

prose

Supply Chain Analysis

Q1 – 2024

Hellen Gaitan

Contents

Introduction.....	2
Objective of the Analysis.....	3
Specific Objectives.....	3
About the company: Prose.....	4
Product Categories.....	5
Why this company?.....	5
Business Questions	7
Data Model.....	8
One-to-many relationships	9
Measures	9
Executive Dashboard.....	10
Key Performance Indicators	11
Metrics	11
Average Shipping Time by Carrier	12
Average Freight Cost (Kg) by Carrier	13
On-Time Shipments by Transportation modes	14
Shipped quantities by Fulfillment Status.....	15
Inventory Availability Trend	16
Conclusion	17
References.....	18

Introduction

In the dynamic and competitive market of natural beauty products, where consumer preferences and market trends shift rapidly, a robust and streamlined supply chain is crucial for achieving and sustaining success. This project is dedicated to developing a comprehensive supply chain dashboard tailored for a company that specializes in haircare, skincare, and supplements manufacturing and distribution using natural ingredients.

The dashboard is designed to provide a thorough assessment of the company's performance in key supply chain areas such as shipping costs and time efficiency, across various provinces in Canada. Specifically focusing on the first quarter of 2024, this analysis will offer valuable insights into operational strengths and areas for improvement, enabling the company to make informed decisions and optimize its supply chain strategies for enhanced performance and customer satisfaction.

Objective of the Analysis

The primary objective of this project is to provide actionable insights to enhance the performance of the supply chain department in the second quarter of 2024. It is crucial to evaluate key performance indicators and measures based on the company's specific questions. This analysis will enable the company to take targeted actions to improve on-time and fulfilled deliveries.

Specific Objectives

- Focus on improving the total number of on-time shipments by transportation mode to enhance customer satisfaction and operational efficiency.
- Analyze fulfillment rates by location and implement strategies to improve performance in regions with lower fulfillment rates.
- Evaluate and optimize the quantities shipped for each fulfillment status (fulfilled, unfulfilled) for haircare, skincare, and supplements products.
- Identify cost-saving opportunities in both manufacturing and logistics to decrease the total costs associated with operations.
- Evaluate average shipping times per carrier and province to identify the best-performing companies. This will enable the assignment of the most efficient carriers to provinces and thereby improving service quality.
- Enable the company to take targeted actions to improve on-time and fulfilled deliveries in Q2 2024 by focusing on implementing inventory stock optimization strategies. This will be based on an assessment of the order fulfillment rate throughout and inefficiencies in overall Q1 of 2024.

About the company: Prose

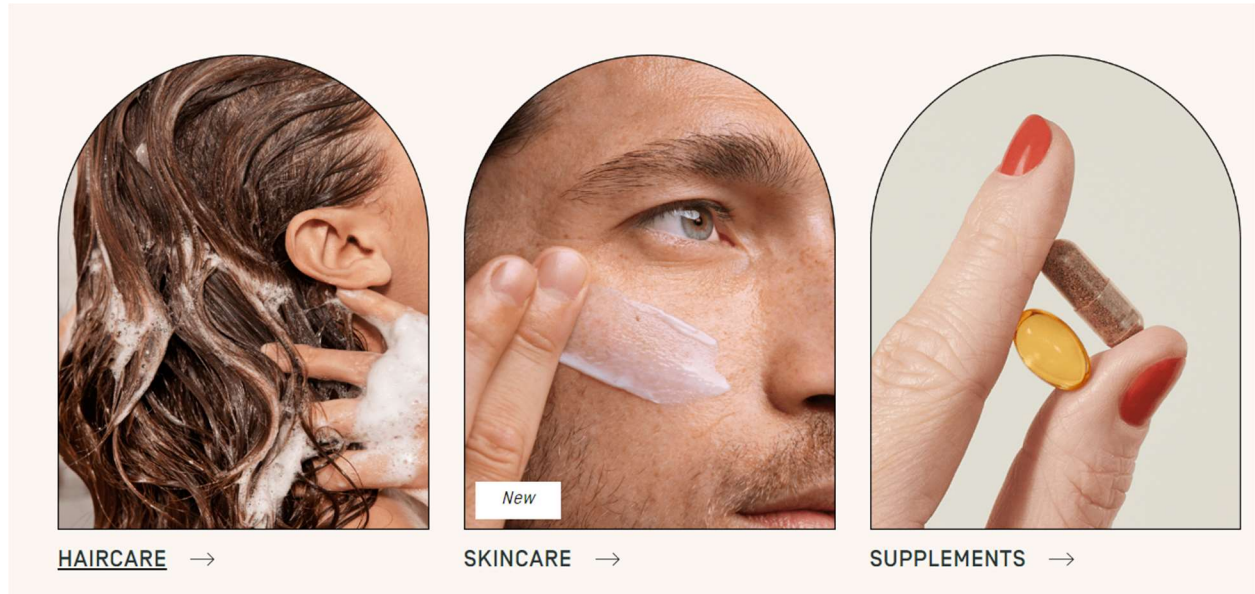


Prose Beauty is a Canadian company that specializes in personalized hair care and skin care products. They offer exclusive haircare products (shampoo, conditioner, and hair masks tailored to individual hair needs), skin care products made with natural ingredients. They offer natural supplements with great formulation that helps hair grow naturally with sustainably grown ingredients.

Customers can create their personalized hair care formulas by completing an online consultation that considers factors such as hair type, texture, goals, and lifestyle. Prose uses natural ingredients and avoids harmful chemicals like sulfates, parabens, and phthalates in their products. The company aims to provide a unique and effective hair care and skin care experience for each customer, emphasizing the importance of personalization and natural ingredients.

Prose employs over 150 people at their manufacturing facility. The importance of creating high-paying jobs for residents, stimulating the local economy, and helping to revitalize a longstanding manufacturing hub is at the heart of the company values.

Product Categories



Why this company?

This company was chosen because they are disrupting the beauty industry with an inherently sustainable, made-to-order model that creates collective change one individual at a time. Additionally, the information shown in the dataset brings a good comprehension of the current situation on their operations throughout the Q1 of 2024.

The dataset is composed by:

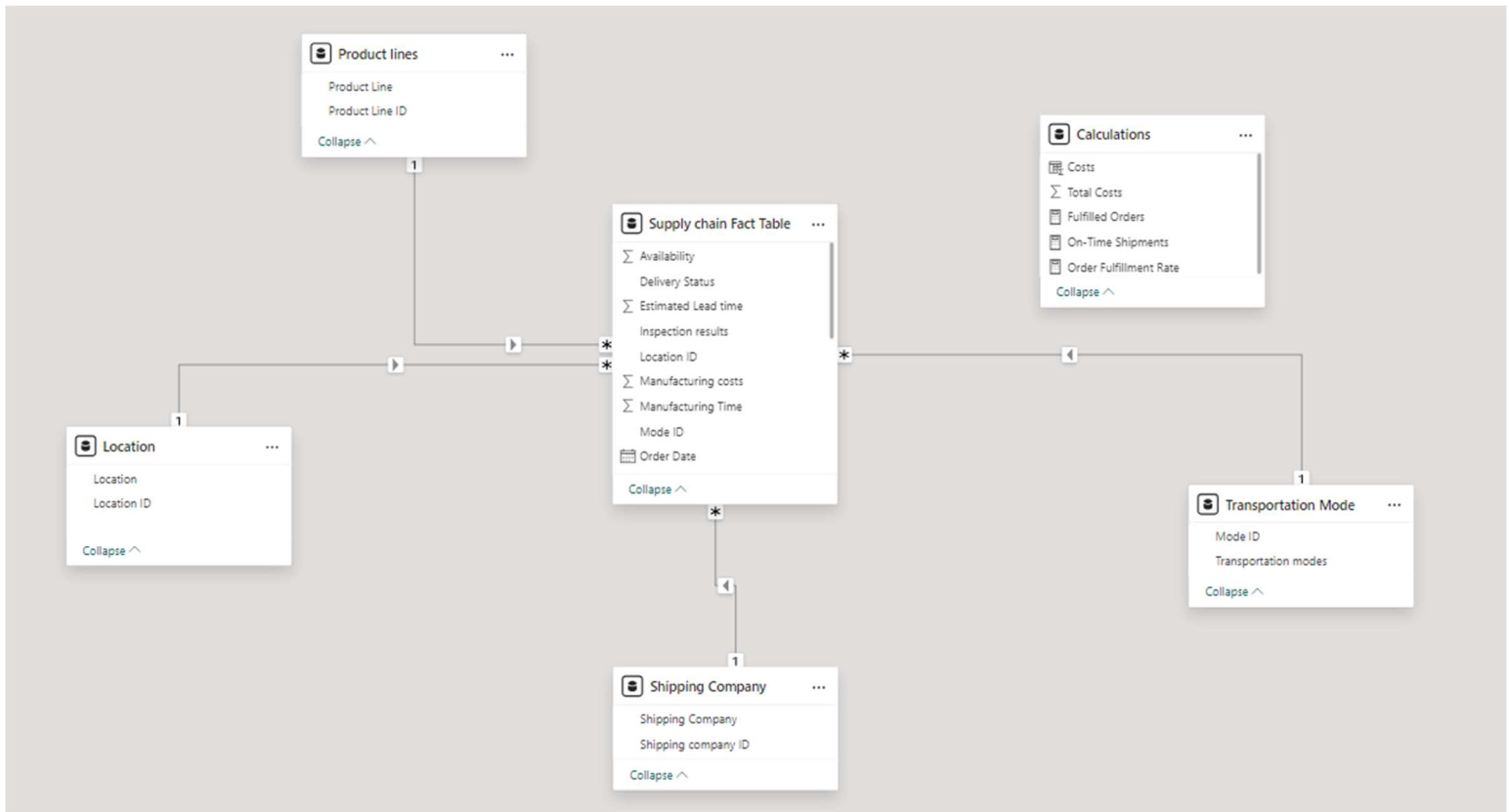
- 1. Order ID:** A unique identifier for each customer order.
- 2. Ordered Quantities:** The quantity of products (haircare, skincare, supplements) ordered by customers.
- 3. Stock Levels/ Availability:** The current stock levels or availability of products in inventory.

4. **Order Fulfillment (Unfulfilled and Fulfilled):** Indicates whether an order has been fulfilled or is still pending fulfillment.
5. **Price:** The price of the products ordered by customers.
6. **Manufacturing Costs:** The costs associated with manufacturing the products.
7. **Shipping Costs:** The costs associated with shipping the products to customers.
8. **Shipping Time:** The time taken for the products to be shipped to customers.
9. **Manufacturing Time:** The time taken to manufacture the products.
10. **Estimated Lead Time:** The estimated time between placing an order and receiving the products.
11. **Real Delivery Time:** The actual time taken for the products to be delivered to customers.
12. **Delivery Status:** The status of the delivery (on-time or late).
13. **Location:** The provinces in Canada where customers have placed orders: Alberta, Manitoba, British Columbia, Ontario, Quebec.
14. **Product Line:** The category of products ordered by customers. These are Haircare, Skincare, Supplements.
15. **Shipping Company / Carrier:** The company or carrier responsible for shipping the products from the manufacturing place to the customer destination.
16. **Transportation Mode:** The mode of transportation used for shipping. These are air, road, rail and sea.

Business Questions

- What are the total costs (manufacturing + logistics) for the Q1 of 2024?
- What percentage of shipments are delivered on time?
- Which transportation modes have the highest on-time delivery rates?
- What is the average shipping time per carrier and province?
- What is the distribution of orders by delivery status (fulfilled, unfulfilled)?
- What is the overall order fulfillment rate?
- How many shipments are delivered on time in total?
- How do fulfillment rates vary between different locations?

Data Model



The relationships in the data model connect the fact table (containing transactional data) with dimension tables (containing descriptive attributes). Here's how the relationships are structured:

Fact Table:

- **Order ID** as Primary key
- **Shipping Company ID** as Foreign key: Links to the “Shipping company table”.
- **Location ID** as Foreign key: Links to the “Location table”.
- **Product Line ID** as Foreign key: Links to the “Product lines table”.
- **Transportation Mode ID** as Foreign key: Links to the “Transportation mode table”.
- Other columns represent various aspects of each order, such as quantities, costs, times, and statuses.

Dimension Tables:

- **“Shipping company table”:** Contains details about each shipping company, with the `Shipping company ID` as the primary key.
- **“Location table”:** Contains details about each location (province), with the `Location ID` as the primary key.
- **“Product lines table”:** Contains details about each product line (haircare, skincare, supplements), with the `Product line ID` as the primary key.
- **“Transportation mode table”:** Contains details about each transportation mode, with the `Mode ID` as the primary key.

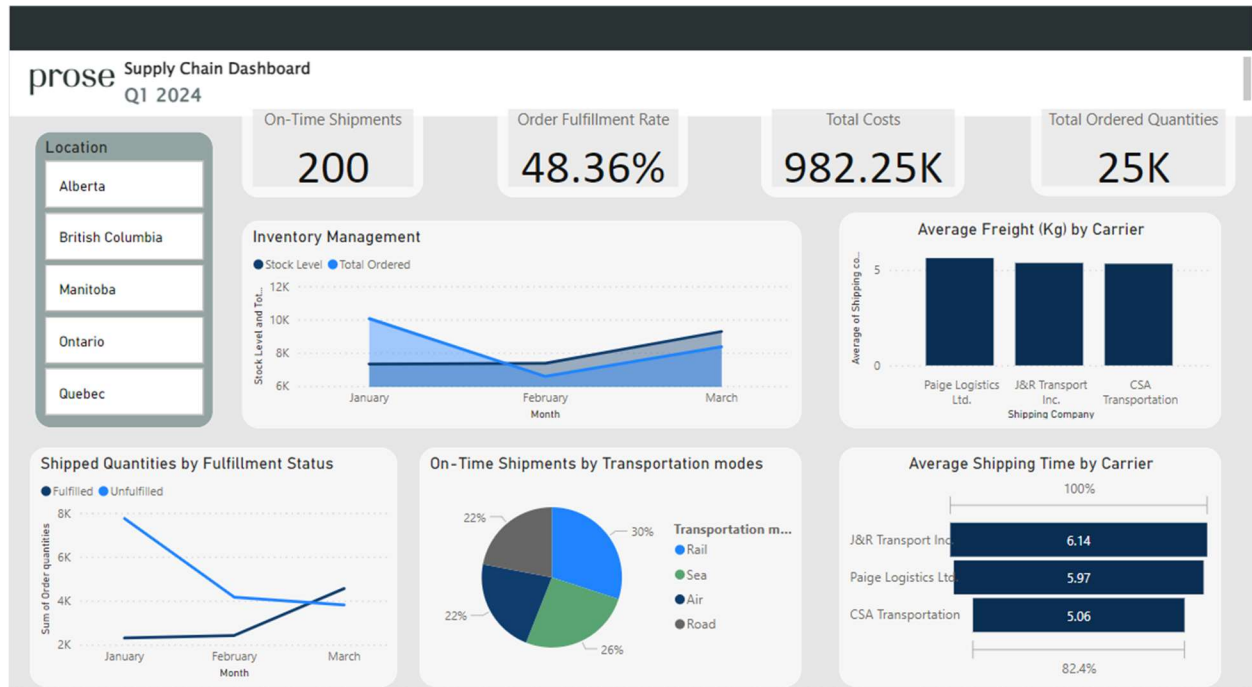
One-to-many relationships

Each of the entities (Shipping company, Location, Product line and Transportation mode) can be associated with multiple orders. For example, this one-to-many relationship is done because one shipping company, can have many orders, but each order is associated with only one shipping company. Same happens with, Location, Product line and Transportation mode.

Measures

- **Total Cost:** This measure calculates the total cost of each order, including manufacturing costs, shipping costs, and any other associated costs.
- **Fulfilled Orders:** This measure counts the number of orders that have been successfully fulfilled.
- **On-time Shipments:** This measure calculates the percentage of shipments that were delivered on time.
- **Order Fulfillment Rate:** This measure calculates the percentage of orders that were successfully fulfilled out of the total orders placed.

Executive Dashboard



The dashboard for this project is a comprehensive tool that provides a visual representation of key supply chain metrics and performance indicators. It will allow stakeholders to quickly and easily access important information related to logistics, deliveries, costs, and shipping efficiency across different provinces in Canada.

Segmentation of data by product type (haircare, skincare, supplements) will enable users to analyze performance and identify opportunities for improvement by visualizing the charts for each case.

Users will be able to analyze charts displaying delivery times and fulfillment levels across different provinces and transportation modes. Additionally, the dashboard allows users to identify areas for cost savings.

Key Performance Indicators

Metrics



Total Ordered Quantities

This metric refers to the total number of products (haircare, skincare, supplements) ordered by customers between January, February, and March, (first quarter of 2024). It provides insight into the demand and helps in forecasting inventory needs and production requirements. In this case, Prose has a total of 25000 units delivered by March 2024.

Order Fulfillment Rate

Order fulfillment measures the percentage of customer orders that are successfully processed and delivered to customers on time. It reflects the efficiency of the supply chain in meeting customer demands. The order Fulfillment rate is 48,36% which means that operations are not enough strong to accomplish with the lead times proposed to the customer, impacting on loyalty and customer satisfaction.

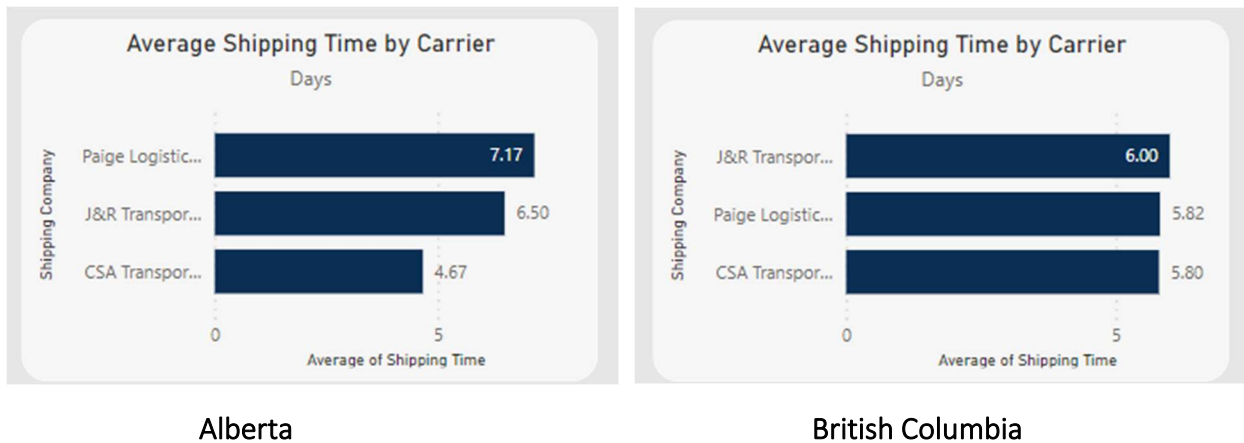
Total Cost

Total cost includes all costs associated with the supply chain, including manufacturing, transportation, warehousing, and shipping. It provides an overview of the overall expenses incurred to fulfill customer. For the Q1 2024, Prose has spent 982.250 dollars in all these items.

On-Time Shipments

On-time shipments is the counts of shipments that are delivered to customers within the expected delivery timeframe. It reflects the reliability of the supply chain in meeting delivery deadlines and can be used to assess customer satisfaction and identify areas for improvement in the shipping process. By March 2024, Prose has only accomplished with 200 orders from 488, which is correlated with order fulfilment rate, being both almost the half of the total orders.

Average Shipping Time by Carrier



This is a crucial metric that provides insights into the efficiency and effectiveness of the shipping process. This metric calculates the average time taken for shipments to reach their destination.

By analyzing average shipping times by carrier, Prose can identify which carriers are consistently delivering orders faster or slower than others. As there is a slicer with provinces, this information will evidence the performance of each shipping company in terms of average time. For example, the best performance for shipments delivered to Alberta (4.87 days) and British Columbia (4.18 days) was Paige Logistics Ltd.

This information can help in decision-making processes related to selecting carriers based on their performance and negotiating better terms with carriers that provide faster delivery time.

Average Freight Cost (Kg) by Carrier



Alberta

British Columbia

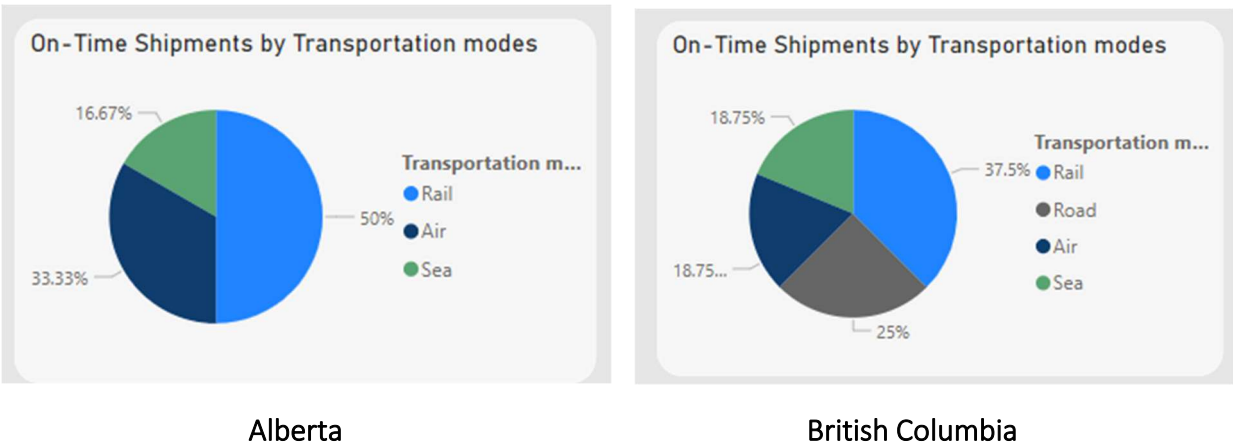
The Average Freight (Kg) by Carrier measures the average weight of freight handled by each carrier. It provides insights into the efficiency and capacity of carriers in transporting goods, highlighting their ability to manage and transport heavy loads.

Calculating this KPI involves summing the total weight of freight for each shipment handled by a specific carrier and then dividing it by the total number of shipments. This gives an average weight per shipment for that carrier, indicating how much freight they typically handle.

This information can be used to make informed decisions about carrier selection, negotiate better terms with carriers, and optimize shipping strategies to ensure timely and cost-effective delivery of goods.

In this case, Paige Logistics, offers a good price for shipments to Alberta with \$4.87 per Kg, being the best option for costs. This same company has the best average freight cost for British Columbia.

On-Time Shipments by Transportation modes

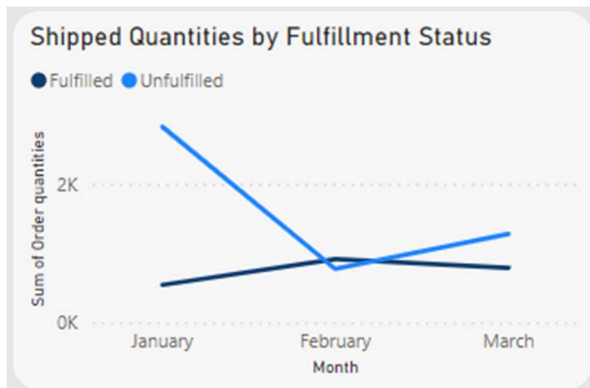


This metric provides valuable insights into the reliability and efficiency of different transportation modes in meeting delivery deadlines, measuring the percentage of shipments delivered to customers on time, categorized by the mode of transportation used (air, road, rail, sea).

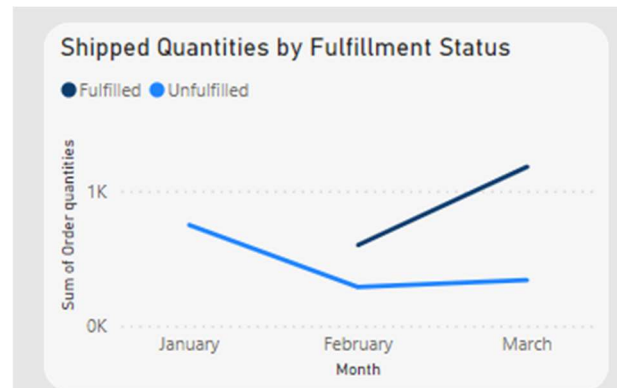
For the Q1 of 2024, for Alberta and British Columbia shipments the best option of delivery is rail.

This information can be used to optimize transportation strategies, such as prioritizing the use of rail transportation mode or improving processes for less reliable modes.

Shipped quantities by Fulfillment Status



Alberta



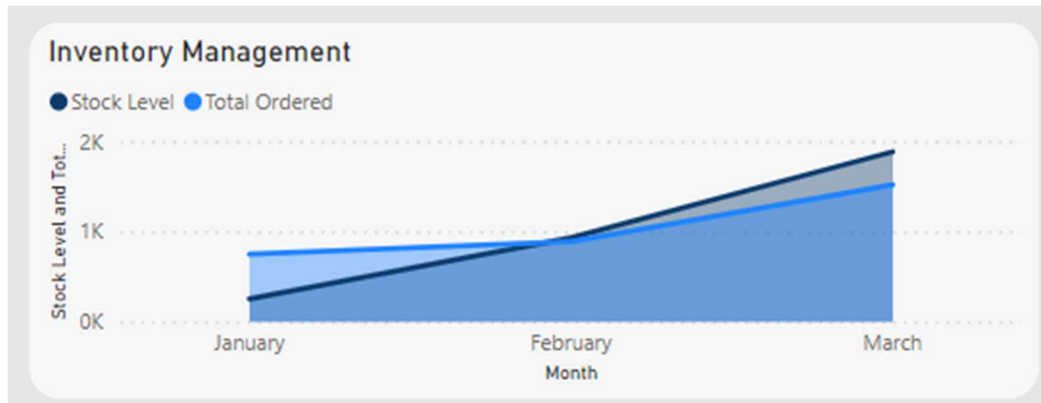
British Columbia

The Shipped Quantities by Fulfillment Status index measures the total quantity of products that have been shipped based on the fulfillment status of orders "fulfilled" or "unfulfilled". It provides insights into how product shipments are distributed between orders that have been fulfilled and those that are still unfulfilled during January, February, and March of 2024.

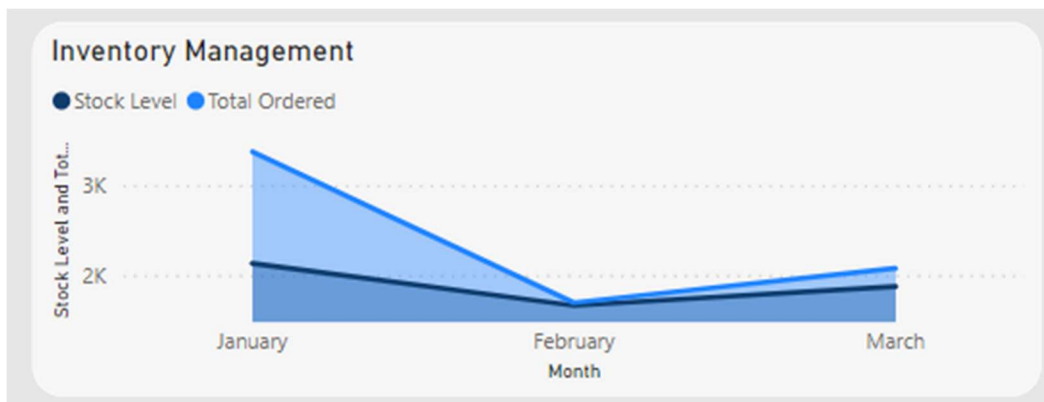
For Alberta and British Columbia, although they have different rates, the pattern is similar. In January, the number of unfulfilled orders was higher, then in February, it increased slightly. However, for Alberta, the number of fulfilled orders remained low, while in BC, it increased. This indicates that the supply chain company needs to focus on enhancing the fulfillment of orders in Alberta.

Inventory Availability Trend

This graphic typically displays the trend of stock levels compared to the total quantity of products ordered over the first Q of the year.



Alberta



British Columbia

The graphic has two lines: one representing the stock levels (inventory on hand) and the other representing the total quantity of products ordered. These lines would intersect or move in relation to each other, showing how stock levels fluctuate in response to customer orders.

This information can be used to optimize inventory levels, ensure timely order fulfillment, and avoid stockouts or excess inventory. This plot is correlated with "Shipped quantities by Fulfillment Status", since it is showing the reason why the company is fulfilling or not the orders.

For Both provinces the scenarios are different, it's possible to evidence that while in Alberta the level of stock and orders were increasing, the opposite was for British Columbia, this could be because of different needs of products.

Conclusion

The dashboard provides valuable insights into the supply chain operations of Prose, offering a comprehensive view of key performance indicators (KPIs) related to inventory management, order fulfillment, shipping, and customer satisfaction. With the following findings the managers are going to be able to make decision for Q2 of 2024 towards the enhancement of operational strategies, customer satisfaction and shipping efficiency.

- The total cost of (manufacturing + logistics) for the Q1 of 2024 is 982.25 K.
- The transportation mode with highest on-time delivery rates is Rail.
- Depending on the province where the shipments are delivered, the average shipping timeframe is between 4 and 6 days, and the best shipping time is done by CSA, however for , for Alberta and British Columbia the best shipping company in terms of cost and time is Paige Logistics Inc.
- The distribution of orders by delivery status is 200 orders On-time and 288 late.
- The order fulfillment rate is 48,26%. This reflects negatively on the company's ability to process orders efficiently and deliver products on time. So they must increase the production levels and improve the shipping times in order to deliver more orders successfully, in at lest 70% for next the next quarter of the year.

These KPIs demonstrate that Prose needs to change direction of the supply chain operation, that's why is important to make decisions based on the shipping company per province, taking into account the best performance in terms of time and cost.

References

- Prose Beauty Inc. Website <https://prose.com/>
- Kaggle - Supply chain Analysis Data set <https://www.kaggle.com/code/mozhgaan/supply-chain-analysis-fashion-beauty/input>
- <https://storage.googleapis.com/prose-www-media/social-impact-report-2023.pdf>
- <https://www.numerro.io/guides/top-10-power-bi-dashboard-examples-free-template>