Scientific glass sg provides specialized glassware finance essay

Scientific Glass provides specialized glassware for a variety of organizations such as pharmaceutical companies, hospitals, research labs, quality-control sites and testing facilities. As of January 2010, there was a substantial increase in their inventory balances which tied up the capital necessary for further investment needed for expansion. The debt-to-capital ratio surpassed the target of 40% preventing the company to use their capital in other areas. In addition, the shipping costs were rising, competitive pressures were accelerating, and certain markets in North America and Europe were becoming saturated which underscored the necessity for capital investment for expanding market opportunities in Latin America and Asia. Moreover, expanding warehousing network increased the inventory levels along with costs, documentation complexities and errors.

The company hired a new Manager of Inventory Planning, Ava Beane, to come up with an effective plan to manage SGî€€s inventory without requiring a large capital investment. In order to finance operations in year 2010, SG requires an external funding of $53. 8 million (Exhibit1). These expenses would further limit the company to use their existing capital in other areas such as research and development and expanding to international markets. To improve customer service levels, SG had increased the target customer fill rate to 99% and added six more leased ware houses to meet the demand more accurately. This led to an increase in the inventory levels as some warehouse managers kept extra inventory in order to meet the company target fill rate.

Good practices

Maintained continued sales growth and higher customer satisfaction

Produced creative products with lower life cycle costs

Focused on durable products, innovative designs and superior customer services

Reduced time between ordering and delivering the products to the customers

Bad practices

Treated inventory management as an afterthought, due to which inventory imbalances were increasing

The company exceeded its target debt to capital ratio of 40%

Incurred both underage and overage costs

High Inventory Problem

Due to increasing in customer service level, SG planned to add regional warehouses in many parts US. SG has the main and the largest one in Waltham, MA, which is next to manufacturing plant. SG also has another warehouse that located outside of Phoenix, Arizona. However, at the end of 2008, SG bought other six warehouses. This means SG has the total 8 warehouses to serve customers. Annual rental and operation costs for North American warehouses were 15% of the cost of the warehoused inventory. However, in 2006, before add more 6 warehouses, SG already made investment to expand the warehouse at Waltham in anticipation of continued growth, but after these 6 warehouses had been bought, this warehouse does not work full efficiency of its capacity. Another problem of

warehouse management is company expected to reach high level of customer service to 99%, so that warehouse managers keep order inventory ahead before it reach threshold of inventory level to order new one to assure that they will meet the customer service target level at 99%. This situation causes high inventory levels than required and also high inventory turnover. Moreover, salespeople were allow having its products up to $10, 000 worth from ware house and kept them in trunk stock in their homes and cars in order to deliver this inventory on short notice to any customer who was within driving distance. This amount could lead to high finished goods in warehouse and in-transit as shown in exhibit 6. It could lead to missing products in inventory, and lost.

Proposed solutions to inventory problem

In order to solve the inventory issues, there are actually two main aspects to consider:

Number of warehouses and their structure can be changed;

Related policies can be changed and of course appropriate ones can be done simultaneously.

For changing the number of warehouses, in other words, centralizing or decentralizing warehousing functions, available options are considered as:

Centralized warehousing in Waltham:

In this option, one central warehouse near to manufacturing facility at Waltham will send all customer orders from one location. Centralize warehousing in Waltham to meet demand in Southeast and Northeast

regions using delivery service of Winged Fleet as their rates are cheaper for these two regions. This would allow SG to pool its inventory in order to meet demand. However, the customer response times would increase

Decentralized warehousing:

In addition to the main warehouse at Waltham, there would be another warehouse at Dallas which would be supplied from Waltham. This would allow demand to be met for all the regions and prevent any stock-outs in a single warehouse.

Continuing with 8 warehouses:

This option makes no change on the network of the warehouses and all regions will be supplied its warehouse if there is no stock-out occurs.

Two centralized warehouses:

In this option, addition to the main warehouse at Waltham, there will be an additional warehouse at the west, at Phoenix, and it will be supplied from Waltham. Demand of east region will be met from Waltham, demand of west region will be met from Phoenix and demand of central region will be met from both warehouses, assuming to have equal shares on the central region.

Outsourcing the warehousing functions:

In this option, all warehousing actions will be outsourced to Global Logistics (GL) and distribution will start from main warehouse at Waltham and then GL will be responsible from rest of the operations. Outsource warehousing to GL to meet demand in the Central, Southwest and Northwest regions because shipping costs for those regions is cheapest with the GL rates. Outsource

warehousing to Global Logistics (GL) which will provide a centralized warehousing in Atlanta. Goods will be transported in bulk from Waltham to Atlanta and GL would take responsibility of inventory-control and delivery to the customers. This way SG would not have to bear the warehouse rental charges and could focus on increasing sales and develop newer products to meet customer needs.

Changes in inventory policy:

In addition to these options, Beane should propose the following actions to Eric Gregory and Melissa Hayes

Lower fill rates to the industry-average in order to decrease inventories.

Greater enforcement by managers to avoid keeping excess inventories in the warehouses.

Have periodic reviews of inventory and control procedures for all stocks in the warehouses.

Evaluations of the proposed solutions

Evaluation of mentioned alternatives will be conducted from mainly five aspects:

Transportation costs,

Average inventory levels,

Time responsiveness,

Fill rates and

Additional costs and benefits

Transportation Costs:

Transportation costs for alternatives are calculated for the two products, namely Griffin and Erlenmeyer, since they are mentioned as the best representative for a total of nearly 3000 products of Scientific Glass. In addition, for each option, demand for the next year calculated considering the 20% increase in sales. When warehouse to customer shipments are considered average shipment weight of 19, 5 pound is used and to have an average transportation cost value, these two products' costs are averaged according to their relative proportion in sales . It also be mentioned that, inter-warehouse transshipments occur only when stock-out occurs and as the number of warehouses are decreasing, effect of this costs will be diminished; therefore, it is only considered in the option where there are 8 warehouses.

For the 1st option, having 8 warehouses and making no change, from Waltham to all other 7 warehouses all items are sent by bulk shipment. Inter-warehouse transshipments are calculated by bulk shipment rates and they are considered only when a stock-out occurs, therefore fill rate is included in these calculations and average total cost found as $2701, 41

For the 2nd option, when there is only one warehouse, all customer shipments are calculated for rates of Winged Fleet. In this option, average total cost is calculated as $12210, 16.

For the 3rd option, when two centralized warehouses considered, it is assumed that Waltham will supply east region, Phoenix will supply will west

region and they will equally supply the central region. Average total cost is found as $2332. 07.

For the last option, when warehousing functions are outsourced, assuming the 5 regions of Global Logistics (GL) will have equal amount of demand. Total average cost is calculated as $2276, 83.

To conclude, as it is expected, when numbers of warehouses are decreased transportation costs are increased.

From the aspect of transportation costs, GL option has the smallest cost amount.

Average Inventory Levels:

First of all, it must be decided which inventory policy that the company should apply.

Begin with the review type; although firm monitors the entire inventory transfers from Waltham warehouse to other warehouses; they think taking physical counts of inventory at all warehouses. Therefore, it is concluded that company uses periodic inventory review policy.

Secondly, company did not mention any due date, therefore the inventory plans should consider infinite time horizon. And lastly, though there exists a fixed cost for shipments from warehouses to customers; there is no other fixed cost related to transportation to the warehouses, i. e. no fixed ordering cost. The only order cost is $0. 40 per pound bulk shipment cost which is a variable cost with weight. As a result, all analysis can be conducted considering critical ratios and the related fill rate values, which is the only

option that is left and also it is considered as the most applicable to the situation. Since some of the simultaneous changes can be done, considering ceteris paribus principle and when fill rate is maintained exactly as 99% for all warehouses, we can calculate the average inventory level that must be kept at warehouses.

Weighted-average biweekly inventory levels are found as:

8 warehouses : 98853

2 warehouses : 68034

1 warehouse : 59703

Outsourcing : 59703

When outsourcing option is used, it will be the same for the company in the sense of kept inventory levels for the one-centralized-warehouse option therefore they are assumed to be equal.

As number of warehouse decreases, level of inventory decreases as it is expected. This is because, “ the greater the degree of collaboration, the lower the uncertainty (standard deviation of the error or coefficient of variation) of the demand model”

This implies that the money tied up in the inventory decrease sand this extra capital can be used in other areas, like expansion plans to international markets

Time Responsiveness:

Delivery system of the company compensates 2 weeks of shipment cycles including the stock-out situations. In order to be a market leader, differentiation on this subject is also needed and unfortunately since this is not an exact quantitative scale, only possible situations could be mentioned.

For having one centralized, or two centralized or 8 decentralized warehouse options, they all include at most 3 days ready to shipment duration and Winged Fleet’s delivery time of at most 3 days if there is no stock-out situation and the stock-out probabilities are diminishing with the aggregated demands.

On the other hand, GL has 1-day premium shipment in addition to 3-day regular shipments. Considering the highly growing market situation and different segment of products, having different delivery times to different products and also to different customers will make this company focus on the most yielding areas.

Therefore, it can be said that working with GL has the advantage of differentiating customers/orders and, since there will be 2 warehouses, stock-out probability and related durations will be less compared to other options. And all of these aspects will increase the time responsiveness of the company.

Additional Costs and Benefits:

Quantitative issues to related to options of inventory management

In order to continue with the current warehouses total of $10M investment is necessary, it is assumed that all of this amount will be equally shared among all warehouses.

Since warehouse operating costs will be the %15 of the total warehoused inventory, these costs could be directly compared with the annual average inventory levels that are kept in each option

The amount paid to sales forces will not change when the company has 1, 2 or 8 warehouses because it is assumed that as the number of warehouses decreased, number of salesperson per warehouse will increase and total of 32 will not change. On the other hand, when warehousing is outsourced this amount will not be paid

Qualitative issues to related to options of inventory management

When GL is used for warehousing, SG’s senior managers will be able to focus on increasing sales, marketing issues and developing next generation of products.

There are some issues that must be mentioned from the proposed policy changes. Stopping the practice of trunk stock could conclude with a decrease in the time responsiveness and therefore it should not be stopped.

Also as mentioned in the same proposed policy changes, improving thec ontrolling systems will create a better understanding of the current situation after the warehousing functions changed.

Finally, when GL is used, the approach of warehouse managers to keep more than99% fill rate and 60-day-supply will not be a problem, because all of these operating issues will be responsibility of GL. This will help to company not to keep excessive amount of inventory and less tied-up money in the inventory which can be used in other areas.

Fill Rate:

Company’s fill rate policy should also be calculated for the different alternatives.

The company replaced the earlier fill rate policy of 93%, which is only marginally better that the industry average fill rate of 92%, with 99%. However, there is no sign that the company is implementing this policy because it is the best approach that must be taken for the company objectives. Moreover, using a fill rate higher than optimal level leads to higher inventories and more money tied up in the inventory. Therefore, company should lower the rates down to optimal levels, if there is no other concern related to market leadership or customer satisfaction.

To calculate the optimal levels of fill rates for all four alternatives we should consider cost items which are added to underage and overage costs. However, the sales leadership noted that underage costs are 10% of the gross margin and overage costs are 0. 6% of the unit cost of any product. Also it is assumed that unit costs covers all the costs such as warehouse

rental and operation costs, cost of capital and inventory write-offs. For the three alternatives other than outsourcing, there is no change in cost items, only the multiplied quantities are changed; but the outsourcing alternative eliminates the 15% warehouse rental and operating costs and 1% inventory write-offs. As a result, overage costs are decreased while underage costs are increased. Resulting optimal fill rates are as follows:

1, 2, or 8 warehouses Outsourcing

Reference product 1 95. 4% 96. 5%

Reference product 2 94. 9% 96. 1%

These numbers can be interpreted in two different ways:

If company is flexible about the determination of fill rate, in other words if it can lower the fill-rates from 99% to optimal levels, outsourcing option pushes the optimal fill rates to higher levels which results in larger inventories and more money to tie up.

If the company still insists on keeping fill rate at 99%, the additional costs that must be paid to maintain 99% fill-rate level is lowered in the outsourcing alternative.

Consequently, the better policy related to fill rates depend on the attitude of the company.

Finally, another policy change about fill-rates can be considered. Rather than using one fill-rate for over all products of the company, different rates for

different products can help the company in decreasing inventory costs related to, at least, for some of the products.

Conclusion

To conclude, since available options are studied from different aspects, it must be mentioned that the company should choose the alternatives and compare the results of evaluations according to their priorities. For instance, evaluation criteria like inventory levels and transportation costs are conflicting on interests. Company can see their situation and make decisions according to priorities.

While assessing the weights for factors, it is considered that average inventory level and the transportation costs are the most important costs for the company. Then, the fill rate follows them. Time responsiveness is the next important factor which is followed by additional costs and benefits with equal weights for each.

Changes in warehouse management are considered as options other than outsourcing do not provide radical policy changes which could make warehousing management better. These weights and the scores related to our previous investigations yield that the outsourcing the warehousing function to Global Logistics is the best alternative among all. All of investigations and cost studies conducted in this case study are to find the most cost effective option in order to getting closer to the target debt to capital ratio of the company and provide more capital to fund expansion into new international markets while maintaining or even improving the high customer satisfaction level