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T.I.M 125 HW#6

Homework 6

Plan

Fiday	Sunday	Monday	Tuesday	Thursday
- Lookover homework assignment - Plan out schedule for HW 5	- Work on problem #1,2	- Work on problem 3,4	- Work on cast study	- Review and submit

Problem 1 Exercise 11.2

Define

Reconsider the Best Buy store in Exercise 1. The store manager has decided to follow a period review policy to manage inventory of cell phones. She plans to order every three weeks given a desired CSL of 95%, how much safety inventory should the store carry? What should its OUL be?

Plan

What information is available for solving the problem?

- Lecture notes
- Textbook
- Structure problem solving

Execute

Mean (D) = 300 Deviation=200 CSL=95% L=2 weeks Assume σ=0

Statistical Table shows that .95

Demand during Lead time: D*L=300*3=900 phones; D=average demand; σ_D=standard deviation of demand; L=average lead time for replenishment; S_L= standard deviation of lead time

$\sigma_L = \sqrt{L\sigma_D^2 + D^2 S_L^2} = \sqrt{2 * 200^2 + 300^2 * 0} = \mathbf{282.84}$

NORMSINV(.95)=1.64

ROP=$L * D + 1.64\sqrt{2 * 200^2 + 300^2 * 0} = \mathbf{1063.86}$

SS=ROP-DDLT = 1064-900=**164**

$D_{T+L} = 300(3 + 4) = 2100$

OUL=$D_{T+L} + ss$ =164+2100=**2264**

The store should have 164 safety inventories. The order to level should be 2264.

Check your Work

I have checked my work by reviewing the equations and going over the answers.

Learn and Generalize

The safety inventory decreases as the replenishment time increases. The order up to level ins 2264 which is more than before because if the shorter cycle time. As the replenishment cycle becomes shorter there is not need for larder S.S since those inventories are mainly to cover and assure stock does not run out before shipment arrives.

Problem 2 Exercise 11.3

Define

Assume that the best buy store in Excursive 1 has a police of ordering cell phones from Motorola lots of 500. Weekly demand of Motorola cell phones at the store is normally distributed , with a mean of 300 and a STD of 200. Motorola takes two weeks to supply an order, If the store manager is targeting a fill rate of 99% what Safety inventory should the store carry? What should its ROP be?

Plan

What information is available for solving the problem?

- Lecture notes
- Textbook
- Structure problem solving

Execute

Time = 3 weeks L=2 weeks Mean=300 Standard Deviation=200 Lots of 500 99%CDL

$D(T+L) = 300(3+2) = 1500$

$\sigma_{(t+l)} = \sigma(d) * \sqrt{T+L} = 200\sqrt{3+2} = \mathbf{447.21}$

Safety Stock = $F_s^{-1}(CSL) * \sigma_L = NORMINV(CSL) * \sigma_L ROP = 2.33 * 447.21 = \mathbf{1041.99}$

The Safety stock is now 1042 phones and their ROP is about 448 phones.

Check your work

All the math is displayed and has been calculated for review. I looked over the calculations and am sure I did the math correctly.

Learn and Generalize

Everything must be recalculated depending on how often a company ship. I have learned how to solve from ROPs and the safety stock after normalizing the data with a certain mean and standard deviation. These needed to calculate so a company does not overfill their S.S.

Problem 3 Exercise 11.4

Define

Weekly demand for HP printers at Sams club store is normally distributed, with a mean of 250 and a std of 150. The store manager continuously monitors inventory and currently orders 1,000 printers each time the inventory drops to 600 printers. HP currently takes two weeks to fill and order. How much safety inventory does the store achieve?

Plan

What information is available for solving the problem?

- Lecture notes
- Textbook
- Structure problem solving

Execute

ROP =600 $Q_L = 1000$ $\sigma_w = 150\sqrt{2}$ RL=2*250=500

CSL = $\frac{(ROP-RL)}{\sigma_w} = \frac{(600-500)}{150\sqrt{2}} = .4714$

We checked over our stat table and see that, 47 correlated with **.6808** = CSL
We then plug that number into our formula to find the safety inventory

ESC= $-SS\left[1 - F_z\left(z = \frac{ss}{\sigma_L}\right)\right] + sigma\ LF_z\left(z = \frac{ss}{\sigma_L}\right) = -100[1 - .4717] + 150\sqrt{2} * .4714 =$ $\mathbf{47.14}$

fill rate:

Fill Rate $= \frac{Q_L - ESC}{Q_L} = \frac{(1000=47.139)}{1000} = \mathbf{95.286}\%$

The fill rate should be about 95% and Sam's Club should carry about 47 HP printers. Because of this policy they achieve a CSL of 68%.

Check your Work

I show all of my work above and checked my calculations.

Learn and Generalize

Doing this problem, I was able to see that every time a store changes some sort of policy on the way they receive inventory the CSL, the safety inventory and the fill rate changes. The safety inventory is not a lot because even though it takes two weeks to replenish orders are large.

Problem 4 Case Study McMaster-Carr

Define

McMaster – Carr: please read the slide presentation by Daniel Lifschitz on SCM at McMaster-Carr, available on the TIM125 website. Then answer the following questions:

- What is McMaster-Carr's business model and supply chain strategy?
- How does SCM at McMaster-Carr differ from companies like Walmart or Office Depot?
- Explain how "aggregation" is important to the success of Mc-C's supply-chain business model.

Plan

- Read the slide presentation
- Skim over chapter 13 and find significant information
- Answer the questions

Execute

- What is McMaster-Carr's business model and supply chain strategy?
-

McMaster-Carr's business model is based on a catalog online in which customers order directly from the site. It's a private company that deals with B2B transactions. They carry large variety of inventory. McMaster-Carr is solutions oriented rather than product oriented and they do not have a sales force that does sales for them. They have 24/7 customer support. McMaster Carr's supply chain is based on direct order online and they ship to customers directly without distribution centers. McMaster Carr makes it easier for customers who want smaller orders but can't receive them because those vendors require large minimums, and they have contracts that sell through distributors.

- How does SCM at McMaster-Carr differ from companies like Walmart or Office Depot?

McMaster manages the unpredictability of customer's by having orders sit before being shipped and also batching up orders to make them easier to fill. McMaster makes business decisions that are in line with this business model rather than focus on revenue and growth. The SCM at McMaster-Carr differ from other companies like Wal-Mart and Office Depot because both those chains have distribution centers which distribute products to those local stores. They serve other retail stores and their products are sold through stores unlike McMaster which either directly online or through catalogs. Wal-Mart and Office Depot have retail stores but McMaster ships the products directly to customers so they do not have to make the trip there.

- Explain how "aggregation" is important to the success of McMaster supply chain business model

McMaster Carr's suppliers provide value primarily by aggregating inventory which allows them to significantly lower inventory lower overall uncertainty and improve economies of scale in transportation. They carry less safety and cycle inventory than would be required if each customer

decided to carry inventory on its own. McMaster Carr gains the most supply chain surplus when demand from customers is fragmented and uncertain.

Check your work

I have checked my work by making sure that I have answered all of the equations. I then proceeded to go over my answers again and make sure that I had addressed the questions accordingly.

Learn and Generalize

After reviewing the presentation, I have a better understanding on how other companies similar to Home Depot or Wal-Mart works, especially when they are companies that are online. I also learned the usefulness of aggregation where it can benefit the company. Aggregation can help reduce the uncertainty and unpredictability of certain products within the company making things more responsive.