**BIA 674 Supply Chain Analytics**  Aishwarya Jha (20016802)

Executive Summary of data-exhibits\_project.xlsx

This executive summary is an explanatory analysis of all the 4 data exhibits of data-exhibits\_project.xlsx. The data exhibits highlight 3 main areas: Supplier Risk, Inventory SKU Data, Capacity Constraint. The data sets in the exhibit are distinct and provide different insights, which may or may not be codependent among each other.

**Data Exhibit – 1**

This sheet contains data about the suppliers of MediCrystals collected by the 'Risk Complaince' team and has the information about different suppliers, their warehouse location, revenue, cash flow from Operations reported by the supplier in their annual financial statements, credit rating provided by D&B, Supplier On-time delivery (S-OTD) performance, Single Source information, IP Protection information, Data security information, Labor Unrests and Environmental Incidents for each supplier. All the information is based on the data available for the past 12 months.



Figure:1

We can see from figure 1 that most of the suppliers for MediCrystals are located in the US but if we want to analyze continent wise, Asia has the highest number of suppliers with a total of 6 out of 12 implying that 50% of suppliers of MediCrystals are from the Asian market.



Figure:2

RealGlass had the highest revenue for FY 2019 and comparatively very low cash flow from operations as seen in figure 2 while the other suppliers had almost similar range of revenues and cash flows from operations.



Figure:3

The suppliers with S-OTD (Supplier on-time delivery performance) of about 0.9 are Plaxian, Saanch, MedicMetric and Opticful while Boavidro had the lowest S-OTD for the past 12 months as seen from the bar graph in figure 3.



Figure:4

As per the graph obtained for credit rating for all the suppliers in figure 4, we can see that basicPharm had the highest credit rating while RealGlass had the lowest.

A chart of different types of characteristics

Description automatically generated with medium confidence

Figure:5

Each of the suppliers is evaluated based on the presence (denoted by "Y" for Yes) or absence (denoted by "N" for No) of the characteristics including Single Source, IP Protection, Labour Unrests, and Environmental Incidents. This kind of comparison is crucial for assessing supplier reliability, ethical practices, and risk factors associated with each supplier. Suppliers with "N" across all categories would generally be considered lower risk and more desirable from an operational and ethical standpoint. In contrast, those with "Y" in one or more categories may require further scrutiny or risk mitigation strategies if chosen.

We can conclude from figure 5 that Boavirdo, GutesGlas, Opticful, PharmyLeaf and Saanch can be considered lower risk while RealGlass would be the maximum risk.

**Data Exhibit – 2**

This sheet contains data about the inventory at GlasWork. Each column describes the SKU information as described below:

SKU - SKU NUmber

Std. Price ($) - Price of each unit of SKU

On-Hand Stock ($) - Total stock on-hand as of 30th Sep'20

APU (units) - Average monthly consumption (30 days) of the SKU

APU Trend - Anticipated APU trend provided by marketing (e.g. 50% indicates 50% increase in APU consumption)

S-OTD - Supplier On-time delivery (S-OTD) performance for the past 12 months

Demand variability (COV) - Demand Coefficient of variance for the past 12 months

Lead Time (days) - Lead time in days to procure the SKU

The following analysis compares the trends and patterns for the 10 highest priced SKUs and 10 lowest priced SKUs.

**A comparison of blue and white bars

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From figure 6, we can see that top 10 highest priced SKUs are in the range of $700-$6600 approx. From figure 7, we can see that the lowest priced SKUs are of about $5 approx.

**A graph of a graph with a line

Description automatically generated with medium confidence**

The on-hand stock for the top 10 highest priced SKUs ranges from $5000 to $1,750,000 approximately while the on-hand stock for the top 10 lowest priced SKUs ranges from $0 to $20,000. We can see that SKU 9753 has the highest on-hand stock among the highest priced SKUs while SKU 99156 has the highest on-hand stock among the lowest priced SKUs.

**A graph of a trend

Description automatically generated with medium confidence**

Most of the highest priced SKUs have a negative anticipated APU trend while most of the lowest priced SKUs have a positive anticipated APU trend.

**A graph of different types of data

Description automatically generated with medium confidence**

We can see that in the highest priced SKUs, the average monthly consumption (APU) is very fluctuating and not in line with the inventory on hand while in the lowest priced SKUs, the APU is in line with the inventory on hand except for SKU 991566 where we can see a very large difference.

**A graph with blue lines

Description automatically generated**

Figure:14

Figure 14 shows the distribution of lead times in days for all the SKUs. We can see that most of the SKUs have lead times in the range of 0-50 days. There are also some SKUs which have lead times of about 300 days.

**Data Exhibit – 3**

This sheet has data related to demand projections for the products from Fabricadas for the year 2020, starting from Q3 of 2020 to Q2 of 2021 for each product in units of lots of each product manufactured in a single quarter. It also has data that mentions the cycle time for each product in number of hours for each lot and cycle time for each product broken up according to the respective process times, in number of hours for each lot. And finally table it contains the net lot equivalents rejected in a quarter by Fabricadas, averaged from the previous year's data.

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Figure:15

From figure 15, we can see that there is a significant increase in the demand projection of all three products especially ampoules for Q4 2020 as compared to the actual demand in Q3 2020.

**A screenshot of a product

Description automatically generated**

Figure:16

Ampoules require 60 hours; Vials require 63 hours and Syringes require 57 hours for each lot.

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Figure:17

Tubing: Vials require the most time while Ampoules and Syringes require the same time for Tubing.

Hot-forming: Ampoules require the most time for this process.

Washing: Vials require the most time.

Packing: All the three require the same time.

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Figure:18

From figure 18, we can conclude that maximum lots are rejected in a quarter for all three products due to contamination.

**Data Exhibit – 4**

According to the plans shared with the team, steps for manufacturing can be said to have the following processes: the glass tubing capacity unit, the hot-forming process unit that creates the required shape, washing and inspection unit and finally the packing and distribution unit.

Each plant manufactures the three products: Ampoules, Tubular Vials and Glass Syringes. Each product has it's own separate movement through the manufacturing chain which is shown in the figure of this sheet.

A diagram of a product

Description automatically generated

Figure:19

A table with numbers and symbols

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Figure:20

The figure above is the data on shutdowns of Fabricadas provided by the Plant Manager. Each column gives the number of days a particular unit of the plant remains shut in a year, on an average and for what reasons.