Data-Driven Innovations In Supply Chain Management With Qlik Insights.

1. Introduction

1.1. Overview: In the rapidly evolving field of supply chain management, data-driven insights have become essential for enhancing efficiency and responsiveness. As businesses face increasing competition and market volatility, the ability to quickly and accurately analyze supply chain data is crucial. This document explores the transformative power of Qlik Insights in optimizing logistics, forecasting, and inventory management. By leveraging Qlik's advanced analytics and visualization capabilities, businesses can achieve significant improvements in operational performance. Qlik's platform offers intuitive and interactive dashboards that allow users to explore data in real-time, identify trends, and uncover hidden opportunities. Through the integration of various data sources, Qlik provides a comprehensive view of the supply chain, enabling proactive decision-making and strategic planning.

1.2. Purpose: The primary purpose of this project is to demonstrate how Qlik Insights can be utilized to drive innovations in supply chain management. The goal is to provide stakeholders with clear, actionable insights through dynamic dashboards and real-time analytics, ultimately leading to enhanced decision-making and operational efficiency. By implementing Qlik Insights, organizations can gain a deeper understanding of their supply chain operations, identify inefficiencies, and implement corrective actions. The project aims to showcase the potential of Qlik in delivering real-time visibility into key performance indicators (KPIs), such as inventory levels, order fulfillment rates, and transportation costs. This enhanced visibility will empower stakeholders to make informed decisions, optimize resource allocation, and improve overall supply chain resilience.

1.3. Technical Architecture: This section outlines the technical architecture employed in this project, detailing the integration of data sources, the configuration of Qlik Sense for data processing, and the deployment of visualization dashboards. The technical architecture is designed to ensure seamless data flow and real-time analytics. It involves the following components:

1. **Data Integration:** The integration of diverse data sources, including ERP systems, warehouse management systems, transportation management systems, and external

market data. This ensures a holistic view of the supply chain.

2. **Data Processing:** The configuration of Qlik Sense for data processing involves data extraction, transformation, and loading (ETL). Qlik's associative engine allows for efficient data processing and association, enabling users to explore relationships within the data without predefined queries.

3. **Visualization Dashboards:** The deployment of interactive and user-friendly visualization dashboards. These dashboards are tailored to meet the needs of different stakeholders, providing them with relevant insights at their fingertips. Key features include drill-down capabilities, trend analysis, and predictive analytics.

4. **Security and Governance:** Ensuring data security and governance by implementing robust access controls, data encryption, and compliance with industry standards.

2. Define Problem / Problem Architecture.

2.1 Specify the business problem

The core objective is to revolutionize supply chain management by leveraging data-driven insights. This involves optimizing logistics, improving forecasting accuracy, and enhancing inventory management. By employing Qlik's advanced analytics, the project aims to elevate operational efficiency and responsiveness

2.2 Business Requirements

To achieve the project goals, the following business requirements have been identified:

- Implement a robust data integration strategy to aggregate and centralize data from various supply chain sources.
- Utilize Qlik's visualization capabilities to create intuitive, dynamic dashboards for comprehensive insights.
- Analyze historical logistics data to identify patterns and optimize transportation routes.
- Implement real-time tracking solutions to enhance visibility and reduce transportation costs.
- Facilitate quick decision-making through real-time analytics in response to unforeseen events or changes in demand.

2.3 Literature Survey

- **Visibility and Decision-Making:** Studies have demonstrated the critical role of data analytics in enhancing supply chain visibility and decision-making. Improved visibility allows for real-time monitoring and more informed decisions, reducing uncertainties and improving overall efficiency.
- **Logistics Optimization:** Research has shown that analytics tools like Qlik can significantly optimize logistics operations. These tools help streamline transportation

routes, improve load planning, and enhance delivery schedules, leading to cost reductions and better service levels.

- **Forecasting and Inventory Management:** Various studies provide evidence that advanced analytics improve forecasting accuracy and inventory management. Predictive analytics reduce forecast errors, align supply with demand, and minimize inventory holding costs, resulting in more efficient operations.
- **Successful Implementations:** Numerous case studies highlight successful data-driven supply chain management (SCM) transformations across different industries. These examples demonstrate substantial improvements in operational efficiency, cost savings, and product availability through the application of data analytics.
- **Challenges and Opportunities:** The adoption of data-driven approaches presents challenges such as data governance and cultural change within organizations. However, the opportunities, including greater agility, better risk management, and enhanced competitive advantage, outweigh these challenges, as evidenced by industry reports and research findings.

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3. Data Collection.

3.1 Collection of Dataset

Datasets were collected from various sources, covering diverse aspects of the supply chain, including logistics, inventory, and sales data. The data includes key metrics such as shipment days, profit per item, sales per customer, delivery risk, and demand forecasts. This comprehensive dataset ensures a holistic view of the supply chain, enabling detailed analysis and insights.
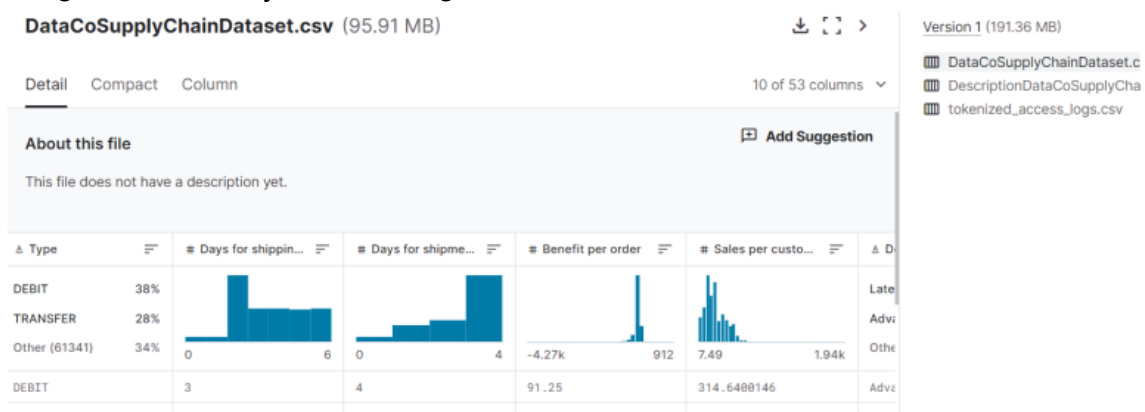
3.2 Connect Data with Qlik Sense

The collected data is integrated into Qlik Sense, allowing for seamless data processing

and visualization. This step involves configuring data connections, setting up data loading scripts, and ensuring data accuracy.

4. Data Preparation.

4.1 Prepare the data for Visualization

Data preparation involves cleaning, transforming, and exploring the data to ensure suitability for visualization. This process includes removing irrelevant data, handling missing values, and normalizing datasets. Structuring the data for easy interpretation is crucial. Additionally, ensuring consistency and accuracy in data entries is important. This preparation phase sets the foundation for effective analysis and visualization.
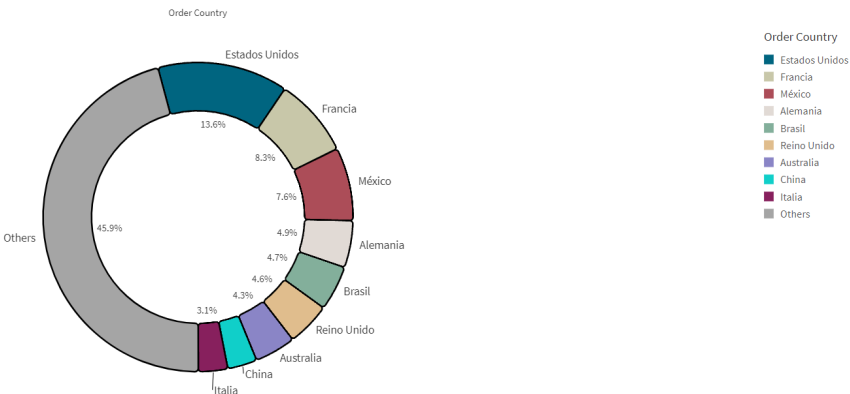
5. Data Visualizations

5.1 Visualizations

Various visualizations are created to analyze supply chain performance, including bar charts, line charts, heat maps, scatter plots, and pie charts. These visualizations offer insights into performance metrics, trends, and relationships between different variables. By presenting data visually, stakeholders can quickly identify patterns, monitor key indicators, and make informed decisions to enhance supply chain efficiency.

Global Profit Ratio

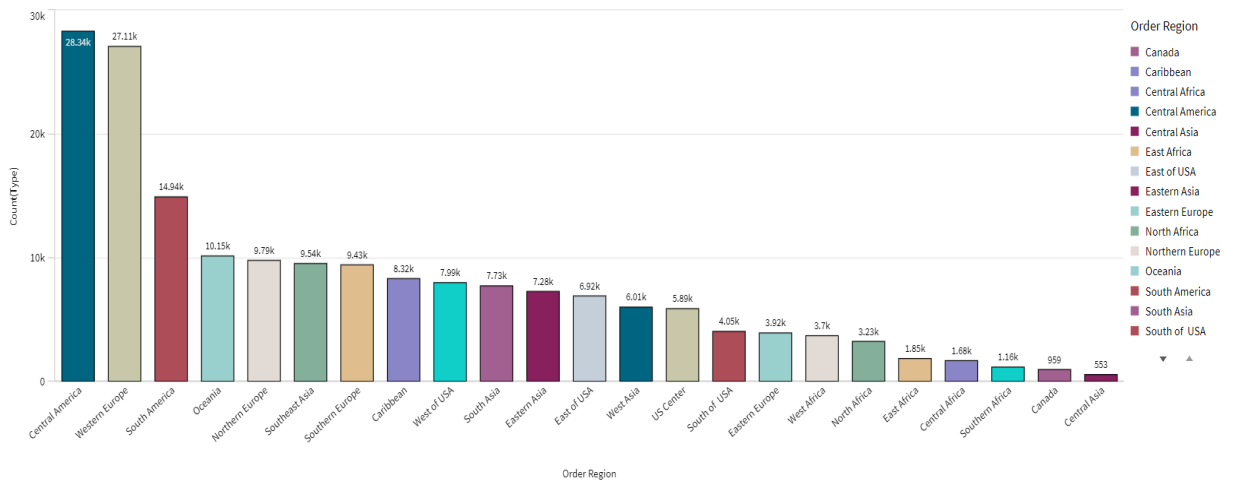**Total Item Place by a state**
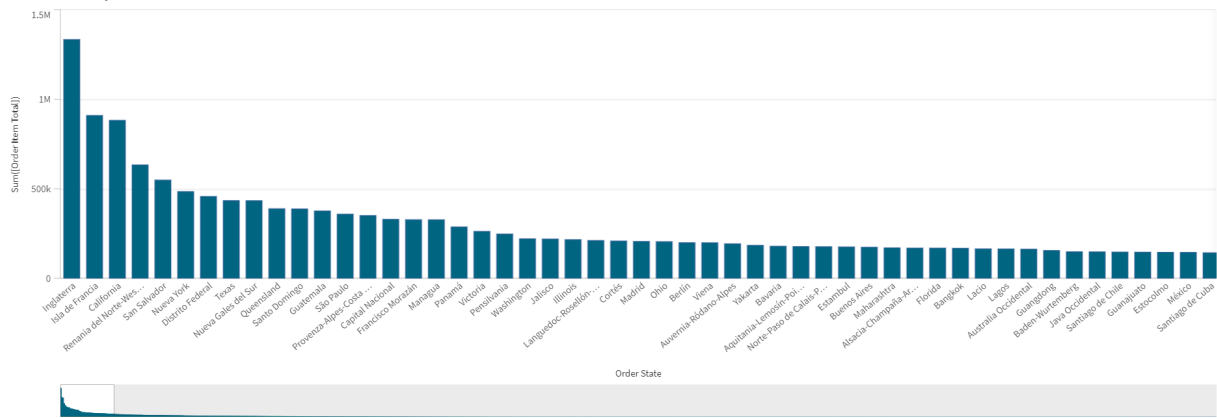
Analysis on customer segment
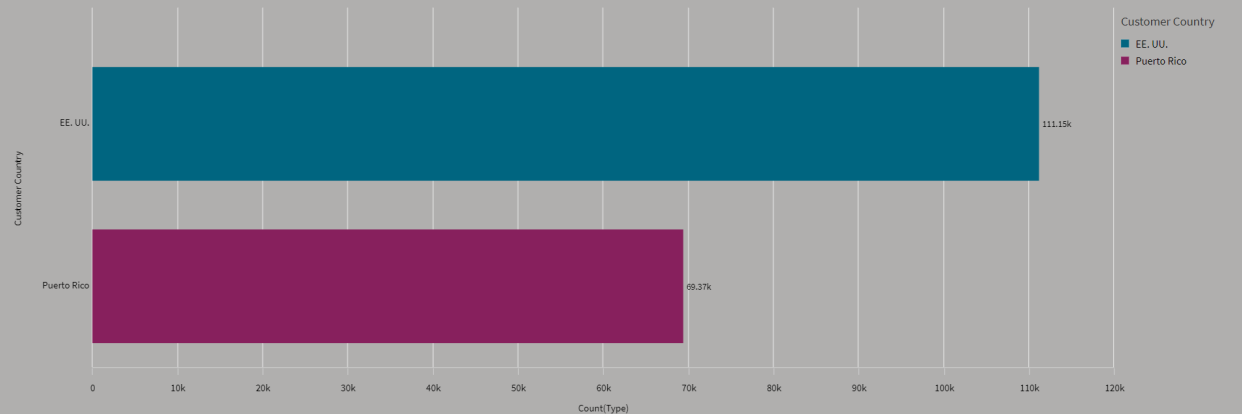
Hamza Asif Basri Supply Chain Management system

Analysis of order region

Count(Type) vs Order Region

Bar	Value
Central America	28.34k
Western Europe	27.11k
South America	14.94k
Oceania	10.15k
Northern Europe	9.79k
Southeast Asia	9.54k
Southern Europe	9.43k
Caribbean	8.32k
West of USA	7.99k
South Asia	7.73k
Eastern Asia	7.28k
East of USA	6.92k
West Asia	6.01k
US Center	5.89k
South of USA	4.05k
Eastern Europe	3.92k
West Africa	3.7k
North Africa	3.23k
East Africa	1.85k
Central Africa	1.68k
Southern Africa	1.16k
Canada	959
Central Asia	553

Order Region
- Canada
- Caribbean
- Central Africa
- Central America
- Central Asia
- East Africa
- East of USA
- Eastern Asia
- Eastern Europe
- North Africa
- Northern Europe
- Oceania
- South America
- South Asia
- South of USA

Mode of Payment

Count(Type) vs Type

Type	Value
CASH	19.62k
DEBIT	69.3k
PAYMENT	41.73k
TRANSFER	49.88k

Type
- CASH
- DEBIT
- PAYMENT
- TRANSFER

Customer purchase by city

Customer Country vs Count(Type)

Customer Country	Value
EE. UU.	111.15k
Puerto Rico	69.37k

Customer Country
- EE. UU.
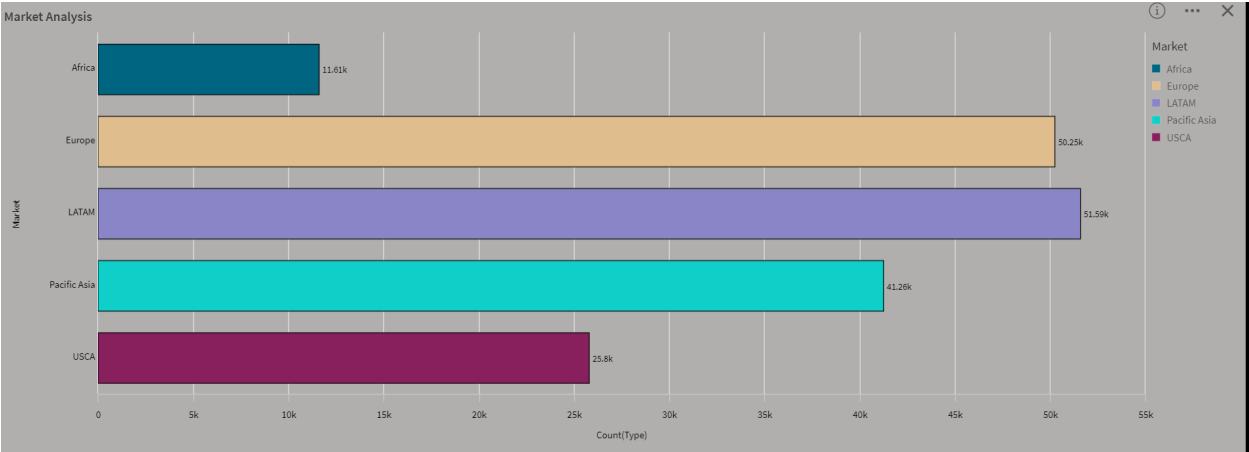- Puerto Rico

6. Dashboard

6.1 Responsive Design of Dashboard

The dashboard is designed to be user-friendly and responsive, ensuring accessibility across different devices. It includes interactive elements that allow stakeholders to drill down into specific data points and gain deeper insights. The responsive design adapts to various screen sizes, providing a seamless user experience. This enables stakeholders to access critical information anytime, anywhere, enhancing decision-making and operational efficiency.
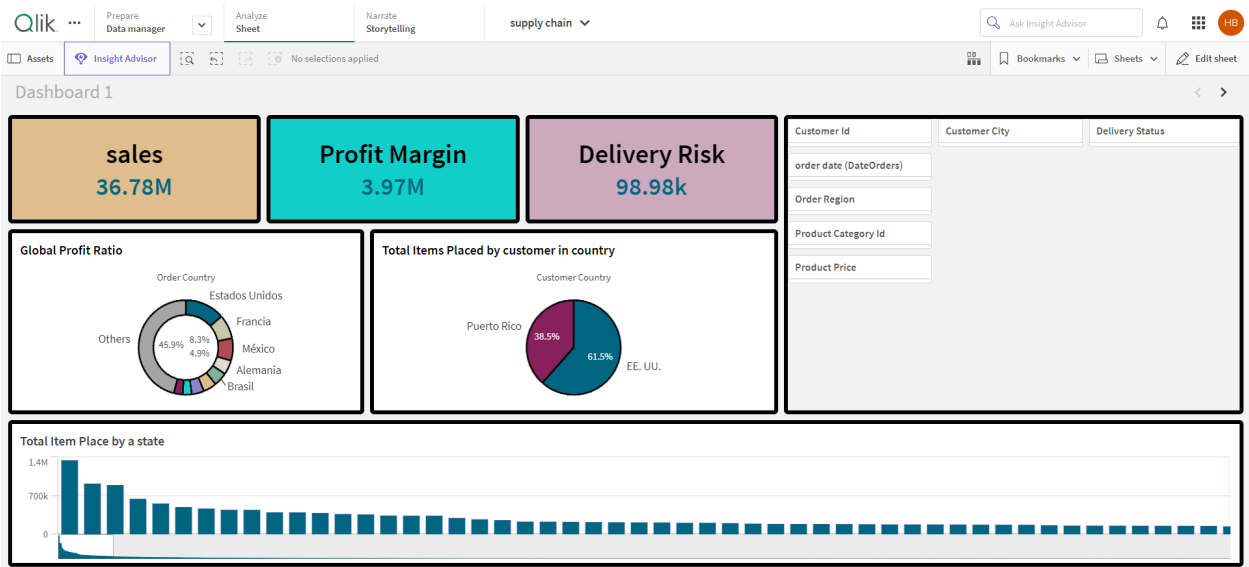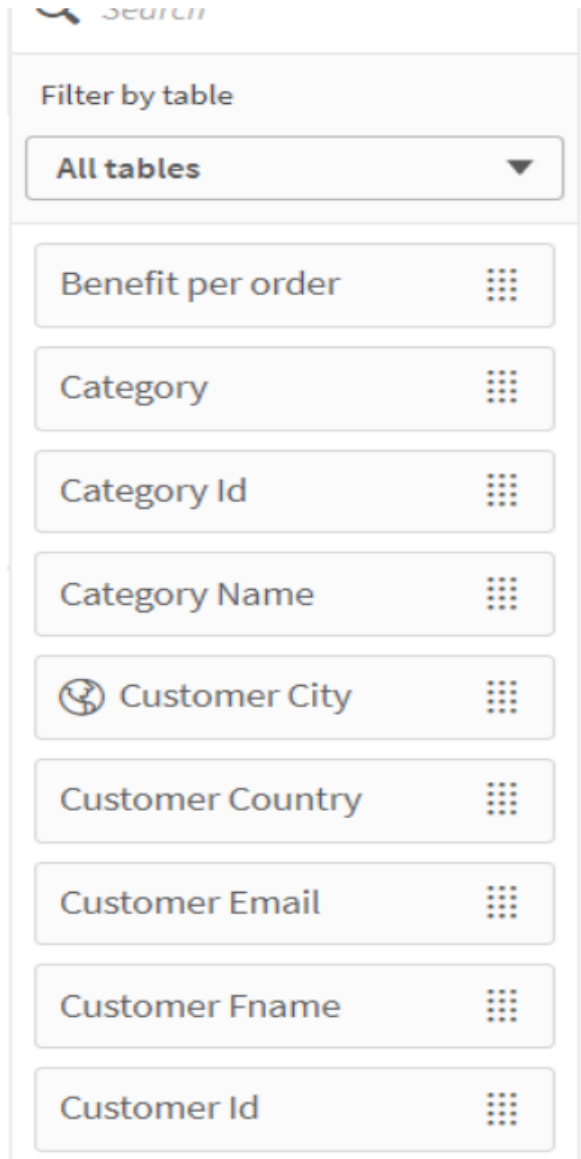

7. Report

7.1 Report Creation

Reports are meticulously crafted to encapsulate the key findings derived from thorough data analysis. These comprehensive reports feature detailed visualizations, accompanied by insightful narratives that contextualize the data. Each visualization is strategically chosen to elucidate crucial aspects of supply chain performance, such as trends, outliers, and correlations. Moreover, the reports offer actionable recommendations aimed at optimizing various facets of supply chain operations, thereby driving efficiency and resilience.

8. Performance Testing

8.1 Amount of Data Rendered

Performance testing involves assessing the system's ability to handle large volumes of data. This ensures that the analytics and visualizations remain fast and responsive even with extensive datasets.

Search

Filter by table

All tables ▼

Benefit per order ⣿

Category ⣿

Category Id ⣿

Category Name ⣿

🌐 Customer City ⣿

Customer Country ⣿

Customer Email ⣿

Customer Fname ⣿

Customer Id ⣿

8.2 Utilization of Data Filters

The utilization of data filters undergoes rigorous testing to validate their effectiveness in narrowing down data to the most relevant information. This testing process involves examining various scenarios and user interactions to ensure that the filters accurately capture the desired criteria. By meticulously testing data filters, the user experience is enhanced, providing stakeholders with focused insights tailored to their specific needs and objectives. This ensures that users can easily navigate through vast datasets and

extract meaningful insights without being overwhelmed by irrelevant information. Ultimately, the robust utilization of data filters contributes to a more intuitive and efficient analytical experience, empowering stakeholders to make informed decisions and drive continuous improvement in supply chain management.