Logistics & Supply Chain Management

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Lecture 29 : Supply Chain Drivers

Hello dear friends, welcome back to NPTEL online course on logistics and supply chain management. So, today we will start our discussion on very important chapter in supply chain management that is supply chain drivers. So, we will spend couple of session on this because this is very very important and we have 6 different supply chain drivers and we will discuss in detail the each driver what is the impact on the supply chain of each driver how we can model that we can you know change that driver in a way that how it will affect the cost efficiency of the supply chain or sometimes can be the responsiveness and we will talk about what are the different components under decision making when we are talking about facilities, inventory, transportation what different types of decisions we are making and what are the components under decision making and we will talk about some of the matrix in each of the your driver right. like supply chain drivers as the name suggest are the key points key drivers which is driving your the overall performance of the supply chain right but the thing now for next couple of sessions you will keep in mind that whatever we will do with these drivers they are going to affect your these two ends cost or responsiveness Whenever you will change anything in any driver, it will affect either your cost scenario or responsive. Quickly, I will take one example and then we will go with, we will take different examples as we will go with the different slides. Let us talk about transportation.

because it is one of the driver. We have 6 drivers, inventory, information, facility, transportation, sourcing and pricing. Let us only take for just quick understanding how these drivers will affect the cost and responsiveness. Let us say I am taking transportation I am doing through air.

how it will affect it will add more to the responsiveness that means we are now responsive our transportation parameter we have set for the responsiveness so in that way we are quickly delivering the product to the customer but cost will be very high because we are using fastest delivery of the delivery mode right so this is how it will affect will go through each this driver facilities what type of different facilities we are using? We are using either manufacturing facilities or we are using the warehousing facilities right. So, at different location manufacturing facility raw material supplier they are also having

manufacturing units right that will also be counted as manufacturing facility. and then warehousing facility wherever you are temporarily storing doing the cross docking or you are storing the raw material those kind of stores can be considered another facilities. So, under this facility we will see the design that obviously what type of product you are handling solid product large product shape items or may be gases product you are handling So, that depends upon design capacity how much capacity is required depends upon again the demand from that particular location and where you will set up your facility. So, if you want speedy delivery you will set up your warehouse near to the customer already we discussed right, but if you want to minimize the cost inventory cost you will keep the centralized facility and from there hub and spoke model from where you will transport the product to the all the markets right this is about facility.

talking about inventory we are keeping inventory either raw material semi finished goods or finished goods keeping more inventory again will increase your cost but that will enhance your responsiveness as well because as soon as the customer is reaching your warehouse or retail shop you can quickly meet the demand but the risk of getting that product obsolete is always there because you are keeping enough stock and then you need to minimize the carrying cost because if you are keeping excess inventory you are carrying storing cold storage are required so handling is also required stock rotation you need to ensure all those cost will be there transportation already i talked about we have different mode of transportation either through air through road, through ship, through train, through pipelines whatever mode you will pick depending upon you will affect either your cost or fast delivery in terms of responsiveness right. So, that will also define information this is a kind of driver which will affect the performance of all other drivers. when you need to ship the product that information should be shared quickly, how much you need to ship the product, how much you need to keep the inventory, where you should store in the warehouse right, how much you need to you know source from the raw material supplier. This information throughout means integrate all the stakeholders all the activities throughout the network right. So, coordination and decision making will be done based on this particular driver that is information.

and then the fifth driver is sourcing then selection of suppliers then how much you will outsource whatever you are going to manufacture raw material what is the quality you want to buy how much lead time you are going to give to your vendors and what is the cost so obviously when you will feed large orders like walmart is doing to their vendors then you can negotiate on the cost right lead time you need to give reasonable lead time but that large order maybe then you need to keep the inventory so then again that will trigger the inventory cost right pricing now again what type of pricing policy you are opting in the initial sessions when we discussed about you know e-commerce industries and we said that they are coming up with the big billion days amazon prime offers and

then the suddenly the sales is increasing to 25 to 35 percent in some of the products your mobile home appliances sale is increasing like anything so that means you are very unpredictable in that way how the sales pattern will behave right so suddenly you need to manage maintain the very high inventory but on the other hand what Walmart is doing for this managing this particular component they are keeping this strategy everyday low pricing everyday low pricing means once as a customer if i am entering walmart store i know that this price is fixed and everyday i am getting the low price there is no hurry right so. I need not to buy in bulk whatever you require you can buy that and then i need not to postpone my order because maybe after two months there will be sales and what in return walmart is getting that they are getting very fixed orders fixed supplies so minimize they can minimize the inventory cost because in that way they are pretty sure about there So, you can just see how these 6 drivers we will see in details will affect your performance and will add to the cost right. will go through all these. So, as per Chopra and Mendel. So, they have divided these six first facility inventory and transportation as logistical drivers.

They are related to logistic activity where you are shipping, you are storing, inventory you are producing right and these are cross sectional cross functional drivers which are you know different functional units you are touching so that depends upon the scope of these particular drivers right so what is the ultimate target is whatever competitive strategy you are opting maybe your supply chain is say you want to be responsive whenever customer is placing the order you want to you know deliver the order quickly or whatever quality level he is expecting you want to deliver that quality whatever variety he wants you want to deliver all those feature whatever are there .So your supply chain strategy should target the responsive parameter right but yes you cannot be purely responsive and then you are selling may be 5 rupees item in 500 items you cannot convince your customer for that right so then you have to be little efficient but we have some status class product as well where you know you you are just saying that we are responsive we are the best those status product like bmw mercedes rolex those kind of players they are they are not competing on cost right so cross functional versus logistics driver cross functional involve collaboration and integration across different functional area within a company right all those sourcing pricing information these are cross functional drivers right so within a company they will integrate all the different functional units because information is required sourcing you need to do and then pricing Logistics drivers they are working you know with different stakeholders are involved in that not one company where you are taking care of the your facilities, warehouses, transportation and will define how the final delivery will happen efficiently and timely. So, key differences if we will talk about scope cross functional drivers have a broader scope. where we are encompassing all the aspects of supply chain from procurement to the customer end, but logistics drivers will take care only your physical transportation of

the product from one end to the other end. If we will talk about collaboration in terms of cross functional drivers.

across different department it will be there logistics we have external partner collaboration right so impact cross functional drivers have more significant impact on the responsiveness and agility . How quickly you are sharing the information? how quickly you are responding to market trends? how quickly you are changing the pricing policies right how quickly you are responding to big billion days your customers are responding to big billion days right so that will help logistics drivers primarily focus on efficiency and cost optimization So, let us talk about now the very first driver which is facility. Already I talked about facility either the manufacturing facility or the stores warehouses where you are keeping the inventory right. What will be role in competitive strategy? Already now we will discuss all these drivers one by one on this cost responsiveness continuum. How will alter the driver from one end to other end and it will touch either cost efficient or responsiveness.

See, this facilities decision impact supply chain performance by balancing the efficiency and responsiveness. How? Centralized facility. Now, it will reduce the responsiveness. How? Because this is centralized warehouse from where we are shipping the orders to all the markets like we talked about. these all are markets right now from this warehouse we are shipping to all the markets this will reduce the responsiveness because lead time will increase anywhere if I will keep the order it will take time to record the order and to travel this much distance right because centralized warehouse is there ok.

in that case responsiveness will reduce if you are going with this kind of model responsiveness will reduce but you will be cost efficient because instead of maintaining if you what can be the alternate alternate may be one warehouse for these three markets. Other warehouse may be here serving these two markets, third warehouse may be here serving these two markets. Now, instead of maintaining inventory at one point, we are maintaining inventory at three different locations. those location facilities are required manpower is required all those resources are required which are you know maintaining the inventory within those facilities so in that way but you will be more responsive because you are very near to the end market customer is asking for the product you are quickly delivering the product but the inventory cost will increase. So, this you need to keep in mind.

If we will talk about Toyota and Honda, they are more responsive. How they are more responsive? Because they are opening local manufacturing facilities near to the markets.

many facilities near to the market now what are the benefits they are getting after opening the local facilities one is currency fluctuation if Indian markets they will not you know transport or export from India if they are manufacturing in India to some other country because currency fluctuations are there always right trade barriers they don't want to go with that right then increase the responsiveness any change is required within Indian market we can do easily in india market the other models in the rest of the world can go smoothly right so that we can ensure the other best part of this honda facility is they are manufacturing suvs or normal cars sedans in the same manufacturing unit so this ensure the high utilization of those manufacturing facilities right so this is the best example how they are managing their facilities Now let us talk about components of facility decision. when we are talking about the facilities what is the role role is capacity and flexibility capacity what type of you know warehouse you will design and how much will be the capacity how much you will you know store in that warehouse so then again if you are storing too much excess inventory stock how sorry your obsolete inventory will be there your inventory you can damage in the storage house if you are storing less inventory less capacity you can be stock out in the market flexibility how flexible you are with your manufacturing facilities that quickly something input is coming from the market and then you are amending your product changing your product design sometimes component sometime process design whether your manufacturing facility you want product focused or functional focused product focused is that let us say I am producing fan so what will what I will do whatever related to fan assembly soldering pcb we are developing and then packaging everything we are doing in house right that is a kind of you know product focused we will add raw material at different stages at the last stage we will get the output. But functional focused is let us say I am having one molding plant where I am dealing with all the plastic parts.

Now, this molding plant will provide the plastic raw material to all the fan manufacturers. Fan manufacturer may be Havel's, may be Philips, may be some other manufacturer right, any manufacturer. I am just producing the plastic components that is molding plant I am having that is functional focused. cross docking or storage whether you are designing your warehouse for storing for some time some period or it is only small stoppage center where the inventory will be shift from one container to other container may be you are consolidating sometimes order sometimes you are segregating orders pin buys location buys and sending in different containers right. then location where you will set your facility or either you are talking about your manufacturing facility or you are talking about your warehousing facility so some condition already we talked about if you are near to customer no need to explain again but you need to consider some of the factors what is the labour cost if you are setting up your manufacturing somewhere in Europe right may be very high cost operational cost

somewhere in nation countries may be you can get cheap labor cheap resources in that term right .

Infrastructure then may be you are struggling with the infrastructure if you are working in developed nations you have all the access to the infrastructure parameters then tax implication what is the tax structure it is simplified very complex very high taxes so that also will help you to define your location Capacity, keeping excess capacity you are responsive, but then you are adding to cost. Keeping low capacity you are efficient and but you are not responsive because you may be stock out because you are keeping minimum capacity with you. What are the facility related matrix? the parameters which we are observing when we are evaluating whether a facility is you know doing well or not first is capacity what is the maximum capacity that facility can process if I am talking about manufacturing unit how many units it can produce daily if I need to run in two shifts how many units I will get if three shifts how many units I will get can I go for expansion of the capacity those parameters we will consider Utilization, I am having that capacity, but how many times I am utilizing right? If you are you see if one truck is going from point A to point B and it can carry 10 ton capacity, but it is carrying only 8 ton. So, that means per unit cost will be little higher, but if I am carrying 9 ton per unit cost will reduce, if I am carrying 10 ton per unit cost will reduce further. the same way so utilization if you are doing maximum you can reduce the per unit cost right but delays will increase with the increase utilization how it will happen because let us say if you are making a model on one production line you need 50 items only but just to you know explore economies of scale you are producing 100 items minimum in one go to minimize the cost of production but then you are waiting to produce the B model right so then delay will increase processing time setup time down time idle time processing time how much time is required to convert the raw material into finished one but it's not only always raw material if you are talking about the warehousing how much time you are taking to load the product how much time you are taking to kit the product how much time you are taking to pack the product setup time whenever you are initially setting up the process changing the product how much time you are taking change over time right from one model to all second model you need to change some equipments right you need to change the raw material so then how much time you are taking downtime how much time you are process is down because of some breakdown in the equipment or may be absenteeism rate or any reason but your process you are not idle time how much time you are just waiting idly just to you don't have any order to process right so that is also if you are designing facility with over capacity obviously you will be waiting most of the time production cost per unit that directly affects how many units you are producing right.

If you are producing more units that productivity will be improved so per unit total units

today produced and you can just divide the overall cost that cost you can include the material cost your how many manpower was working on that day the equipment depreciation cost the facility you are using everything you can add in that and divide total number of units right so then you will get the unit cost quality losses .I produced hundred products but after inspection and all that i got only ninety five ok items five are rejected because of different reasons some missing components not operational safety related parameters were compromised something right theoretical cycle time of the production this is the pure time we are considering that everything is going perfect way and how much time it is required to produce that product let's say to packet to packet one product you are you need may be 30 seconds right so but in that time you are not considering the change over from one product to other product you are not considering something goes wrong with the packaging sometime packaging tape is finished you need to change that is not you are considering so theoretical flow is the flow time is the minimum time to convert that product into finished one right actual average flow time now here we will consider the delay also if that is happening right so then if we will talk about flow time efficiency it will be ratio of your theoretical flow versus your actual flow. So, we will try to come little closer may be to 0.

80, 0.9, 0.95. So, maximum 1 we cannot have more than 1 right. So, flow time efficiency will help you to calculate whether the productivity is above 90 percent, 95 percent how efficiently you are converting the your raw material into finished one. Product variety then how many different product variety models you are offering. So, this is again if you are having different model offering in same product you are you know like we talk about automobile industry. so if car manufacturer they are coming with more than hundred models right in the same product right so then they need to change over from one model to other model sometime they are changing color sometime changing in engine capacity sometime they are adding air bags so many different way sometime petrol version diesel version all things you need to take care right so that will add volume contribution of top 20 percent that means 80 20 rule we can apply we can find out those 20 SKUs.

SKUs are stock keeping units these stock keeping units usually we have 8 alpha numeric digit right we are using to code all those different products but if any product is having any variation let us say if you are keeping soap on your shelf right for selling. if soap size is different then also the SKU number will change if the packaging is different then also flavor is different then also it will change right price is different then also will change color is different then also it will change so SKUs we are identifying the products we are identifying how much inventory is depleted How much inventory is left out so that we can again replenish the inventory. So, here we need to find out within our facility what are those 20 percent of SKUs which are adding 80 percent of the volume. These 20 items we are manufacturing in huge number, demand is very huge that 80 percent market is

captured by these 20 percent item. 80% of the items are only contributing 20% of the volume.

So, we need to take care of these 20% of the items right. Average production batch size I talked about if you will produce more items in particular batch before change over will reduce your transportation cost, but then will increase your inventory storage cost right. So, but yes you need to again make the balance how much you want to produce so that you can reduce the batch cost. now we will come to the second driver that is your inventory and inventory we are keeping why to manage the balance between supply and demand right so because we are unsure about your production we are sometimes unsure about the consumption cycles because hundred percent we are not sure so then we are maintaining the inventory right so that we can match the supply and demand exploiting economies of scale see when we are keeping extra inventory that means we are producing in bulk so first thing is when we are producing in bulk .The production cost will reduce because economies of scale.

Second, the transportation cost will also reduce, distribution cost will also reduce because we are transporting in bulk. It is not only one order is transported from McD to IIT Kharagpur campus, right. I am combining 10 orders. So, 10 pizzas are going from one location to other. So, in that way we can enjoy the economies of scale, right.

Enhancing responsiveness. if you are keeping extra inventory quickly customer is coming you can meet the demand but if you are keeping minimum inventory then you are recording the order like dell is doing they are providing you the customized product but if you want today only right now your product may be then you need to buy the standardized product only if you want to configure then it may take one day two days lead time right so that will affect your responsiveness impact on cost and profitability obviously increasing inventory will your handling cost will be there and you are keeping that idle inventory with you right until you will consume you will not get the money right so you need to consume the inventory as soon as possible in the market right so it will lower down your profit margin because anyhow any cost is deducting your profit margin material flow time material flow time is the time required from the entry to the exit point usually we have this little law i is equal to dt right this inventory i t is your flow time and d is your throughput rate throughput rate is the rate at which the sales to end customer is happening so how frequently sales is happening will be reflected by your throughput rate right customer demand and throughput rate obviously more the customer demand is the more rate of consuming the final product so you can align your inventory levels with the demand of the customer and then you can you know save that excess inventory role in competitive strategy first is we need to define where we will locate the inventory right how much inventory we will locate then if you are locating large quantity of finished

goods near to customer obviously responsiveness will be very high but then cost will be also very high. On the other hand if you are keeping centralized inventory, so then you can reduce the cost instead of maintaining inventory at 10 different location you are placing inventory central. That is why Amazon is having different hubs right. So, when you are placing order from Kharagpur, so finally it is coming to Calcutta hub and from Calcutta hub it is distributing to all other hubs. balancing cost and responsiveness then how much inventory you will keep at every level that will help you to define whether you are cost efficient or you are responsive in that way amazon best example very beautiful best sell they have segregated the books which they are selling into three category best selling books they are placing order with the regional warehouses where they have located their regional warehouses and quickly delivering the product high responsiveness for best selling books if books are you are slowly moving compared to best selling then you are stocking those books may be little away from the customer centralized location.

So, that the overall cost of inventory can be reduced, but if it is very slowly moving right very less demand then you place the order only once you are getting the order then only you are replenishing your inventory from the publisher or distributor. So, this is best example with respect to inventory. components of inventory decisions. So, you can see product availability is important point if you are keeping the inventory you are always you know meeting demand that is fill rate we are calculating in inventory how many times you are filling the demand of the customer from the existing inventory. So, that depends upon you want to be stock out or not right, but then the again the maybe the decision you need to model if I will reduce the inventory 5 percent what will be the effect of on the stock out maybe I will be 0.

5 percent stock out whether you are ready to take that chance to be you know 0.5 percent stock out or you do not want to. So, that let us keep 5 percent extra inventory. cycle inventory how much inventory you are keeping to meet the usual demand cycle between these two if you are ordering between these two orders how much inventory you are keeping and that depends upon what is the average demand of that region order quantity what is the lead time customers are expecting safety inventory what is the minimum level always you are maintaining with you so that if any unpredictable demand happens so then you can meet that So, that is safety inventory, seasonal inventory that is for particular season only for may be now the summer season is going on you will maintain inventory for that much period then winter season will come. So, that much inventory you will keep right.

So, inventory related practices or performance measures cash conversion cycle how quickly you are consuming or inventory in the market and receiving the receivables. cash right cash to cash cycle we are calculating it as cash to cash cycle how quickly you are

getting the cash in return of consuming your product in the final market average inventory always we talk about your starting inventory and inventory you add up and divide by 2 that is your average inventory you are maintaining you can not only record the inventory in terms of unit you are maintaining sometimes what we are saying ok we have 2 days stock left so that is days you are talking inventory in terms of days right. If I am having maybe 10 days stock. So, I am little reluctant in that way to replenish the stock right because still maybe the replenishment will take 5, 6 days I am having 10 days stock right. Financial value I am maintaining 10 crore inventory every day to meet the customer demand that is another measure to calculate the inventory.

Seasonal inventory always we already we talked about right. So, you need to anticipate in that way so that you can meet those spikes in the demand right. Inventory turnover, cost of goods sold and total inventory you are maintaining average inventory you are maintaining. So, higher inventory turnover that means, quickly you are efficiently you are rotating your stock in the market.

Days of inventory outstanding. So, average inventory you can calculate it by dividing the average inventory by the cost of goods sold per day. A higher days of inventory outstanding indicates a longer time to sell in the inventory. You are not able to generate enough demand. So, you need to stop producing excess inventory because you are not able to consume that. Average replenishment batch size, whenever you are placing order with the manufacturer, distributor, how much units you are placing.

Then again you are measuring all the SKUs you are keeping with you and then you are placing the order. That larger batch size will help you to negotiate the price of the batch, right. average safety inventory average safety inventory how much you are keeping for units or number of days for two days I am keeping the inventory may be tomorrow again I will go for that fill rate I was just talking about this is fill rate how many times you are meeting the customer demand from your existing inventory and how many times fraction of time you are out of stake if customer visited 100 times 98 times I have met the demand from existing capacity inventory that means I am 98 percent is the fill rate and 2 percent is the stock out rate I could not meet that. Obsolete inventory how many times how much inventory is going obsolete in the stock only and we are not able to consume that that also we need to keep in mind because that excess inventory we can manage. So, overall trade off with respect to responsiveness versus efficiency.

So, obviously, if we will maintain the inventory near to customer, we will be more responsive. If we are keeping little away from the customer, our inventory, it will take

more lead time to deliver the product, but that will save the cost. So, this is how inventory will touch these two points. So, the third logistic driver is transportation. Again, faster mode will reduce the lead time, but will increase the cost and will increase the responsiveness because quickly you are delivering the product.

So, that way you can either you are talking about train, but train then shipping cost will be lesser. If you are talking about ship then the least cost option you are having, but then that infrastructure is available or not that also you need to find out and end mile delivery also that cannot happen using ship right. So, those things we will take care when we are talking about the transportation. What will be the influence on inventory and facility location? See if you are using very you know want to utilize the full capacity of the container. you need to develop big size warehouses where you will keep the inventory that size you can keep right and then facility locations if frequently you are doing that then also it will affect the facility location decision right.

So, faster transportation method you can opt to reduce the inventory levels and enhance the responsiveness and this is Dell how they are using that strategy flying components from Asia. So, this will increase the responsiveness, responsiveness how because whenever you will visit Dell showroom and place your order for the customized product the components will directly fly from the Asia and because the cost will be higher in responsiveness obviously will be higher. but this cost you can compensate somewhere because you are not keeping extra inventory right so quickly you can purchase so that you can reduce inventory cost role in competitive strategy balancing responsiveness and efficiency so obviously a competitive strategy if you want to compete on the speed of the delivery obviously you have to go by air the fastest mode available in that reason right if you are competing on efficiency so obviously you need to take care of the cost and mild delivery let us do by cycle or let us do by electrical vehicle right so how we can reduce that cost right strategic adaptation if you are selling high value items then responsiveness is required right so high value items you cannot store near to customer because the value is very high and example is blue nile where this is online diamond store but what they are doing They are ensuring the overnight delivery using FedEx and ensuring high responsiveness. So, in that way they are centralizing the diamond inventory. So, centralizing means inventory cost they are reducing and the other cost because diamond industry is a kind of where you need to invest heavily on security parameters as well.

So, that also instead of investing on security parameter at five different location you can just manage the security at one point and that you can manage that. right. So, this is how you can minimize the cost right. Components of transportation decision, design of transportation network, what is the mode, location, route, routing algorithm will help you

to find out the optimal route to minimize the cost right. And then multiple supply or demand points maybe you can include or you can means you can consolidate all the orders or you are going for single delivery 30 minutes delivery of pizza so then go for the single delivery as well choice of transportation mode will affect yours again responsiveness quick through air and then may be if you are looking for reducing the cost then through sea if available not available then road or train may be better option and then again depends upon the factors which mode you will pick speed shipment size cost or flexibility right.

transportation related matrix quickly will go through all those points which we are counting when we are talking about evaluating the transportation your driver average inbound transportation cost. So, I always talk about that this average your trans inbound cost is always higher than the outbound transportation cost that's why your manufacturing facility or assembling facility should be near to the market so that the outbound logistic distance can be reduced so average inbound transportation cost how many units you are transferring raw material to your company so that you can calculate and we are usually reflecting it at percentage of cost of goods sold so that how much this Inbound transportation cost is ah sharing in our overall cost 5 percent, 7 percent, 10 percent what is the share. average incoming shipment size whether we are buying in small loads or we are buying in large lot that will help you to define your inventory practices as well then how much you can negotiate on your large orders right average inbound transportation cost per shipment so same example if in one shipment you are transporting ten thousand units so total cost may be 10000 you can divide. So, then that will be per unit cost right total cost 10000 divided by 10000 1 rupee, but let us say still you are your transportation cost is 10000 only, but this time you transported 11000 units. So, then the 10000 divided by 11000 units that that way your per unit cost will be reduced.

average outbound, outbound means whatever is going away from your market as your manufacturing unit, right? your final product you are shipping from your manufacturing unit to the end customer. So, that cost you are calculating. So, what is the average cost transportation cost total because I already discussed that this cost is higher than the inbound logistics. So, again measure as the percentage of sale this much cost your outbound logistics is contributing towards the overall sales right. average outbound shipment size how many units you are transporting right so that also whether you are going for economies of scale or you are processing the individual order average outbound transportation cost per shipment one shipment how many units you are transporting you can divide the total cost divided by your shipment size and then economies of scale you can find out the percentage of that average outbound transportation cost per shipment in the total sales fraction of fraction transported by mode so I am using 5 percent may be

ship I am using 20 percent may be by train I am using 50 percent by road I am using rest of the part may be by air so this is how you can find out and then you can say that our major portion is going through air why do not we you know streamline that process and will go with the routine may be using ship or train which is more you know cost efficient then you need to may be set up location near to market you need to figure your demand function in more refined way so that accurate information you can get right so then it will help you to reduce that cost.

overall trade of responsive versus efficiency so transportation you can see will add to efficiency if you are working on economies of scale combining many orders and if you are individually processing the order will add to the responsiveness so if you want fast quick delivery through air you can go through drone you can make the delivery if you want you have lead time you can go by normal transportation mode that will help you to reduce the cost. So, this is all about your logistics drivers. In the next session, we will discuss about your cross functional drivers. So, these are the references. Thank you very much.