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# Course Project Part 4-EXECUTIVE SUMMARY

# Executive summary

Our course project is based on a case study Building the supply chain for Covid-19 vaccines. In phase 1 of the case study, we tried to explain what COVID-19 was and how it impacted the supply chain of the world. In phase II, our goal was to work with the COVID-19 dataset and create insights, stories, and visualizations of the dataset and create forecasts for them. In phase III, we identified the different risk domains and developed a risk-scoring methodology for the different suppliers. In phase III, we basically understood the data provided and the problem provided in phases I and II and did a procurement analysis to see which supplier is the best. Due to the pandemic, the suppliers are facing different challenges and they are facing difficulty in supplying the material to their companies. To overcome this problem and see which supplier is the best for giving orders, the VP of the company has decided to develop a high-level risk-scoring methodology to score the different suppliers and review mitigation activities currently in place.

Now, the last part of the project is phase IV. In this, the marketing team has gathered insights regarding the anticipated demand trend for various SKUs based on their product families. We have to estimate the change in the inventory position to understand the working capital impact in one of the most critical plants in Switzerland, GlasWork. Moreover, based on the marketing insights gathered, we also have to understand the potential obsolete inventory that they currently have. It is very important for a company to estimate the change in inventory position over time. Inventory in any company is not at the same level and changes over time. It affects the profitability of the company and its potential value. Other than this, as the demand falls and items become obsolete, the inventory needs to be discounted so that new items can be added to the stock.

To do all this and find a solution to our problem stated in the above paragraph, we have to create a methodology to find out the working capital and to find out obsolete inventory. Working capital is calculated as the difference between the company’s current assets and current liabilities. Secondly, obsolete inventory is the excess or dead inventory which is of no use and the company needs to get rid of it so that company can stock up the new ones.

To create the methodology of working capital of inventory and obsolete inventory, we will create some new columns to our current excel sheet so that it is easy to do the calculation. The columns added are as follows….

Annual Demand: It means the demand for units annually

Demand after Initial Inventory: It is the inventory that the company has in stock for the rise in demand even after having enough inventory.

Daily Demand: Daily Demand is the aggregate pool demand on any day.

Demand During Lead time: It is the amount of stock that the company needs to have on hand after ordering. This is to make sure that you don’t run out before the order arrives.

Standard Deviation of Demand: It shows the variation in demand over time.

Service Level: It is the expected probability of not hitting a stock-out during the next replenishment cycle.

Re-order Point: It shows the specific level at which the stock needs to be restocked.

Working Capital of Reorder Point: It shows the amount available for the reorder point.

A picture containing text, building

Description automatically generatedThis will help finally to get the sum of the working capital of the company’s inventory. A screenshot of the excel is attached below, which includes new columns added to the excel.

The work is done in excel which will help the company to make many decisions. In this, we can see that the re-order point is a good magnitude to change. Companies can use this parameter to know when to order the stock which will help them to order quantity according to the demand and there will be no overstocking. This will result in less obsolete inventory. Moreover, the working capital re-order point will help to see how much amount the company has for the restocking of the items. With the help of the excel sheet prepared for the company, they can also have an eye on the service level. This will help the company to know that they have enough stock in hand for the next replenishment cycle. This is very important because if the company doesn’t have some extra stock in hand and customer has to go back without getting it. it can create a negative image for the company. Other than this, is the annual demand and daily demand which is an essential parameter for any company to make decisions as, without this, the company can’t do anything and won’t know what to order and when to order.

Now, as mentioned above we have created this methodology and all calculations to find out working capital and obsolete inventory. We will now apply them to tableau to make some visualizations that will help the company to make decisions.

**Demand Variability Vs S-OTD**

In this, I have tried to compare Data Variability with On-time delivery performance within the past 12 months. It shows the data variability and on-time delivery performance of different SKUs during the whole year. If we see some of the SKUs that are on the higher side, it shows there is a lot of demand variability for them along with high supplier on-time delivery. So, these are risky products, but they come on time. Companies can take risks with these products.

Calendar

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**SKU VS Demand During Lead Time**

The second visualization that I have made is the SKU vs Demand during lead time. As mentioned above, demand during time means a measure of customer demand for a particular item during lead time. This visualization shows which SKUs have the highest demand even during the lead time. An example can be seen that SKU number 56,722 has the highest demand during lead time. This means that this SKU is very popular and in demand so the company should have this item always in stock so that there is no shortage. On the other hand, we can see SKU 748 has low average demand during the lead time so the company reduces its stock for this SKU. This will help them to manage the obsolete inventory as they will only have items that are most in demand.

Chart, scatter chart

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**Re-order Point Vs Working Capital of Re-order Point Taking into consideration the Annual Demand**

I believe this is the most important visualization for the company. In this, I have tried to see the re-order point and working capital required for the re-order point at a different level of annual demand. For example, we can see in the below visualization that, when the annual demand is at its highest level of 3,345,466, the company should have a working capital of $6,556,257 in hand and they should re-order stock at 1,244,308 units. I believe this will be the most important data for the company to reduce its absolute inventory.

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**Annual Demand Vs Demand During Lead Time**

In this visualization, we can see the annual demand vs the demand during lead time. This will help us to track the annual demand of the different SKUs and their demand during the lead time. This will help to understand the company which SKUs should be ordered more and in what quantity. This will help to reduce the absolute inventory and will help in increasing the working capital for the re-order point. This is because the company will only order at the time when the demand is high and it can be predicted using the visualization.

Chart, scatter chart

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**APU Trend VS SKU Sum**

In this visualization, we can see the APU trend of each SKU unit along with their annual demand. APU shows the average monthly consumption (30 days) of the SKUs and SKU is the number of units. This will help us to know which SKU has the most monthly consumption and what is the annual demand for that product. An example is SKU number 13,016, 684 has an APU of 1.2 with an annual demand of around 15,930,130.

**Chart

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**Conclusion**

Above we have shown the different visualizations that the company can use to track their working capital of re-order points and the obsolete inventory. This will help the company to understand the methodology that they have created and will result in profits for them. However, this is not enough and there are many other parameters that should be considered but for now, I believe this will be enough for them to make quick decisions and increase the revenue for the company.