



Report

Exploring Insights from Synthetic Airline Dataset with Qlik

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Introduction

Supply chain management is changing rapidly due to the rise of data and advanced analytics technologies. Traditional supply chains are often slow and inefficient and struggle to keep up with today's fast-paced market demands. To remain competitive, companies need to adopt smart, data-driven methods to streamline operations, cut costs, and make better decisions.

Qlik Insights, a powerful business intelligence and analytics tool, is used to analyse the data. It helps companies by bringing together data from various sources, making it easy to visualize and analyse, and providing actionable insights. The report looks at how Qlik Insights solves major Supply Chain Management problems like improving demand forecasting, managing inventory more effectively, optimizing logistics, and enhancing supplier relationships.

By using predictive analytics, Qlik Insights helps companies forecast demand accurately, avoiding issues like overstocking or running out of stock. Real-time data monitoring improves inventory management, and advanced route and carrier selection enhance logistics efficiency of the supply chain. Additionally, it combines supplier performance data, which helps in better managing of supplier relationships.

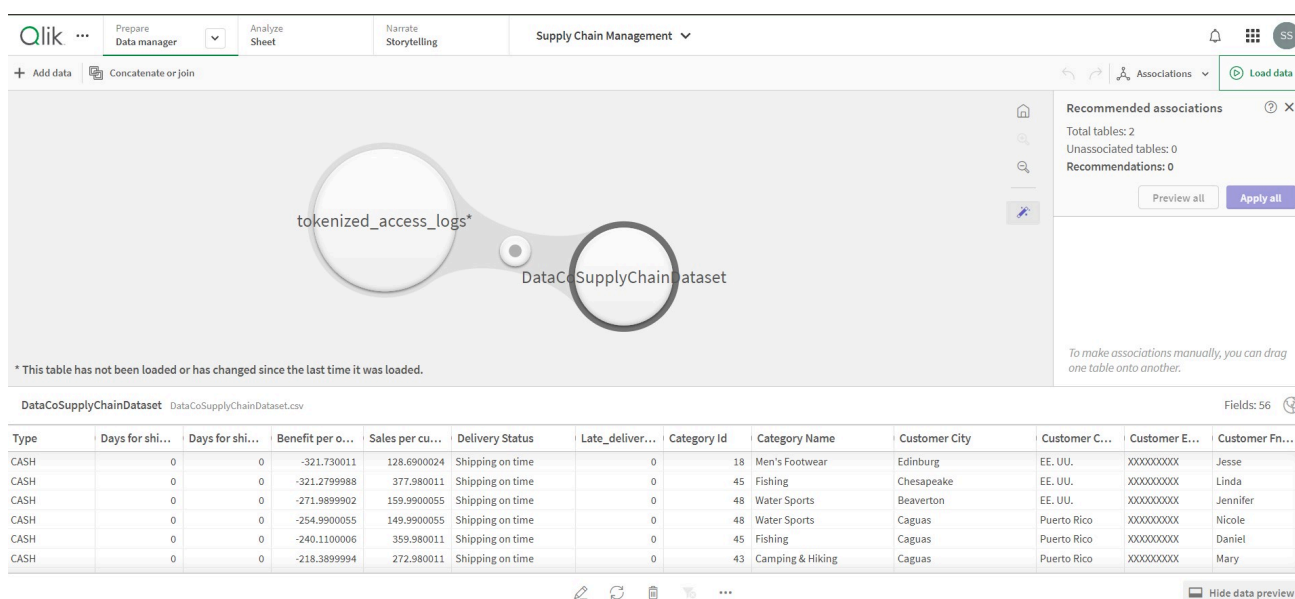
Purpose: The use of this project. What can be achieved using this:

Supply Chain Management is used to manage supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It involves developing and running supply chains in the most effective and efficient ways possible. Supply Chain Management aims to control centrally or link the production, shipment, and distribution of products, allowing companies to cut costs, eliminate unnecessary steps, and deliver products faster

“Data-Driven Innovations in Supply Chain Management with Qlik Insights” aims to supply chain management through data-driven insights using Qlik. By doing advanced analytics, it seeks to optimize logistics, forecasting, and inventory management for the businesses, ultimately enhancing operational efficiency and responsiveness.

By addressing traditional Supply Chain Management challenges such as data inefficiency and lack of real-time visibility, Qlik Insights enhances forecasting, inventory management, logistics optimization, and supplier relationship management in the businesses. Through advanced analytics and machine learning, Qlik Insights provides precise demand forecasts, real-time inventory monitoring, optimized logistics, and improved supplier performance management.

Technical Architecture



Type	Days for shi...	Days for shi...	Benefit per o...	Sales per cu...	Delivery Status	Late_deliver...	Category Id	Category Name	Customer City	Customer C...	Customer E...	Customer Fn...
CASH	0	0	-321.730011	128.6900024	Shipping on time	0	18	Men's Footwear	Edinburg	EE. UU.	XXXXXXXXXX	Jesse
CASH	0	0	-321.2799988	377.980011	Shipping on time	0	45	Fishing	Chesapeake	EE. UU.	XXXXXXXXXX	Linda
CASH	0	0	-271.9899902	159.9900055	Shipping on time	0	48	Water Sports	Beaverton	EE. UU.	XXXXXXXXXX	Jennifer
CASH	0	0	-254.9900055	149.9900055	Shipping on time	0	48	Water Sports	Caguas	Puerto Rico	XXXXXXXXXX	Nicole
CASH	0	0	-240.1100006	359.980011	Shipping on time	0	45	Fishing	Caguas	Puerto Rico	XXXXXXXXXX	Daniel
CASH	0	0	-218.3899994	272.980011	Shipping on time	0	43	Camping & Hiking	Caguas	Puerto Rico	XXXXXXXXXX	Mary

Problem Understanding

The business problem in supply chain management revolves around coordinating all the different steps involved in producing and delivering goods to customers in a way that is efficient, cost-effective, and reliable. Companies often struggle with issues such as inventory shortages or surpluses, delays in transportation, fluctuating demand, and communication gaps between suppliers and manufacturers. These problems can lead to increased costs, unhappy customers, and lost sales. The challenge is to streamline these processes, ensure timely deliveries, maintain the right inventory levels, and respond quickly to any disruptions or changes in demand. Solving these problems is essential for keeping the business running smoothly and maintaining customer satisfaction.

Business requirements

In supply chain management, business requirements are the specific needs and conditions that must be met to ensure smooth and efficient operations. These requirements typically include maintaining accurate inventory levels, ensuring timely delivery of products, managing supplier relationships, and optimizing logistics and transportation. Businesses need reliable systems for tracking orders, forecasting demand, and managing warehouse operations. Additionally, effective communication and collaboration among all stakeholders, including suppliers, manufacturers, and customers, are crucial. Compliance with industry standards and regulations, along with the ability to adapt to changes in market demand and supply chain disruptions, are also important. Meeting these requirements helps businesses reduce costs, improve customer satisfaction, and maintain a competitive edge.

Literature Survey

In data-driven innovations in supply chain management, an empirical study examined the role of data-driven supply chain orientation and innovation. The study surveyed 296 Chinese enterprises, combining questionnaire results with a literature review. The findings emphasized the importance of data readiness and its impact on supply chain efficiency and innovation. Additionally, projects like “Data-Driven Innovations in Supply Chain Management with Qlik Insights” leverage Qlik’s advanced analytics to optimize logistics, forecasting, inventory management, and real-time monitoring, ultimately enhancing operational efficiency and responsiveness

Data Collection: Setup and Making App

Creating an Account and Making the project:

Login and Account Creation:

1. Access the Qlik Sense website(<https://www.qlik.com/us/try-or-buy/download-qlik-sense>) and create a new account.
2. Apply for Qlik sense academic license which provides the access for 1 year to the college students .
3. After the account creation, we can start making the App in the Qlik sense Cloud
OR
4. Download the Qlik Sense Desktop unlock file and start making the project.

Note: It is feasible to use the Qlik sense cloud version as it is having more features to work with.

Creating a New App and Upload Data:

Create a New App:

1. Click on the "Add new" button and select New Analytics App to start a new project.

Upload the Dataset:

1. Go to Skill Wallet and download the project data set.
2. In Qlik Sense, upload this data set into the new app.
3. Now, we are ready to generate various insights using the dataset.

Data Preparation

Data preparation involves cleaning the data to remove duplicates, null values, irrelevant or missing data. It transforms the data and assigns meaningful labels or categories to data points.

It also formats to visualize easily, explore the data, and identify patterns and trends. This includes handling missing values, converting data types, and standardizing units.

It filters the data to analyse it on the specific information and prepares the data for visualization software ensuring the data is accurate and complete. This process helps to easily understand the data and create the visualizations to gain insights into performance and efficiency. Since the data is already cleaned, we can move to visualization.

Preparing the Data for Visualization

When preparing data for visualizations in Data-Driven Innovations in Supply Chain Management with Qlik Insights, we consider the following steps:

1. Data Collection:

- Gather relevant data from various sources, including ERP systems, logistics databases, and external APIs.
- Ensure data quality by addressing missing values, duplicates, and inconsistencies.

2. Data Transformation:

- Convert raw data into a consistent format (e.g., CSV, Excel).
- Standardize units, handle time zones, and align data structures.

3. Data Integration:

- Combine data from different domains (e.g., sales, inventory, transportation).
- Use Qlik's data connectors to integrate diverse data sources.

4. Data Modelling:

- Design a data model that supports your supply chain use cases.
- Define relationships between tables (e.g., shipments, products, suppliers).

5. Data Visualization:

- Leverage Qlik's visualization tools to create dashboards and reports.
- Visualize key supply chain metrics (e.g., on-time delivery, inventory turnover) using charts, graphs, and maps.

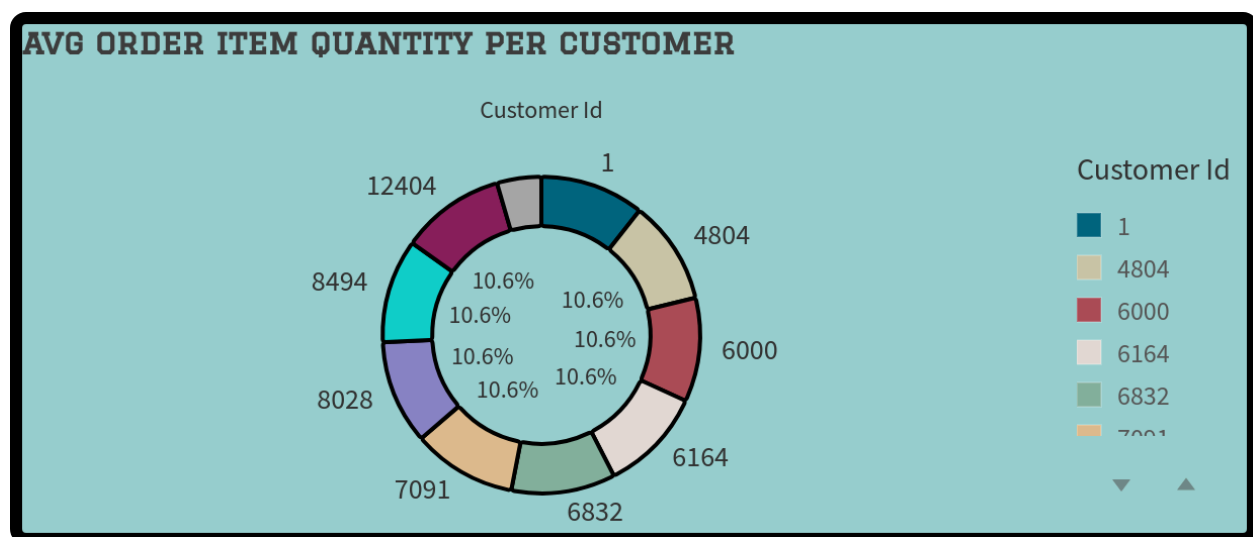
Data Visualization

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. Additionally, it provides an excellent way for employees or business owners to present data to non-technical audiences without confusion.

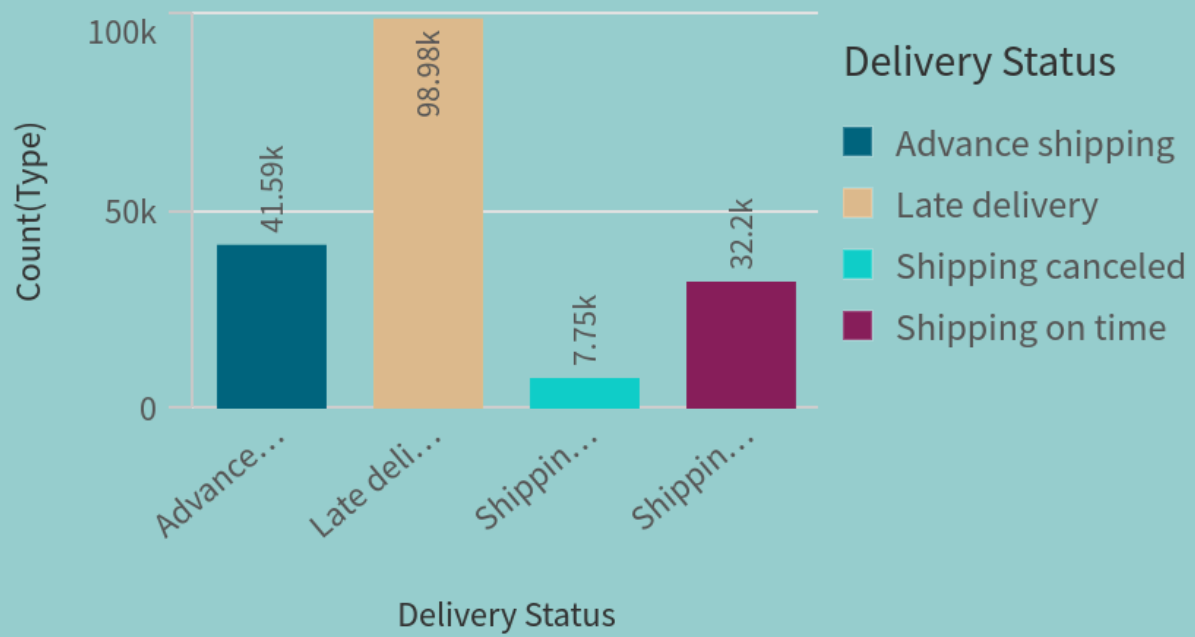
In the world of Big Data, data visualization tools and technologies are essential to analyse massive amounts of information and make data-driven decisions.

Data visualization can be used to share information visually easily. We also can visualize patterns and relationships and interactively explore opportunities.

Eg for visualization:



Delivery Status of orders



Dashboard

Dashboard Creation

Design Dashboards:

1. Create two dashboards, aligning the visualizations and key performance indicators effectively.

Storytelling

Create a Story:

1. Use the storytelling feature in Qlik Sense to create a presentation (PPT).
2. Include the visualizations and narrative to explain the insights derived from the data.

These are the two dashboards, that i have created using the Qlik sense.



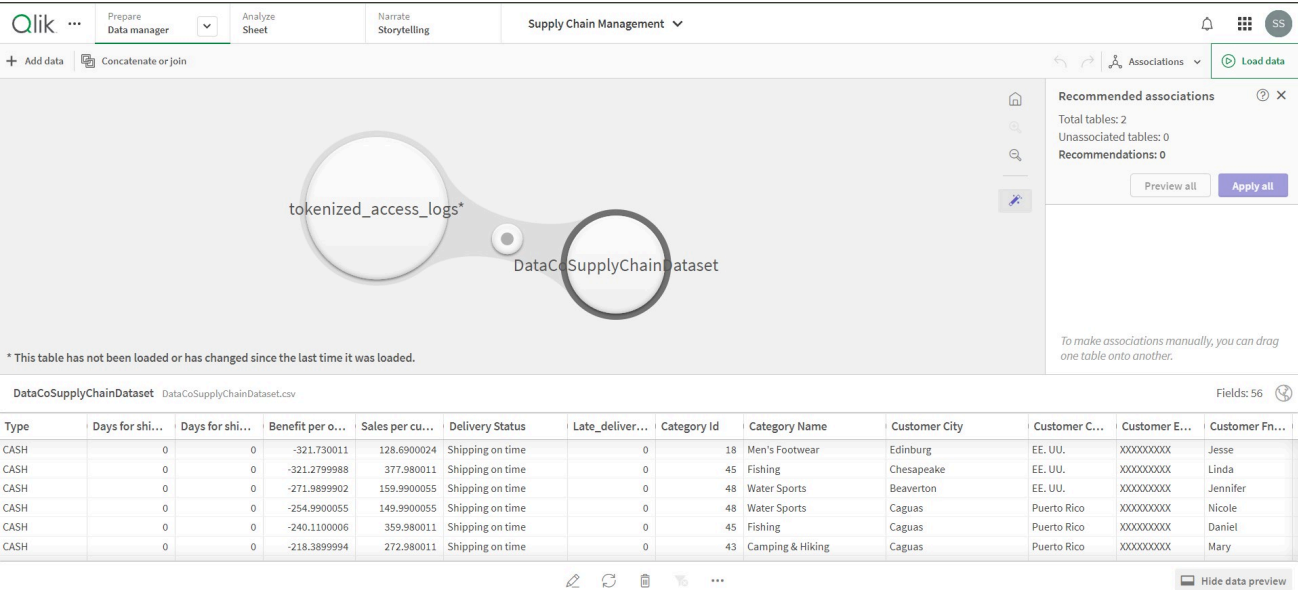
Performance Testing

Data-Driven Innovations in Supply Chain Management with Qlik Insights, performance testing ensures that the platform operates efficiently. Key aspects include assessing system responsiveness, dashboard load handling, data refresh rates, and scalability. By simulating various scenarios, organizations can optimize resource allocation and enhance overall performance.

Amount of Data Rendered

In supply chain management, the amount of data rendered refers to the vast quantity of information generated and processed at various stages, from sourcing raw materials to delivering finished products to customers. This data includes details about inventory levels, transportation schedules, supplier performance, customer orders, and more. By effectively managing and analysing this data, businesses can improve efficiency, reduce costs, and respond more quickly to market demands. Advanced technologies like big data analytics, IoT, and AI play a crucial role in making sense of this data, helping companies optimize their supply chain operations.

This is the dataset, I have uploaded and created the association.



Utilization of Data Filters

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 performance and efficiency of banks 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, breakdown of revenue and customer demographics, workload, resource allocation and location of banks