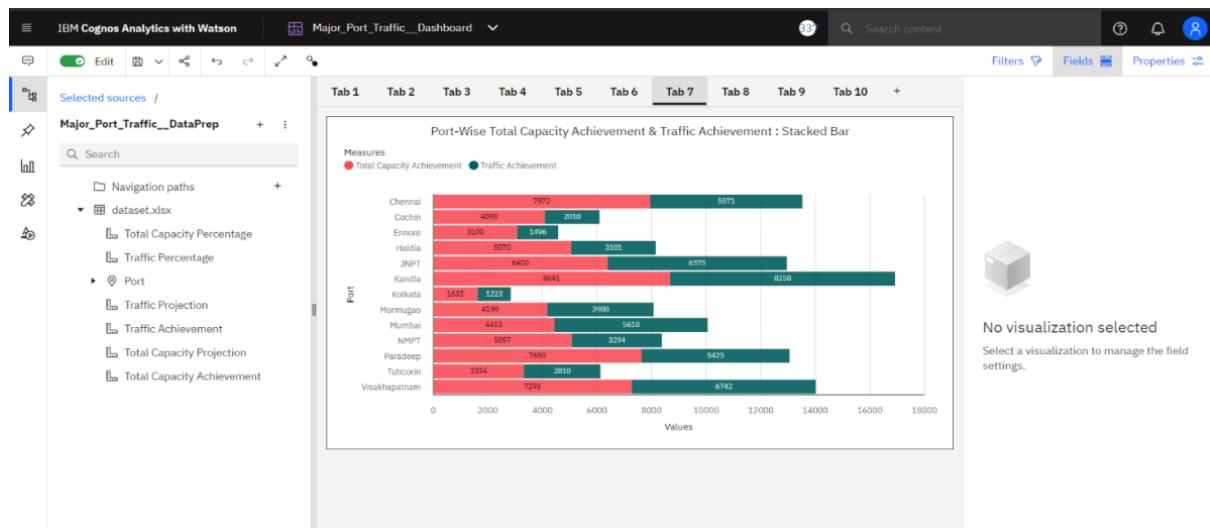
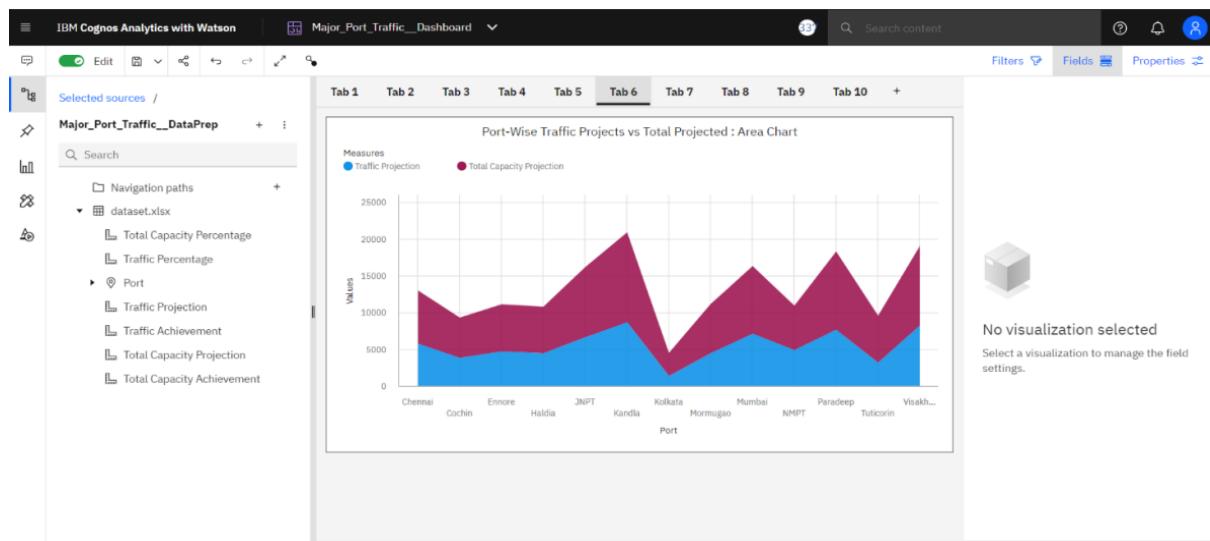
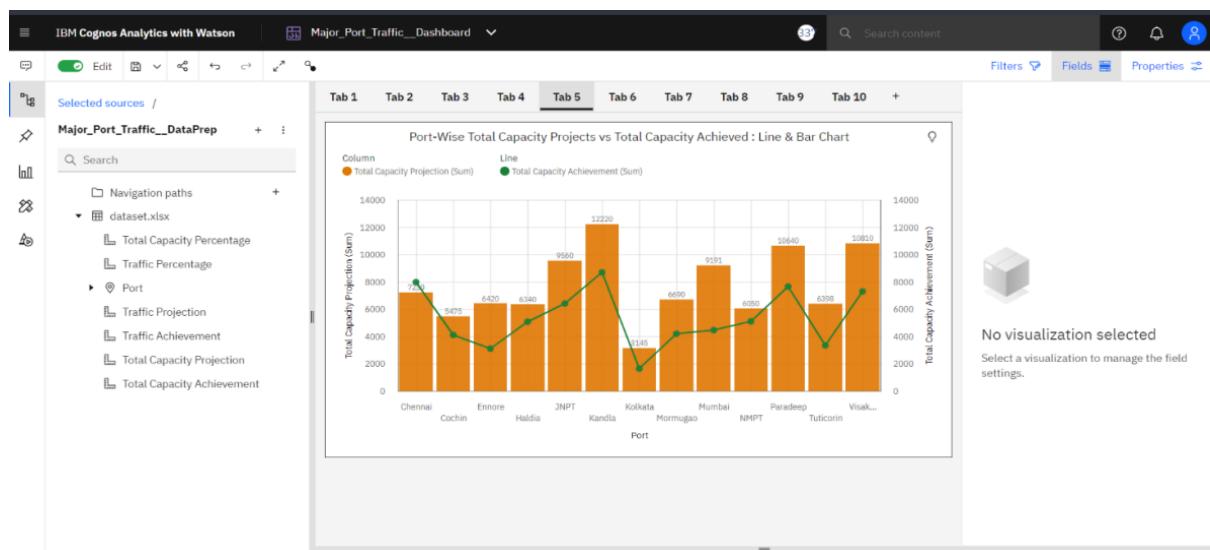
# Final Step : Create Data Visualizations Charts

## Data Visualization

Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.







IBM Cognos Analytics with Watson

Major\_Port\_Traffic\_Dashboard

Selected sources / Major\_Port\_Traffic\_DataPrep

Search

Navigation paths

- dataset.xlsx
  - Total Capacity Percentage
  - Traffic Percentage
  - Port
    - Traffic Projection
    - Traffic Achievement
    - Total Capacity Projection
    - Total Capacity Achievement

Tab 1 Tab 2 Tab 3 Tab 4 Tab 5 Tab 6 Tab 7 Tab 8 Tab 9 Tab 10 +

Port-Wise Traffic vs Capacity : Line Chart

Measures: Traffic Percentage

Port-Wise Traffic Projected vs Achieved : Column Chart

Measures: Traffic Projection, Traffic Achievement

Traffic Projected vs Traffic Achieved : Stacked Column Chart

Measures: Traffic Projection

Filter : Port Select

No visualization selected  
Select a visualization to manage the field settings.

IBM Cognos Analytics with Watson

\* Major\_Port\_Traffic\_Dashboard

Selected sources / Major\_Port\_Traffic\_DataPrep

Search

Navigation paths

- dataset.xlsx
  - Total Capacity Percentage
  - Traffic Percentage
  - Port
    - Traffic Projection
    - Traffic Achievement
    - Total Capacity Projection
    - Total Capacity Achievement

Tab 1 Tab 2 Tab 3 Tab 4 Tab 5 Tab 6 Tab 7 Tab 8 Tab 9 Tab 10 +

Port-WiseTotal Capacity Achievement : Maps

No visualization selected  
Select a visualization to manage the field settings.

IBM Cognos Analytics with Watson

\* Major\_Port\_Traffic\_Dashboard

Selected sources / Major\_Port\_Traffic\_DataPrep

Search

Navigation paths

- dataset.xlsx
  - Total Capacity Percentage
  - Traffic Percentage
  - Port
    - Traffic Projection
    - Traffic Achievement
    - Total Capacity Projection
    - Total Capacity Achievement

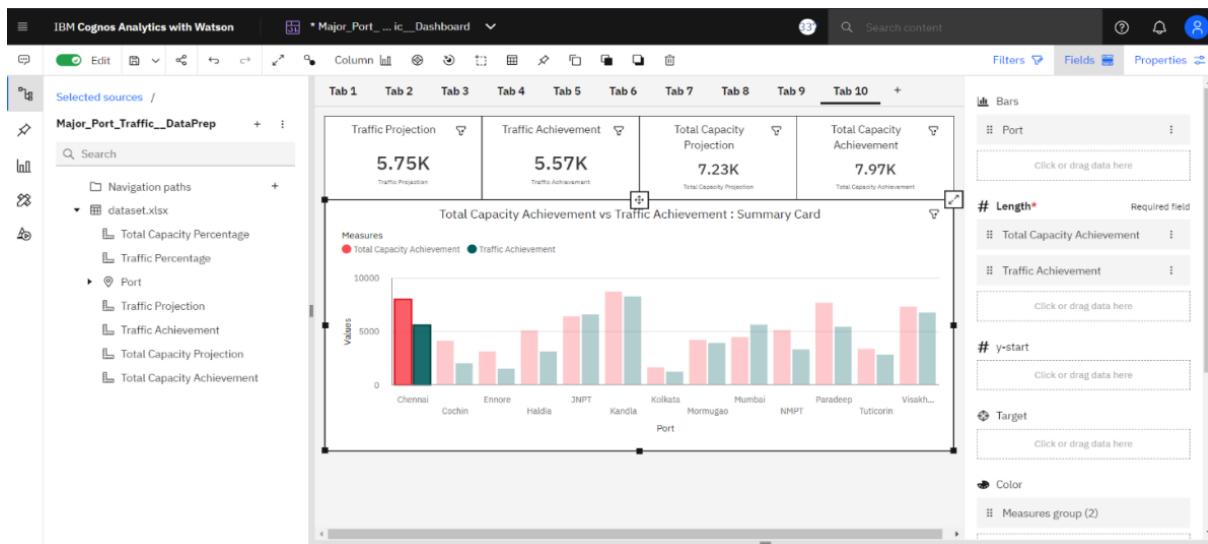
Tab 1 Tab 2 Tab 3 Tab 4 Tab 5 Tab 6 Tab 7 Tab 8 Tab 9 Tab 10 +

Traffic Projection	Traffic Achievement	Total Capacity Projection	Total Capacity Achievement
<b>70.8K</b>	<b>56K</b>	<b>100K</b>	<b>69K</b>
Traffic Projection	Traffic Achievement	Total Capacity Projection	Total Capacity Achievement

Total Capacity Achievement vs Traffic Achievement : Summary Card

Measures: Total Capacity Achievement, Traffic Achievement

No visualization selected  
Select a visualization to manage the field settings.



## CONCLUSION:

I have learned fundamental concepts and I can work on IBM Cognos Analytics , also : Understanding big/small industrial dataset , Making data preparation report of real dataset(s) , Calculations in dataset for getting meaningful insights & visuals for appropriate predictive result for data(s) , Have learned a broad understanding of plotting different graphs , Learned to create meaningful dashboard