

INTRODUCTION

1.1 Overview

Today's businesses face intense competition, therefore in order to survive, many rely on data to help them make strategic decisions. Supply chain management requires a similar approach to operate more effectively.

This project focuses on analyzing DataCo's smart supply chain data using Qlik sense analysis techniques. By leveraging advanced analytics and visualization tools, we aim to extract valuable insights from the data to improve supply chain efficiency and decision-making processes.

1.2 Purpose

This project aims to give a thorough analysis of the supply chain data, highlighting important delivery patterns, trends, anomalies and On-Time Rates. This research will improve supply chain performance overall, save costs, and optimise shipping time and customer segmentation. Stakeholders may see the supply chain processes in a clear, dynamic, and actionable manner by using Qlik Sense for data visualization.

1.3 Technical Architecture

The technical architecture of the project involves the following components:

- Data Collection: Gathering raw data from Kaggle of DataCo Smart Supply Chain Management.
- Data Storage: Storing the collected data in a scalable data warehouse using Qlik sense.
- Data Processing: Cleaning, transforming, and preparing the data for analysis using the Data Manager tab and options like add fields.
- Data Visualization: Using Qlik Sense (Analyze Sheets) to create interactive dashboards and visualizations.

DEFINE PROBLEM/PROBLEM UNDERSTANDING

2.1 Specify the Business Problem

Having employed Qlik Sense and data-driven insights, this project intends to revolutionize DataCo Global, a retail company's supply chain management. Its objective is to optimize inventory control, prediction, and logistics, among others, for enhanced operational response times that were hitherto unimaginable using advanced analytic tools.

The project aims to transform DataCo Global's supply chain management through the use of Qlik's data-driven insights. It will try and create new ways of looking at significant areas like inventory management, forecasting, and logistics with the help of advanced analytics, which would increase operational reactivity rates beyond what had been thought possible.

2.2 Business Requirements

At DataCo Global, we will develop a strong system for integrating information that will help organization to come up with an appropriate plan and to collect accurate data from the supply chain sources. We are going to use Qlik's incredible visualization tools in order to create interactive dashboards that will be friendly to users and that would ensure they grasp the whole picture of how the supply chain ecosystem looks like.

Qlik's advanced analytics tools will be used in analyzing historical logistic data, spotting trends and designing better routes for transportation. The major reason behind this is that real-time tracking and monitoring techniques have enabled more visibility as well as reduced both lead times and transport costs. It means therefore that we can monitor the movement of goods closely. This calls for decision-making on the go through real-time analysis thereby guaranteeing proactive demand response and agile supply management.

2.3 Literature Survey

A review of literature on the theme of the project subject using advanced analytics and data-driven insights to change supply chain management shows a growing body of scholarly articles and research dedicated to such projects. Research points to an increasing recognition about how data analytics can transform traditional supply chains. One refers the reader into practical studies Show that the use of sophisticated analytical tools, such as Qlik, improves transparency in supply chain decision making process.

The study shows various positive influences on inventory efficiency, forecasting accuracy and logistic optimization as well as other analytical approaches and technology changes in relation to data-supported supply chains.

The findings highlight viable implementations that have resulted in significant improvements in responsiveness along with operating effectiveness for several industries.

DATA COLLECTION

3.1 Collect the Dataset

The process of acquiring and assessing data on relevant variables in a predetermined, methodical manner is known as data collecting. It allows one to assess results, test hypotheses, respond to research questions, and draw conclusions from the data.

The supply chain operations of DataCo from 2015 to 2018 are included in the dataset for this project. This data includes sales records, supplier performance metrics, transportation logs, and inventory levels. The information was gathered via the kaggle.com website.

3.2 Connect Data with Qlik Sense

- Importing the raw data file in CVS format into the Qlik Sense app is the first step in connecting the dataset to Qlik Sense.
- Data was cleaned and processed using the data manager tab.
- Data models were built up to facilitate the necessary analysis and visualizations, such as by adding calculated fields to the data set using the add files tab.

DATA PREPARATION

4.1 Prepare the Data for Visualization

Data preparation involves the following steps: - Using the edit option in the data manager tab, the data was cleaned to eliminate errors, duplicates, null values, and inconsistencies.

A calculated field for the On-Time Rate matrices and the Difference in Shipping Time matrices was added to this by using the Add Files option. The 'select data from source' option's capability was utilized to eliminate certain unnecessary columns, resulting in improved dataset understanding. We have only chosen 39 of the dataset's 52 columns, which total 180519 rows, to make the data more streamlined.

- Converting the data to meet the needs of the analysis, such as by using metrics like OTR (number of orders shipped on time / by total orders)*100. Variation in shipping duration = actual shipping days - shipment days (anticipated)
- Producing aggregations and subsets of data to enable effective analysis and display.

Type	Days for shi...	Days for shi...	Benefit per o...	Sales per cu...	Delivery Status	Late_deliver...	Category Name	Customer City	Customer C...	Customer
CASH	0	0	-1088.949951	395.980011	Shipping on time	0	Fishing	Winter Park	EE. UU.	Helen
CASH	0	0	-854.960022	379.980011	Shipping on time	0	Fishing	Buena Park	EE. UU.	Dylan
CASH	0	0	-652.7700195	383.980011	Shipping on time	0	Fishing	West Haven	EE. UU.	Samantha
CASH	0	0	-595.1699829	383.980011	Shipping on time	0	Fishing	Princeton	EE. UU.	Sarah
CASH	0	0	-594.9699707	339.980011	Shipping on time	0	Fishing	Caguas	Puerto Rico	Mary

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SOCIAL IMPACT ANALYSIS

Making charts and dashboards to give useful insights on supply chain management's demographic dispersion. Examine the effects that data-driven innovations in supply chain management had on financial inclusion, social welfare programs, and other important sectors and also looking for any connections between improvements and usage.

BUSINESS IMPACT ANALYSIS

Examine the effects that Data-Driven Innovations in Supply Chain Management have on companies, particularly those involved in e-commerce, mobile, and banking, also consider how data-driven innovations in supply chain management have affected client's onboarding, sales, and operational effectiveness.

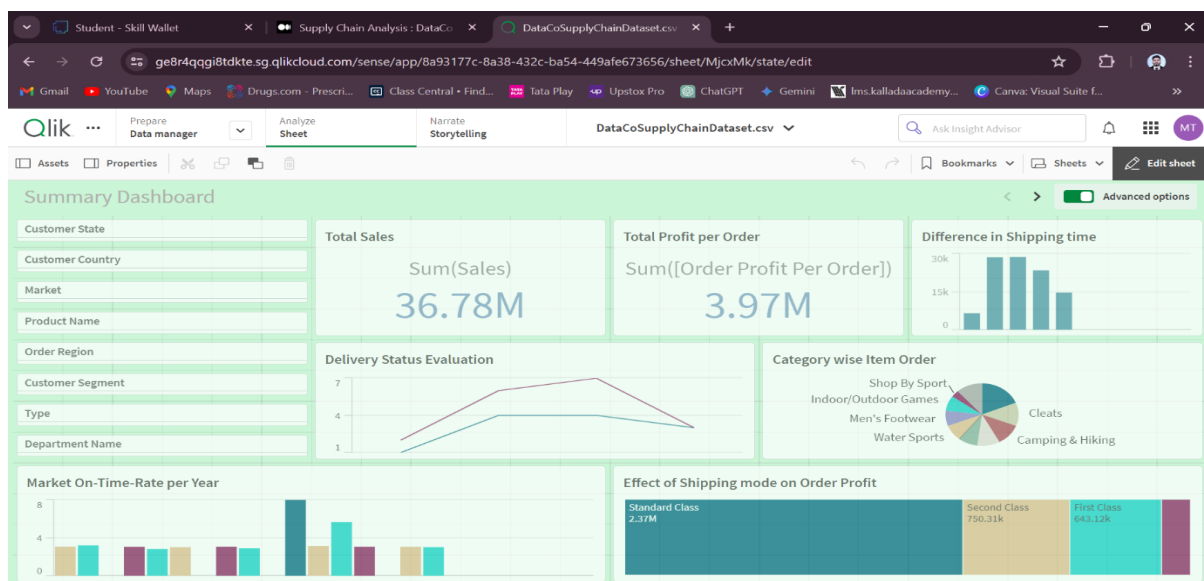
DATA VISUALIZATIONS

5.1 Visualizations

The technique of producing graphical representations of data to aid in understanding and information exploration is known as data visualization. Making complex data sets more approachable, intuitive, and interpretable is the aim of data visualization. Data visualizations make patterns, trends, and outliers in the data easier to see by using visual components like charts, graphs, and maps.

We have attempted to develop four dashboards, each of which offers a variety of distinct visualizations that may be produced using a DataCo Global dataset. Numerous popular visualization formats, such as bar charts, line charts, heat maps, scatter plots, pie charts, and more, can be used to analyze the effectiveness and performance of DataCo's supply chain operation.

These visualizations can be used to compare performance, monitor changes over time in order quantity, display distribution and correlations between variables, target and segment customers, allocate resources, and determine consumer location.



DASHBOARD

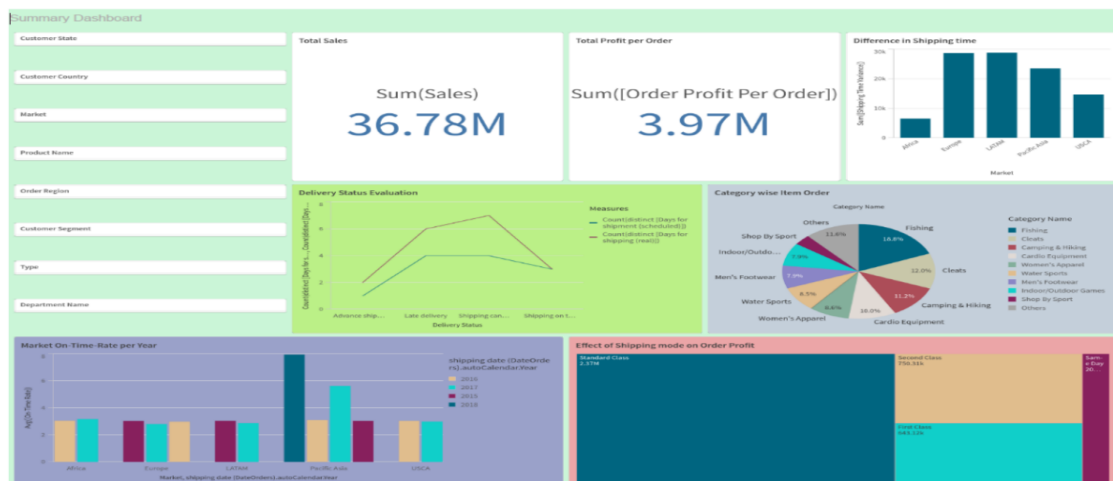
6.1 Responsive and Design of Dashboard

A dashboard is a type of graphical user interface (GUI) that presents facts and information in a logical, readable manner. Dashboards are usually created with a specific goal or use case in mind and are frequently used to provide real-time data monitoring and analysis.

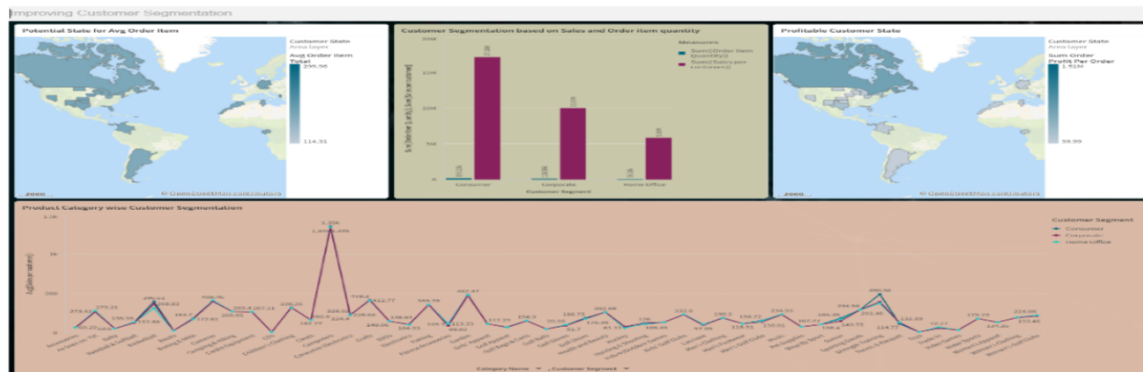
Dashboards have application in diverse domains, including business, finance, manufacturing, healthcare, and numerous other sectors. They can be used to monitor performance metrics, track key performance indicators (KPIs), and present data as tables, graphs, and charts.

For this project, we have produced four dashboards in total, including,

1.The Summary Dashboard provides an overview of DataCo Global's whole supply chain management. It allows us to utilize the filter pane option to learn about the performance of the supply chain, shipping time differences, order benefits, and on-time ratio.



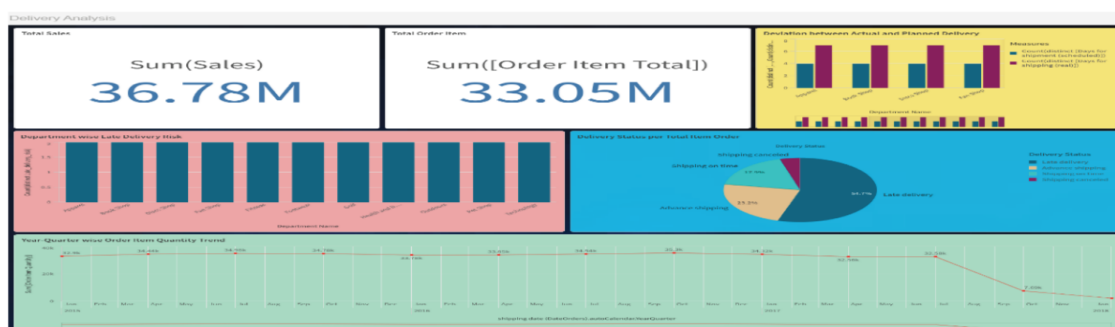
2.Customer segmentation: this describes the customer target base and the product category they are ordering.



3.Inventory management: This discusses how to keep track of the different products in stock and provides information on which products are in high demand.



4.Delivery performance: this provides information on the variations in the delivery status and performance of the products that are delivered on schedule. Consequently, by using this dashboard, Dataco Global's issues will be better recognized, and the analysis will assist the organization in resolving these issues and enhancing performance.



REPORT

7.1 Report Creation

The report outlines all of the project's findings. We have produced a four-page report. The first page discusses how to improve customer segmentation by displaying the location of potential customers and grouping customers according to profitability. By doing this, DataCo Global will be able to focus more on specific customers and their locations, which will help them deliver orders more effectively and with the fewest errors possible.

We have discussed the organization's inventory level on the second report page. Here, the visualization shows the most popular product, the most ordered product category, and the state-wise product demand. By applying the knowledge gained from this, DataCo worldwide will manage inventories more effectively.

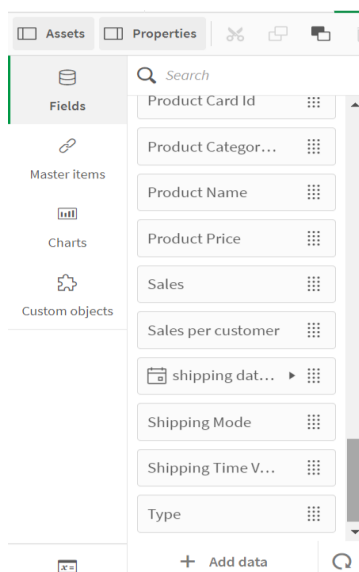
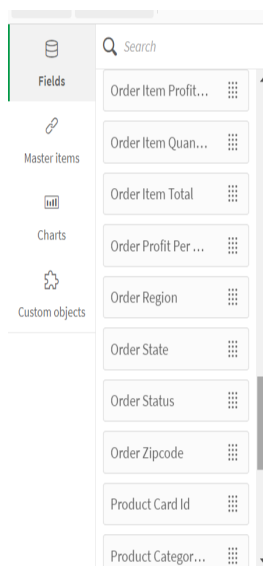
We covered the delivery analysis in the third report. This report details the difference between the actual and expected deliveries, as well as the delivery status and the year-quarter trend in requested quantities. All of this information can assist DataCo Global in minimizing product delivery delays. They will also learn the effect that this delivery status has had on the company's sales, and they will eventually work to enhance it.

The last report concludes the supply chain's overall overview. Here, the average on-time rate (2-4) across all markets, with the exception of the Pacific Asia market, is examined. Furthermore, additional visualizations included different inventory summaries, variations in shipping times, total sales, etc. A variety of filter panes were added, allowing us to filter and obtain insights for appropriate problem solving and wise decision making.

PERFORMANCE TESTING

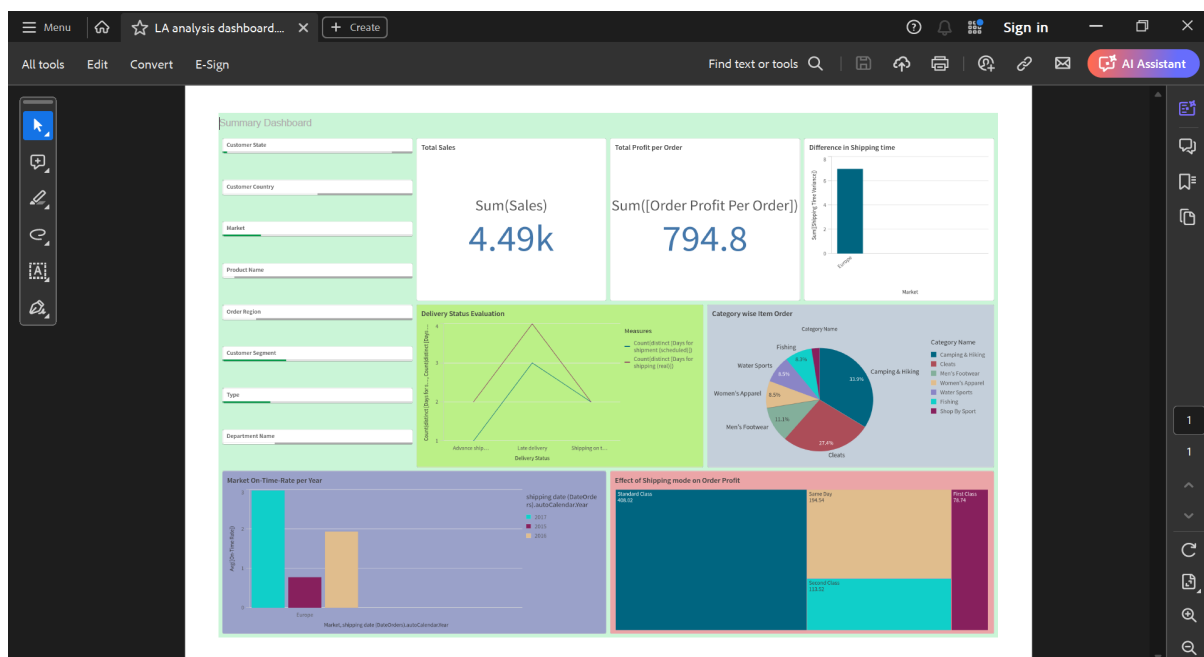
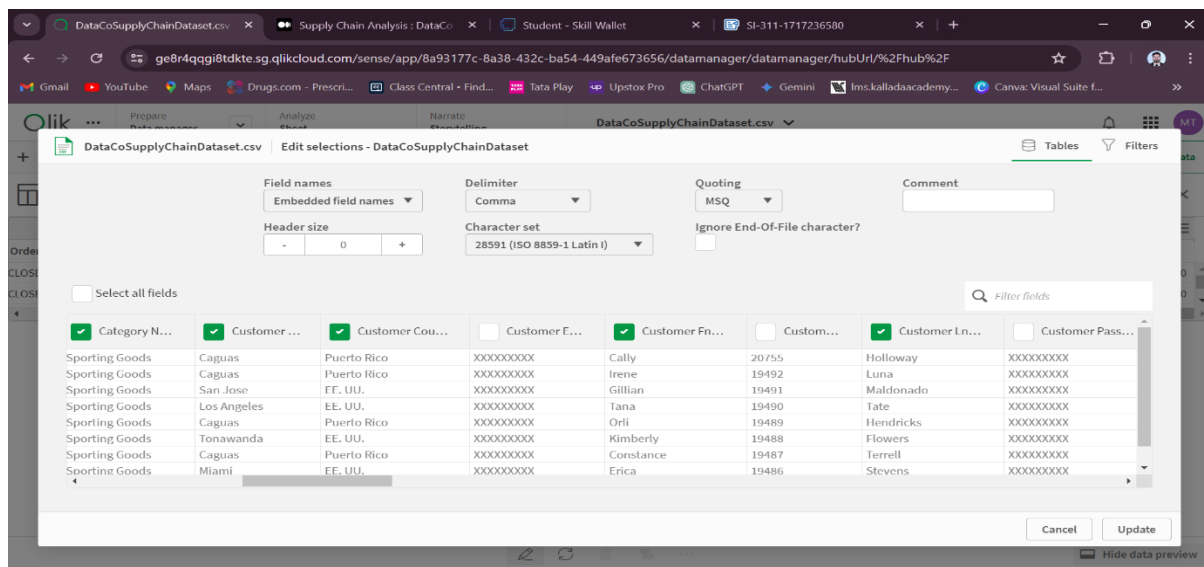
8.1 Amount of Data Rendered

The term "Amount of Data Loaded" describes the amount or volume of data that has been loaded into a database, software program, system, or other data processing or storage environment. It is a gauge of the volume of data that has been effectively processed and made accessible for the system's use, analysis, and manipulation. As previously stated, we have taken 38 columns out of the 52 columns in the table and added two more columns (shipping time differential and on-time rate) using add fields.



8.2 Utilization of Data Filters

The term "Utilization of Filters" describes the practice of using or utilizing filters in a pipeline, software program, or system to extract, alter, or analyze data in a targeted manner according to predetermined standards. Filters are used to focus solely on pertinent data that satisfies predetermined criteria, hence reducing the scope of the data. The preprocessed dataset was uploaded, unnecessary columns were removed using the "select from the table" option, and one filter was utilized by using the bookmark option. in that, the performance of the Louisiana state has been filtered.



CONCLUSION

In order to increase productivity and decision-making, this project effectively used Qlik Sense to evaluate DataCo Global's supply chain.

Principal results: Insights from customer segmentation can enhance delivery targeting and lower errors. Visualizations for inventory management aid in determining state-by-state demand and popular products. Analysis of delivery performance results in less delays and higher on-time rates. Dashboards for the entire supply chain include information on sales, inventories, shipment timeframes, and on-time rates.

Techniques for Data-visualization: A variety of graphs and charts, including scatter plots, heat maps, bar charts, and line charts, were used to construct interactive dashboards.

How to Implement Qlik Sense: Qlik Sense was used in the project for data processing, storage, visualization, and collecting. Data was imported into Qlik Sense after being gathered from Kaggle. The Data Manager tab's Add Fields option was used to generate calculated fields, data processing, and cleaning.

Evaluation of Performance: Together with two extra calculated columns, 38 of the 52 original data columns were utilized. To concentrate on particular data sets, such as Louisiana's performance, filters were employed.

Overall, this study demonstrates how Qlik Sense and data visualization can significantly improve DataCo Global's supply chain management, resulting in improved decision-making and increased customer satisfaction.

