



Section A

I. Logistics and SCM have developed considerable over the last years.

First, I would like to explain shortly what logistics and SCM is all about.

Logistics can be defined as the process of planning, implementing and controlling the process of efficient and effective transportation of goods and services from point of origin to the point of consumption.

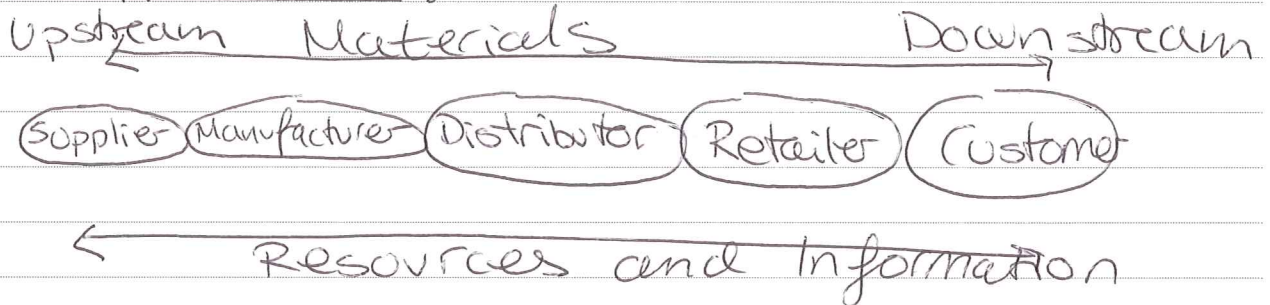
Logistics is about getting the right product, to the right customer, in the right way - to the right price and in the right time.

SCM is a much wider concept, and it ~~it~~ can be defined as the management, across and within, a network of upstream and downstream organisations of both relationships and flows of materials, resources and information. The purpose of SCM is to create



value, enhance efficiency and satisfy customers.

SC illustrated:



We consider logistics as a part of SCM, also known as an "unionist" point of view.



Now that I've explained what SCM and logistics really is, I can go further to the topic of the revolution of these two.

Six key developments

- 1) Freight is getting generally more valuable. The freight that is moved all around the world is in general getting more valuable in relation to size. Just think of chickens. Before it was not unusual that living ~~animals~~ animals was sent from one place to another.



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Nowadays is it much more common that the chickens are processed in smaller parts like breast, legs and so on, and then shipped.

All of the electronic devices we humans ship and transport in other ways around the globe is another example of valuable freight with relative low volume.

✓ 2) Falling product prices and shorter lifetimes of products forces companies to manage their supply chain and logistics in a way that copes with this. Today it is really the supply chains which compete, not the product!

But, we must not forget that a brilliant SC can not help us sell a bad product. It is essential that the market wants our product.

✓ 3) Deregulation of markets has given a big "push" to world trade, as it has been much easier to transport freight all around the world.



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✓

4) More efficient ways to move freight, like the invention of transport containers. Technology like for example Radio Frequency Identification gives us the opportunity to track the shipment all the way. Other information-technologies give the opportunity to secure the freight in better ways, and also to communicate across an integrated supply chain.

✓

5) Focus on minimising inventory has grown over the last years, mainly because inventory costs a lot of money to hold! Just-in-time inventory is one of the solutions to this. This system focuses on having a minimum of stock, and getting materials ~~exactly~~ exactly when the company needs it.

✓

6) Last, but not least, companies are getting less vertically integrated. This means that it's getting more usual to outsource (transfer of a process previously performed by the company itself) some or all of the business processes.



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Before, it was more common to own big parts of the supply chain, for example to have ownership of a sugar fabric and a cocoa fabric, a chocolate manufacturer and also do the logistics all alone.

Today, outsourcing of the logistics function to 3PLS is very common.

3PLS = 3 part logistics service providers.

All of these six key developments have pushed the evolution of SCM and logistics. These two areas are getting more and more important as the world keeps changing, and firms that want's to assert oneself have to pay them much attention.



Section B

Block III

3 a) "Lead time" describes how long time it takes from placing an order until the orderer has the order in the desired delivered place.

5 If the lead time is long this creates uncertainty in the supply chain, and the parts of the chain are more likely to have a bigger inventory buffer.

If an unpredictable demand should show up, it will take some time to get the desired order "in house". In this case would the seller (orderer) probably loose money because they are out of stock, and the customer may not be willing to wait for the new order to arrive.

When we have to face non-zero lead times in a supply chain we can talk about the so called "Bullwhip" effect. This effect describes the phenomenon of small changes in demand fluctuating



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up in the supply chain. This may cause way to big holdings of inventory, because of the uncertainty with long lead times.

✓ If the lead time is reduced, is the uncertainty also reduced, and the parts of the supply chain can reduce their inventory buffer.

✓ This reduction will not hurt customer service, because the reduced lead time makes the part of the supply chain more agile to unexpected demand. So, even if the inventory buffer is reduced, it should be possible to obtain the same level of customer service.



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b) $D = 1200$ harddisks

$$P = 40 \$ \quad H = 12 \$ (40 \times 0,3)$$

$$S = 30 \$ \quad Q(\text{now}) = 100$$

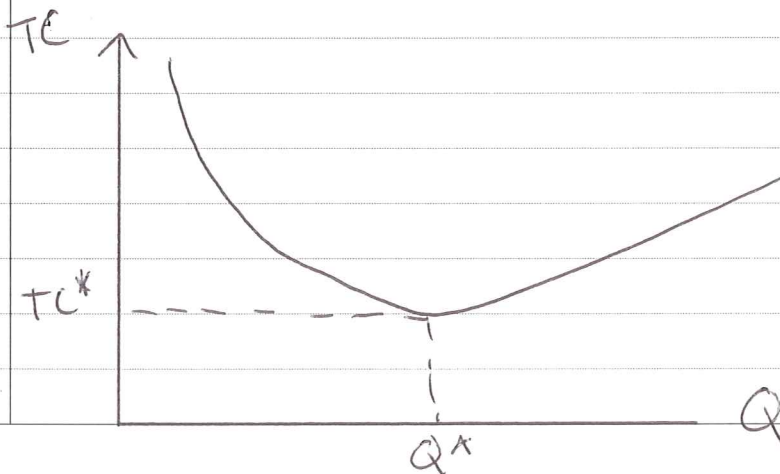
a) Current order quantity: 100

$$\text{Ordering cost: } \frac{D \cdot S}{Q} = \left(\frac{1200}{100} \right) \cdot 30 \$ = \underline{360 \$}$$

$$\text{Holding cost: } \frac{Q \cdot H}{2} = \left(\frac{100}{2} \right) \cdot 12 \$ = \underline{600 \$}$$

$$\text{Total inventory costs} = \underline{960}$$

b) The EOQ formula minimise the total inventory costs.





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$$c) Q = 78$$

$$\text{Ordering cost: } \frac{D \cdot S}{Q} = \left(\frac{1200}{78} \right) \cdot 30 \$$$
$$= \underline{461,54 \$}$$

$$\text{Holding cost: } \frac{Q \cdot H}{2} = \left(\frac{78}{2} \right) \cdot 12 \$$$
$$= \underline{468 \$}$$

10 Total cost: 929,54

Total inventory cost have gone down with 30,46 \$.

Ordering cost are a bit higher with this Q (101.5 higher), because ~~was~~ they order more times (78 per time instead of 100).

Holding cost are 132 \$ less because they hold less inventory.

10 In total a favourable variance of 30,46.

(they ordered $1200/100 = 12$ times before)

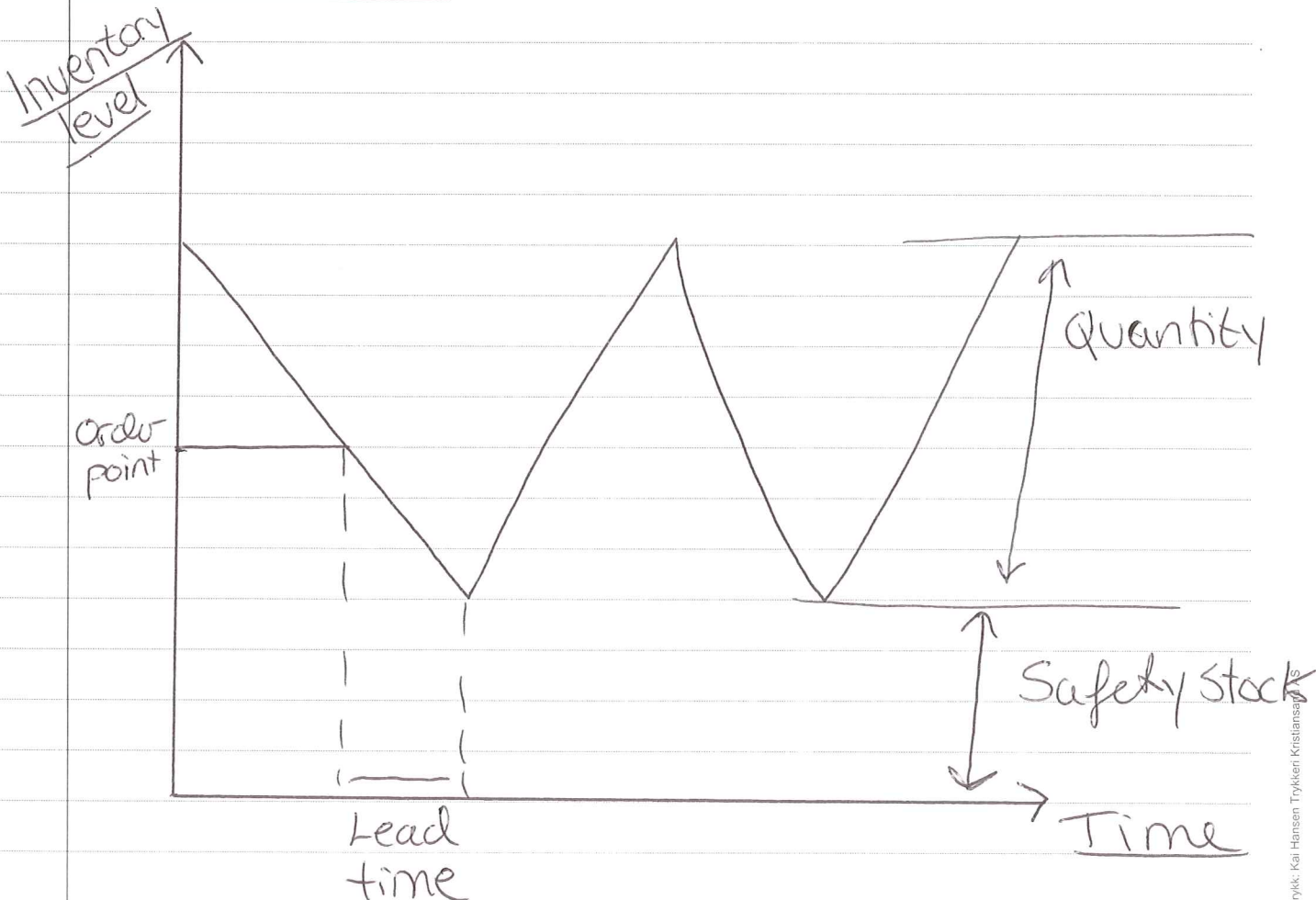


c)

Safety stock is an extra buffer against uncertain demand.

If a company expects to sell f.ex 3000 units over a period of time, they can choose to have an extra amount of inventory to cover for any unexpected demand over 3000 units.

Illustration:





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Why is amazon.com able to provide larger varieties of books and music with less safety inventory than a similar bookstore chain selling through retail stores?

- Amazon base their business on internet scale instead of selling in physical stores.

When Amazon orders new books I assume that the lead time of the delivery is reduced because the order is delivered straight to their storehouse without any connecting link.

A bookstore in the bookstore chain I assume has to order first to the central storehouse for the whole chain, and that the order is passed along from there to the suppliers.

As I discussed in a) is longer lead times a reason for bigger inventory buffers, safety stocks. Amazon can therefore have a smaller safety stock.