Supply Chain Management Analytics Project Report

Introduction

In the dynamic world of global commerce, effective supply chain management (SCM) is essential for the seamless flow of goods and services. This project harnesses the power of data preparation, visualization, and performance testing to enhance the efficiency and performance of SCM systems. Our primary goals include optimizing delivery times, boosting customer satisfaction, and improving overall supply chain efficiency.

Project Objectives

1. ***Data Preparation***: Cleanse and transform the dataset for comprehensive analysis.
2. ***Data Visualization***: Develop insightful visualizations to understand key supply chain metrics.
3. ***Performance Testing:*** Identify and mitigate risks associated with late deliveries.
4. ***Social Impact Analysis***: Assess the impact of data-driven innovations on social welfare.
5. ***Business Impact Analysis***: Evaluate the effects of data-driven innovations on business operations, especially in banking, telecommunications, and e-commerce sectors.
6. ***Data Integration Strategy***: Aggregate and centralize data from diverse supply chain sources.
7. ***Advanced Analytics***: Utilize Qlik's features to optimize logistics and transportation routes.
8. ***Real-Time Tracking and Monitoring:*** Enhance visibility and reduce lead times.
9. ***Real-Time Analytics***: Enable quick decision-making in response to demand changes or unforeseen events.

Dataset Description

The dataset includes various attributes related to shipping details, customer information, product details, and order specifics. Key attributes include:
- Payment Type
- Real and Scheduled Shipping Days
- Benefit per Order
- Sales per Customer
- Delivery Status
- Late Delivery Risk
- Customer and Order Location Details
- Product Information

Data Preparation

Steps:

1. ***Data Cleaning***: Address missing values, correct inconsistencies, and standardize data formats.
2. ***Data Integration:*** Implement a robust data integration strategy to aggregate and centralize relevant data from diverse supply chain sources.

Data Visualization

Key Visualizations:

1. ***Delivery Performance:***
   - ***Columns***: `Days for shipping (real)`, `Days for shipment (scheduled)`
   - ***Visuals***: Histogram, Box Plot
2. ***Late Delivery Risk:***
   - ***Columns***: `Late_delivery_risk`, `Order Region`
   - ***Visuals***: Bar Chart, Pie Chart
3. **Financial Metrics:**
   - ***Columns:*** `Benefit per order`, `Sales per customer`

- ***Visuals***: Histogram, Scatter Plot

4. ***Geographical Analysis:***
   - ***Columns***: `Customer City`, `Customer Country`
   - ***Visuals:*** Bar chart
5. ***Order and Shipping Details:***
   - ***Columns:*** `Order Item Quantity`, `Sales`, `Order Region`
   - ***Visuals***: Bar Chart
6. ***Customer Segmentation:***
   - ***Columns:*** `Customer Segment`, `Sales per customer`, `Benefit per order`
   - ***Visuals***: Bar Chart, Pie Chart
7. ***Temporal Analysis:***
   - ***Columns:*** `order date (DateOrders)`, `Sales`
   - ***Visuals***: Line Chart

Visualizations and Analysis:

1. ***Demographic Distribution:***
   - ***Columns:*** `Customer Country`, `Customer State`, `Customer Segment`
   - ***Visuals:*** Demographic Distribution Maps, Bar Charts
2. ***Impact on Social Welfare Programs:***
   - ***Analyze:*** Improvements in delivery times, access to products in remote areas.
   - ***Visuals:*** Trend Analysis Charts, Correlation Heatmaps

3. ***Financial Inclusion:***
   - ***Analyze***: Accessibility improvements for financially underserved populations.
   - ***Visuals***: Geospatial Analysis, Correlation Charts
4. ***Correlations Between Usage and Improvements:***
   - ***Analyze:*** Correlations between increased usage of SCM innovations and improvements in service delivery.
   - ***Visuals***: Scatter Plots, Heatmaps

Visualizations and Analysis:

1. ***Impact on Businesses:***

- ***Sectors***: Banking, Telecommunications, E-commerce
- ***Analyze***: Sales growth, customer onboarding rates, operational efficiency improvements.
- ***Visuals***: Line Charts, Bar Charts, Scatter Plots

2.***Sales and Operational Efficiency***:
- ***Columns***: `Sales`, `Order Item Quantity`, `Order Region`
- ***Visuals***: Trend Analysis, Efficiency Scatter Plots

3. ***Customer Onboarding***:
- ***Columns***: `Customer Id`, `order date (DateOrders)`
- ***Visuals:*** Onboarding Trends Charts

Literature Survey

A thorough literature survey on revolutionizing supply chain management through data-driven insights reveals a growing body of research. Key findings include:
- ***Data Analytics in SCM:*** Highlighting the transformative role of data analytics in traditional supply chain processes.
- ***Advanced Analytics Tools***: Demonstrating the effectiveness of tools like Qlik in enhancing visibility and decision-making.
- ***Positive Impact***: Showing significant improvements in logistics optimization, forecasting accuracy, and inventory management efficiency.
- ***Broader Landscape***: Exploring diverse analytical techniques and technologies, showcasing successful implementations.
- ***Challenges and Opportunities:*** Emphasizing the need for robust data governance frameworks and a data-driven culture to fully realize potential benefits.

Data Integration Strategy

- ***Approach***: Implement a robust data integration strategy to aggregate and centralize relevant data from diverse supply chain sources.
- ***Tools***: Utilize Qlik's advanced visualization capabilities to create intuitive and dynamic dashboards, providing stakeholders with clear insights into the entire supply chain ecosystem.

Advanced Analytics

- ***Historical Data Analysis***: Leverage Qlik's advanced analytics features to analyze historical logistics data, identify patterns, and optimize transportation routes.

Real-Time Tracking and Monitoring

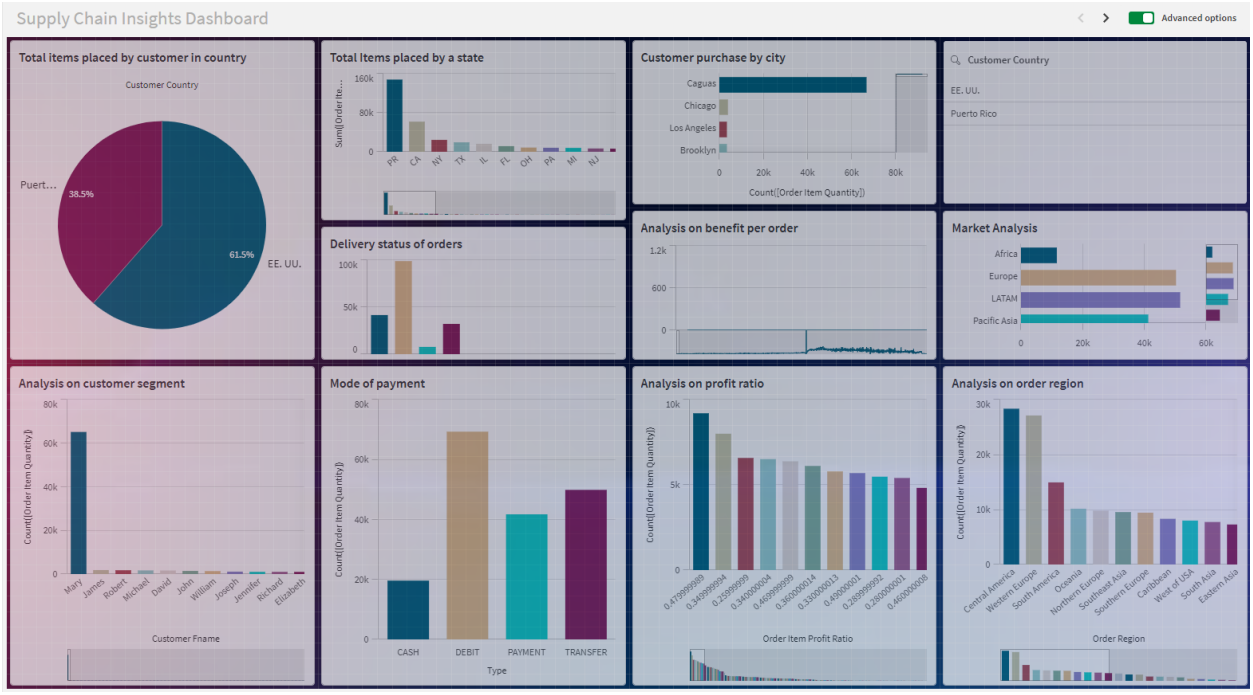
- ***Visibility Enhancement:*** Implement real-time tracking and monitoring solutions to enhance visibility into the movement of goods, reducing lead times and minimizing transportation costs.
- ***Quick Decision-Making:*** Implement real-time analytics to facilitate quick decision-making in response to unforeseen events or changes in demand, ensuring a proactive and responsive supply chain.

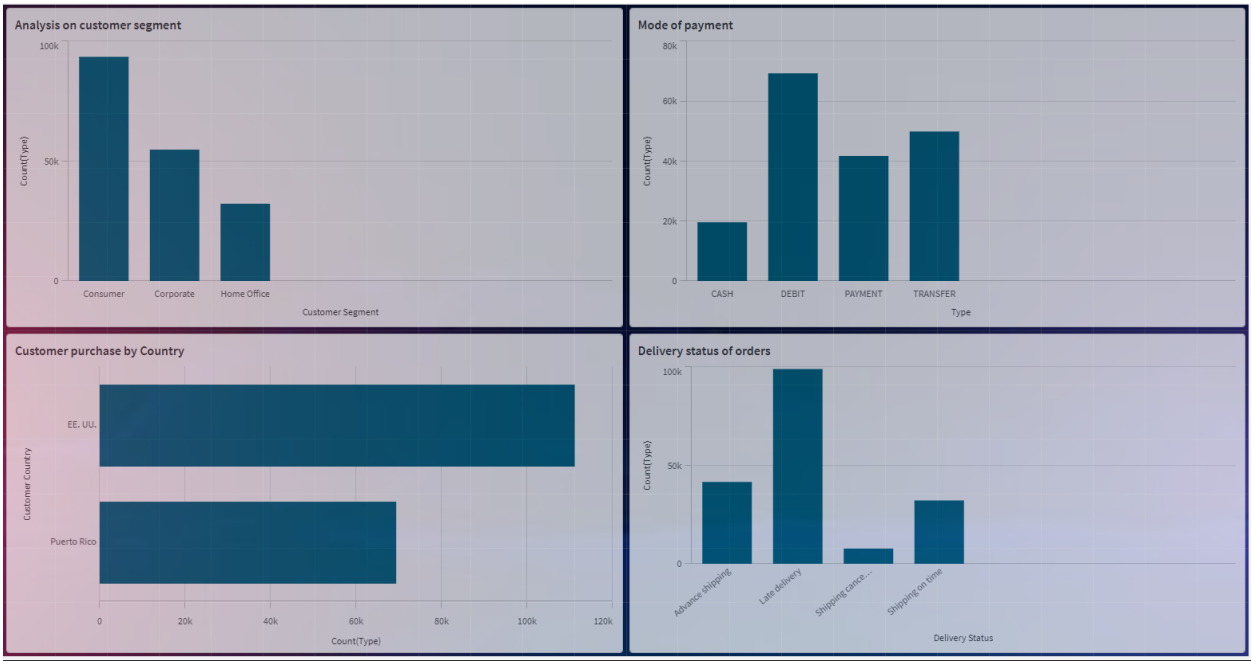
Conclusion

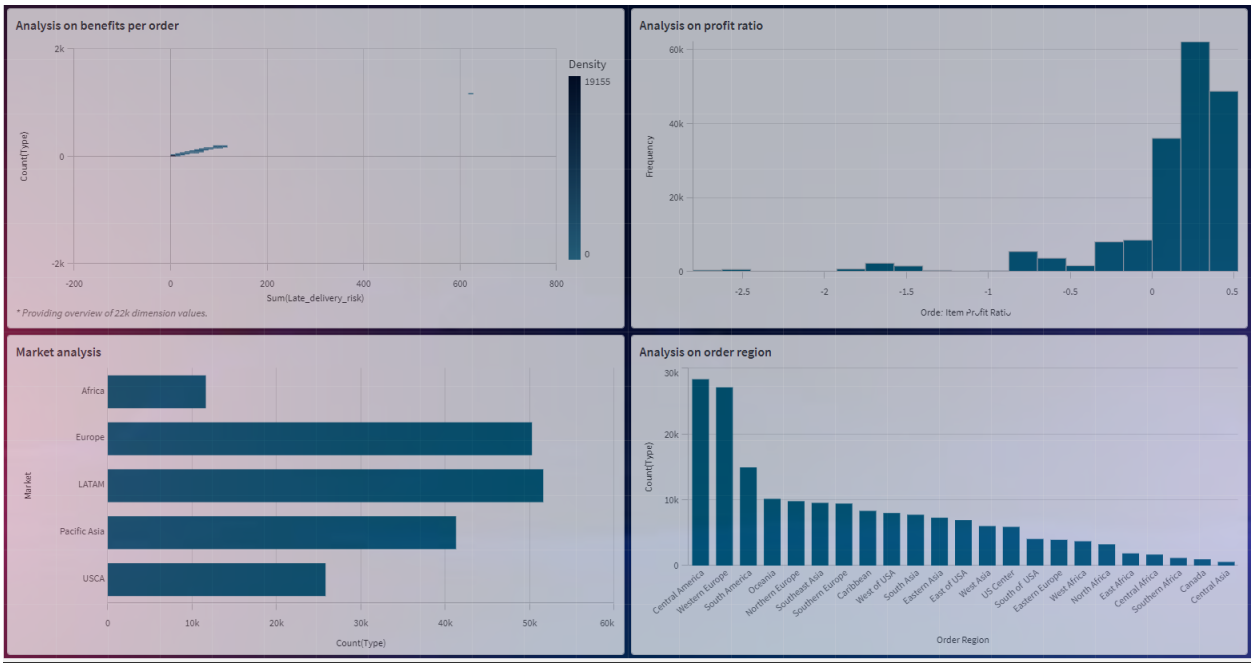
This project aims to revolutionize supply chain management through data-driven insights using Qlik. Leveraging advanced analytics, it seeks to optimize logistics, forecasting, and inventory management, enhancing operational efficiency and responsiveness. By focusing on key metrics and utilizing advanced visualization techniques, we can provide actionable insights that enhance operational efficiency, customer satisfaction, and overall performance. The social and business impact analyses further underscore the transformative potential of data-driven innovations in supply chain management.

Dashboard Name:

Supply Chain Insights Dashboard


Supply Chain Insights Dashboard
Advanced options
Total items placed by customer in country
Customer Country
Puert...
38.5%
61.5%
EE. UU.
Total Items placed by a state
Sum([Order Ite...
160k
80k
0
PR
CA
NY
TX
IL
FL
OH
PA
MI
NJ
Customer purchase by city
Caguas
Chicago
Los Angeles
Brooklyn
0
20k
40k
60k
80k
Count([Order Item Quantity])
Customer Country
EE. UU.
Puerto Rico
Delivery status of orders
100k
50k
0
Analysis on benefit per order
1.2k
600
0
Market Analysis
Africa
Europe
LATAM
Pacific Asia
0
20k
40k
60k
Analysis on customer segment
80k
60k
40k
20k
0
Count([Order Item Quantity])
Mary
James
Robert
Michael
David
John
William
Joseph
Jennifer
Richard
Elizabeth
Customer Fname
Mode of payment
80k
60k
40k
20k
0
Count([Order Item Quantity])
CASH
DEBIT
PAYMENT
TRANSFER
Type
Analysis on profit ratio
10k
5k
0
Count([Order Item Quantity])
0.479999989
0.349999994
0.259999999
0.340000004
0.469999999
0.360000014
0.339999973
0.490000011
0.289999992
0.280000001
0.460000008
Order Item Profit Ratio
Analysis on order region
30k
20k
10k
0
Count([Order Item Quantity])
Central America
Western Europe
South America
Oceania
Northern Europe
Southeast Asia
Southern Europe
Caribbean
West of USA
South Asia
Eastern Asia
Order Region
sales
36.78M
profit margin
3.97M
delivery Risk
98.98k
Customer Id
Delivery Status
order date (DateOrders)
Order Region
Product Category Id
Product Price
Customer City
Global profit Ratio
Estados Unidos
Francia
México
Alemania
Brasil
Others
45.9%
8.3%
4.9%
3.1%
total items placed by customer in country
Puerto Rico
38.5%
61.5%
EE. UU.
Total items placed by a state
1.5M
1M
500k
0
Sum([Order Item Total])
Inglaterra
Isla de Francia
California
Reñania del No...
San Salvador
Nueva York
Distrito Federal
Texas
Nueva Gales de...
Queensland
Santo Domingo
Guatemala
São Paulo
Provenza-Alpe...
Capital Nacional
Francisco Mora...
Managua
Panamá
Victoria
Pensilvania
Washington
Jalisco
Illinois
Languedoc-Ro...
Order State


Analysis on customer segment
100k
50k
0
Count(Type)
Consumer
Corporate
Home Office
Customer Segment
Mode of payment
80k
60k
40k
20k
0
Count(Type)
CASH
DEBIT
PAYMENT
TRANSFER
Type
Customer purchase by Country
Customer Country
EE. UU.
Puerto Rico
0
20k
40k
60k
80k
100k
120k
Count(Type)
Delivery status of orders
100k
50k
0
Count(Type)
Advance shipping
Late delivery
Shipping cance...
Shipping on time
Delivery Status


Analysis on benefits per order
2k
0
-2k
Count(Type)
-200
0
200
400
600
800
Sum(Late_delivery_risk)
Density
19155
0
* Providing overview of 22k dimension values.
Analysis on profit ratio
60k
40k
20k
0
Frequency
-2.5
-2
-1.5
-1
-0.5
0
0.5
Orde: Item Profit Ratio
Market analysis
Africa
Europe
LATAM
Pacific Asia
USCA
Market
0
10k
20k
30k
40k
50k
60k
Count(Type)
Analysis on order region
30k
20k
10k
0
Count(Type)
Central America
Western Europe
South America
Oceania
Northern Europe
Southeast Asia
Southern Europe
Caribbean
West of USA
South Asia
Eastern Asia
East of USA
West Asia
US Center
South of USA
Eastern Europe
West Africa
North Africa
East Africa
Central Africa
Southern Africa
Canada
Central Asia
Order Region