

# **Data-Driven Innovations In Supply Chain Management With Qlik Insights**

(Smart-Internz)

## **Documentation**

**Problem Statement:** The supply chain management landscape is fraught with inefficiencies, characterized by suboptimal logistics, inaccurate forecasting, and poor inventory management. These issues lead to increased operational costs, longer lead times, and reduced responsiveness to market changes, adversely impacting the overall efficiency and competitiveness of businesses. The challenge is to leverage advanced data analytics to transform and optimize these key facets of supply chain management.

**Objective:** This project aims to revolutionize supply chain management through the implementation of Qlik's advanced data analytics capabilities. By integrating, visualizing, and analysing data from diverse sources, the project seeks to enhance operational efficiency, optimize logistics, improve forecasting accuracy, and streamline inventory management. The ultimate goal is to create a more responsive and cost-effective supply chain ecosystem.

### **Business Requirements:**

#### **1. Data Integration and Centralization:**

- Develop a comprehensive data integration strategy to aggregate data from various supply chain sources.
- Centralize this data within Qlik to ensure seamless access and analysis.

#### **2. Advanced Visualization:**

- Utilize Qlik's advanced visualization tools to create dynamic dashboards.

- Provide stakeholders with clear, actionable insights into the entire supply chain.
- 3. Logistics Optimization:**
  - Analyse historical logistics data using Qlik's analytics features to identify patterns.
  - Optimize transportation routes to reduce lead times and minimize transportation costs.
- 4. Real-Time Tracking and Monitoring:**
  - Implement real-time tracking solutions to enhance visibility into the movement of goods.
  - Enable quick response to changes and unforeseen events in the supply chain.
- 5. Real-Time Analytics for Decision-Making:**
  - Deploy real-time analytics to facilitate prompt decision-making.
  - Ensure a proactive and responsive supply chain that can adapt to demand fluctuations and other changes.

### **Literature Survey Insights:**

Research indicates a strong trend towards utilizing data analytics to transform supply chain processes. Key findings include:

- **Visibility and Decision-Making:** Advanced analytics tools like Qlik significantly enhance visibility and decision-making capabilities within supply chains.
- **Operational Efficiency:** Implementation of data-driven insights leads to notable improvements in logistics optimization, forecasting accuracy, and inventory management efficiency.
- **Successful Implementations:** Case studies across various industries show substantial gains in operational efficiency and responsiveness due to data-driven supply chain transformations.
- **Challenges and Opportunities:** Adoption of data-driven insights requires robust data governance frameworks and a culture shift towards data-centric decision-making.

## **Social and Business Impact Analysis:**

### **Social Impact:**

- **Demographic Distribution Visualizations:** Use data visualizations to highlight the demographic distribution within supply chain management.
- **Impact on Social Welfare Programs:** Analyse how innovations in data-driven supply chain management have enhanced social welfare programs, financial inclusion, and related areas.
- **Correlations and Improvements:** Explore potential correlations between the usage of data-driven supply chain management and improvements in social welfare metrics.

### **Business Impact:**

- **Sectoral Analysis:** Examine the effects of data-driven supply chain management on sectors such as banking, telecommunications, and e-commerce.
- **Impact on Sales and Efficiency:** Evaluate how these innovations have influenced sales, customer onboarding, and overall operational efficiency.
- **Operational Efficiency Gains:** Assess the improvements in efficiency and responsiveness within businesses adopting these data-driven strategies.

By addressing these aspects, the project not only aims to optimize supply chain management but also seeks to understand and amplify its broader social and business impacts.

## **Collecting and Understanding the data:**

To optimize supply chain management using Qlik's advanced analytics, we begin with a comprehensive data collection and understanding phase. We gather and integrate data from diverse sources, including sales, shipping, customer demographics, products, and geographic information. The dataset comprises various attributes

like shipping days, profit margins, customer details, and order specifics. Key steps involve cleaning, transforming, and merging data to ensure integrity and consistency. Through exploratory data analysis, we calculate summary statistics, create visualizations, and identify correlations. This structured approach provides a robust foundation for leveraging Qlik's capabilities to enhance operational efficiency, optimize logistics, and improve forecasting accuracy in the supply chain.

## **Data Preparation and Visualization**

**Data Transformation:** The initial step involves transforming the cleaned dataset into formats suitable for analysis. This includes calculating global profit ratios and aggregating the total items placed by customers across different countries and states. Customer data is segmented to aggregate relevant metrics, while payment modes are categorized and analysed. Additionally, purchases are aggregated by city, and orders are categorized by delivery status. Further analysis is performed on the benefit per order and profit ratios across products and categories. Key markets are analysed for sales and profit metrics, and order data is aggregated by region to facilitate comprehensive insights.

**Data Aggregation and Filtering:** To ensure meaningful insights, data is filtered to focus on specific time periods or geographic regions. Aggregation is performed at the required level of granularity, such as monthly or quarterly, to enable detailed analysis. This step ensures that the data is organized and ready for visualization, highlighting significant trends and patterns.

**Key Visualizations:** A variety of visualizations are created to convey insights effectively. Global profit ratios are represented on a world map with colour gradients, while total items placed by customers are shown using bar charts for both country and state levels. Customer segment analysis is depicted through pie charts or stacked bar charts, and modes of payment are illustrated using pie charts or horizontal bar charts. Geo-heatmaps display customer purchases by city, and

delivery status of orders is visualized using donut or bar charts. Benefits per order are analysed with box plots or bar charts, and profit ratios are tracked over time with line charts or scatter plots. Market performance is assessed using bubble charts or tree maps, and order regions are analysed through stacked bar charts or area charts.

**Qlik Data Preparation Steps:** In Qlik, the cleaned dataset is imported, and relationships between data tables are established to ensure accurate aggregations and calculations. Qlik's scripting capabilities are utilized to create calculated fields and aggregate data as needed. Interactive visualizations are then built using Qlik's tools, allowing users to drill down into the data for deeper insights. Finally, data accuracy is validated by cross-checking the visualizations with the raw data, ensuring completeness and correctness.

These steps collectively ensure that the data is effectively prepared and visualized, providing stakeholders with actionable insights into supply chain performance and efficiency.

## **Conclusion**

Through meticulous data preparation and the strategic use of Qlik's advanced analytics capabilities, we have established a robust foundation for revolutionizing supply chain management. By transforming and aggregating data from diverse sources, we ensure comprehensive insights into logistics, forecasting, and inventory management. The creation of targeted visualizations, such as profit ratios, customer purchase behaviour, and delivery status, provides stakeholders with clear, actionable insights. This structured approach enhances operational efficiency, optimizes logistics, and improves forecasting accuracy. Overall, leveraging data-driven insights enables a more responsive and cost-effective supply chain, ultimately driving better business performance and customer satisfaction.