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IMSE 802 Supply Chain Decision Making

Case Study: *Scientific Glass, Inc.*

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**Description of the functional area**

In this study of *Scientific Glass*, of the primary functional areas in the SCOR model, was source and delivery aimed at *Inventory Management*.It was clear that the primary problem being faced was a concerning amount of cost associated with inventory interrupting strategic plans to grow operations.

**Overview of the study**

*Scientific Glass* is a company that distributes glass products and services to pharmaceutical companies, biotechnology firms, hospitals, academic and government research labs. A range of over 3000 products and custom services are offered, including: glasses, plastics, special metals, and glassblowing services. Company strategy involves rapid sales growth and customer satisfaction, largely ignoring inventory management. Newly hired Manager of Inventory Planning, Ava Beane was tasked with her biggest project under very tight timeline restrictions; four weeks. Initial techniques included talking to relevant staff and gathering data. Key analysis included understanding bi-weekly demand of products by region, creating representative products to study in lieu of all 3000, determining the overall distribution of the data, and determining custom metrics to decide how much cost was being generated by not having enough goods on hand. The end product was an *order-up-to­* metric using the inverse of the cumulative normal distribution to determine the probability that the demand will take a value of greater than a random variable X, which was defined as the service level; percentage of underage cost explained in both underage and overage costs. No additional details about these metrics is discussed. Final analysis leads senior leaders with hard decisions to make.

**Three important points learned from the study**

Out of this study the three key takeaways I will be able to directly apply and reflect on when put in inventory based decision making are the following:

1. Designating representative products to speak for the entire population:

This was probably the best take-a-way I got from this case study. I am more use to the term *Cluster Analysis*, but this is essentially the same thing. We are determining a set of representatives that encompass the most redundancy of our products, therefore enabling an omission of products similar. By obtaining this smaller representative set of products, we are able to investigate deeper into the real issues such as: What does the specific demand look like for this product over each region? How much of our current cost on this product are because of underage? What’s the current probability of underage with our current demand under necessary assumptions with a 93% chance of having not enough inventory?

This was a particularly interesting approach, that I personally thought was clever and unique in the given time constraints. I would argue that there is the possibility of more than just two representatives, but that is beyond the scope of this summary.

1. Leveraging assumptions and simple statistics to compute probabilities:

It is easy to underestimate the power of an assumption. By simply stating that the data is normally distributed, we can quite easily calculate probabilities of being in the red-zone (above 95%).

1. Considering all edge cases to make your argument rock solid:

By considering each possibility, Beane looked at three situations: Warehouses filling demand in that region (individual), allowing demand in east and west to both be pooled (bi-individual), and all demand pooled (universal). I thought this was also pretty cool, with sufficient data to do the math correctly, this allows you to in some sense examine a min, middle, and max of all situations. This produces a flavor of what the extremes are and what a simple compromise might look like (by-individual).

**Conclusion**

The analysis of *Scientific Glass* looked at the severity of inventory management and supply chain decision making. This illustrated the real struggles that a large corporation faces in terms of undermining logistics and inventory management. These issues can cause real strategic challenges for a company if ignored. This analysis also included, in great detail, what a creative mind can do when provided sufficient data and problem solving techniques to examine what a company needs to consider when making a recommendation for a multi-million-dollar investment. Many other key points were discussed that were outside of the scope of inventory including: competitive pressures, sales and distribution, increasing customer service levels, inventory control systems, and outsourcing. All of these and more are of grave importance for a corporation to assess. Final results from Beane illustrated that it was imperative that the company have sufficient capital to expand its international distribution network and make the $10 million investment in plant equipment. This left senior management to make important decisions. No final decisions were discussed.