Data-Driven Innovations in Supply Chain Management with Qlik Insights

1.Introduction:

In today's fast-paced business environment, effective supply chain management (SCM) is crucial for maintaining a competitive edge. Qlik Insights, a leading data analytics platform, offers innovative solutions to transform traditional SCM practices by leveraging data-driven decision-making.

Key Features of Qlik Insights for SCM:

1. **Real-time Visibility:** Qlik provides real-time insights into inventory levels, shipment statuses, and supplier performance, enabling proactive issue resolution.
2. **Predictive Analytics:** By analyzing historical data and trends, Qlik predicts demand fluctuations, potential supply disruptions, and optimal inventory levels.
3. **Supplier Performance Monitoring:** Qlik's dashboards track supplier metrics like on-time delivery, quality, and cost, facilitating better supplier management.
4. **Route Optimization:** Using geospatial data and algorithms, Qlik optimizes delivery routes, reducing fuel costs and improving delivery times.
5. **Risk Management:** Qlik identifies potential risks in the supply chain by analyzing factors like geopolitical events, weather patterns, and financial health of suppliers.

Benefits of Using Qlik Insights:

1. **Cost Reduction:** By optimizing inventory, reducing waste, and improving logistics, companies can significantly cut operational costs.
2. **Enhanced Customer Satisfaction:** Real-time tracking and efficient delivery lead to faster order fulfillment and improved customer experience.
3. **Resilience:** Data-driven risk management strategies make supply chains more resilient to disruptions.
4. **Collaboration:** Qlik's user-friendly interfaces foster collaboration among different teams and with suppliers, improving overall efficiency.

2.Define Problem / Problem Understanding :

2.1- Specify The Business Problem: The business problem addressed in "Data-Driven Innovations in Supply Chain Management with Qlik Insights" appears to be:

Inefficient and reactive supply chain management due to a lack of real-time, comprehensive data insights. This leads to challenges such as:

1. Delayed response to supply chain disruptions
2. Suboptimal inventory management
3. Increased costs due to inefficiencies
4. Difficulty in forecasting demand accurately
5. Lack of visibility into supplier performance and risk

The article likely discusses how Qlik's data analytics platform can help overcome these challenges by providing real-time data integration, visualization, and predictive analytics. This enables proactive decision-making, better risk management, and overall supply chain optimization.

2.2- Business Requirements: Here are the key business requirements for "Data-Driven Innovations in Supply Chain Management with Qlik Insights":

1. Real-time Data Integration:
    - Connect to various data sources (ERP, CRM, IoT sensors, etc.) to gather supply chain data in real-time.
    - Ensure seamless data integration without data silos or latency.
2. Advanced Analytics and Visualization:
    - Utilize Qlik's associative engine for in-memory data processing and analysis.
    - Create interactive dashboards and reports for supply chain KPIs.
    - Enable drill-down capabilities for root cause analysis.
3. Predictive Analytics:
    - Implement machine learning algorithms for demand forecasting.
    - Predict potential supply chain disruptions and suggest mitigation strategies.
    - Optimize inventory levels based on historical data and future predictions.
4. Supplier Performance Management:
    - Track supplier metrics (on-time delivery, quality, responsiveness).
    - Generate supplier scorecards for performance evaluation.
    - Identify and mitigate supplier risks.
5. Transportation and Logistics Optimization:
    - Monitor transportation costs, route efficiency, and carrier performance.
    - Optimize routes and shipment consolidation using Qlik's geospatial analysis.
    - Provide real-time tracking and alerts for in-transit goods.
6. Inventory Management:
    - Implement ABC analysis for inventory categorization.
    - Monitor stock levels, turnover rates, and carrying costs.
    - Generate alerts for low stock or excess inventory scenarios.
7. Customer-Centric Supply Chain:
    - Analyze customer order patterns and preferences.
    - Monitor order fulfillment rates and on-time deliveries.
    - Enable "what-if" scenarios for customer demand changes.
8. Sustainability and Compliance:
    - Track carbon footprint and sustainability metrics.
    - Monitor compliance with regulations (e.g., GDPR for data, trade regulations).
    - Generate sustainability reports for stakeholders.
9. Mobile and Remote Access:
    - Provide mobile apps for on-the-go decision-making.
    - Enable secure remote access for distributed teams.
10. Scalability and Performance:
    - Ensure the solution can handle growing data volumes.
    - Maintain fast query response times even with complex analyses.

11. User-Friendly Interface:
    - Intuitive drag-and-drop interface for building analyses.
    - Role-based dashboards for different supply chain roles.
    - Natural language query capabilities for non-technical users.
12. Integration with Existing Systems:
    - Seamless integration with ERP, WMS, TMS, and other systems.
    - Support for APIs and webhooks for data exchange.
13. Security and Data Governance:
    - Implement role-based access control (RBAC).
    - Ensure data encryption at rest and in transit.
    - Compliance with data privacy laws and auditing capabilities.
14. Collaboration and Knowledge Sharing:
    - Enable sharing of insights and reports across teams.
    - Collaborative features for commenting and annotating analyses.
15. Training and Support:
    - Provide training materials and workshops for user adoption.
    - Offer 24/7 technical support for issue resolution.

These requirements aim to leverage Qlik's capabilities to transform supply chain management into a data-driven, agile, and customer-focused operation.

2.3- Literature Survey:

A literature survey on the project theme of revolutionizing supply chain management through data-driven insights and advanced analytics reveals a growing body of research and scholarly articles focused on similar endeavors. Studies underscore the increasing recognition of the pivotal role that data analytics plays in transforming traditional supply chain processes. Research highlights the effectiveness of leveraging advanced analytics tools, such as Qlik, to enhance visibility and decision-making in supply chain operations. The study emphasizes the positive impact on logistics optimization, forecasting accuracy, and inventory management efficiency. Moreover, delves into the broader landscape of data-driven supply chain transformations, exploring diverse analytical techniques and technologies. The findings showcase successful implementations, demonstrating notable improvements in operational efficiency and responsiveness across various industry sectors. In addition, examines the challenges and opportunities associated with the adoption of data-driven insights in supply chain contexts. The literature emphasizes the need for organizations to develop robust data governance frameworks and cultivate a data-driven culture to fully unlock the potential benefits.

2.4- Social Or Business Impact:

1. Social Impact Analysis:

- Create visualizations to showcase the demographic distribution of Supply chain management .
- Analyze how Data-Driven Innovations in Supply Chain Management have impacted social welfare programs, financial inclusion, and other key areas.
- Explore any correlations between usage and improvements.

2. Business Impact Analysis:

- Analyze how Data-Driven Innovations in Supply Chain Management have affected businesses, especially in sectors like banking, telecommunications, and e-commerce.
- Evaluate the impact of Data-Driven Innovations in Supply Chain Management on sales, customer onboarding, and operational efficiency.

3. Data Collection & Extraction From Database:

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, evaluate outcomes and generate insights from the data.

Downloading The Dataset :- Link

Understand The Data :- Data contains all the meta information regarding the columns described in the CSV files Column Description of the Dataset:

- Type: Type Count
- Days for shipping (real): Product shipment days
- Days for shipment (scheduled): product getting prepared for shipment
- Benefit per item: profit earned per product
- Sales per customer: No of products purchased by the customer
- Delivery: Products delivery date.
- Late_delivery_risk: percentage of late delivery risk
- Category Id: product category ID
- Category: product category
- Customer City: Customer purchase city
- Customer Country: Customer purchase country
- Customer Email: Customer purchase Email
- Customer Fname: Customer First name.
- Customer ID: Customer order ID
- Customer Lname: Customer's last name
- Customer Segment: Types of Customer
- Customer State: Customer order state
- Customer Street: Customer address
- Customer Zipcode: Customer area code.
- Market: top 10 country Market
- Order City: Customer purchase city
- Order Country: Customer purchase country
- Order Customer ID: Customer
- order date (DateOrders): Customer order date
- Order Item Product Price: product price
- Order Item Profit Ratio: profit ratio
- Order Item Quantity: No of orders placed
- Sales: total no of sales
- Order Item Total: total price of the order placed
- Order Profit Per: product
- Order Region: order placed region
- Order State: order placed State
- Order Status: order delivery status
- Order Zipcode: customer area code
- Product Card ID: product number
- Product Category Id: a product whose category belongs to
- Product: what product
- Product Image: image of the product

- Product Price: Price of the product.

4. Data Preparation:

Prepare The Data For Visualization:

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into performance and efficiency. Since the data is already cleaned, we can move to visualization.

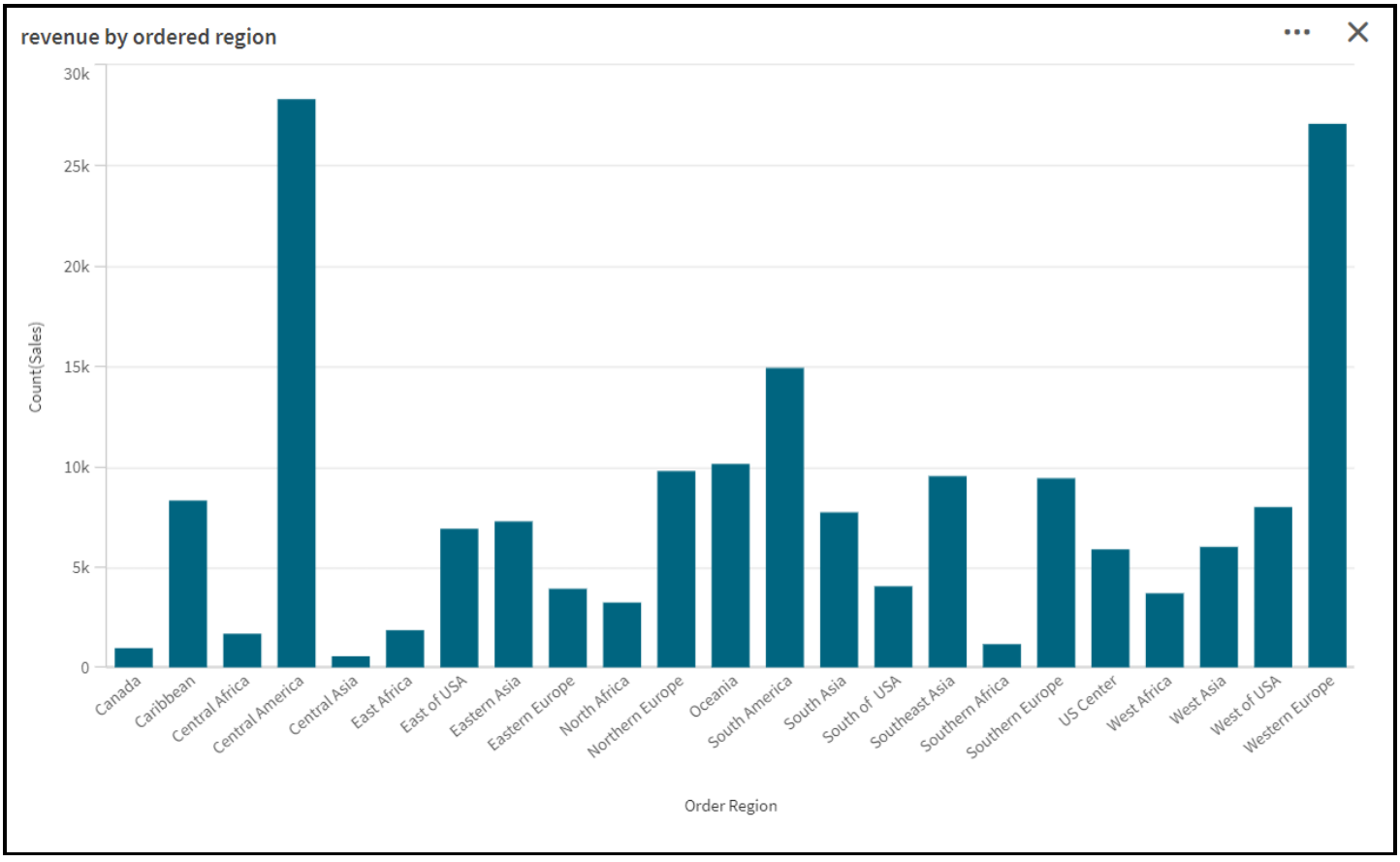
Data Preparation.mp4 - Google Drive.. Link

5.Data Visualization:

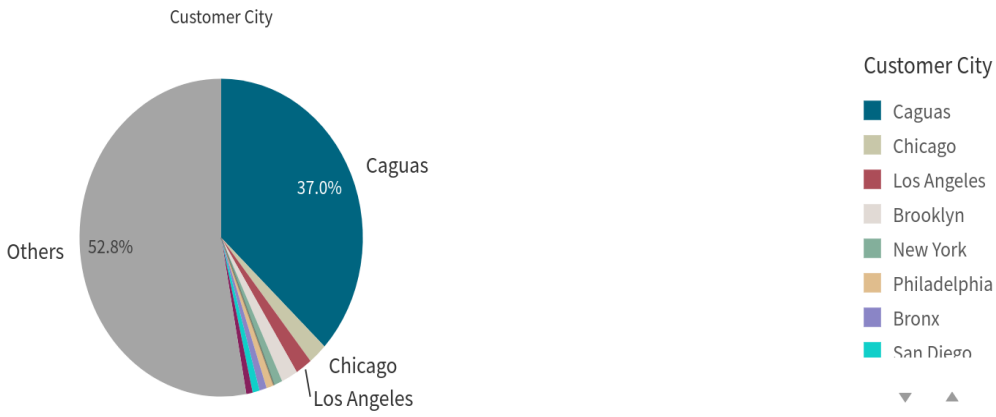
Data visualization is the process of creating graphical representations of data to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

No of unique Visualisation: The number of unique visualizations that can be created with a given dataset. Somecommontypes of visualizations that can be used to analyse the performance andefficiencyof banks include bar charts, line charts, heat maps, scatter plots, piecharts,]Maps etc. These visualizations can be used to compare performance, trackchangesover time, show distribution, and relationships between variables,breakdownof revenue and customer demographics, workload, resource allocationandlocation of banks.

Visualization:-



Sales Per Customer of Customer City



Count Of Sales

Sum(Sales)

36.78M

Profit Per Order

Count([Order Profit Per Order])

180.5k

Total Order Items

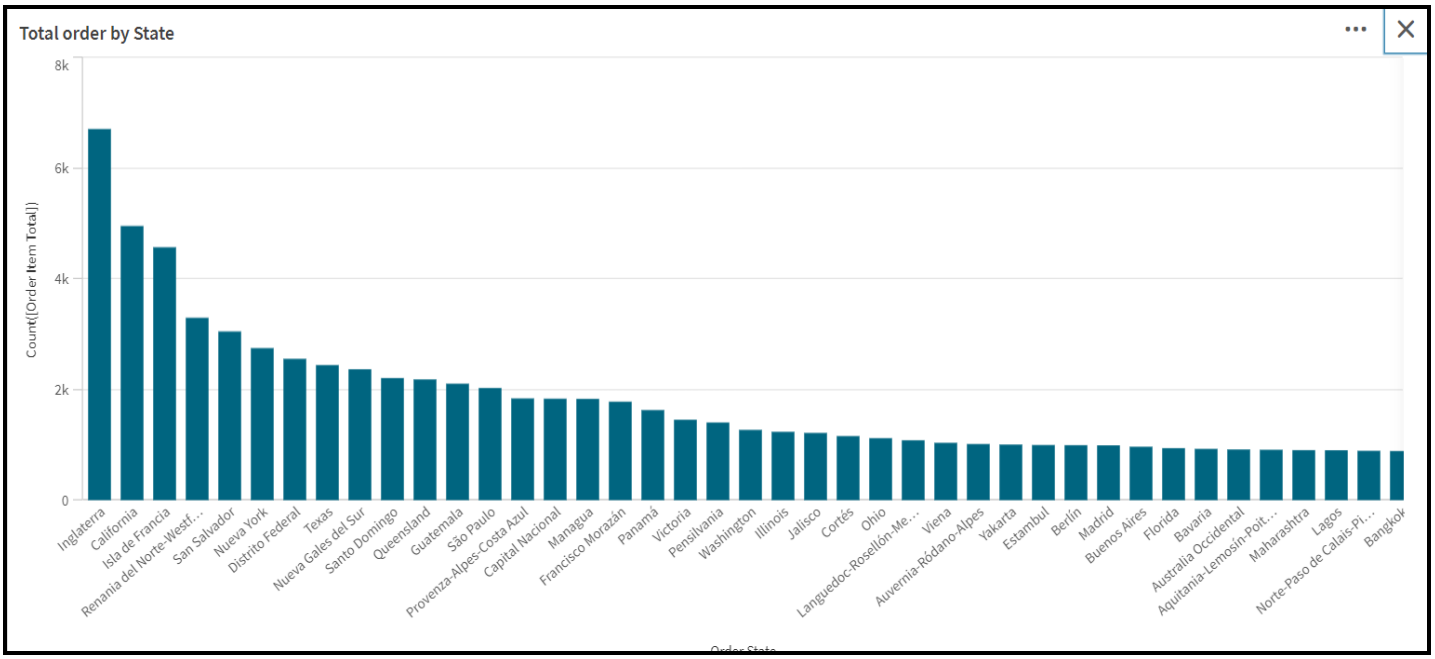
Sum([Order Item Quantity])

384.1k

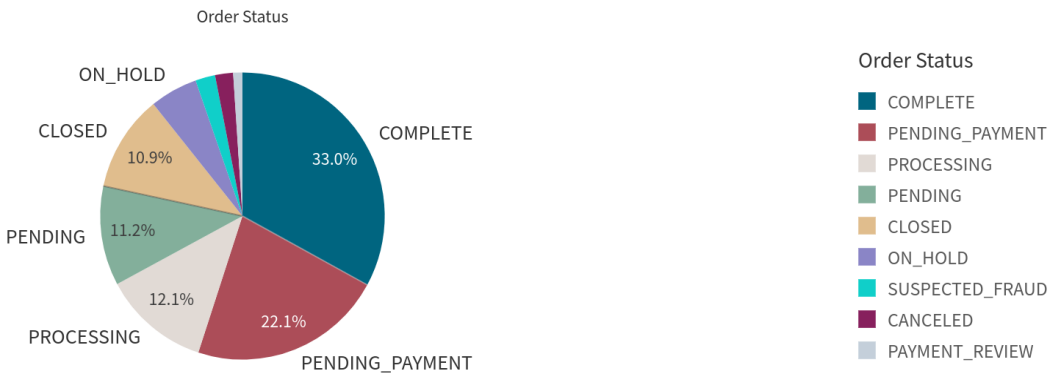
Profit Ration

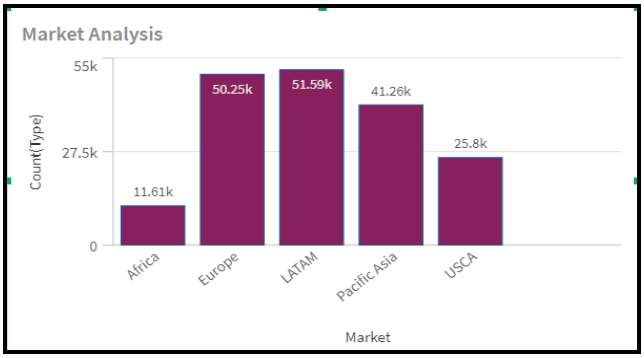
Sum([Order Item Profit Ratio])

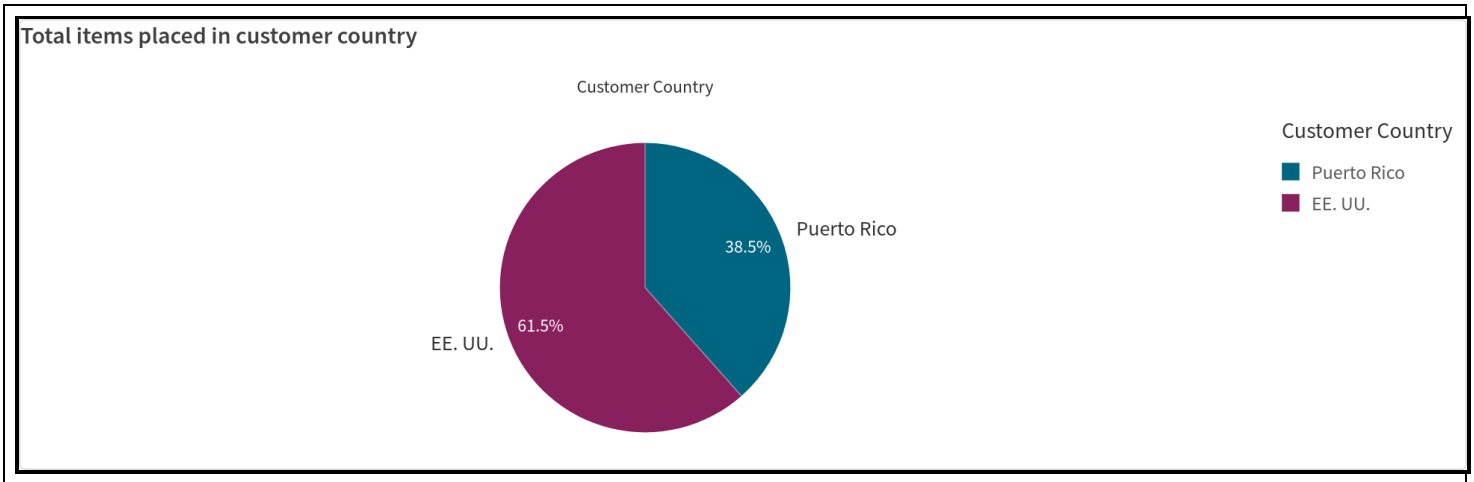
21.78k



Order Status Of Orders



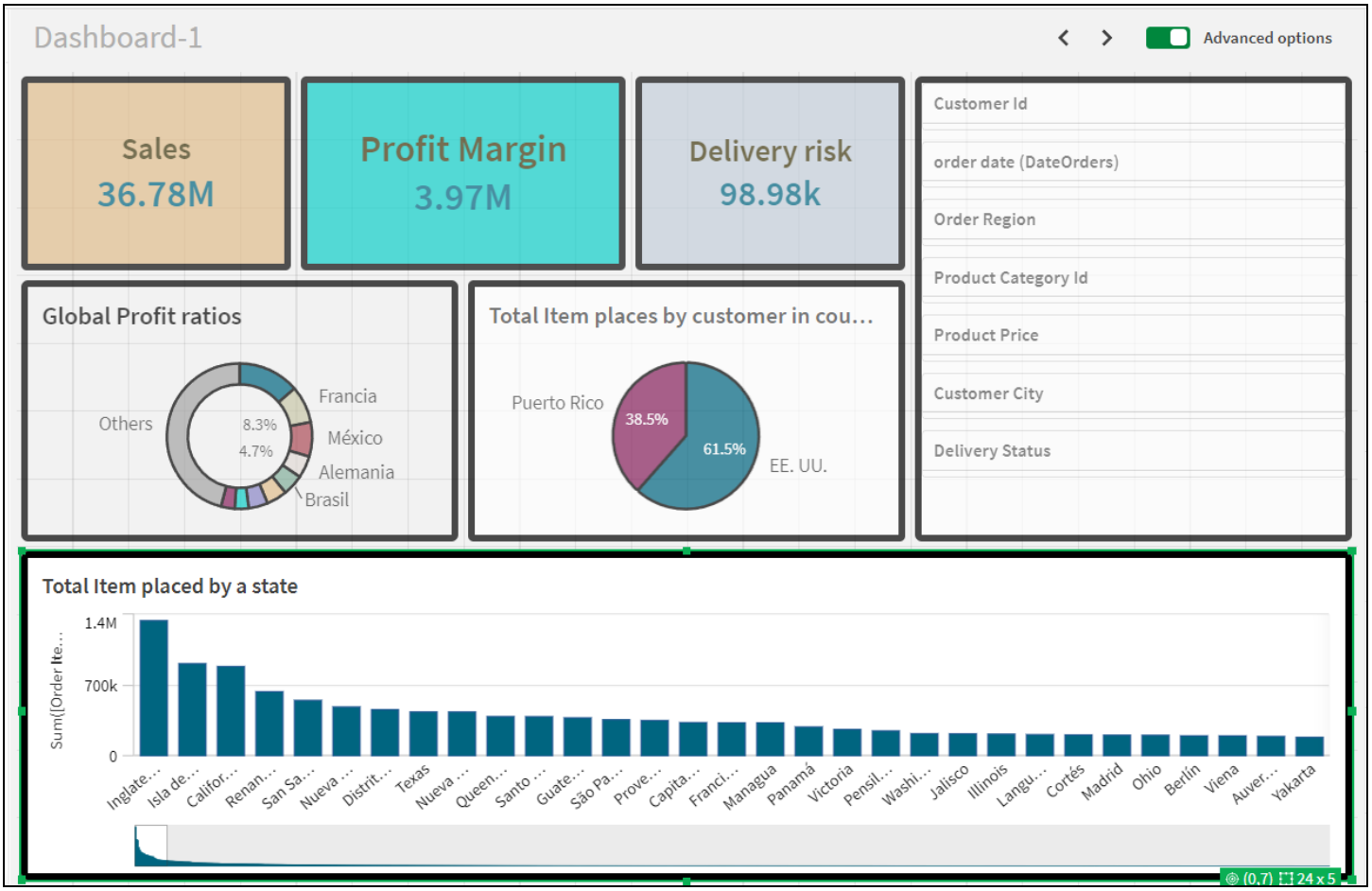




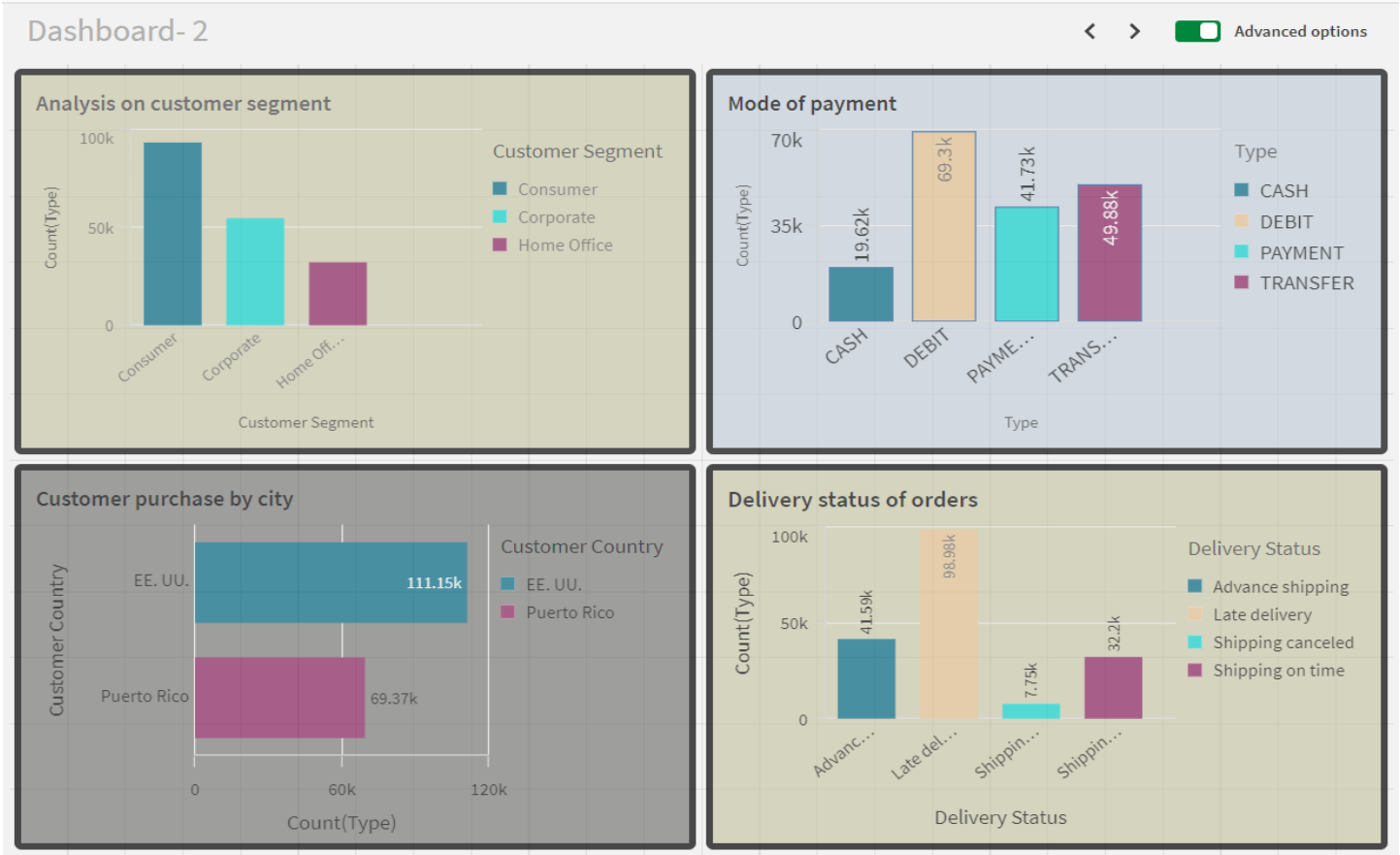
6. Dashboard:

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

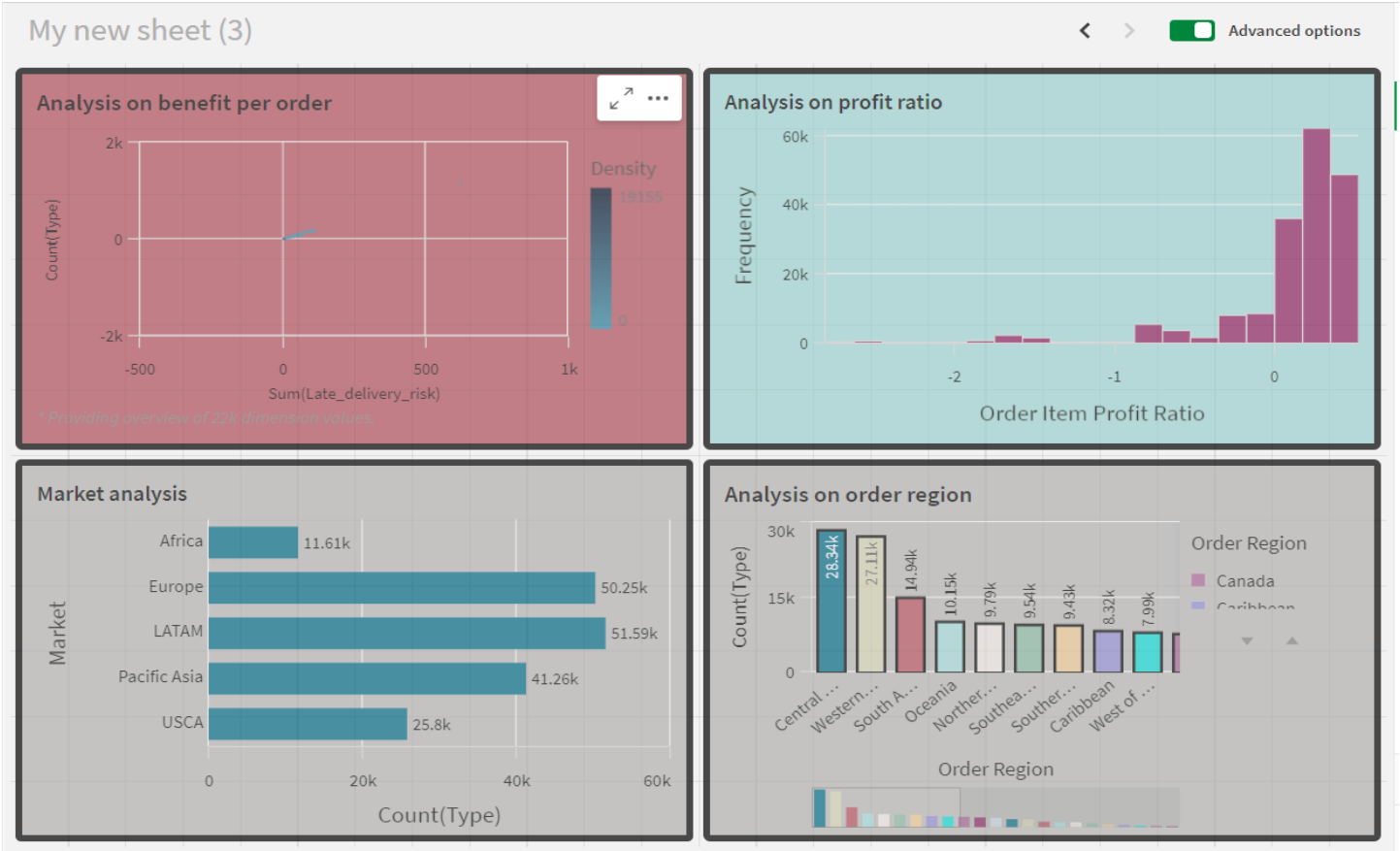
Dashboard-1:



Dashboard - 2 :



Dashboard - 3 :



7. Story:

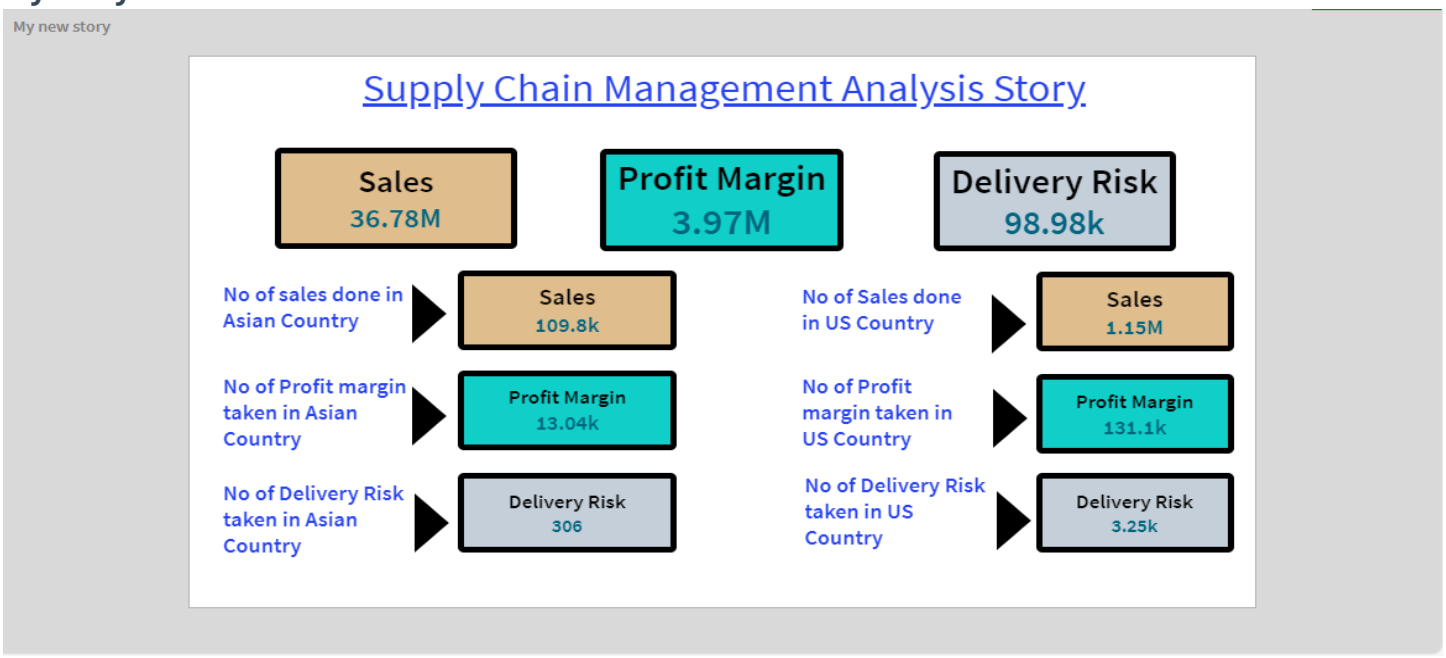
Designing a report in Power BI involves connecting to data sources, creating visualizations like charts and graphs, customizing their appearance and interactivity, organizing them logically on the canvas, formatting elements for consistency and clarity, and optionally creating dashboards for a summarized view. Throughout the process, it's essential to consider the audience's needs and ensure the report effectively communicates insights from the data. Finally, iterate based on feedback to continually improve the report's design and usefulness.

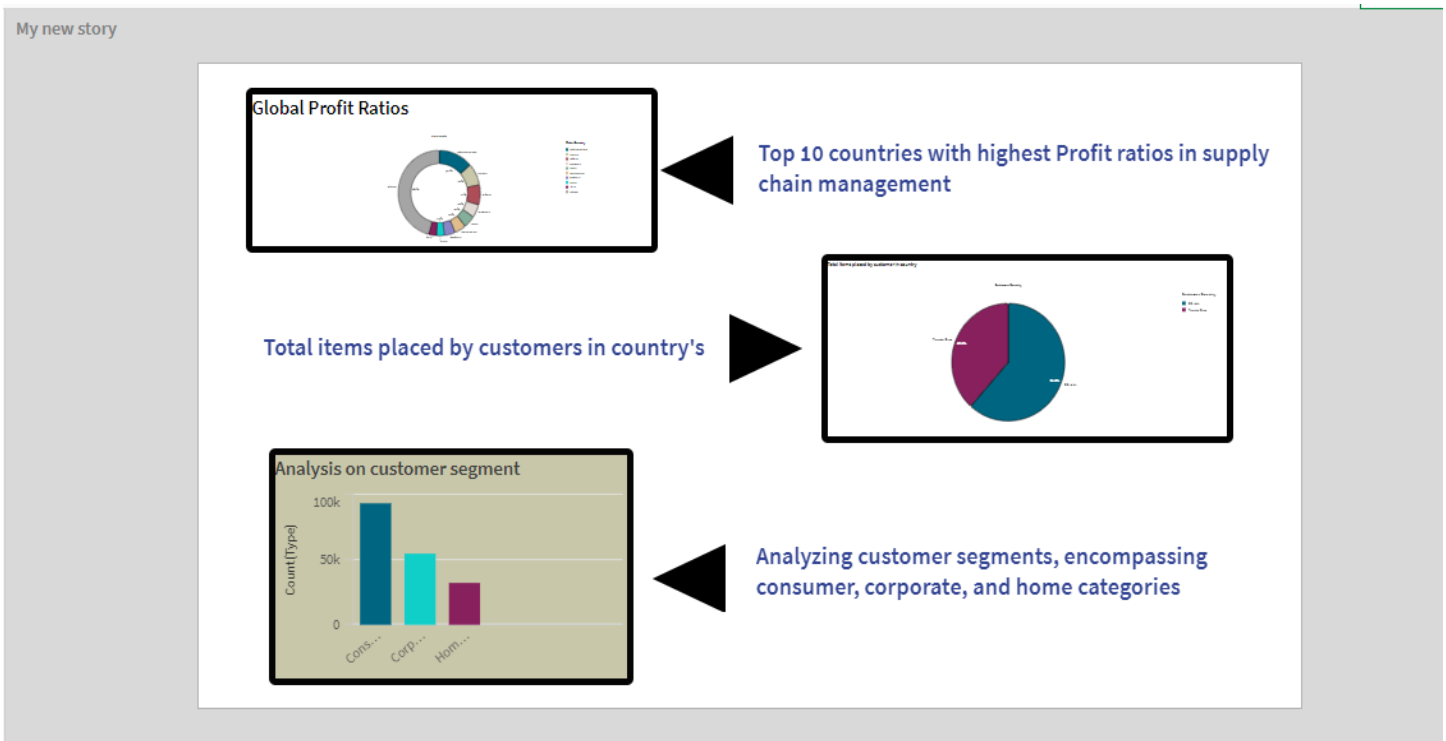
Explanation video link Part 1: Link

Explanation video link Part 2: Link

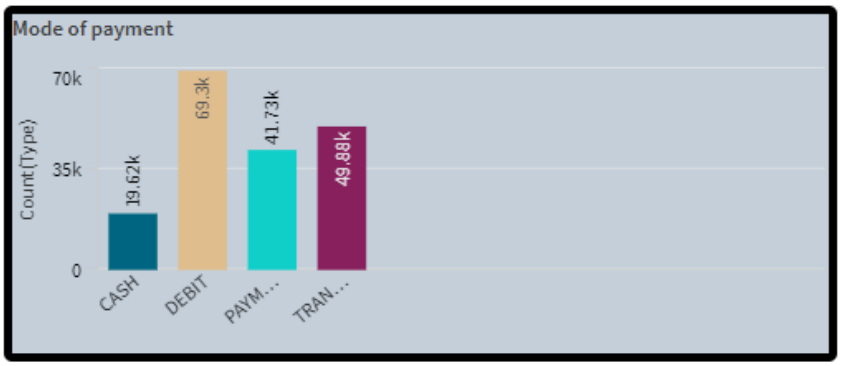
Explanation video link Part 3: Link

My Story:





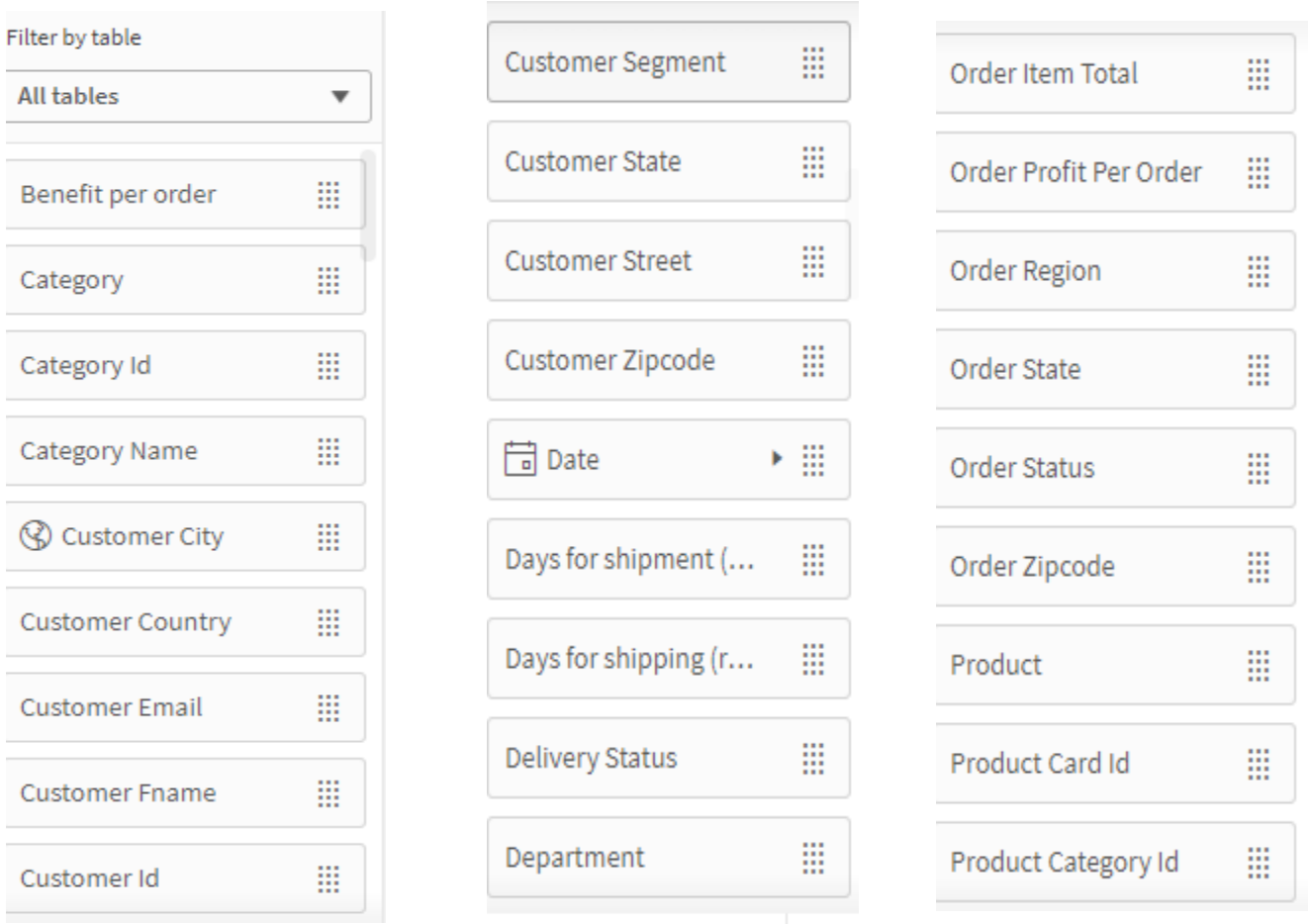
Mode of Payment for Purchase



- ✔ 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

8. Performance Testing:

Amount of data loaded-



Utilization of data filters:

"Utilization of Filters" refers to the application or use of filters within a system, software application, or data processing pipeline to selectively extract, manipulate, or analyze data based on specified criteria or conditions. Filters are used to narrow down the scope of data, focusing only on the relevant information that meets certain predefined criteria.

No. of visualizations / Graphs:

- Global Profit Ratios
- Total Items placed by customer in country
- Total Items placed by a state
- Analysis on customer segment
- Mode of payment
- Customer purchase by city
- Delivery status of orders
- Analysis on benefit per order
- Analysis on profit ratio
- Market Analysis
- Analysis on order region

Note : thats all mentioned in Dashboards.