

# **Data Analytics For DHL Logistics Facilities**

## **INTRODUCTION**

In today's dynamic business environment, where speed, accuracy, and efficiency are crucial for success, organizations across industries are increasingly turning to data analytics to gain actionable insights and drive informed decision-making. The logistics industry is undergoing a transformative shift, fueled by advancements in technology and the increasing availability of data. Within this dynamic landscape, data analytics has emerged as a powerful tool for organizations to unlock valuable insights, optimize operations, and stay competitive.

DHL, a global leader in logistics and supply chain management, operates an extensive network of facilities across the globe. As customer demands evolve and supply chains become more complex, DHL recognizes the need to harness the power of data analytics to gain a competitive edge and deliver exceptional service to its clients.

The significance of data analytics in the logistics industry cannot be overstated. By leveraging advanced analytics techniques, logistics companies can gain real-time visibility into their operations, identify bottlenecks, optimize route planning, enhance inventory management, and improve overall efficiency. Data analytics also empowers decision-makers to make data-driven choices, enabling them to adapt quickly to changing market conditions and stay ahead of the curve.

The structure of this report is as follows: we will begin by understanding the data sheet and then connecting the data to IBM Cognos which supports connecting to the wide variety of data. Then we will prepare our data for analysis and we can add or replace certain data if it is missing. We will then explore the data and we will create different visualizations from data and then we will create a dashboard.

This project will help to understand the importance of data analytics

in field of supply chain and how it can improve decision making.

## **Existing problem**

Data is available in excel sheet and Excel is a powerful tool for data analysis, but it has some limitations that can make it difficult to analyze large or complex datasets. Excel is a powerful tool for data analysis, but it has some limitations that can make it difficult to analyze large or complex datasets so If you are working with large or complex datasets and Excel is not as well-suited for analyzing complex datasets as some other data analysis tools. For example, Excel does not have a built-in way to handle missing data, and it can be difficult to perform statistical analysis on large datasets in Excel. Also Excel is not very good at handling inconsistent data formatting. If your dataset contains data that is not formatted in a consistent way, you may have problems when you try to analyze it.

## **Proposed solution**

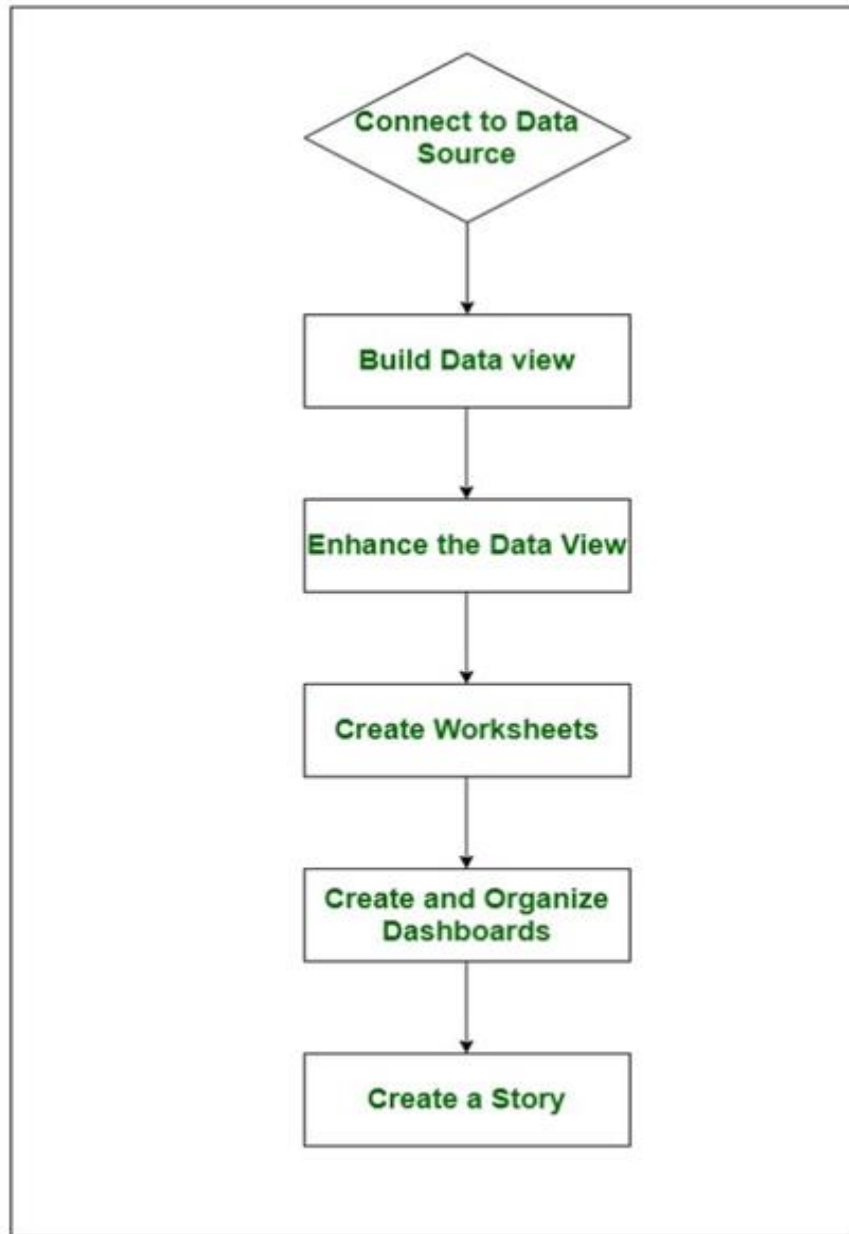
There are many different data analysis tools available, each with its own strengths and weaknesses.

We have used IBM Cognos for data analysis in this project as IBM Cognos offers a wide range of data analysis features, including statistical analysis, forecasting, and predictive analytics. This allows you to gain deep insights into your data and make better decisions.

## **Theoretical Analysis**

Software designing : The software requirement for this data analytics project is a Data Visualization and Reporting software named Cognos by IBM.

Diagrammatic overview of the project:



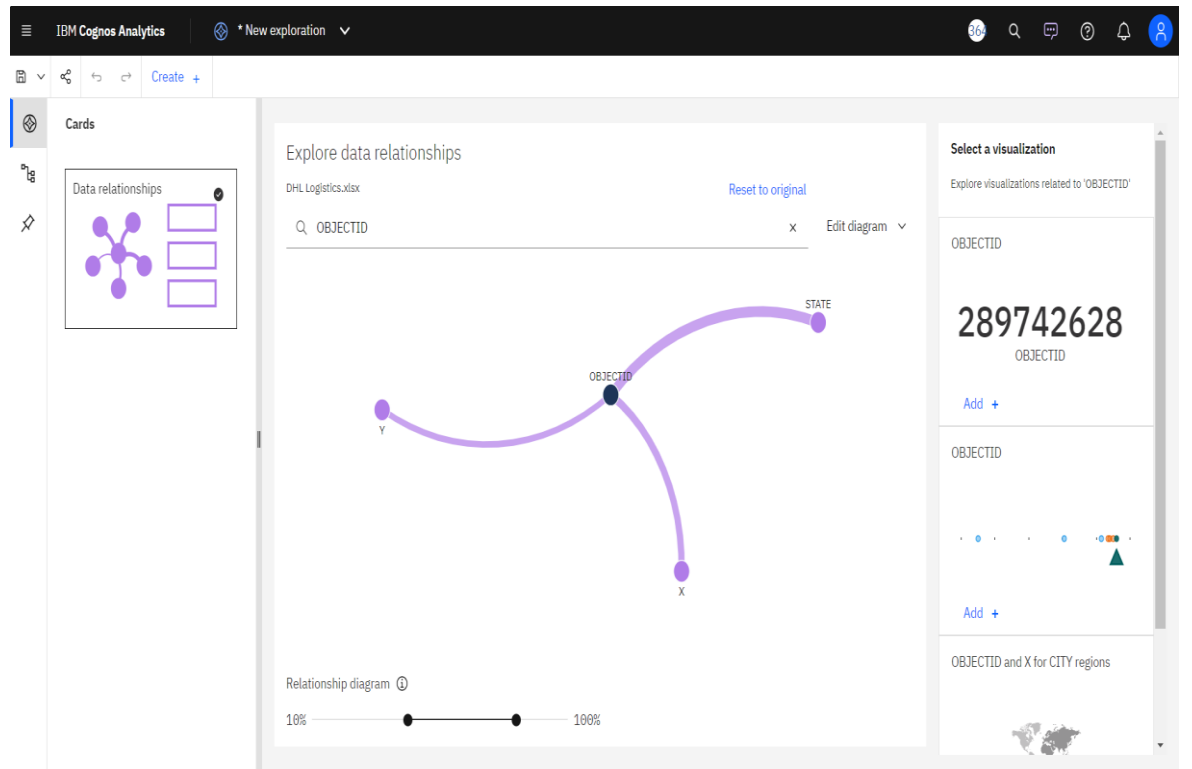
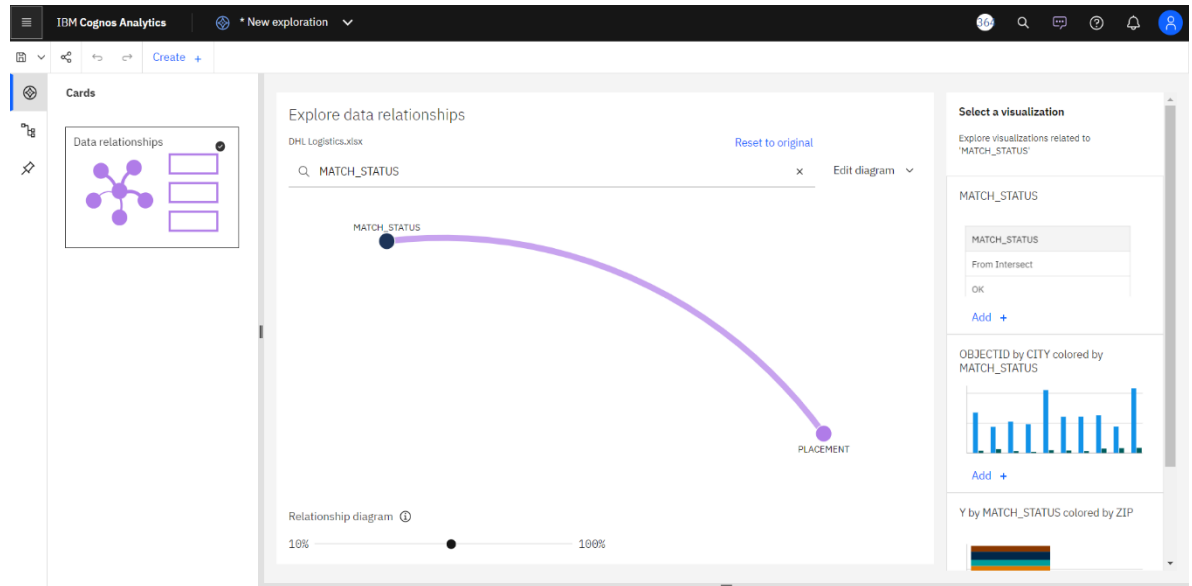
## **Experimental Investigations**

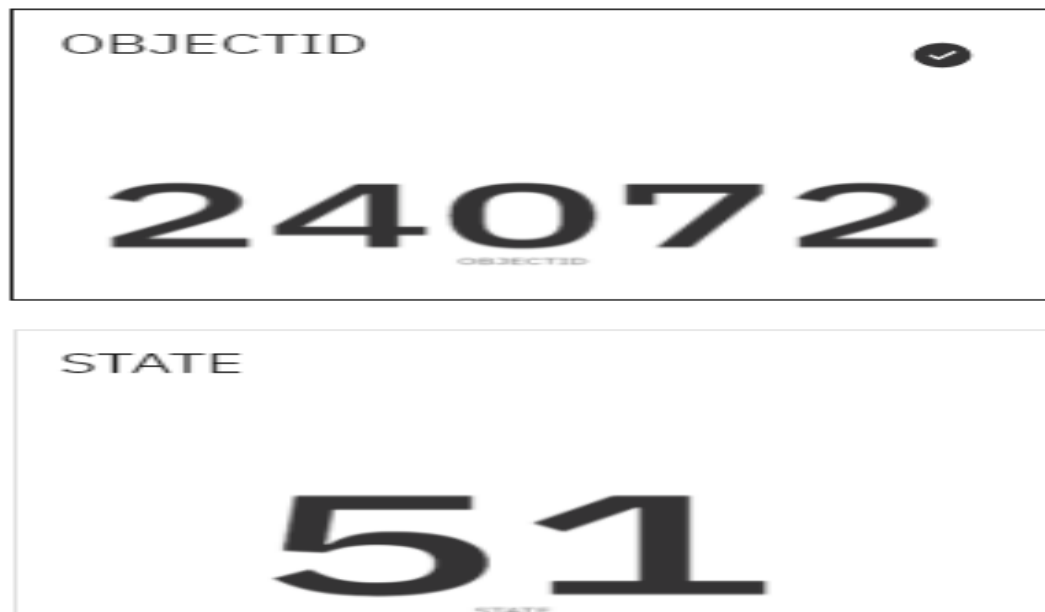
In this project first we first build the understanding of data by going thoroughly through the data sheet (different fields and their description along with type of data) then we connected data to the IBM Cognos and then we prepared the data. This includes checking for missing values, duplicate records, and inconsistencies in data formatting.

Once data was prepared we started exploring the it for better understanding of data and it's structure. This includes understating

relationship between different components of the data and checking the amount of data available like number of object ID or number of products serviced and number of cities where DHL facilities are available and no. of states.

## Exploration of DATA





After exploring data and understanding relationship among different components of data different visualizations were built which includes city-wise number of pickups made, city-wise number of products serviced, State-wise No of Cities, where DHFL Services are provided, Zip Code wise Number of Objects Serviced etc. Then finally dashboards were designed for better understanding and better decision making and we can easily analyze performance.

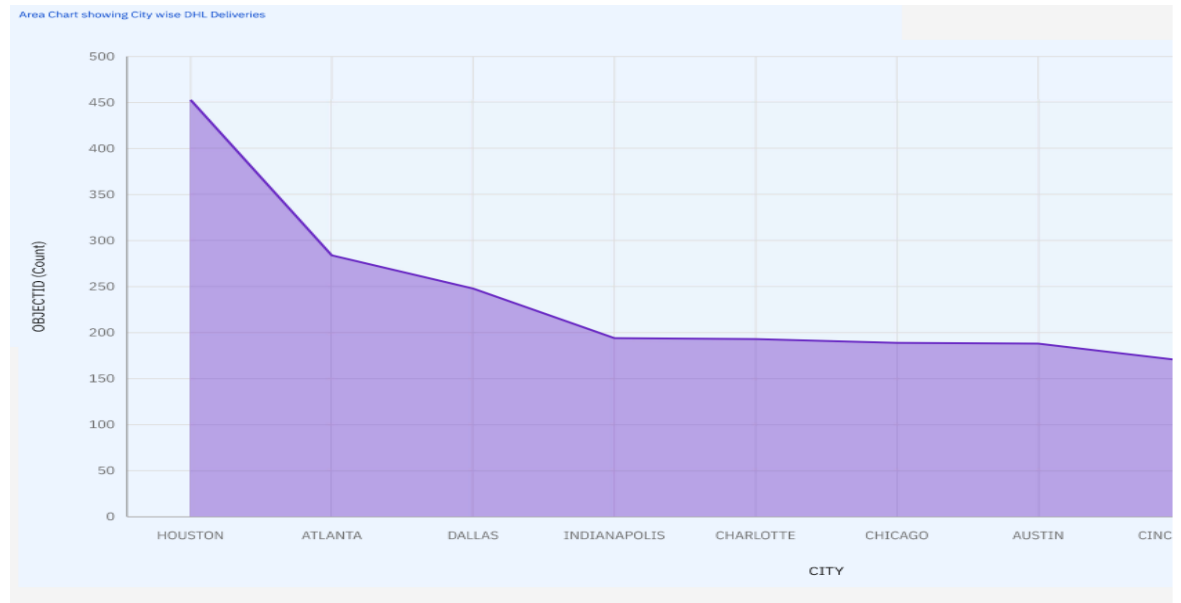
## Results

Relationship between different variables were explored and which helped to understand the data more effectively. Various visualizations were created and also interactive dashboards are which allow you to bring together data from multiple sources into a single view which makes it easy to see how different pieces of data relate to each other.

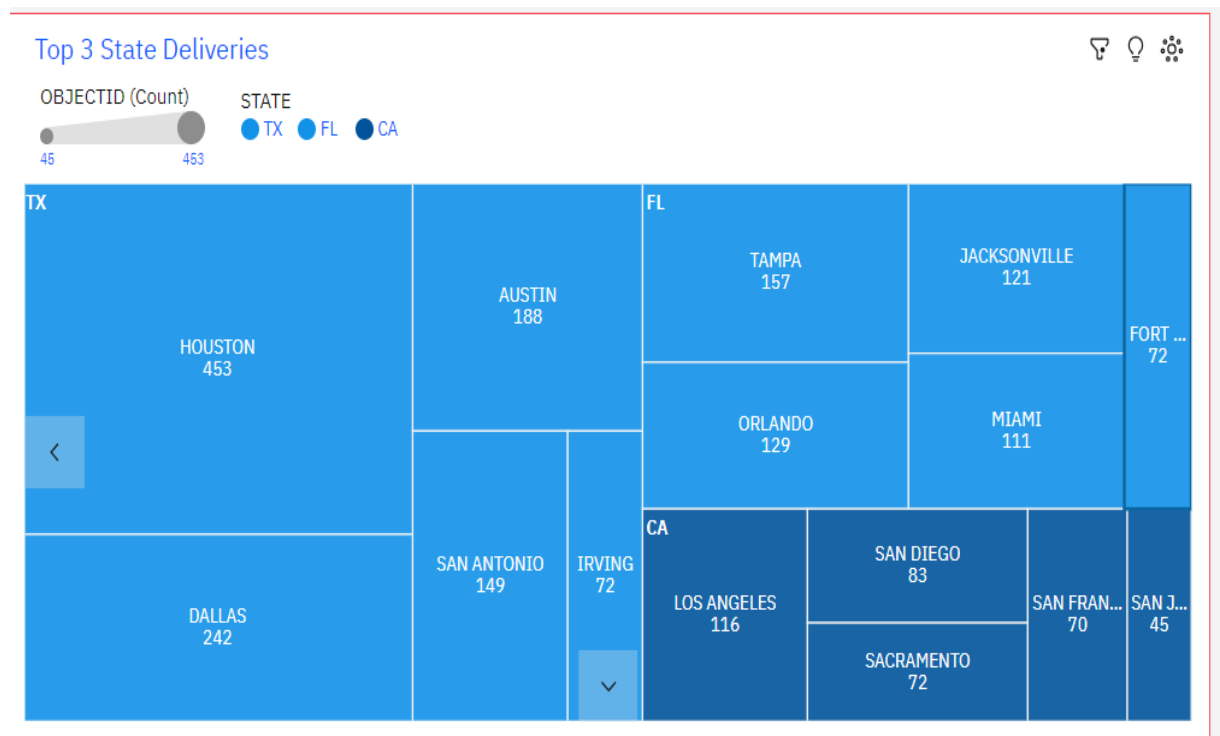
We are able to analyze city-wise number of pickups made, zip code wise number of pickups made, total number of object IDs serviced by DHL and contribution of states through Geo map display.

We also created stories with the help of which we can to communicate your findings to others by telling a story that is both informative and engaging.

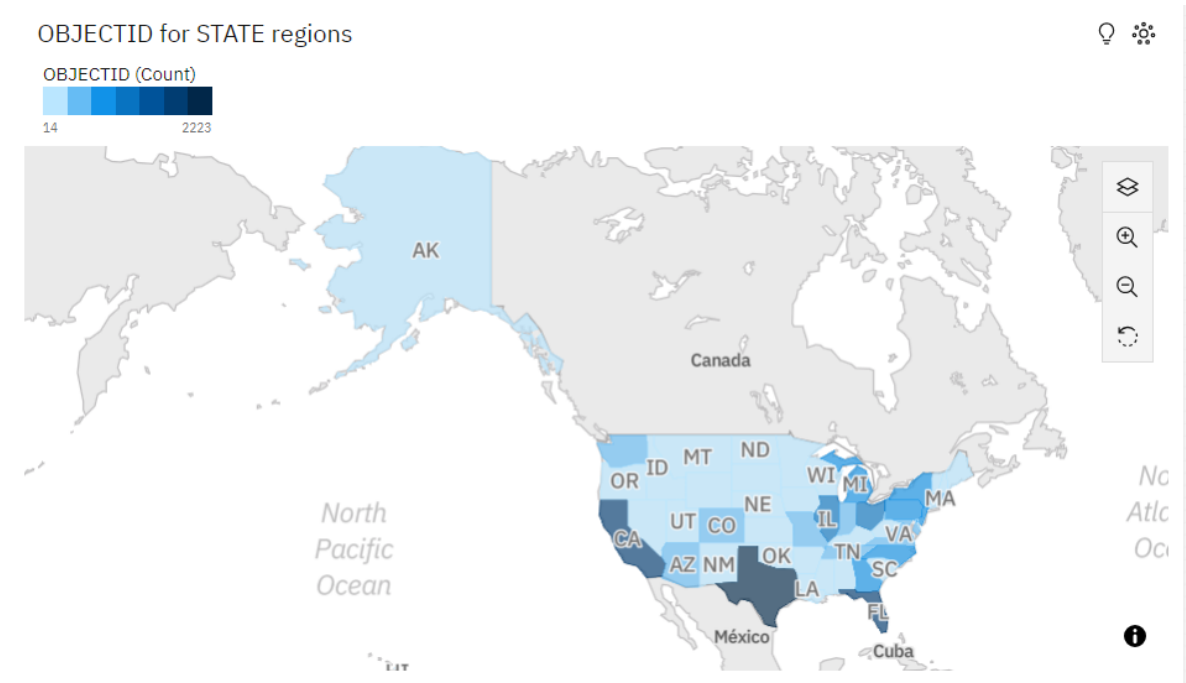
Area chart showing City-wise DHL Deliveries



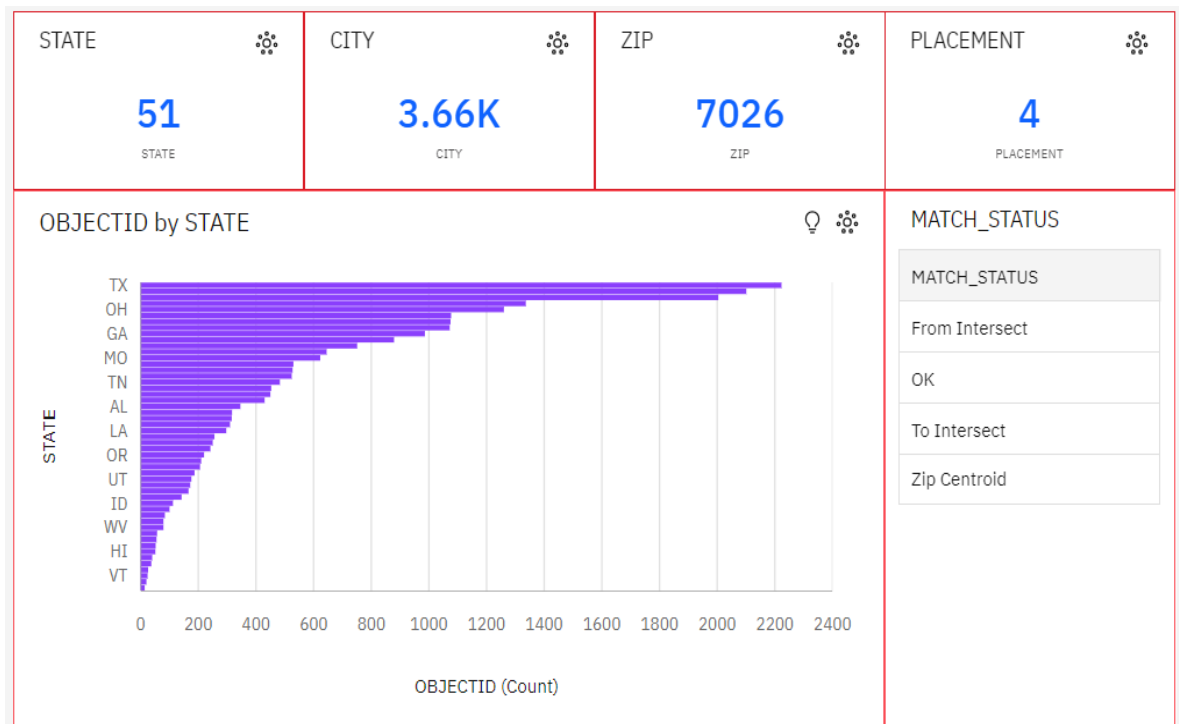
Tree map showing top 3 state deliveries

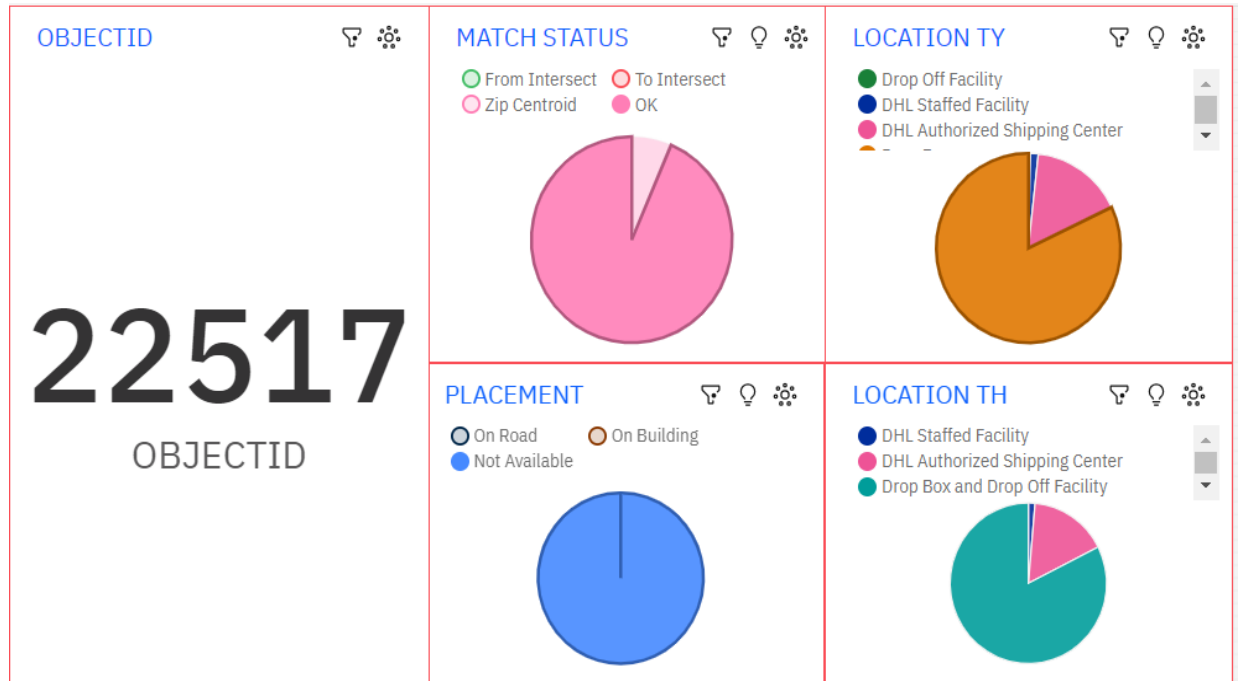


## Geo map displaying contribution of states

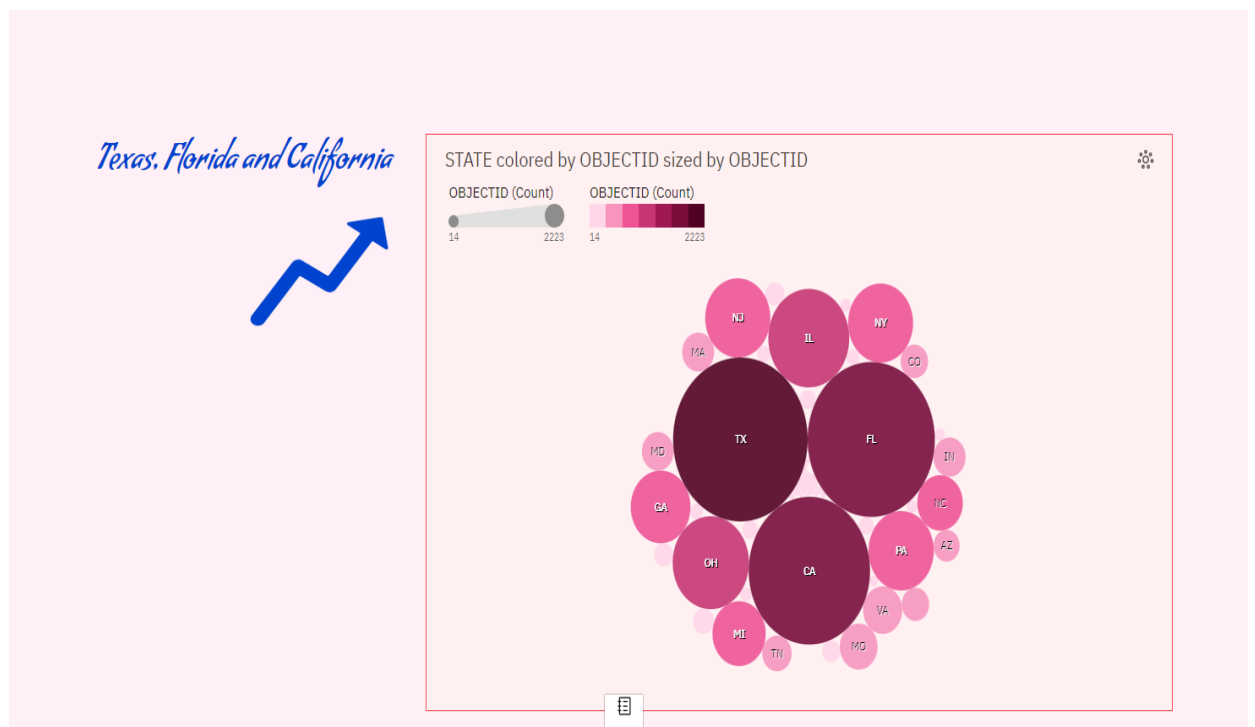


## Interactive Dashboards

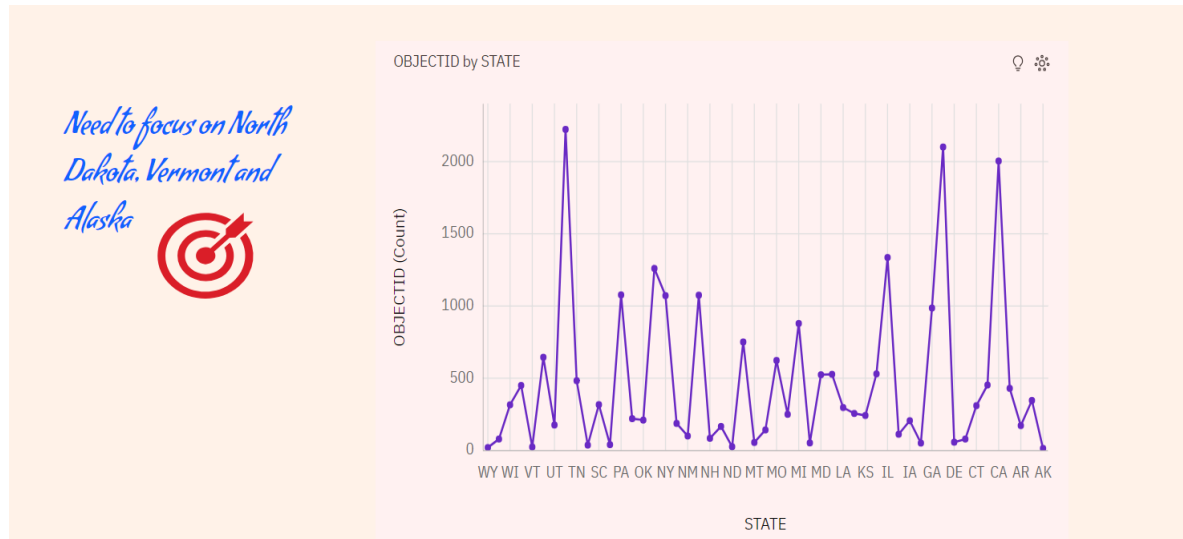




## Stories







## ADVANTAGES & DISADVANTAGES

### Advantages

Analyzing data with BI tools in this case Cognos have a large number of advantages they provides a robust set of tools for creating highly customizable reports and conducting advanced analytics. Cognos allows users to create interactive dashboards, charts, and graphs to visualize data and gain insights. Cognos is designed to handle large volumes of data and can scale to meet the needs of enterprise-level organizations. It leverages parallel processing and in-memory caching to deliver fast and efficient performance even with complex data models.

Cognos integrates well with various data sources, including databases, spreadsheets, and enterprise systems. It supports multiple data formats and provides connectors for popular databases, enabling seamless data integration and consolidation. Cognos offers self-service functionalities that empower business users to access and analyze data without heavy reliance on IT teams. It provides intuitive interfaces and drag-and-drop functionality, allowing users to create their own reports and perform ad-hoc analyses.

## Disadvantages

Cognos is a complex software suite with a wide range of features and functionalities. It can have a steep learning curve, requiring training and expertise to fully utilize its capabilities. Novice users may find it challenging to navigate and master the tool. While Cognos offers extensive customization options, there may be limitations in terms of specific requirements or unique business needs. Customizing certain aspects of the software, such as complex report layouts or advanced calculations, may require additional development effort or workarounds.

## APPLICATIONS

Data analytics in logistics and supply chain can have a wide range of application. Data analytics enables logistics companies to optimize routes for transportation, minimizing distance, fuel consumption, and delivery times. By analyzing factors such as traffic patterns, weather conditions, and real-time data, companies can identify the most efficient routes and make adjustments as needed. Data analytics provides insights into the entire supply chain, allowing companies to track shipments, monitor inventory levels, and identify potential bottlenecks. This visibility helps in improving efficiency, reducing delays, and enhancing customer satisfaction. Analytics can be applied to warehouse operations to optimize inventory placement, improve order picking processes, and streamline overall warehouse management. By analyzing data related to stock levels, order patterns, and operational efficiency, companies can identify areas for improvement and implement strategies to enhance productivity.

Data we analyzed will plays a crucial role in identifying and managing risks in logistics operations. By analyzing historical data, companies can assess risks related to transportation, supply chain disruptions, and inventory management. This enables proactive risk mitigation strategies and contingency planning also it will help the company identify cost-saving opportunities. By analyzing data related to transportation costs, warehousing expenses, and operational inefficiencies, companies can make informed decisions to reduce costs and improve profitability.

Overall we can say data analytics has the potential to transform the logistics industry by providing actionable insights, optimizing operations, and improving customer experiences. By leveraging data

effectively, logistics companies can gain a competitive advantage and drive operational excellence in an increasingly complex and dynamic business environment.

## **CONCLUSION**

Data is being analyzed in a BI tool IBM Cognos and created various visualizations and explored data to get visibilities in how the logistics system works and where we need to work to increase the efficiency.

By creating visualizations of city wise number of objects serviced or number of pickups made we can clearly get the understanding of well the services are working and what are the cities where we need to setup new service centers. We were able to analyze in how many cities in a state the company is operating the service centers. By analyzing data we can find the match status of a product and also where it should be placed at the time of delivery.

In conclusion, analyzing data in the logistics industry offers significant benefits and opportunities for optimization. By harnessing the power of data analytics, logistics companies can enhance operational efficiency, improve decision-making, and drive overall business success. The ability to accurately forecast demand, optimize transportation routes, and manage inventory levels leads to cost savings, improved customer satisfaction, and increased profitability.

## **BIBLIOGRAPHY**

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