Customer responsiveness essay

Littlefield realized that they can increase revenue with a faster turn-around by shipping orders in half a day, but the factory is not producing at that level. If Littlefield charged higher prices customers would pay for dramatically shorter lead times, however, management is currently unwilling to quote shorter lead times because historic lead times often extend into several days. The consulting team was brought in to help Littlefield shorten lead times so that they can charge a higher price, which will then increase revenue.

Relevant Information: There are four things that the consulting team can do: 1.) Buy and sell machines at each station 2.) Change the reorder point 3.) Change the order quantity 4.) Change the contract. To solve this problem, the consulting team calculated and analyzed following data: Average demand- The average demand is constant over the 268 day lifetime, but customer demand is random. The consulting team forecasted the average demand according to the first 50 days' (historic demand), which is around twelve batches per day.

Order quantity The consulting team also calculated the amount of inventory LT needs to order at the reorder point so that they can continue making kits and avoid the gap in production because of low inventory. The consulting team found the order quantity at the point where the company is able to balance the holding cost with the ordering cost. Since LT does not have any shortage cost issues, the consulting team decided to use the EOQ model to get the most efficient order quantity, which turned out to be 386 batches.

Reorder point- The reorder point (“ ROP”) is the level of inventory in stock when an order should be made with suppliers to bring the inventory up by the Economic order quantity (“ EOQ”), which is the order quantity that minimizes total inventory holding costs and ordering costs. At the beginning, LT suffered from a lack of inventory for several days because their reorder point was too large (1440 kits). This resulted in longer lead times, which decreased revenue.

The consulting team’s job, then, is to figure out the correct reorder point to ensure that the company will no longer be short of inventory, also keeping in mind that too much inventory can result in a loss in revenue. To do this, the consulting team set the service level at 95%, which means that for 95% of the production period, the company will have enough inventory to meet the demand. The consulting team also considered the lead time for reordering materials. The consulting team used the formula, d*l+z*std deviation of the demand*(lead time)^0. 5 to get the correct reorder point.

The reorder point should be 3600 kits. Order quantity and reorder point at the end of company’s operating lifetime: The other respective that the consulting team considered was that excess inventory will be useless and have no value at the end of company’s operating lifetime. In addition, the consulting team was informed that the computer will take over the control of the factory after day 218 and the consulting team was responsible for the following: 1) forecasting the total demand of the last fifty days, 2) purchasing the inventory, and 3) setting the order quantity and reorder point to zero.

To get the total demand for last fifty days, the consulting team multiplied the average demand with the fifty days, which equals 600 batches. After we got the total number of batches, the consulting team subtracted the old inventory in the factory to get the total amount of inventory that LT needed to order for the remaining fifty days of operations. Then, the consulting team changed the reorder point to the current inventory level because the lead time of purchasing inventory is four days.

This was done to ensure that the last reorder amount would be entered before day 214 to ensure that the last reorder would be processed before LT ran out of inventory. At the end, the consulting team set both the reorder point and order quantity to 0 to stop order any reorders. Queue- In the first 50 days, the average queue for each station was 756 kits for station one, 342 kits for station two and 583 kits for station three. The high queue was a result of the high demand because when daily jobs exceed the maximum jobs that the station is able to process, some jobs have to wait in line to be processed.

High queues result in longer lead times and because the average queue for each station was relatively high in the beginning, the consulting team decided to buy one machine for each station to lower the queue. Three Contract; Lead time & Revenue: LT offered three different contracts based on different lead time constraints. Contract 1: Quoted Lead Times= 7 days, maximum lead time 14 days, maximum revenue 750 Contract 1 offers the lowest maximum revenue and is also the current contract that Littlefield is using.

However, it has the highest quoted lead times which guarantees that Littlefield will receive their full profit with a rather long lead time. LT is able to earn $750 per job with a seven days lead time or less. If the actual lead time exceeds 7 days, each day after will result in LT experiencing a loss of $107 per job. LT will earn no money if its lead time exceeds 14 days. Contract 2: Quoted Lead Times= 1 days, maximum lead time 3 days, maximum revenue 1, 000 Contract two requires a much shorter lead time but a higher revenue than Contract one.

In contract two, LT is able to earn full revenue of $1000 per job if the lead time is one day or less. Every day past the quoted lead time will result in a loss of $500 per job. LT will earn $0. 00 on revenue if their lead time exceeds three days (maximum lead time). In addition, the consulting team found that contract two allows LT to earn at least $750 per job revenue if its lead time is 1. 5 days. To increase the revenue, the consulting team decided to switch from contract one to contract two with a company lead time of less than 1. 5 days.

Contract 3: Quoted Lead Times= . 5 days, maximum lead time 1 days, maximum revenue 1, 250 Contract three offers the highest maximum revenue and offers a slightly lower quoted lead time. The contract allows LT to earn $1250 per job with a lead time of 0. 5 days' or less. After every additional day after the quoted lead time will result in a loss of $2500 in revenue. LT will earn $0. 00 in revenue if their lead time is greater than one day. The consulting team also found that contract three enables LT to earn $1000 per job if company's lead time is 0. 6 days or less.

The consulting team decided to switch from contract two to contract three if LT's average lead time is 0. 6 days or less. Utilization rate- According to simulation one, the consulting team observed that LT's process time is 7. 2 hours for each job. As seen in Day 6 of the simulation, the shortest job lead time was . 3 of a day or 7. 2 hours. This proves that LT has the ability to finish a job faster than it usually does. Also, the consulting team analyzed the data from simulation one.

For station one, the maximum demand that a machine can process is four and a queue was formed once the demand exceeded four jobs. At that point, LT had to buy a new machine for the station to reduce the queue (Data shown below). Comparing station two and station three, the utilization rate for station two and three is only about 35% when the demand is four and the utilization rate reached 100%. That is to say, there is a 65% utilization rate available when the demand is only four jobs.

Therefore, the demand should be about seven jobs (4*(100%+65%)) to reach 100% utilization rate for station two and three. Based on analyzing these data, the consulting team figured out that one machine can only meet a four job demand for station one, a seven job demand for station two, and a seven job demand for station three. The average demand in this simulation is twelve. The consulting team recommended LT to purchase four machines for station one, two machines for station two, and three.