Data-Driven Innovations In Supply Chain Management With Qlik Insights

1. Introduction

1.1 Overview: A Brief Description about Your Project

This project aims to revolutionize supply chain management through data-driven insights using Qlik Sense. By leveraging advanced analytics, we seek to optimize logistics, forecasting, and inventory management, thereby enhancing operational efficiency and responsiveness. The goal is to harness Qlik Sense's powerful data visualization and analytics capabilities to transform the supply chain landscape.

1.2 Purpose: The Use of This Project. What Can Be Achieved Using This.

The purpose of this project is to improve supply chain operations by providing clear, actionable insights from complex data sets. Achievements include:

- Enhanced visibility into supply chain processes.
- Improved decision-making through real-time data analytics.
- Optimization of logistics and inventory management.
- Reduction in lead times and transportation costs.
- Better responsiveness to market changes and customer demands.

1.3 Technical Architecture

The technical architecture of this project involves:

- **Data Source Integration:** Collecting data from various supply chain databases and systems.
- **Data Processing:** Cleaning and preparing the data for analysis.
- **Qlik Sense Platform:** Utilizing Qlik Sense for data visualization and dashboard creation.
- **User Interface:** Interactive dashboards providing insights and facilitating decision-making.

2. Define Problem / Problem Understanding

2.1 Specify the Business Problem

The project aims to revolutionize supply chain management by utilizing data-driven insights to optimize logistics, forecasting, and inventory management. This will enhance operational efficiency and responsiveness, allowing businesses to better meet market demands and reduce operational costs.

2.2 Business Requirements

1. Implement a robust data integration strategy to centralize data from diverse sources.
2. Utilize Qlik's visualization capabilities to create intuitive dashboards.
3. Analyze historical logistics data to optimize transportation routes.
4. Implement real-time tracking and monitoring solutions.
5. Enable quick decision-making through real-time analytics.

2.3 Literature Survey

The literature survey highlights the growing importance of data analytics in supply chain management. Studies indicate that advanced analytics tools like Qlik significantly improve visibility, decision-making, logistics optimization, forecasting accuracy, and inventory management. Successful implementations demonstrate improved operational efficiency and responsiveness, with an emphasis on the necessity of robust data governance and a data-driven culture.

3. Data Collection

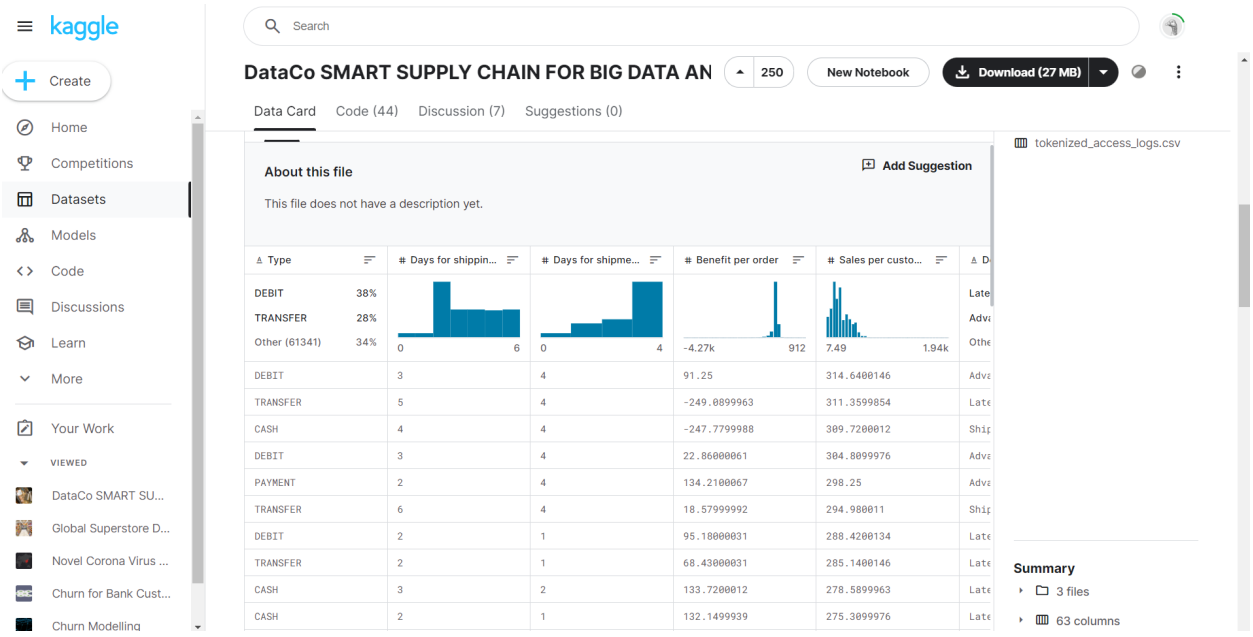
3.1 Collect the Dataset

The dataset was collected from various supply chain sources, containing detailed information on product shipment, customer demographics, sales, order details, and more.

link - https://www.kaggle.com/datasets/shashwatwork/dataco-smart-supply-chain-for-big-data-analysis/data

3.2 Connect Data with Qlik Sense

The collected dataset was loaded into Qlik Sense for analysis. This involved importing the data files and ensuring proper data integration within the Qlik Sense environment.

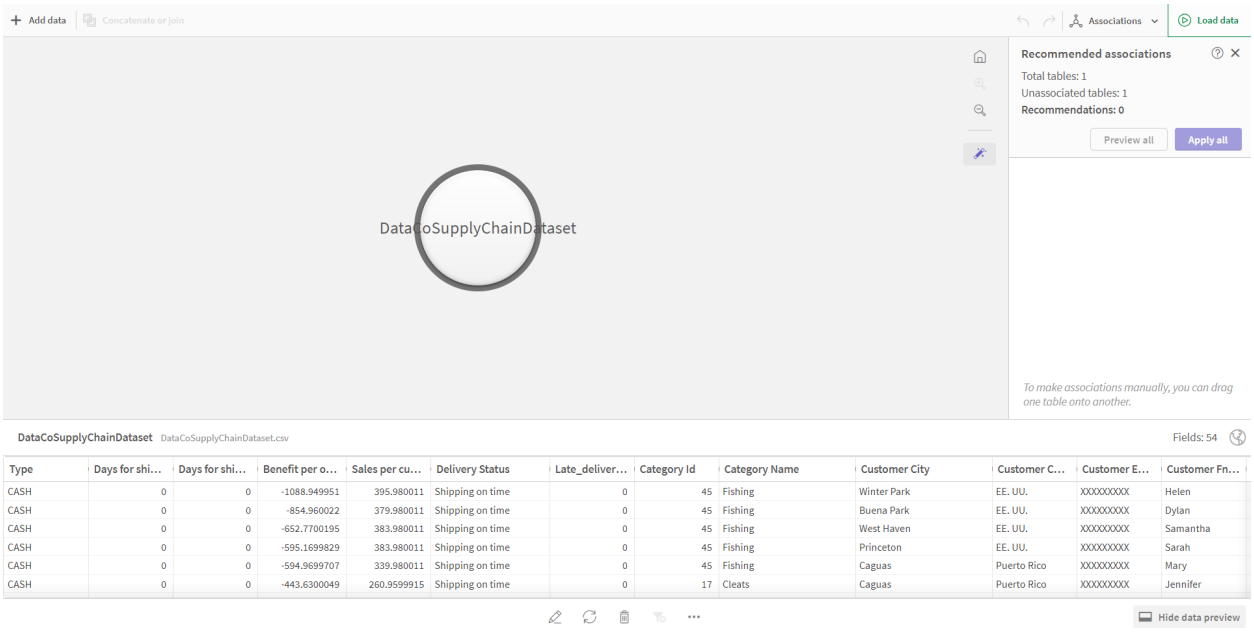


4. Data Preparation

4.1 Prepare the Data for Visualization

Data preparation involved:

- Cleaning the data by handling missing values and correcting data types.
- Transforming the data to ensure consistency.
- Creating calculated fields and aggregations needed for visualizations.



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	-1088.949951	395.980011	Shipping on time	0	45	Fishing	Winter Park	EE. UU.	XXXXXXXXX	Helen
CASH	0	0	-854.960022	379.980011	Shipping on time	0	45	Fishing	Buena Park	EE. UU.	XXXXXXXXX	Dylan
CASH	0	0	-652.7700195	383.980011	Shipping on time	0	45	Fishing	West Haven	EE. UU.	XXXXXXXXX	Samantha
CASH	0	0	-595.1699829	383.980011	Shipping on time	0	45	Fishing	Princeton	EE. UU.	XXXXXXXXX	Sarah
CASH	0	0	-594.9699707	339.980011	Shipping on time	0	45	Fishing	Caguas	Puerto Rico	XXXXXXXXX	Mary
CASH	0	0	-443.6300049	260.9599915	Shipping on time	0	17	Cleats	Caguas	Puerto Rico	XXXXXXXXX	Jennifer

5. Data Visualizations

5.1 Visualizations

The following visualizations were created to analyze various aspects of supply chain performance:

1. **Total Items Placed by Customers in Different Countries:**
    - Vertical Bar Chart
    - Dimension: Customer Country
    - Measure: Sum([Order Item Quantity])
    - Insights into regional demand.
2. **Total Items Placed by State:**
    - Vertical Bar Chart
    - Dimension: Customer State
    - Measure: Sum([Order Item Quantity])
    - Insights into state-level demand.
3. **Analysis on Customer Segment:**
    - Pie Chart
    - Dimension: Customer Segment
    - Measure: Count([Customer ID])
    - Distribution of customer segments.
4. **Mode of Payment:**
    - Pie Chart
    - Dimension: Mode of Payment
    - Measure: Count([Order ID])
    - Distribution of payment methods.
5. **Customer Purchase by City:**
    - Vertical Bar Chart
    - Dimension: Customer City
    - Measure: Sum([Order Item Quantity])
    - Insights into urban demand patterns.
6. **Delivery Status of Orders:**
    - Pie Chart
    - Dimension: Order Status
    - Measure: Count([Order ID])
    - Distribution of order delivery statuses.

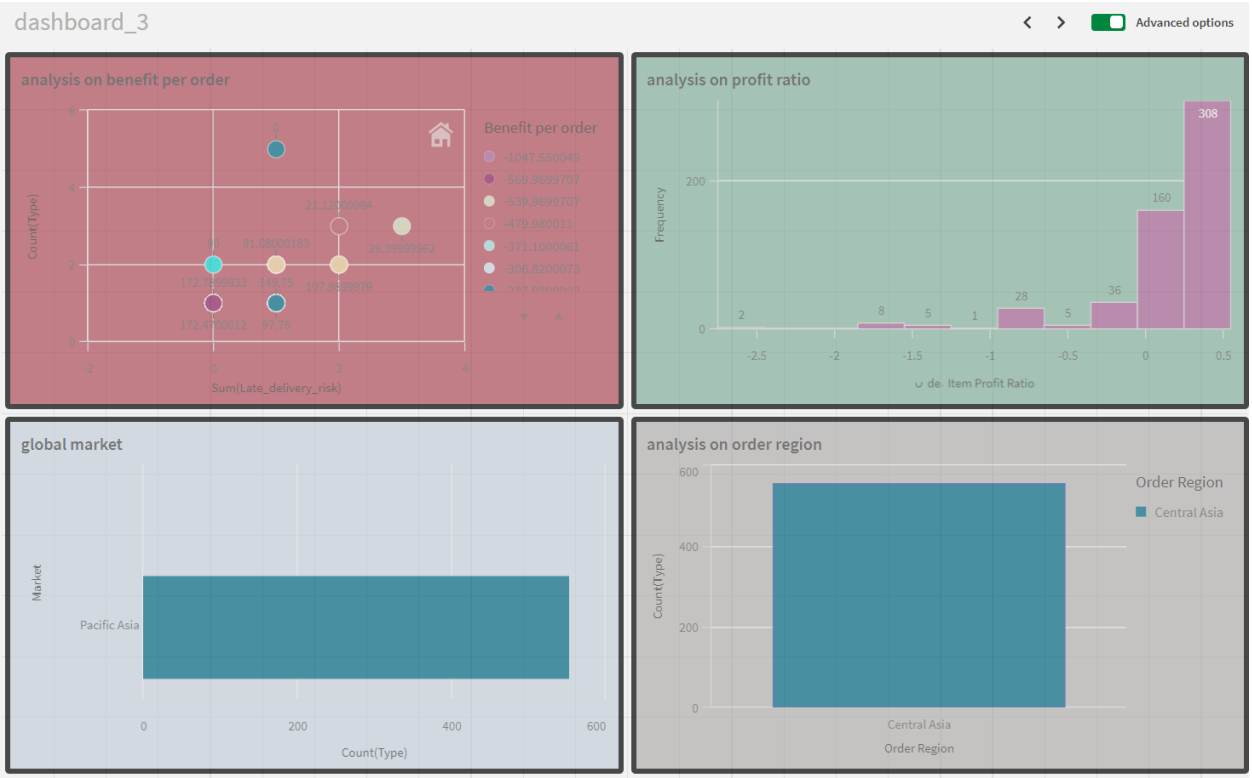
7. **Analysis on Benefit per Order:**
    - Line Chart
    - Dimension: Order Date
    - Measure: Sum([Benefit per item])
    - Insights into profit trends over time.
8. **Analysis on Profit Ratio:**
    - Scatter Plot
    - X-Axis: Order Item Profit Ratio
    - Y-Axis: Sum([Order Item Quantity])
    - Analysis of profit ratios.
9. **Market Analysis:**
    - Heat Map
    - Dimensions: Market, Product Category
    - Measure: Sum([Sales])
    - Sales distribution across markets and categories.
10. **Analysis on Order Region:**
    - Map Visualization
    - Dimension: Order Region
    - Measure: Count([Order ID])
    - Distribution of orders across regions.

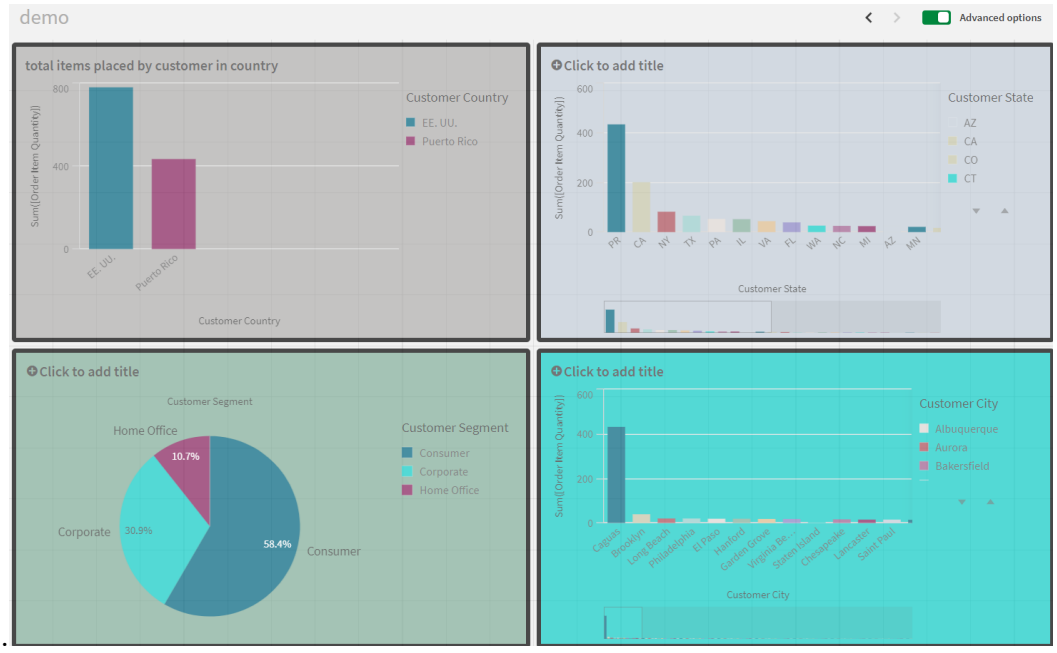
6. Dashboard

6.1 Responsive and Design of Dashboard

The dashboard was designed to be user-friendly and responsive. It includes:

- Interactive visualizations.
- Filter panes for dimensions like Customer Country, Order Date, and Product Category.
- Clear layout to ensure easy navigation and data interpretation.


dashboard_3
Advanced options
analysis on benefit per order
Benefit per order
-1047.550049
-569.9699707
-539.9699707
-479.980011
-371.1000061
-306.8200073
Count(Type)
Sum(Late_delivery_risk)
analysis on profit ratio
Frequency
308
160
36
28
5
1
8
2
global market
Market
Pacific Asia
Count(Type)
analysis on order region
Order Region
Central Asia
Count(Type)
Central Asia
Order Region


demo
Advanced options
total items placed by customer in country
Customer Country
EE. UU.
Puerto Rico
Sum([Order Item Quantity])
Customer Country
Click to add title
Customer State
AZ
CA
CO
CT
PR
CA
NY
TX
PA
IL
VA
FL
WA
NC
MI
AZ
MN
Customer State
Click to add title
Customer Segment
Home Office
10.7%
Corporate
30.9%
58.4%
Consumer
Customer Segment
Consumer
Corporate
Home Office
Click to add title
Customer City
Albuquerque
Aurora
Bakersfield
Customer City

7. Report

7.1 Report Creation

The project report includes:

- Detailed documentation of each step.
- Explanation of the business problem, data collection, preparation, and visualization processes.
- Insights derived from the data analysis.

8. Performance Testing

8.1 Amount of Data Rendered

The amount of data rendered to the database was optimized to ensure quick loading times and efficient performance.

8.2 Utilization of Data Filters

Data filters were implemented to allow users to explore the data interactively without compromising performance. The use of filters enhances the user experience by enabling customized views of the data.