

Vande Bharat Express

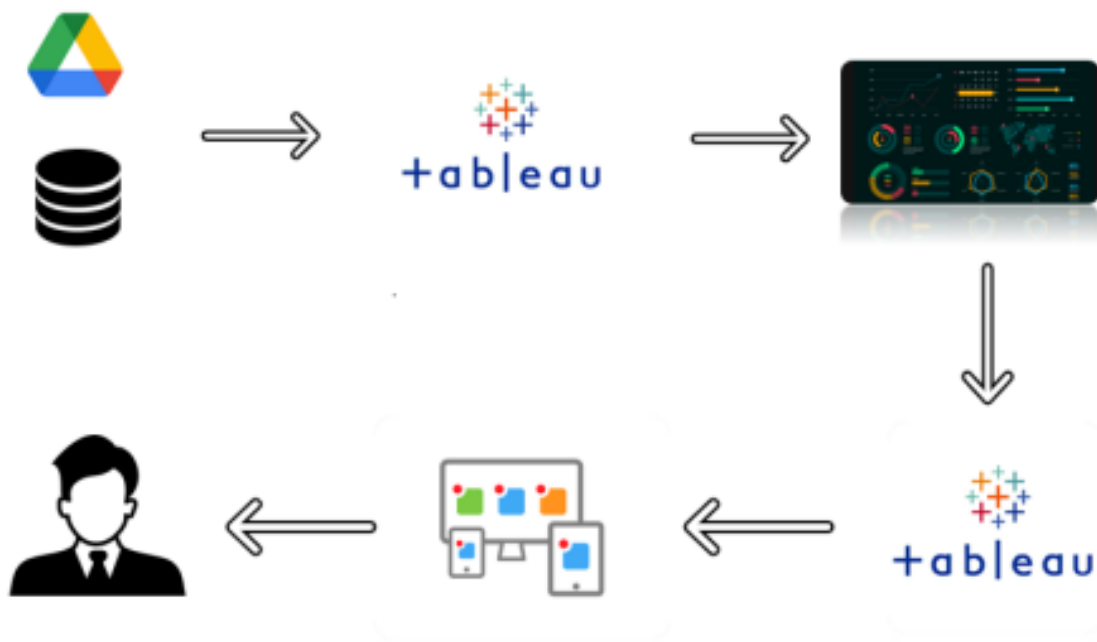
"Vande Bharat Express: Pioneering India's High-Speed Rail Journey"

1. INTRODUCTION

Project Overview

In this project we will outline the features and significance of the Vande Bharat Express, also known as Train 18, a semi-high-speed intercity electric train developed by the Integral Coach Factory (ICF) in Chennai, India. The train, named after the patriotic phrase "Vande Mataram," operates at a maximum speed of 160 km/h and is recognized for its sleek design, energy efficiency, and indigenous technological contributions to India's railway sector. The key features include modern amenities, safety measures, reduced travel time, and alignment with the "Make in India" initiative. While the text emphasizes the positive aspects of the Vande Bharat Express, it does not explicitly mention potential challenges or issues associated with the train's development and operation.

Technical Architecture



Project Flow

To accomplish this, we have to complete all the activities listed below,

Define Problem / Problem Understanding

- o Specify the business problem

- o Business requirements

- o Literature Survey

- o Social or Business Impact.
- Data Collection & Extraction from Database
- o Collect the dataset,
- o Connect dataset with Tableau
- Data Preparation
- o Prepare the Data for Visualization
- Data Visualizations
- o No of Unique Visualizations
- Dashboard
- o Responsive and Design of Dashboard
- Story
- o No of Scenes of Story
- Web Integration
- o Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
- o Record explanation Video for project end to end solution
- o Project Documentation-Step by step project development procedure

Define Problem

Some potential problems or challenges related to the Vande Bharat Express could include:

1. **Technical Challenges:** The introduction of new technology, especially in the context of a high-speed train, can be accompanied by technical challenges. These may include issues with the train's propulsion system, braking mechanisms, or other critical components.
2. **Infrastructure Readiness:** High-speed trains require specialized infrastructure, including well-maintained tracks and signaling systems. Ensuring that the existing railway infrastructure is compatible with the Vande Bharat Express and adapting it for optimal performance could be a potential challenge.
3. **Operational Efficiency:** Achieving and maintaining the desired operational efficiency, especially in terms of adherence to schedules and minimizing downtime, can be a challenge. This involves coordinating various aspects such as maintenance, crew training, and overall logistics.
4. **Safety Concerns:** While safety features are mentioned in the context of the train, there might be ongoing concerns or challenges related to ensuring the highest level of safety for passengers and crew. This includes addressing potential risks such as accidents or emergencies.
5. **Public Acceptance:** Introducing a new mode of transportation may face challenges in gaining public acceptance and overcoming any skepticism or resistance. Passenger comfort and satisfaction are crucial for the success of the train.

2. Business Problem

The successful operation and long-term viability of the Vande Bharat Express face multifaceted challenges that span technical, operational, financial, regulatory, and competitive aspects. These challenges may potentially hinder the intended transformation of rail travel in India and impact the project's overall success.

Technical Issues:

The risk of technical glitches, mechanical failures, and electronic malfunctions can disrupt the smooth operation of the high-speed train, leading to potential service interruptions and passenger dissatisfaction.

Infrastructure Compatibility:

The existing railway infrastructure may not be optimized for high-speed operations, posing a challenge to the train's performance and speed potential.

Maintenance and Repair:

Inadequate or improper maintenance schedules could result in increased downtime, reducing operational efficiency and potentially affecting the reliability of the service.

Safety Concerns:

Any safety-related incidents, whether minor or major, pose a threat to the project's reputation, leading to negative publicity, passenger apprehension, and a loss of public trust.

Operational Costs:

The higher operational costs associated with specialized technology, maintenance, and energy requirements could challenge the financial viability of the project over the long term.

Public Acceptance and Demand:

Failure to meet passenger expectations or offer competitive fares may impact the desired ridership and undermine the project's goal of enhancing the overall passenger experience.

Infrastructure Expansion:

Delays in expanding the high-speed rail network to new routes could limit the project's potential impact on overall transportation and hinder its transformative objectives.

Regulatory and Political Hurdles:

The need for coordination with regulatory bodies and government agencies introduces the risk of political and bureaucratic hurdles, potentially causing delays in approvals, funding, and project implementation.

Competitive Landscape:

3. Business Requirement

High Speed Capability:

Develop a train with the ability to operate at high speeds, specifically targeting speeds around 160 km/h (99 mph) or higher. This is to significantly reduce travel time between cities and compete effectively with other transportation modes.

Aerodynamic Design:

Design the train's exterior with a focus on aerodynamics to minimize air resistance, thereby enhancing speed and overall efficiency. This design consideration is crucial for energy conservation and maintaining stability at high speeds.

Energy Efficiency:

Emphasize energy efficiency and environmental sustainability by powering the train with electricity, preferably utilizing electric multiple units (EMU). This is aimed at reducing emissions and reliance on traditional fossil fuels.

Passenger Comfort:

Prioritize passenger comfort by designing comfortable seating arrangements, ergonomic interiors, proper ventilation, and a noise-insulated environment. The goal is to ensure a pleasant travel experience for passengers.

Safety Features:

Incorporate advanced safety features, including crash-worthy components, fire detection and suppression systems, and emergency braking systems. The focus is on ensuring the safety of both passengers and crew.

Technological Innovation:

Showcase India's engineering and technological capabilities by incorporating state-of-the-art systems for communication, entertainment, and connectivity within the train.

Reliability and Maintenance:

Design the train for reliability and ease of maintenance, utilizing durable materials, modular components, and systems that are easily inspected, repaired, or replaced.

Accessibility:

Ensure accessibility for passengers of all abilities by incorporating features such as ramps, accessible restrooms, and designated spaces for passengers with disabilities.

Efficient Space Utilization:

Maximize passenger capacity without compromising comfort through efficient space utilization in the interior layouts, balancing seating arrangements, storage, and amenities.

Catering and Amenities:

Accommodate catering services, possibly including onboard dining options, by designing facilities for food preparation and serving.

4. Social Or Business Impact

Increased Ridership and Revenue Generation:

Business Impact: The enhanced speed and comfort provided by the Vande Bharat Express could attract more passengers, contributing to increased ridership on relevant routes. This, in turn, can lead to higher revenue generation for the railway sector.

Economic Stimulus and Local Development:

Social and Business Impact: The introduction of the Vande Bharat Express can stimulate tourism, boost local economies, and generate employment opportunities related to maintenance, operations, and hospitality. This contributes to both economic growth and social development.

Environmental Sustainability:

Social Impact: The use of electric trains like the Vande Bharat Express contributes to reduced greenhouse gas emissions, aligning with India's efforts to promote sustainable transportation. This has a positive impact on the environment and public health.

Technological Showcase and Export Potential:

Business Impact: The successful development and deployment of the Vande Bharat Express showcase India's technological capabilities. This can lead to business opportunities through technology transfer and export potential, further contributing to the national economy.

Infrastructure Development:

Business Impact: The introduction of high-speed trains can drive the development and upgrading of rail infrastructure, including tracks, signaling systems, and stations. This infrastructure development is crucial for the efficient operation of the Vande Bharat Express and benefits the overall transportation network.

Competition with Air Travel:

Business Impact: By offering competitive travel times on certain routes, the Vande Bharat Express poses competition to the airline industry. This impact can influence pricing strategies and service offerings in the air travel sector.

Government's Transportation Initiatives:

Social and Business Impact: The Vande Bharat Express aligns with the government's initiatives to modernize and upgrade the country's transportation infrastructure. This has long-term positive impacts on connectivity, economic growth, and public welfare.

Proud National Achievement:

Social Impact: The Vande Bharat Express is not only a technological achievement but also a source of national pride. It symbolizes India's capability to innovate and contribute to the global rail technology landscape, fostering a sense of pride and identity among the citizens.

Modernization of Rail Travel:

Social Impact: The advanced features of the Vande Bharat Express, including comfortable seating, onboard Wi-Fi, and improved amenities, contribute to modernizing the passenger rail experience in India, enhancing overall passenger satisfaction.

Data Collection & Extraction From Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1: Collect the dataset

We will download the dataset from Kaggle

Search

Sign In Register

Vande Bharat, Indian Railways

Data Card Code (8) Discussion (0)

Well-documented 2 Well-maintained 1 Clean data 1 Original 0 High-quality notebooks 0 Other

Vande Bharat Sept - 2023.csv (8.5 kB)

Download

Detail Compact Column 10 of 17 columns

# Sr. No.	Train Name	Train Number	Originating City	Originating Station	Terminal
1	Mumbai CSMT - Ma...	22229/22230	Delhi	Howrah Junction	Hyderabad
2	New Delhi - Varana...	22435/22436	Mumbai	Chhatrapati Shivaji...	Thiruvana
3	Other (32)	Other (32)	Other (25)	Other (27)	Other (31)
4	New Delhi - Varanasi Vande Bharat Express	22435/22436	Delhi	New Delhi	Varanasi
5	New Delhi - Shri Mata Vaishno Devi Katra Vande Bharat Express	22439/22440	Delhi	New Delhi	Katra

Data Explorer
Version 4 (8.5 kB)
Vande Bharat Sept - 2023.csv

Kaggle uses cookies from Google to deliver and enhance the quality of its services and to analyze traffic. [Learn more.](#) [Ok, Got it.](#)

Activity 1.1: Understand the data

Vande Bharat Sept - 2023 - Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Clipboard Font Alignment Number Formatting Styles Cells Editing Add-ins

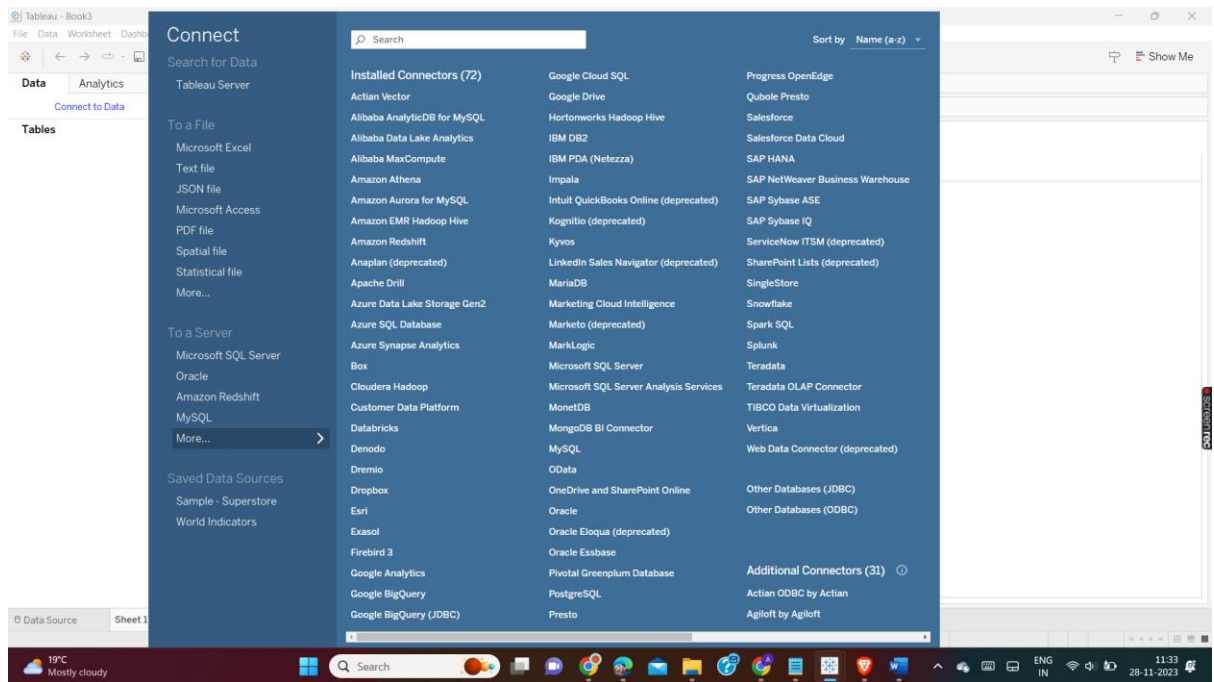
GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today. [Get genuine Office](#) [Learn more](#)

012 04-01-2023

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Sr. No.	Train Name	Train Number	Originating City	Originating St	Terminal City	Terminal Static	Operator	No. of C	Frequency	Distance	Travel Tim	Speed	Average Speed	Inauguration	Average of Color			
2	1	New Delhi - Varan	22435/22436	Delhi	New Delhi	Varanasi	Varanasi Juncti	NR	16	Except Thurs	759Å km	(472Å 08h 00m	130Å km/h	(895Å km/h	59Å m	2/15/2019	126% Blue & White		
3	2	New Delhi - Shri	22439/22440	Delhi	New Delhi	Katra	Shri Mata Vaidi	NR	16	Except Tues	655Å km	(407Å 08h 00m	130Å km/h	(82Å km/h	51Å m	10-03-2019	114% Blue & White		
4	3	Mumbai Central	20901/20902	Mumbai	Mumbai Cent	Gandhinagar	C WVR		16	Except Wedi	522Å km	(324Å 06h 25m	130Å km/h	(82Å km/h	51Å m	9/30/2022	132% Blue & White		
5	4	New Delhi - Amb	22447/22448	Delhi	New Delhi	Andaura	Amb Andaura	NR	16	Except Frida	412Å km	(256Å 05h 10m	130Å km/h	(79Å km/h	49Å m	10/13/2022	70% Blue & White		
6	5	MGR Chennai Ce	20607/20608	Chennai	Chennai Cent	Mysuru	Mysore Junctic	SR	16	Except Wedi	496Å km	(308Å 06h 30m	130Å km/h	(79Å km/h	49Å m	11-11-2022	122% Blue & White		
7	6	Bilaspur - Nagpu	20825/20826	Bilaspur	Bilaspur Junct	Nagpur	Nagpur Junctio	SECR	8	Except Satur	412Å km	(256Å 05h 30m	130Å km/h	(75Å km/h	47Å m	12-11-2022	96% Blue & White		
8	7	Howrah - New Ja	22301/22302	Kolkata	Howrah Junct	Siliguri	New Jalpaiguri	ER	16	Except Wedi	565Å km	(351Å 07h 30m	130Å km/h	(75Å km/h	47Å m	12/30/2022	100% Blue & White		
9	8	Visakhapatnam	20833/20834	Visakhapatna	Visakhapatna	Hyderabad	Secunderabad	ECOR	16	Except Sund	698Å km	(434Å 08h 30m	130Å km/h	(82Å km/h	51Å m	1/15/2023	120% Blue & White		
10	9	Mumbai CSMT -	22225/22226	Mumbai	Chhatrapati S	Solapur	Solapur	CR	16	Except Wedi	452Å km	(281Å 06h 30m	110Å km/h	(70Å km/h	43Å m	02-10-2023	94% Blue & White		
11	10	Mumbai CSMT -	22223/22224	Mumbai	Chhatrapati S	Shirdi	Sainagar Shirdi	CR	16	Except Tues	339Å km	(211Å 05h 20m	110Å km/h	(64Å km/h	40Å m	02-10-2023	82% Blue & White		
12	11	Rani Kamalapati	20171/20172	Bhopal	Habibganj (R)	Delhi	Hazrat Nizam	WCR	16	Except Satur	702Å km	(436Å 07h 30m	160Å km/h	(94Å km/h	58Å m	04-01-2023	90% Blue & White		
13	12	Secunderabad -	120701/20702	Hyderabad	Secunderabad	Tirupati	Tirupati	SCR	16	Except Tues	661Å km	(411Å 08h 15m	130Å km/h	(80Å km/h	50Å m	04-08-2023	106% Blue & White		
14	13	MGR Chennai Ce	20643/20644	Chennai	Chennai Cent	Coimbatore	Coimbatore Ju	SR	8	Except Wedi	495Å km	(308Å 05h 50m	130Å km/h	(85Å km/h	53Å m	04-08-2023	106% Blue & White		
15	14	Delhi Cantonme	20977/20978	Delhi	Delhi Canton	Ajmer	Ajmer Junction	NWR	16	Except Wedi	428Å km	(266Å 05h 15m	110Å km/h	(82Å km/h	51Å m	04-12-2023	70% Blue & White		
16	15	Kasaragod - Thi	20633/20634	Kasaragod	Kasaragod	Thiruvananth	Thiruvananthas	SR	16	Except Thurs	587Å km	(365Å 08h 05m	110Å km/h	(73Å km/h	45Å m	4/25/2023	174% Blue & White		
17	16	Howrah - Puri	22895/22896	Kolkata	Howrah Junct	Puri	Puri	SECR	16	Except Thurs	500Å km	(310Å 06h 25m	130Å km/h	(78Å km/h	48Å m	5/18/2023	99% Blue & White		
18	17	Anand Vihar Ter	22457/22458	Delhi	Anand Vihar	Dehradun	Dehradun Tern	NR	8	Except Wedi	304Å km	(189Å 04h 45m	130Å km/h	(64Å km/h	40Å m	5/25/2023	100% Blue & White		
19	18	New Jalpaiguri	22227/22228	Siliguri	New Jalpaigu	Guwahati	Guwahati	NFR	8	Except Tues	407Å km	(253Å 05h 30m	110Å km/h	(74Å km/h	46Å m	5/29/2023	91% Blue & White		
20	19	Mumbai CSMT -	22229/22230	Mumbai	Chhatrapati S	Madgaon	Madgaon Junct	CR	16	Except	586Å km	(364Å 07h 45m	120Å km/h	(75Å km/h		6/27/2023	84% Blue & White		
21	20	Patna - Ranchi	22349/22350	Patna	Patna Junctio	Ranchi	Ranchi Junctio	ECR	16	Monday	586Å km	(364Å 07h 45m	120Å km/h	(75Å km/h		6/27/2023	84% Blue & White		
22	21	KSR Bengaluru	120661/20662	Bengaluru	Bangalore Cti	Hubballi	Dharwad	SWR	8	Except Tues	370Å km	(235Å 06h 00m	130Å km/h	(63Å km/h	39Å m	6/27/2023	118% Blue & White		
23	22	Rani Kamalapati	20173/20174	Bhopal	Habibganj (R)	Jabalpur	Jabalpur Junct	WCR	8	Except Tues	337Å km	(209Å 04h 40m	110Å km/h	(73Å km/h	45Å m	6/27/2023	72% Blue & White		
24	23	Indore - Bhopal	120911/20912	Indore	Indore Junct	Bhopal	Bhopal Junctio	WR	8	Except Sund	250Å km	(160Å 03h 05m	110Å km/h	(82Å km/h	51Å m	6/27/2023	37% Blue & White		
25	24	Jodhpur - Sabarn	12461/12462	Jodhpur	Jodhpur Junct	Ahmedabad	Sabarmati Junc	NWR	8	Except Tues	449Å km	(279Å 06h 10m	130Å km/h	(73Å km/h	45Å m	07-07-2023	53% Blue & White		
26	25	Gorakhpur - Luck	22549/22550	Gorakhpur	Gorakhpur Ju	Charbagh	Lucknow Charl	NER	8	Except Satur	296Å km	(184Å 04h 15m	110Å km/h	(71Å km/h	44Å m	07-07-2023	77% Blue & White		

Ready Accessibility: Unavailable

Activity 2: Connect Dataset to Tableau



Milestone 3: Data Preparation

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

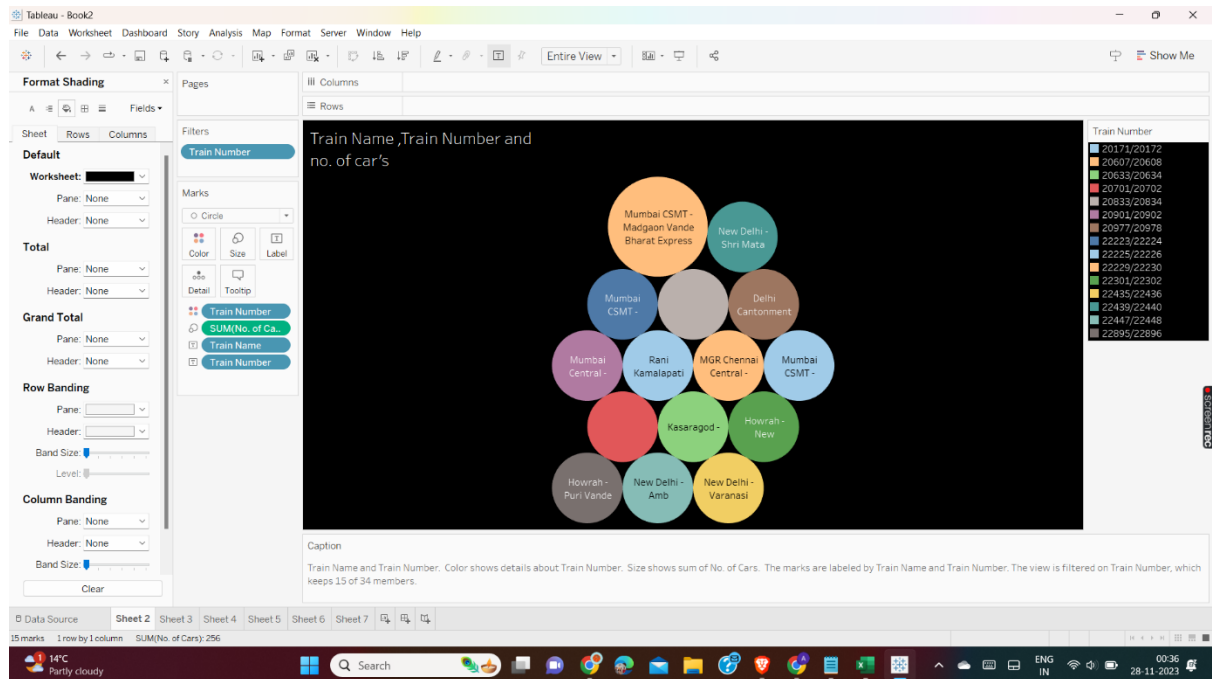
Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Activity 1: No of Unique Visualizations

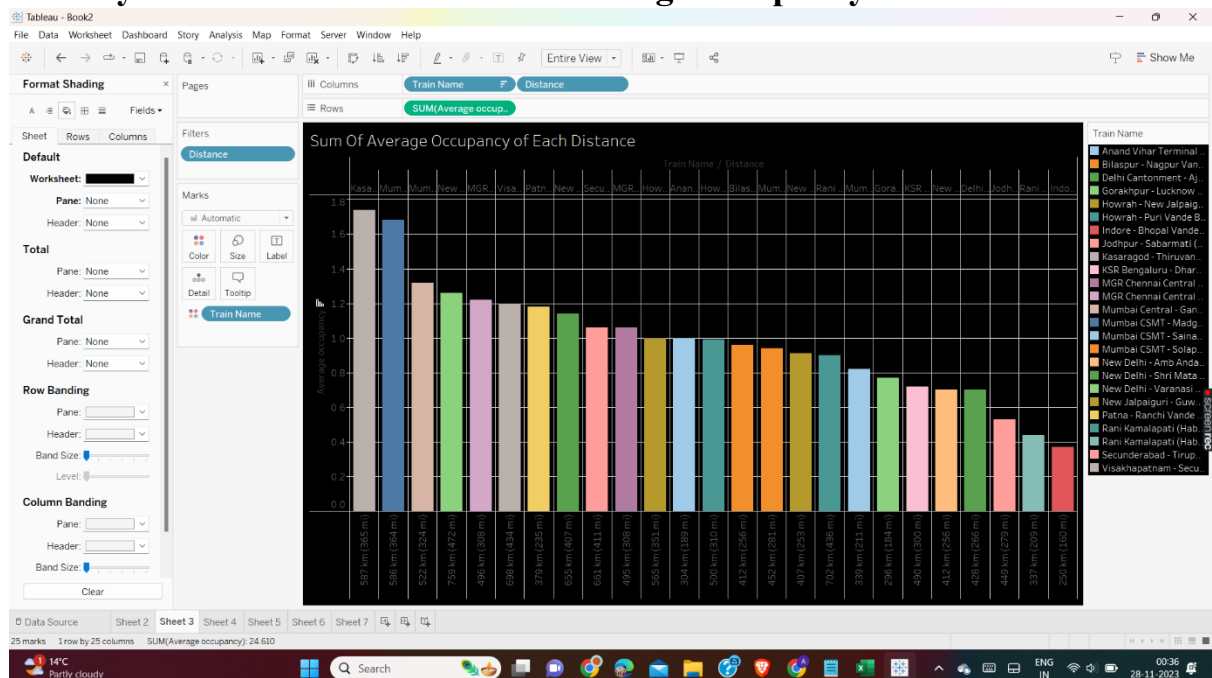
The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyse the Rice production include bar charts, line charts, heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables.

Activity 1.1: Find the Train Name and Train Number and also how many no. of car's are available:



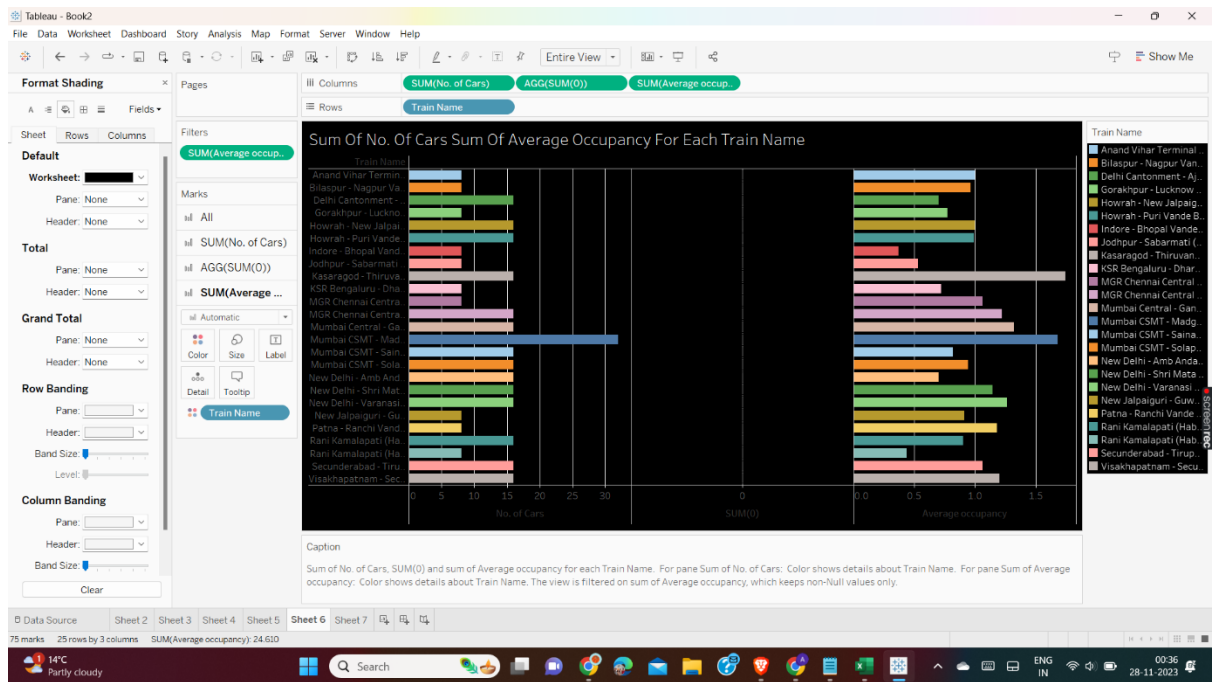
Train Name and Train Number. Color shows details about Train Number. Size shows sum of No. of Cars. The marks are labeled by Train Name and Train Number. The view is filtered on Train Number, which keeps 15 of 34 members.

Activity 1.2: Find the distance and average occupancy of Train:



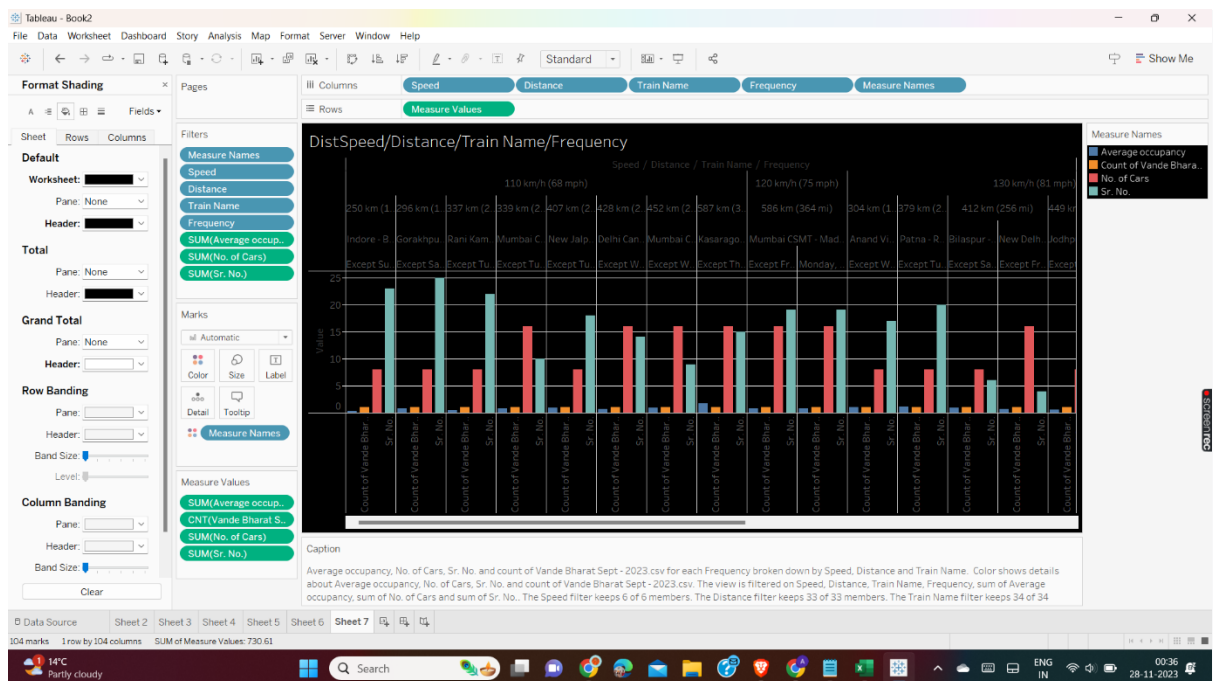
Sum of Average occupancy for each Distance broken down by Train Name. Color shows details about Train Name. The view is filtered on Distance, which keeps 24 of 33 members.

Activity 1.3: Find the distance difference between originating city and Terminal City:



Sum of No. of Cars, SUM(0) and sum of Average occupancy for each Train Name. For pane Sum of No. of Cars: Color shows details about Train Name. For pane Sum of Average occupancy: Color shows details about Train Name. The view is filtered on sum of Average occupancy, which keeps non-Null values only.

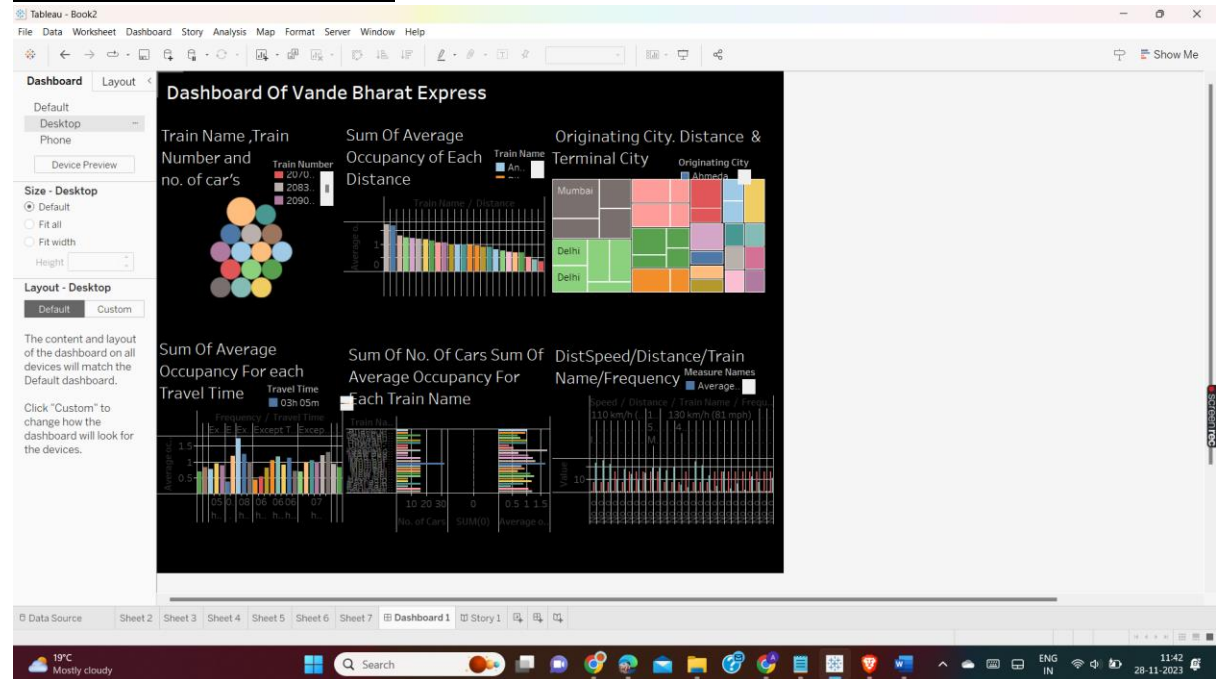
Activity 1.6: Find the Train distance speed and frequency



Average occupancy, No. of Cars, Sr. No. and count of Vande Bharat Sept - 2023.csv for each Frequency broken down by Speed, Distance and Train Name. Color shows details about Average occupancy, No. of Cars, Sr. No. and count of Vande Bharat Sept - 2023.csv. The view is filtered on Speed, Distance, Train Name, Frequency, sum of Average occupancy, sum of No. of Cars and sum of Sr. No.. The Speed filter keeps 6 of 6 members. The Distance filter keeps 33 of 33 members.

members. The Train Name filter keeps 34 of 34 members. The Frequency filter excludes Except Mondays (20632) ,Except Tuesdays (20631) and Except Wednesdays (22926), Except Tuesdays (22925). The sum of Average occupancy filter keeps non-Null values only. The sum of No. of Cars filter keeps non-Null values only. The sum of Sr. No. filter keeps non-Null values only.

Milestone 5: Dashboard



Milestone 6: Story of Vande Bharat Express

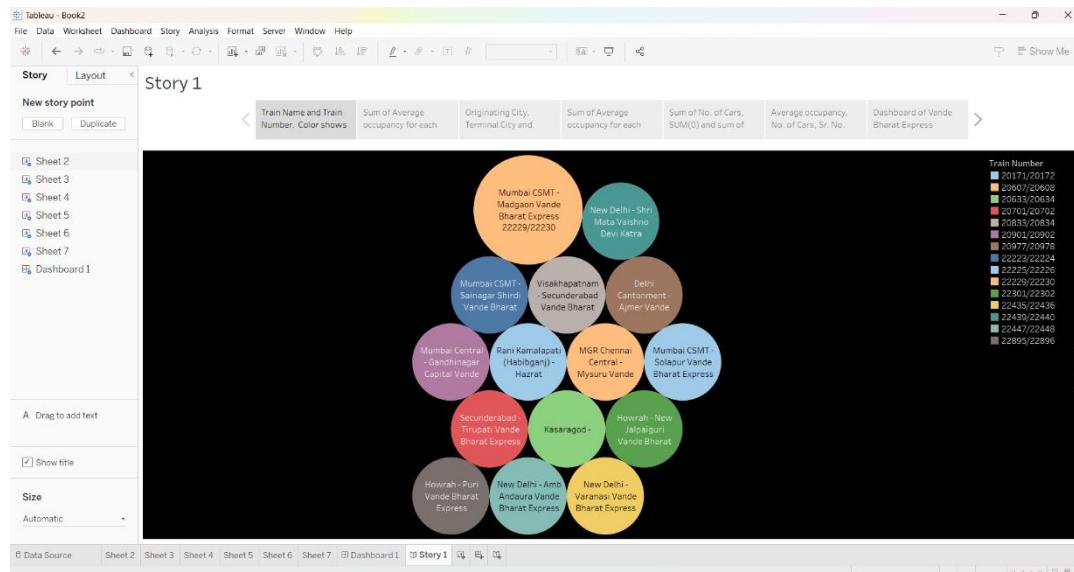
Once upon a time, Olist, a thriving e-commerce platform in Brazil, embarked on a mission to optimize its marketing funnel and drive higher conversions. The team at Olist understood the importance of guiding potential customers through a well-defined journey, from initial awareness to becoming loyal customers.

To kickstart their marketing funnel strategy, Olist decided to revamp their website and create a captivating landing page. The page featured eye-catching visuals, compelling product descriptions, and a clear call-to-action, enticing visitors to explore further. The team also implemented lead capture forms strategically placed throughout the site to capture valuable customer information.

With a steady flow of website traffic, Olist focused on generating leads. They launched an integrated marketing campaign, leveraging various channels such as search engine optimization (SEO), paid advertising, social media, and content marketing. By carefully targeting their audience and providing valuable content, Olist successfully attracted a significant number of leads.

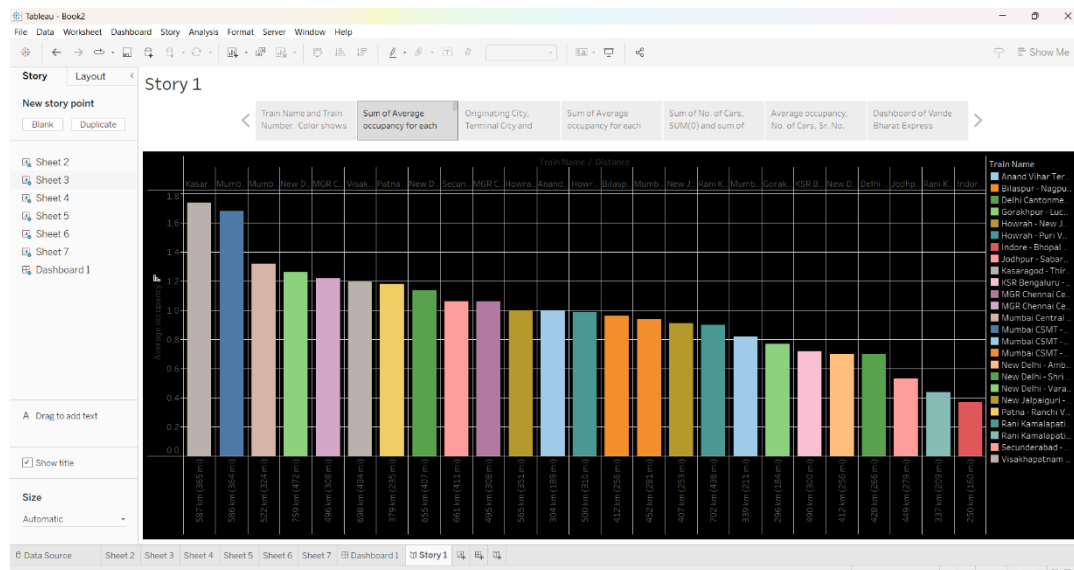
1.Story of Train Name and Train Number and also how many no.of Car's are available:

Train Name, Train Number and sum of No. of Cars. Color shows details about Train Name. Size shows sum of No. of Cars. The marks are labeled by Train Name, Train Number and sum of No. of Cars. The view is filtered on Train Name, which keeps 25 of 25 members..



2. Story of Distance and Average Occupancy of Train:

Sum of Average occupancy for each Distance broken down by Train Name. Color shows details about Train Name. The view is filtered on Train Name, which keeps 25 of 25 members.

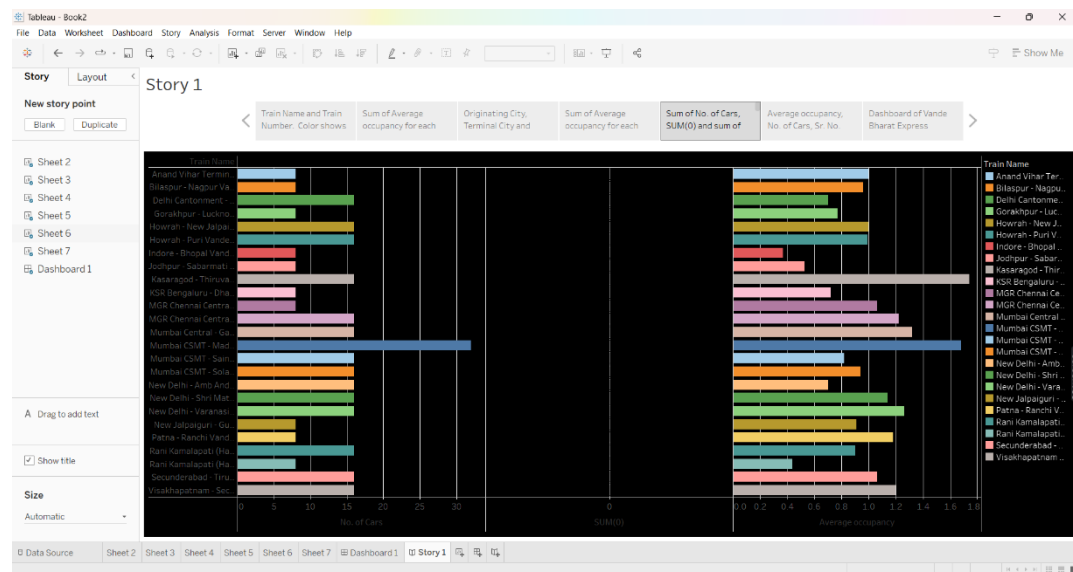


3. Story of Distance Difference Between Originating City and Terminal City:

Originating City, Distance and Terminal City. Color shows details about Distance. Size shows sum of No. of Cars. The marks are labeled by Originating City, Distance and Terminal City. The data is filtered on Train Name, which keeps 25 of 25 members. The view is filtered on Originating City and Terminal City. The Originating City filter excludes Gorakhpur, Indore, Jodhpur, Patna and Siliguri. The Terminal City filter keeps 10 of 25 members.

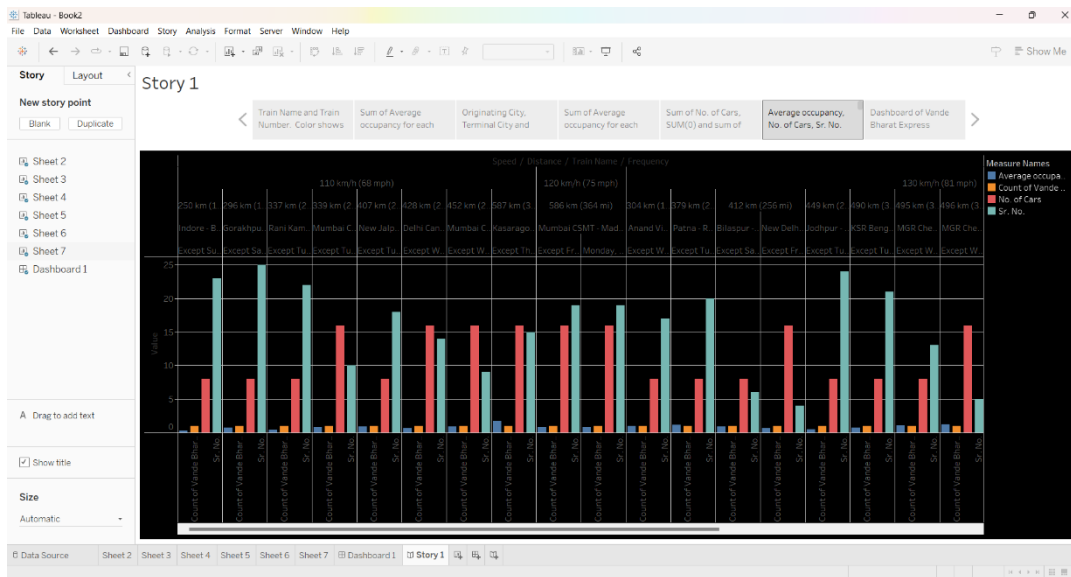
Train Name and its Average Occupancy and No. of Car's:

Sum of No. of Cars, SUM (0) and sum of Average occupancy for each Train Name. For pane Sum of No. of Cars: Colour shows sum of Average occupancy. For pane Sum of Average occupancy: Colour shows details about Train Name. The view is filtered on Train Name, which keeps 25 of 25 members.



6.Story of Train Distance Speed and Frequency:

Average occupancy, No. of Cars, Sr. No., and count of Vande Bharat.csv for each Frequency broken down by Speed, Distance and Train Name. Colour shows details about Average occupancy, No. of Cars, Sr.No., and count of Vande Bharat.csv. The view is filtered on Train Name, which keeps 25 of 25 members.



Milestone 9: Web integration

Publishing helps us to track and monitor key performance metrics, to communicate results and progress, help a publisher stay informed, make better decisions, and communicate their performance to others.

