BIA 674 Supply Chain Analytics

Exploratory Data Analysis

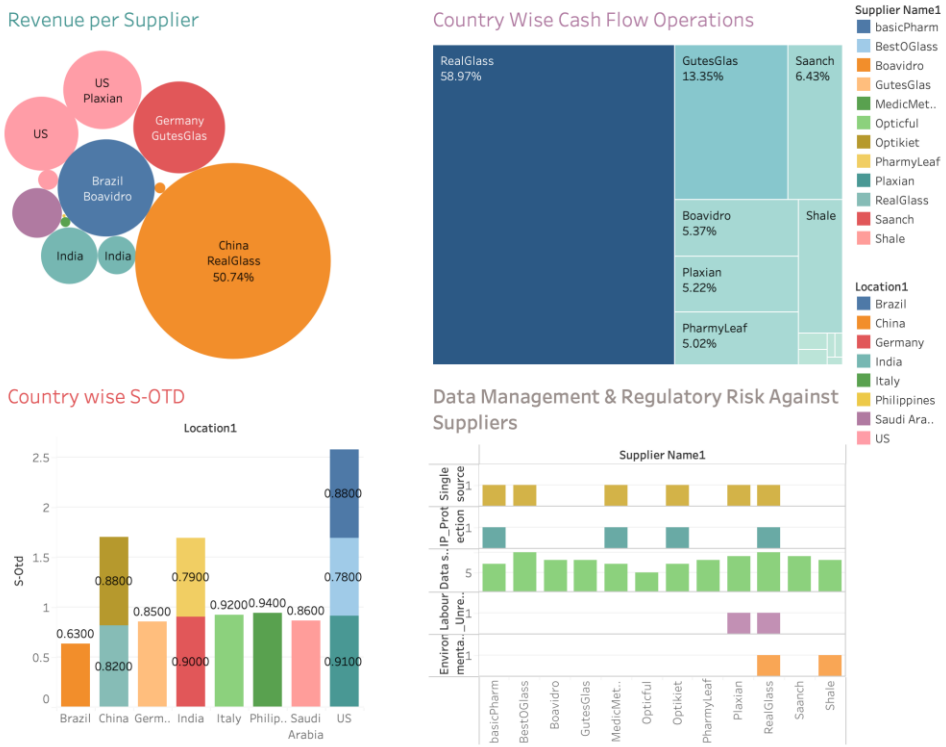
The dataset provided has 3 highlights namely Supplier Risk, Inventory SKU Data, Capacity Constraint. We have performed exploratory data analysis on all 4 data exhibits.

Introduction and Data Analysis

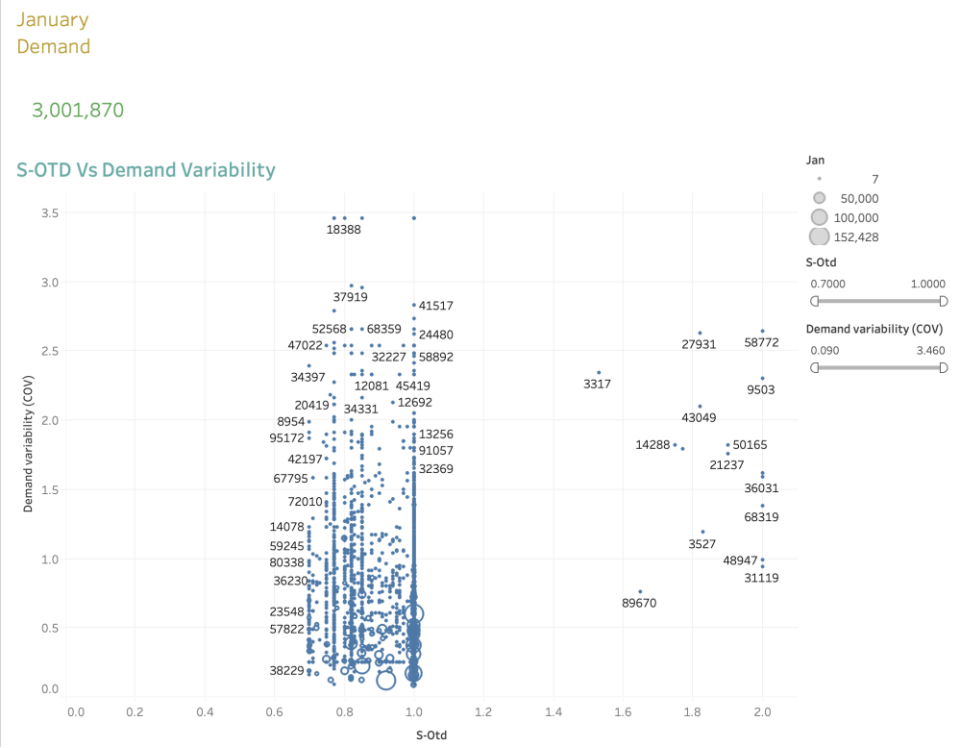
The first data exhibit contains data about suppliers of MediCrystals team collected by 'Risk Compliance' team. It contains data on several parameters including

1. Financial Risk
2. Operational risk
3. Data Management Risk
4. Regulatory Risk

As seen in the below dashboard, Supplier RealGlass, China accounts for 58.97% of cashflow operations 50.74% of revenue. The supplier with second highest cashflow operations is GeuteGlas, Germany with 13.35%. Only a few suppliers such as RealGlass and Shale are exposed to environmental risks and RealGlass and Plaxian are exposed to labour unrest. In contrast all suppliers are prone to data security risks. Supplier in Philippines has highest on time delivery performance. Countries with more than one supplier include US and China.



Data exhibit 2 has data related to demand for the products from Fabricadas. It has parameters including SKU number, Price of SKU per Unit, Supplier on-time Delivery and Lead Times. As seen in the dashboard below, we have plotted S-otd(Supplier on-time Delivery) against Demand Variability. Respective filters are used to see the impacts on the performance by resetting boundaries. As we observe, the performance of the plot can be divided into four segments. Initially the demand variability is less, increases as S-otd increases and drops as s-otd increases further.



In Data exhibit 3, 4 tables are provided as follows

Table 1	Demand Projection from Q3 2020-Q2 2021 for each product
Table 2	Cycle Time for Each Product
Table 3	Cycle Time divided into process times for Each Product
Table 4	Net Lot Equivalents Rejected in a Quarter

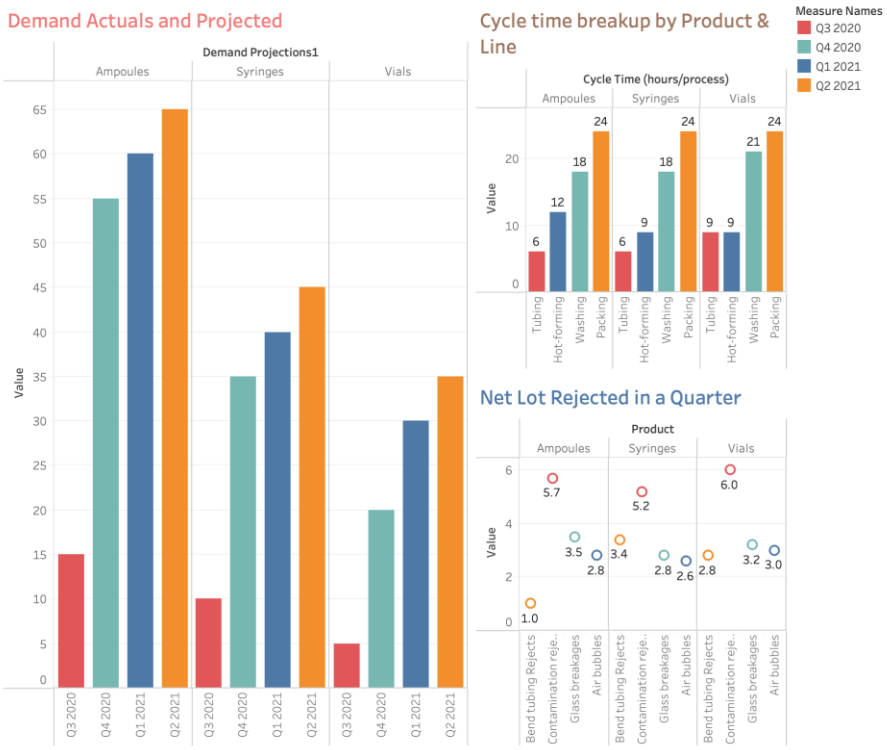
From the dashboard below, Demand for all three products is steadily increasing, in particular Ampoules demand is higher than the rest of the products. Process of completing cycle includes

1. Tubing
2. Forming
3. Washing
4. Packing

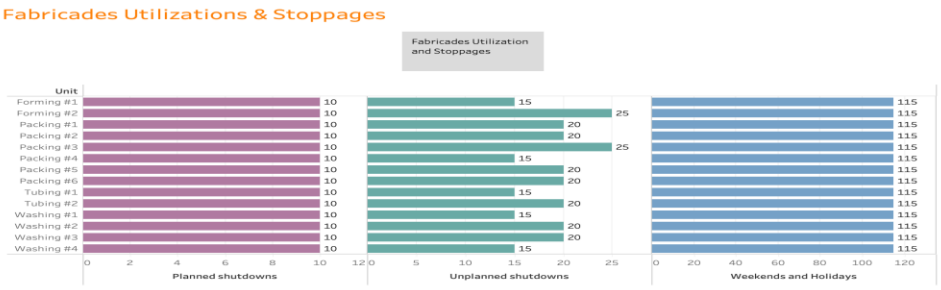
The tubing process is comparatively lesser than other processes. Packing process is the most time-consuming process and takes the same amount of time across all products. There are four types of rejects for a product, such as

1. Bend tubing rejects
2. Contamination Rejects
3. Glass Breakages
4. Air Bubbles

Contamination rejects are comparatively higher for all products. Vials have higher contamination rejects than any other product.



In data exhibit 4, we have data on shutdowns provided by the plant manager. As observed from below worksheet, planned shutdowns, Weekends and Holdiay are same for all process line. In unplanned shutdown, process lines fall into three bins 15, 20 and 25. Forming #2 and packing #3 has more unplanned shutdowns than any other process lines.



Conclusion

Our EDA included analysis of supplier risks of MediCyrstals, product demands of Fabricadas, Cycle time of Products and its data on shutdowns. As a result of our analysis, we could understand the critical suppliers and risks revolve them, impacts of s-otd over demand variability, overlook on most time-consuming process for each product and unplanned shutdowns for each process line.