

# 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

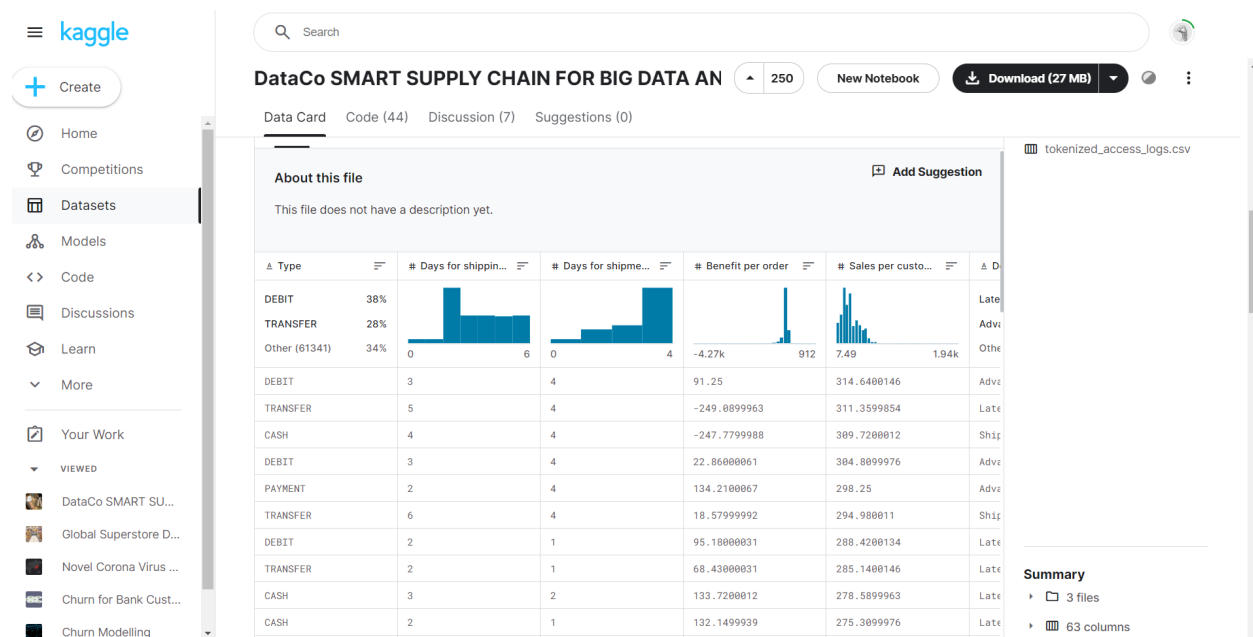
### 3.1 Collect the Dataset

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.

The screenshot shows a data preparation interface. At the top, there are buttons for '+ Add data', 'Concatenate or join', 'Associations', and 'Load data'. The main area displays a large circle with the text 'DataCoSupplyChainDataset' inside. To the right, a sidebar shows 'Recommended associations' with 'Total tables: 1', 'Unassociated tables: 1', and 'Recommendations: 0'. Below this, there are buttons for 'Preview all' and 'Apply all'. At the bottom, a table view is shown with the following data:

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

Fields: 54

## 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.







## **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.



