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Data-Driven Innovations In Supply Chain Management With Qlik Insights

Introduction

In today's dynamic and competitive business landscape, effective supply chain management is crucial for organizational success. The advent of big data and advanced analytics has revolutionized how businesses operate, offering unprecedented opportunities to optimize supply chain processes. This project aims to harness the power of data analytics to transform logistics, forecasting, and inventory management. By leveraging the DataCo SMART SUPPLY CHAIN FOR BIG DATA ANALYSIS dataset and Qlik's advanced visualization tools, this project seeks to enhance operational efficiency, responsiveness, and overall performance.

The primary goal is to integrate and analyze diverse supply chain data sources to provide real-time insights and support proactive decision-making. This will involve creating intuitive dashboards, optimizing transportation routes, improving demand forecasting accuracy, and ensuring optimal inventory levels. The project also aims to identify and mitigate risks, streamline operations, and enhance customer satisfaction through data-driven strategies.

Furthermore, this initiative will explore the broader social and business impacts of supply chain innovations, evaluating their effects on financial inclusion, social welfare programs, and environmental sustainability. By fostering a data-driven culture and implementing robust data governance frameworks, this project aspires to set a new benchmark in supply chain management practices, driving significant improvements across various industry sectors.

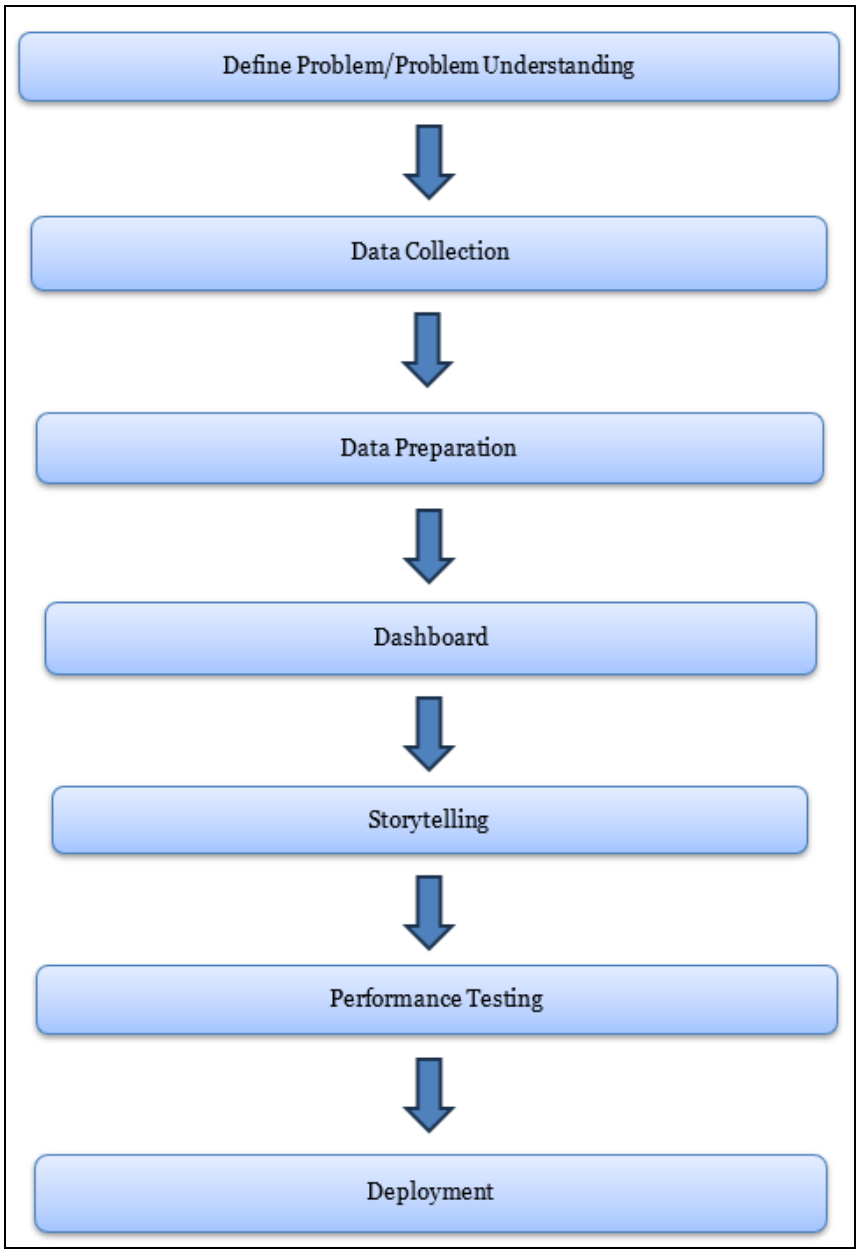
Objectives:

1. **Optimize Logistics and Routes:** Reduce lead times and transportation costs through data-driven route optimization.
2. **Enhance Forecasting Accuracy:** Improve demand forecasting to reduce overstock and stockouts.
3. **Improve Inventory Management:** Optimize inventory levels and implement just-in-time practices.
4. **Increase Supply Chain Visibility:** Use real-time tracking to enhance visibility and provide actionable insights.
5. **Boost Customer Satisfaction:** Improve delivery times and reliability to increase customer satisfaction.
6. **Support Proactive Decision-Making**: Enable quick decision-making with real-time analytics.
7. **Identify and Mitigate Risks:** Detect and mitigate potential supply chain risks.

Name: Prasiddhi Singh

8. **Streamline Operations:** Use data insights to identify and eliminate inefficiencies.
9. **Drive Cost Savings:** Identify and implement cost-saving opportunities.
10. **Evaluate Business and Social Impact:** Assess the impact on business performance and social welfare programs.
11. **Develop Data Governance:** Establish a framework for data quality and security.
12. **Create Intuitive Dashboards:** Design user-friendly, responsive dashboards for key supply chain metrics.

Project Workflow:



1. Define Problem / Problem Understanding

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Specify the Business Problem:

The goal is to transform supply chain management through data-driven insights using Qlik's advanced analytics. This involves optimizing logistics, forecasting, and inventory management to enhance operational efficiency and responsiveness.

Business Requirements:

- **Data Integration:** Aggregate and centralize data from various supply chain sources.
- **Visualization:** Use Qlik's capabilities to create dynamic dashboards for comprehensive insights.
- **Logistics Optimization:** Analyze historical data to optimize transportation routes.
- **Real-Time Tracking**: Implement solutions for real-time monitoring of goods.
- **Proactive Decision-Making:** Enable quick decision-making in response to changes in demand.

Literature Survey:

The literature emphasizes the significant role of data analytics in transforming supply chain processes. Studies show that tools like Qlik enhance visibility and decision-making, leading to optimized logistics, accurate forecasting, and efficient inventory management. Successful implementations across industries demonstrate improvements in operational efficiency and responsiveness.

Social or Business Impact:

- **Social Impact:** Visualizations to show the demographic distribution of supply chain management and its impact on social welfare programs, financial inclusion, and other areas.
- **Business Impact:** Analysis of the effects on various sectors like banking, telecommunications, and e-commerce, focusing on sales, customer onboarding, and operational efficiency.

2. Data Collection

Dataset Download and Connection:

- Download the dataset using the provided link.
- Connect the data to Qlik Sense for analysis.

Understand the Data:

The dataset includes various fields such as type, shipping days, benefit per item, sales per customer, delivery dates, late delivery risk, product categories, customer details, market information, order details, and product prices.

3. Data Preparation

Prepare the Data for Visualization:

- Clean the data to remove irrelevant or missing entries.
- Transform data into a format suitable for visualization.

Name: Prasiddhi Singh

- Explore and filter the data to focus on specific subsets and ensure accuracy.

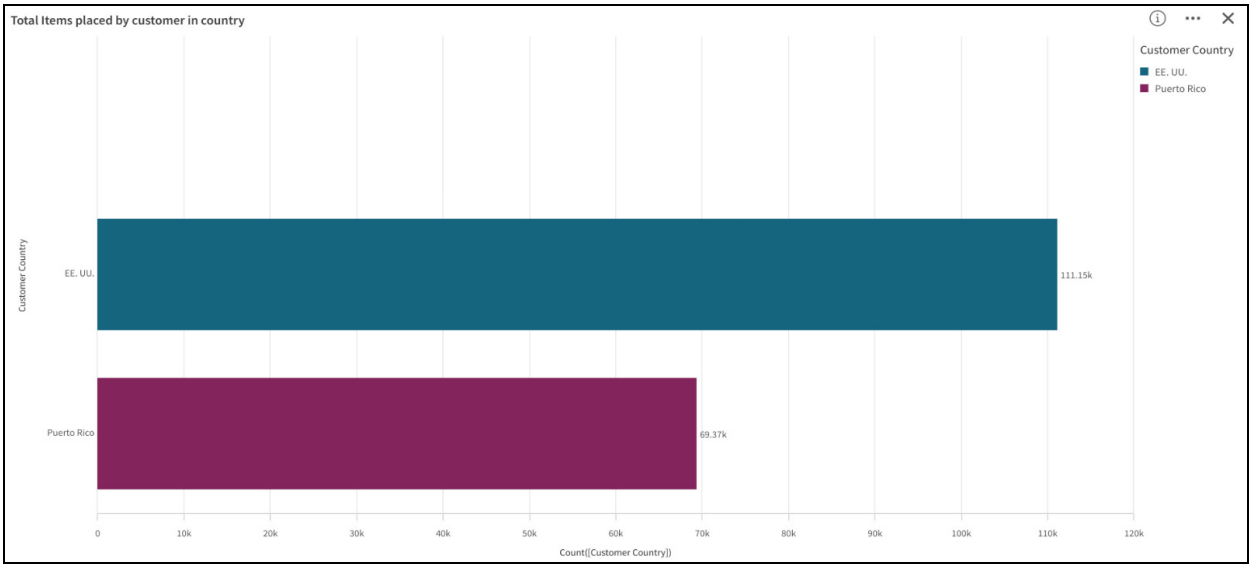
4. Data Visualizations

Unique Visualizations:

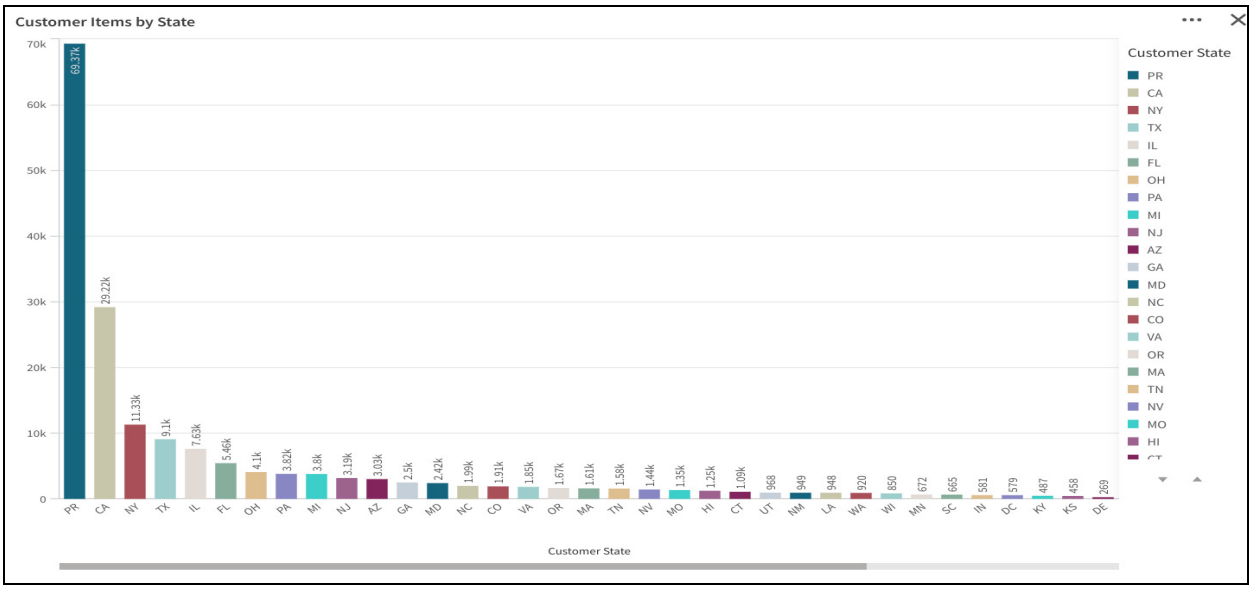
- Visualizations help in identifying patterns, trends, and outliers in the data.
- Common types include bar charts, line charts, heat maps, scatter plots, pie charts, and maps.

Examples of Visualizations:

1. Total items placed by customers in different countries:



2.Total items placed by state:



3. Analysis of customer segments:

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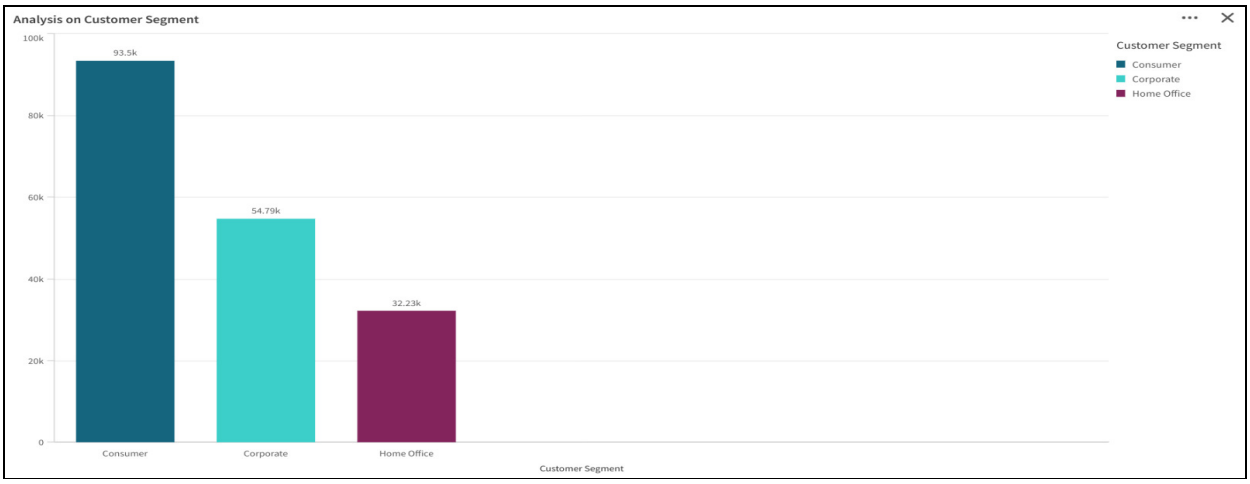
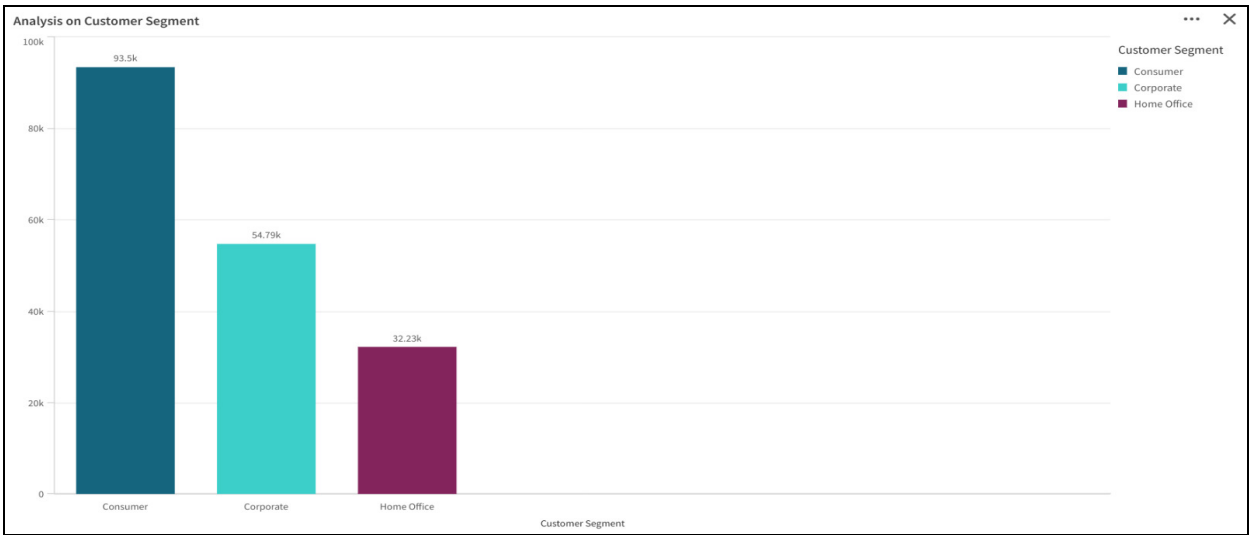
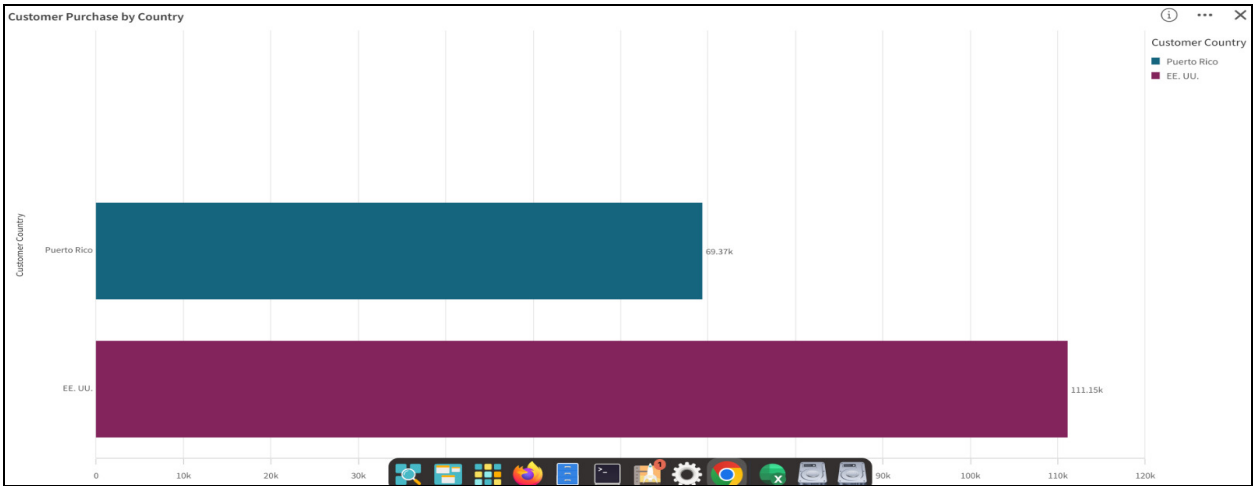


4. Mode of payment distribution:



5. Customer purchases by country:



6. Delivery status of orders:

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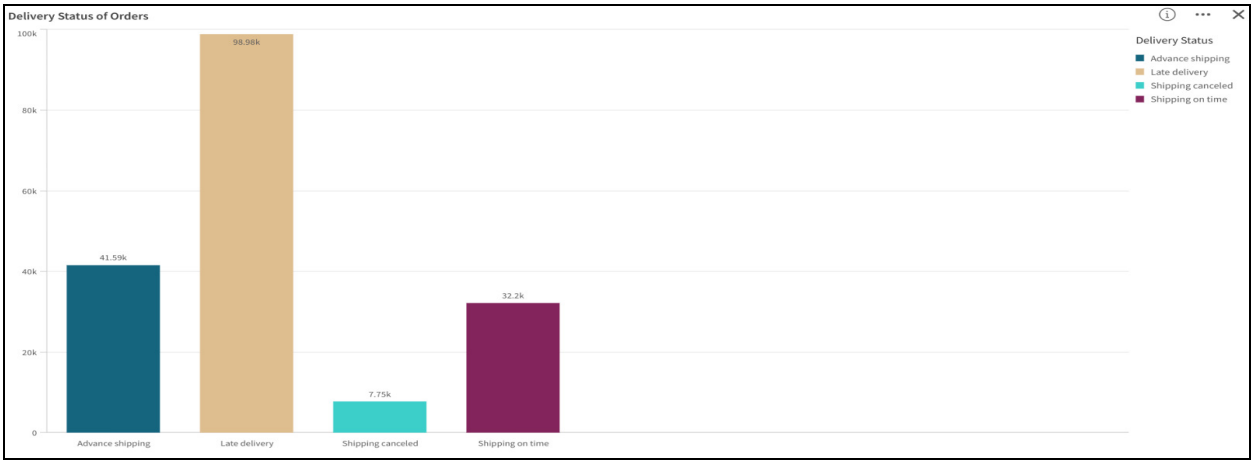
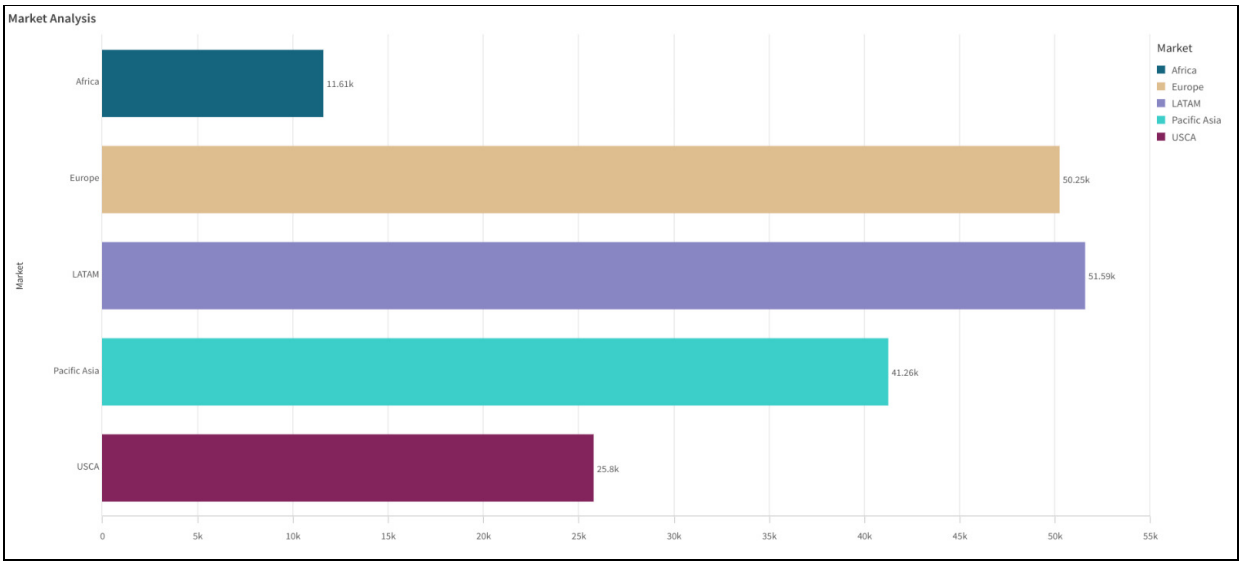
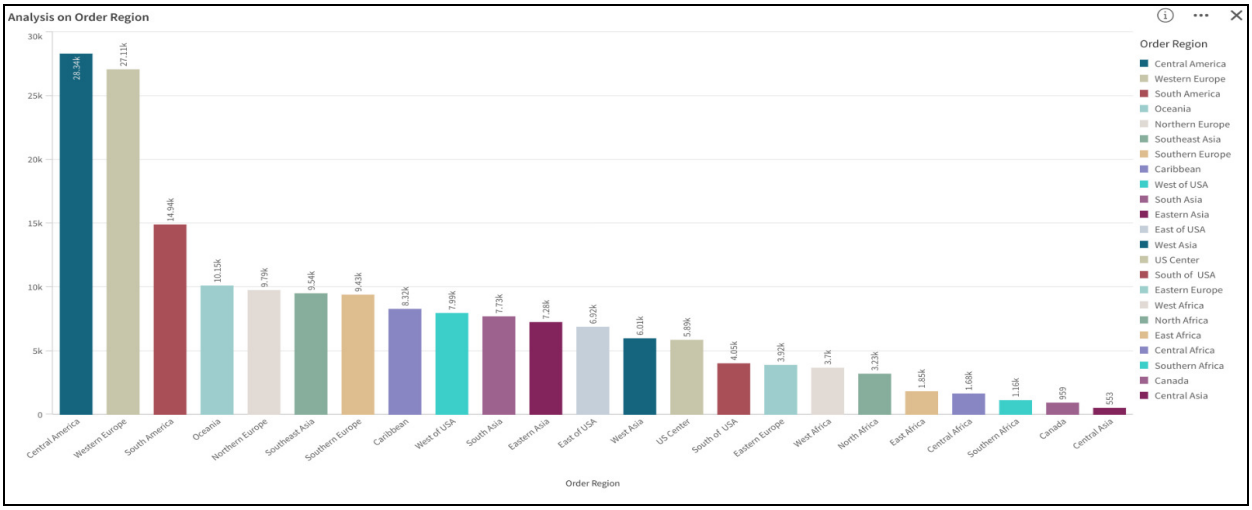


7. Market analysis:



8. Analysis of order regions:



9. Item Profit Ratio Frequency:

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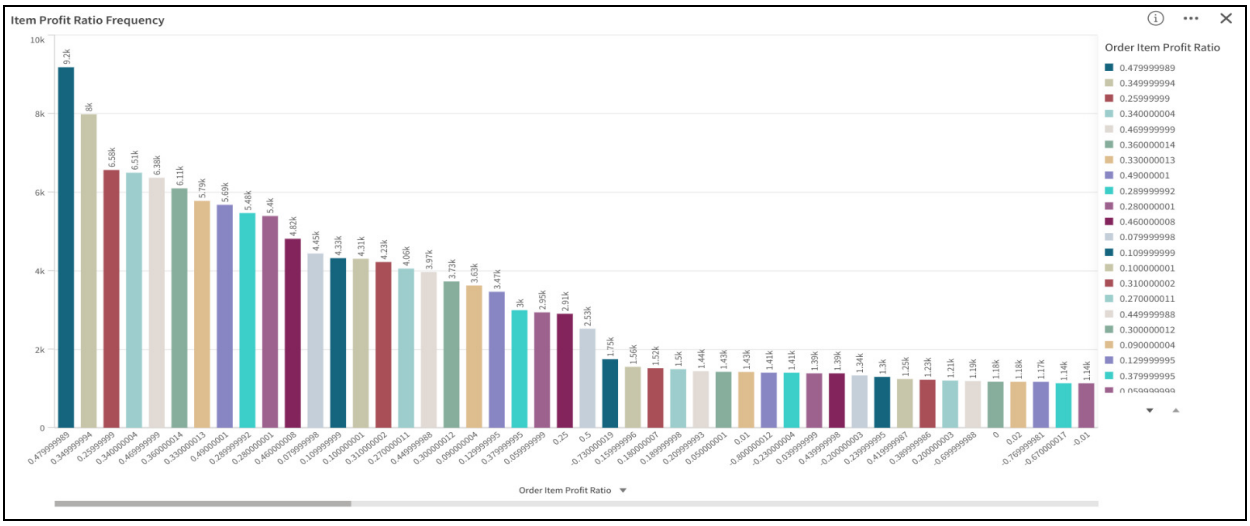
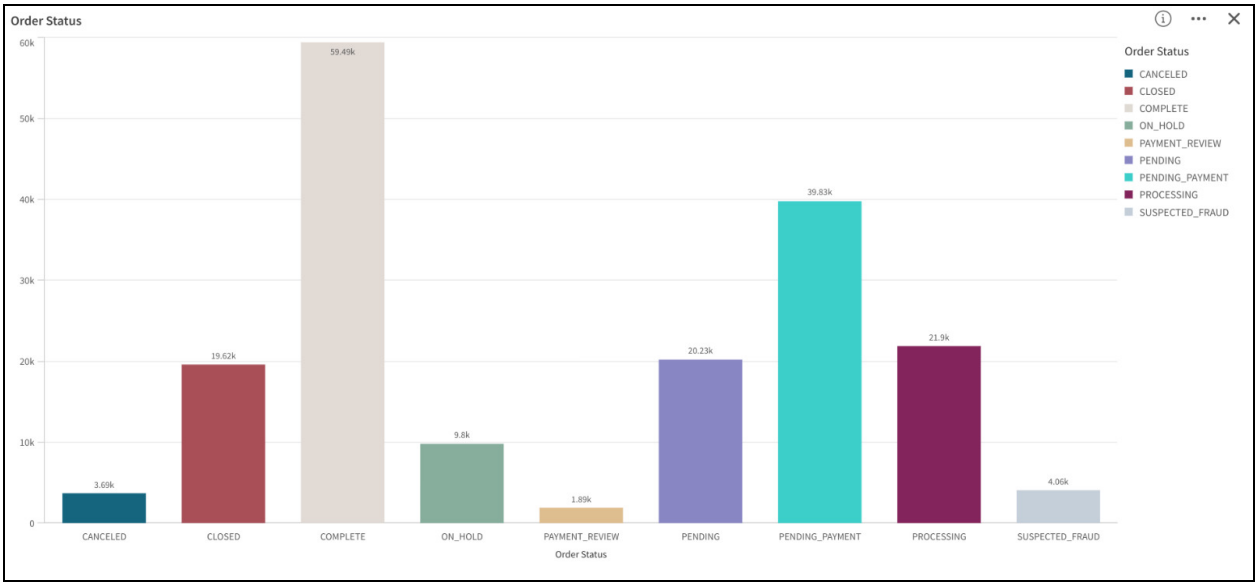


10. Order Status:



5. Dashboard

Responsive and Design of Dashboard:
Dashboards are designed to be user-friendly and provide real-time monitoring and analysis. They display data in charts, graphs, and tables to track key performance indicators (KPIs) and performance metrics.

Dashboard-1:

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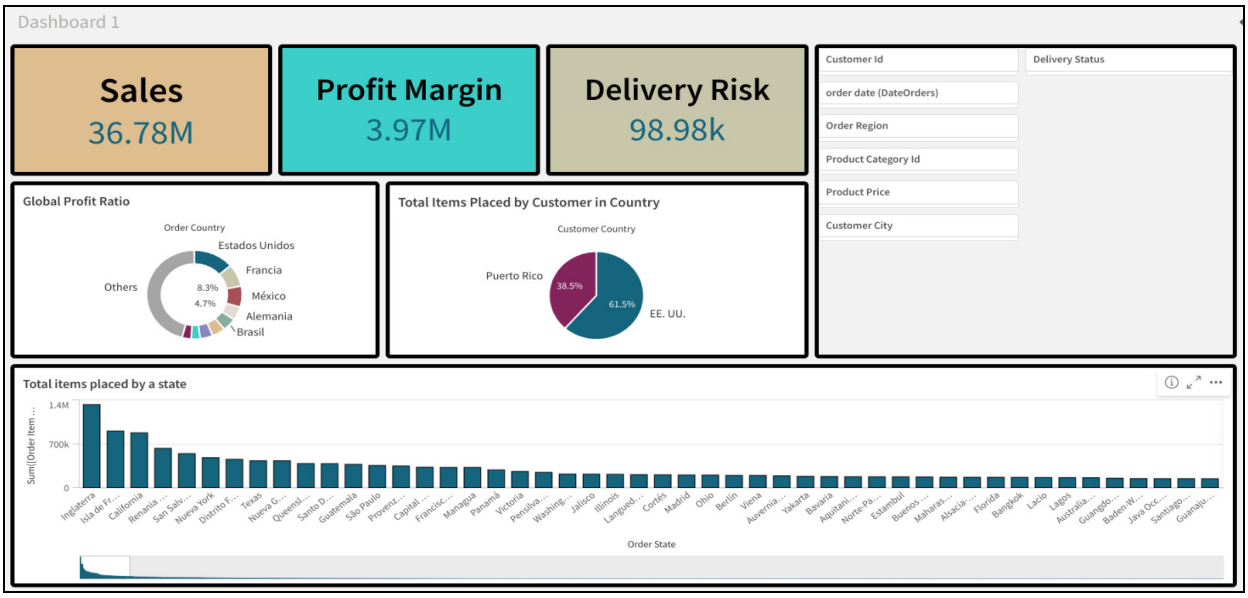
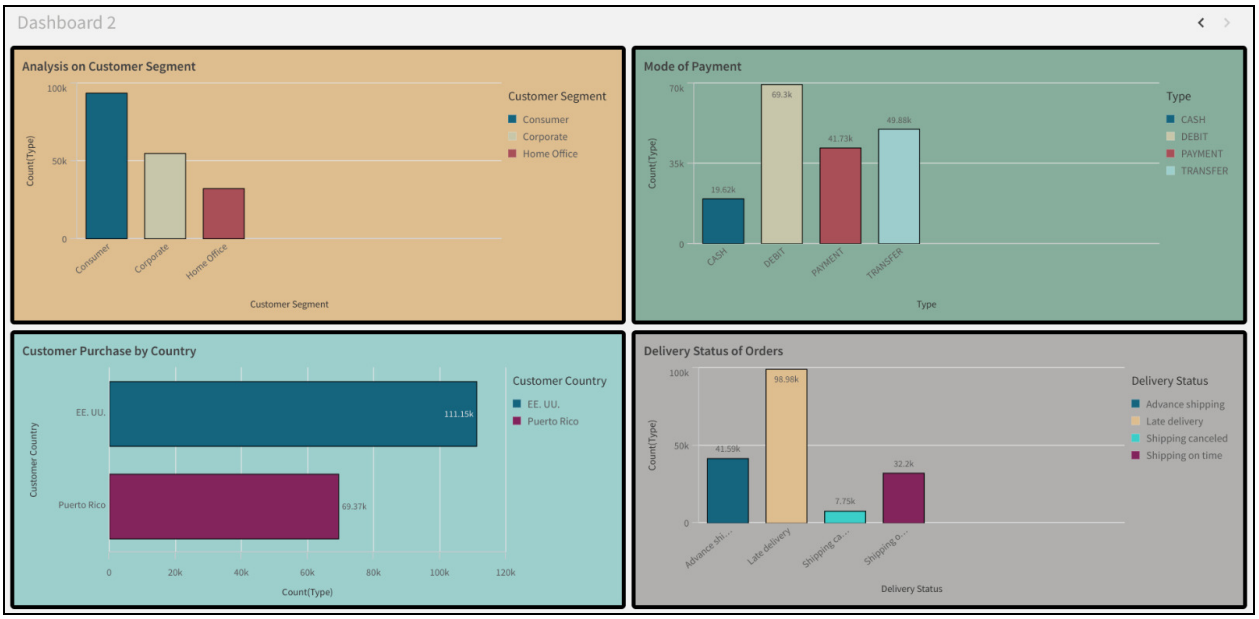


Dashboard-2:



6. Storytelling:

Creating a Data Story:

- Present data and analysis in a narrative format to make it engaging and easy to understand.
- Include an introduction, a body presenting data systematically, and a conclusion summarizing key findings.

Design of Story:

- Connect to data sources, create visualizations, and customize their appearance.

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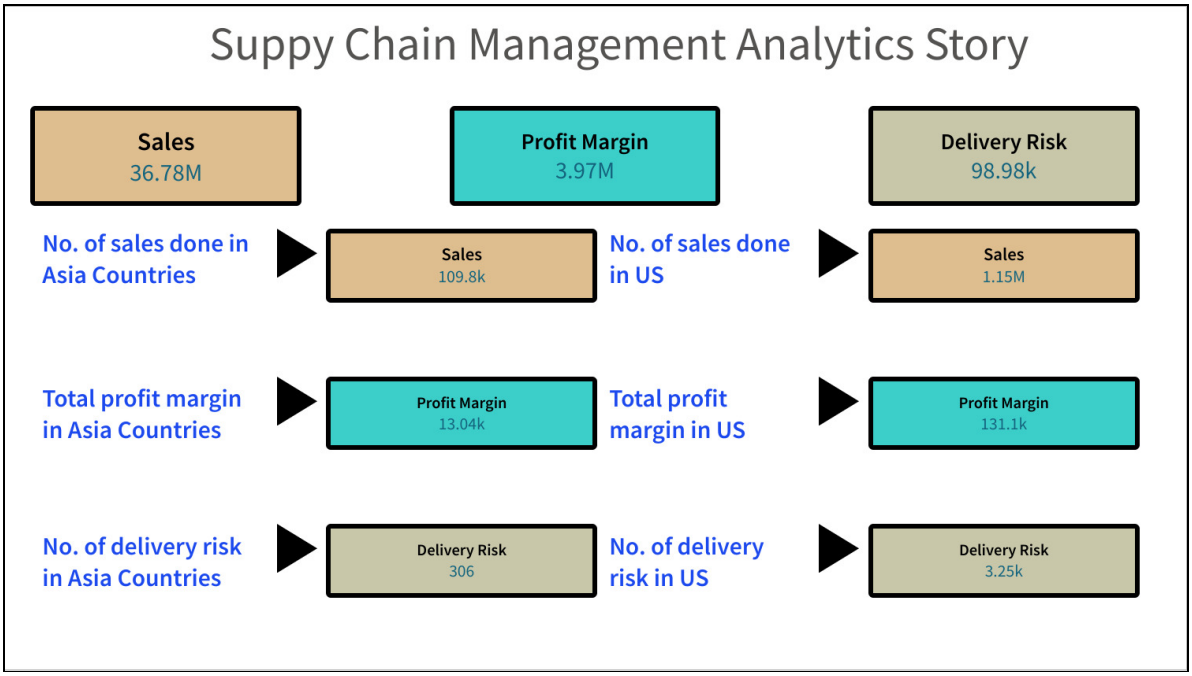
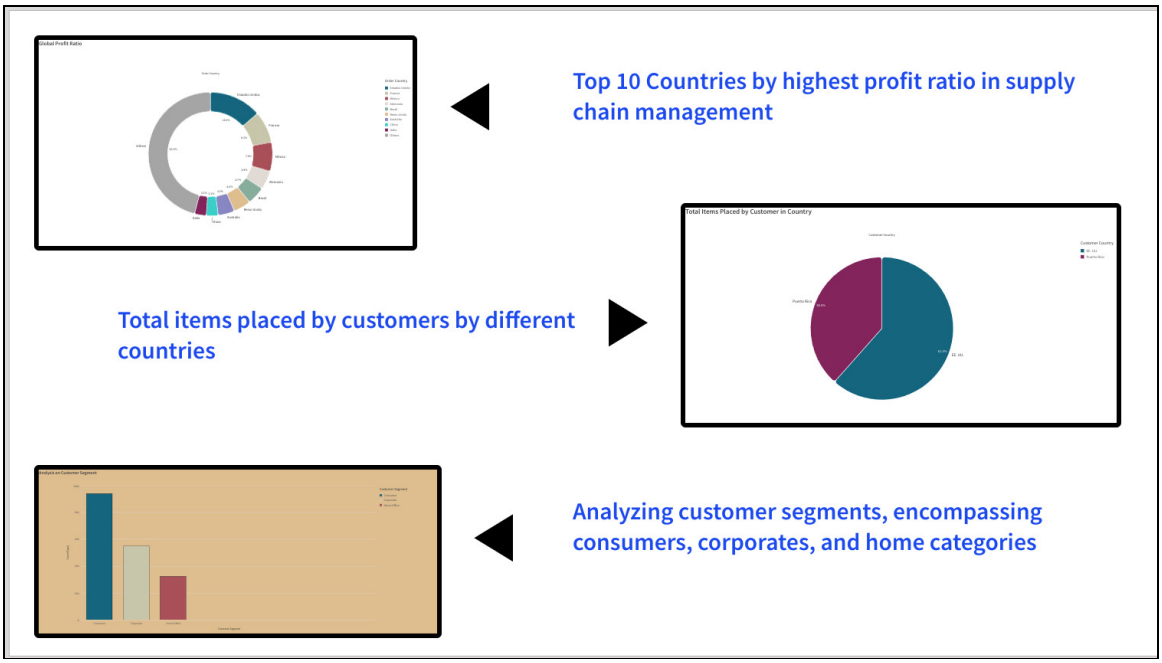
- Organize visualizations logically and format elements for consistency.
- Consider the audience's needs to ensure the report effectively communicates insights.

Story-1:



No.of Sales, No. of Delivery risk and Total profit margin in Asian countries and US is compared in this visualization.

Story-2:



Story-3:

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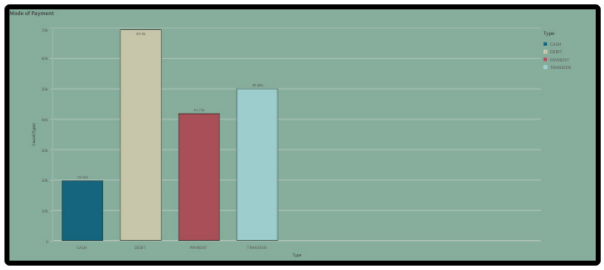
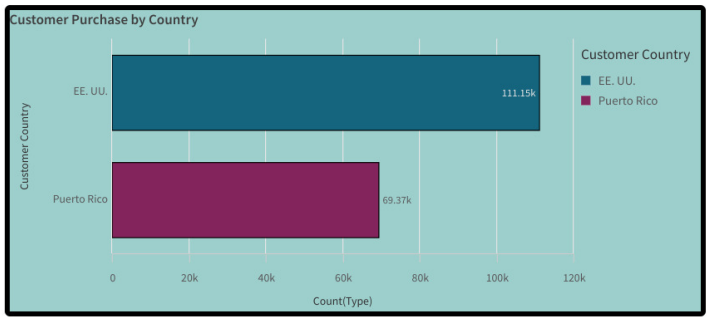
Mode of Payment for Purchase



- Cash transactions offer immediate liquidity, providing a straightforward and tangible method of payment.
- Debit payments, directly linked to bank accounts, offer convenience and real-time deduction of funds
- Credit payments provide a deferred payment option, allowing customers to make purchases
- Transfer payments leverage electronic methods for seamless and secure fund

Story-4:

Customer Purchase Item by Country



- Customer purchase count in Puerto Rico reflects the transactional dynamics in this vibrant location, capturing the local consumer behavior and market engagement.
- Customer purchase count in the United States provides a comprehensive overview of buying patterns across diverse cities.

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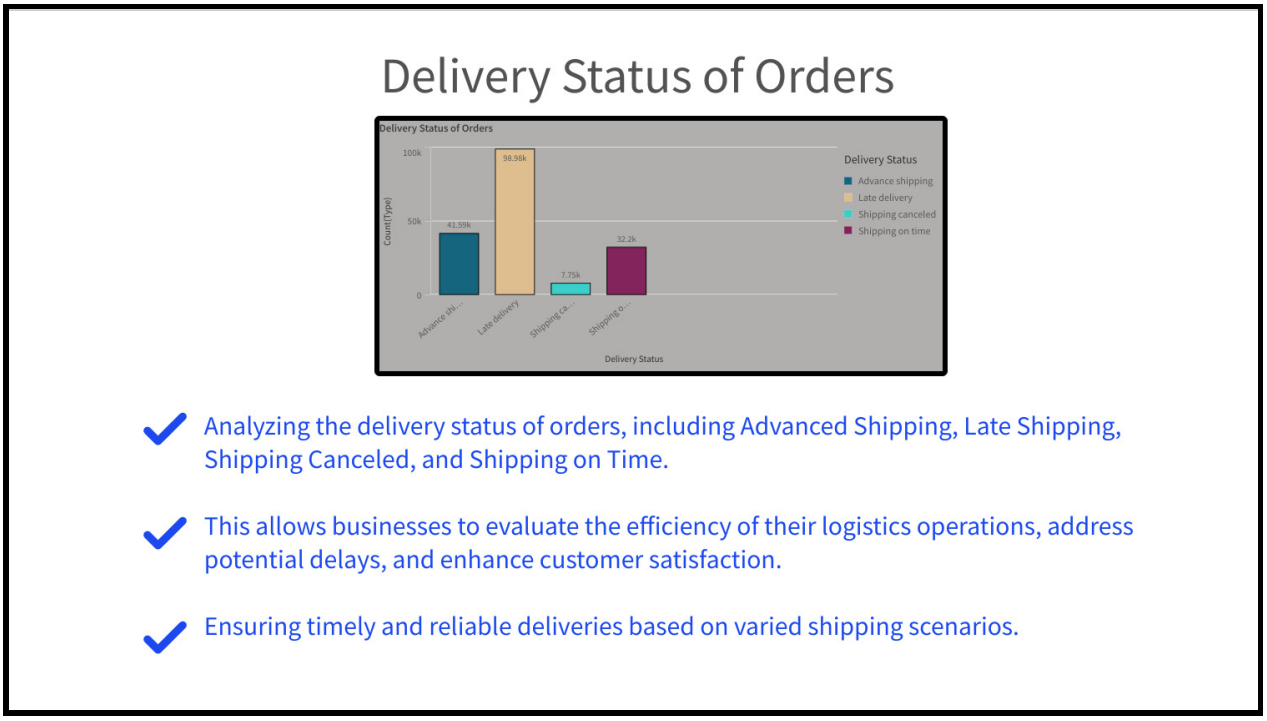
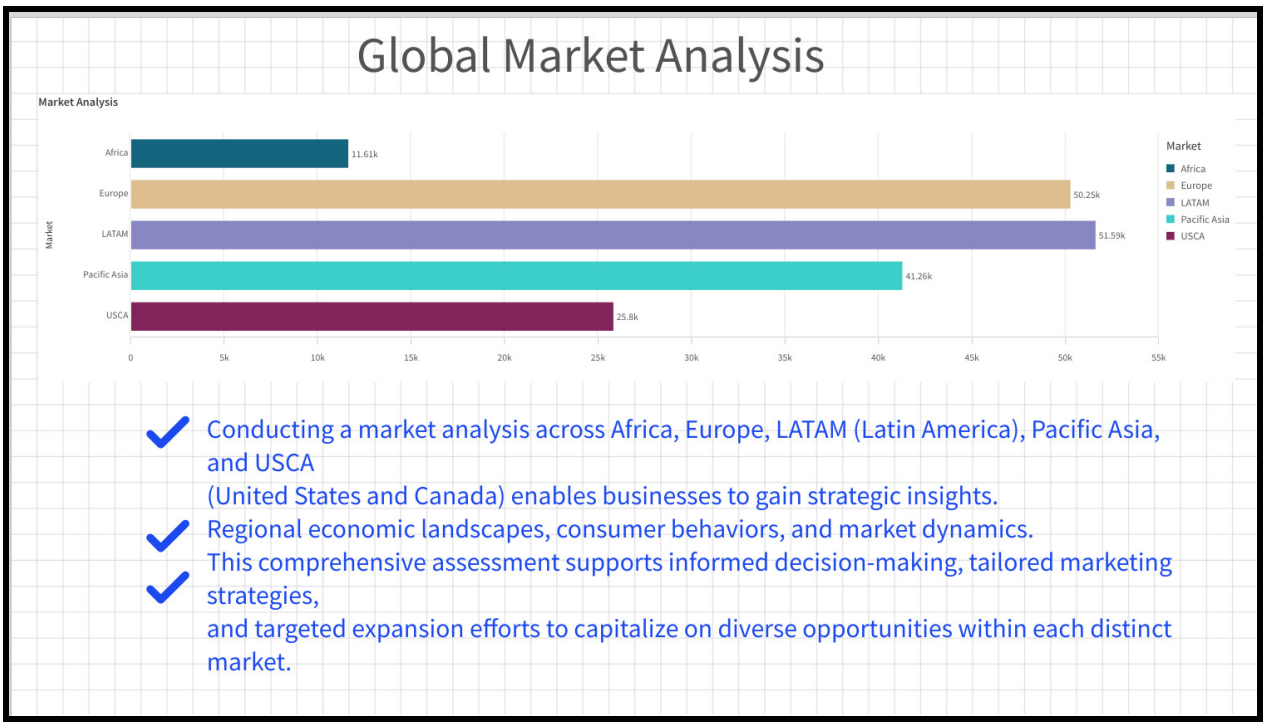
Story-5:



Story-6:



7. Performance Testing:

Amount of Data Loaded:

- Measure the volume of data imported into Qlik for analysis.

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Utilization of Data Filters:

- Apply filters to narrow down the data scope and focus on relevant information.

Number of Visualizations/Graphs:

- Various visualizations include global profit ratios, items placed by customers by country and state, customer segments, payment modes, city-wise purchases, delivery status, benefit per order, profit ratios, market analysis, and order regions.

8. Deployment:

Server Setup:

- Deploy the dashboard on a robust server or cloud infrastructure to handle the load and ensure high availability.
- Configure server settings to optimize performance, including caching and load balancing.

Access Control:

- Set up user roles and permissions to control access to the dashboard, ensuring sensitive information is only accessible to authorized users.
- Implement security measures to protect the data from unauthorized access and breaches.

Testing:

- Conduct thorough testing to ensure the dashboard functions correctly and performs well under various scenarios.
- Perform user acceptance testing (UAT) to gather feedback from end-users and make necessary adjustments.

Conclusion

Effective deployment of a supply chain management dashboard using Qlik Insights involves careful preparation, user-centric design, secure deployment, comprehensive training, and ongoing maintenance. By following these steps, organizations can ensure that their dashboard provides valuable insights, supports decision-making, and enhances overall supply chain efficiency.