

Logistics & Supply Chain Management

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Lecture 31: Supply Chain Impellers and Value Chain

Hello dear students, welcome back to NPTEL online course on logistics and supply chain management. So, now, we will start discussion on supply chain strategy right, we will see what are the different factors or maybe impellers we can say which are forcing our supply chain you know to behave in that way. So, that they can survive for a longer period of time there is as such no longer period, but yes because daily the scenario is changing. So, they have to you know keep on changing their they need to keep on revising their capabilities as well. So, this is a part of your supply chain strategy, how you are coming up with new tools and then may be how you are tracking your customers in that way, how you are tracking their behavior so that you can develop that type of particular strategy right. So, this week we will talk about developing the supply chain strategy right.

And here is the basic first introductory part we will talk about what are the supply chain impellers. In the last week we talked about supply chain drivers right, what are main those logistics and cross functional drivers. How we can change those drivers so that the overall efficiency and responsiveness of the supply chain can be managed. In this particular session we will talk about what are the impeller those forces which are forcing us to change the drivers to manipulate those drivers here and there in terms of coming up with the basket of product and services right.

And then we will talk about the value chain as well in this particular session right. We will talk about some specific success parameters when we will talk about supply chain success and we will end up with the case study right. So, already we discussed about supply chain drivers. So, other than that what are those forces and factors we need to consider and these forces factors are known as impellers of supply chain right. In that way how they are putting extra pressure on the supply chain that this is not now that era where you can you know stretch a customer or maybe you can do something illegal unethical and then customer is not aware about those things right so because customer is now full of information even if you talk about very simple example if you are keeping little higher price maybe one percent two percent with your competitors in the mass at the

same moment they can find out okay the price is something else he is offering something else So, then that way that customer will never turn back to you right.

So, these are some of the forces because this transparency has been maintained throughout the supply chain. This transparency is obviously, very very important when you are manufacturer, you are services provider, you are those product provider, you are selling the product. but this transparency is equally spread along that network for the customer as well. If you along with other 30 players in the market operating with the same product or services, obviously, they have access to information of all those 30 players right. So, then you need to pick your pricing strategy very carefully, you need to pick your delivery strategy, your feature you are offering, the quality you are offering.

the variety you are offering. So, that in the end you can convince the customer that you should visit our store and then you should make the purchase decisions. So, other than what drivers we discussed obviously, facility, inventory, transportation, information system, sourcing, These drivers are there, but these drivers we are forced to you know change these drivers, enhance these drivers depending upon those impellers right, what are those forces coming from the market we need to change these drivers accordingly and then we will be coming up with the competitive strategy as well as your supply chain strategy. Having said that competitive strategy means for the whole organization the competitive strategy may be how you can get the maximum customer potential right may be to increase your customer a group right from maybe right now you are having only 10 percent share you want to increase to 25 percent right how you can do that and then you know that you are targeting those middle class families or lower class families so then your pricing is very very important efficiency in supply chain is very very important. So, that means, because your overall vision is to capture that mission is to capture that 25 percent of the market based on efficiency cost parameter, then your supply chain strategy should be in synchronization with your your overall strategy competitive strategy.

So, if you go through literature we have identified initially we identified three main impellers and in that empowered customer is the first one. Like I talked about the knowledge the customer is having right now and how he is getting the knowledge because of the access to information. Simple example if you want to book air ticket right, so then you have all those options make my trip is there goibibo is there may be irtc is there may be the individual website of that airlines is there right so all these platforms are there not only the now what this these platform will do indigo will not do that because indigo will give the information this you can consider at the first level indigo is at first level in that way providing the services you will get all the related information of the indigo flights going from one point to the other point where you are searching right and

prices of all the points how many stoppage are there timing and all that information you will get right second level you can include these players now what this second level players are doing you will search flight from Calcutta to Delhi, it will give you all the possible combinations, mix up of may be different players, individual players, pricing, all those things routes and how many stoppage and all those things will be highlighted on the website and then you can compare within no time and that way you are as empowered customer. Now, there is this is not the end, the next third level you include. kind of ixigo player.

Now, what ixigo is doing? ixigo is putting all these platform at one platform right. So, what is happening? Sometime I am confused that whether I will get this ticket cheaper on make my trip or goibibo or IRCTC or some other platform. right so then you will first you will check in make my trip then goibibo then make irctc so this will consume time i want immediate solution you go to ixigo. Ixigo will give you from calcutta to delhi all the possible flights and And prices what is the best price in MMT, what is the best price in Goibibo, IRCTC in for particular flight right. So, this is how the customer is so empowered.

So, any offline retailer cannot say that I am charging 3000 and you are getting that product through online in 2500 right. offline retailer can you know negotiate with you as per the price somewhere may be 200 or 300 rupees but then in the end he will say this point that may be online it will take time so then responsive supply chain we are saying that within same day delivery within two days delivery if that product is not that much urgent we can wait for two days we can save 500 bucks what is there so in that way the customer is more empowered right he is having access to whole information and thanks to the IT tools we are having now this is one example I quoted for customer let us take now the producer perspective the manufacturer the services provider We have material resource planning, enterprise resource planning, vendor manage inventory, total asset visibility, these kind of softwares are there, right. In the warehouse, we have warehouse management softwares. During transportation, we have transportation management softwares finding the best route, optimum route in terms of distance, in terms of what load you are carrying, in terms of infrastructure, road condition. Everything, weather condition you are getting, MRP material resource planning, ERP enterprise resource planning, how many different raw material required, what should be the batch size of each material, when you should place order with the vendors and out of three vendors A vendor will get this much order B will get this much all this information thanks to all IT tools they are collecting the information the future of supply chain we talked about in last to last session I think where we talked about supply chain control towers.

All these parameters can be tapped there and if you are taking decision related to

sourcing related to procurement regular procurement. 5 listed vendors are there for this particular component let us check the vendor rating of each vendor. So, related to price this third vendor is most efficient, related to delivery first is most you know quick in making delivery, related to quality fifth one is the high reliable in terms of quality, quickly you are getting the information and then you can place the orders. The third impeller of supply chain is globalization. Now because this we cannot say that here this is working in local market and it is not working in foreign market.

If these days if someone is coming that with the credit card option to you and it is saying that only it will work in India hardly I think anyone will be interested in that. How you can provide solutions overseas when we are visiting because the frequency of traveling is also now increasing day by day. right and globalization it's not only that local Indian market or any other Asian market right so wherever you are getting the best quality best quantity best price you should outsource and then within no time we thanks to about that infrastructure fastest infrastructure and that way channelized supply chains distribution network that we are getting delivery in no time so then globalization is third major impeller which is forcing you to be always responsive cost efficient you cannot say that this we are manufacturing in india this is more cost carrying why don't you ship to the some other location we are you know you can reduce that cost you can reduce the raw material cost, labor cost, the location where you are spending your you are planning your facilities that cost you can reduce right. So, that globalization is another major impeller other than these two because the research now is more on how we can go for sustainability, how we can enhance the integration and collaboration among those players. So, that way it is also working as one of the impeller.

Because every other day in news also because this time is now summer season is going on. So, yesterday there was news 53 degree temperature in Delhi first time right. So, that means then may be couple of days we will talk about the environmental change and then how things are pollution and we will talk about having debates in the media and all those things will be there. then in that way customer is also getting information at least this is the stage where we are getting information we somewhere we in our unconscious mind we are thinking about yes we should make some decision we should take some steps to you know go sustainable go green we should reduce the wastage and then when we are going in the office we are keeping all the lights on AC always on and all those things are happening and then we are actually not you know trying to or we are not relating what we are doing in our day routine life but very soon the time will come when you will be forced to you know you you will force yourself only that you have to be sustainable when it will be unbearable for everyone right so then Sustainability, talking about supply chains, we have to stretch in that way. Green logistics, we talked about green supply,

recycling, reuse, remanufacturing, refurbishment of the products, how we can ensure, how we can extend the life of the product so that waste should not be generated, how we can add value to the after the end use of the product, right.

So, that sustainability measure is important. collaboration and integration is another thing that it's not that in isolation you are working and you are collaborating with your suppliers and then you are there and maybe distributor is there you have to include the customer also in your manufacturing process that concept is also now gone that customer are part of only services processes manufacturing also we need to record the customer requirement their specification like Dell is doing for years together right they are recording their requirement they are specification and then they are configuring the laptop or PCs whatever your requirements are as per that. So, in that way it can happen only when you have strong partnership and relationship not only with suppliers with suppliers with storage houses with manufacturing houses with your distribution network with your warehouses distribution fulfillment centers. transportation agencies with customers with end consumers right from where the information is being generated and being circulated. So, these 5 major impellers of supply chains are there which will help you to design your supply chain.

So, these two video link I have given you first one is on highlighting the bullwhip effect of COVID-19 pandemic. You can just go through this video and here it has been highlighted that how during COVID-19 we realized that may be suddenly there will be because shutdown was happening. Maybe tomorrow we will not get the grocery items. How we will survive? Tomorrow we will not get all the kitchen items, right? So, then we started stocking the items, right? We started purchasing more and more than what we are consuming, right? that is known as panic buying. So, this video is on that right how it can see now there is again the same population is there earlier they were let us say they were giving demand for 500 units now suddenly 1500 units it is coming right.

So, that means still the demand is same, but they because of the panic buying they started purchasing more right. So, this video is on that another case of Amazon giving customer what they want you can see just that this is highlighting all the impellers how and what customers are you know time to time they are it is not that for one product I will say tomorrow I need that product for other product may be I will say I can wait for 5 days. so amazon need to design the services as per that they need to operate their network distribution network as per that right maybe today i am cost efficient because i can afford 10 days delivery but tomorrow i want same day delivery of one product so then i am ready to pay higher so that these two videos you can just go through So, there are some concepts may be we discussed little bit about that or may be on that during this last 5-6

weeks journey. So, just quickly we will go through if we missed some points of supply chain system concept. So, this is holistic approach and interconnected system integrated system right.

So, that means it is not supply chain for one manufacturer, it is not supply chain of the raw material supplier, it is one complete supply. Let us take the example like the bullwhip effect we were talking about right, how the thing at one hand end is happening and it is. how it is reaching to the other end of the supply chain right. So, because it is system concept we need to avoid this bullwhip effect over lack in the information we are sharing right. So, you need to recognize the changes or disruptions whatever are happening at one end and because these changes or disruptions will have ripple effect.

How? Like I told you during COVID-19, we suddenly started realizing maybe tomorrow there will be shortage of the grocery item. Not only grocery item, let us say there was sudden increase in using the hand gloves, using the mask, sanitizers and mask price earlier may be 20-25 rupees, now it was coming with 100 rupees cost. right so because there was increase in the disruption happened in the jet supply chain right and demand because now every other person is using the mask earlier we were using rarely or when we were traveling or when we are usually visiting the hospital then we used to wear right but now you use after covid 19 during that particular period of two years especially you see if you are traveling through air right how many PPE kit you are bearing face shield face mask gloves all those things right so then this this is this disruption at one end happened so then raw material supply interrupted right shortage of raw material supply so ripple effect is there so this is total system concept we need to understand right total cost concept right this is one system concept. So, cost is also the total supply chain cost right. If I am saying that total supply chain cost is 500 dollar from starting to end that means, it is not only the manufacturer is bearing, some part supplier who is supplying the product is bearing, the suppliers of supplier some part is bearing, manufacturer is bearing, then the distributor who is distributing to 500 retailer he is bearing some cost.

So, this is total supply chain cost and in the end if I am saying the profit by selling one unit is 50 dollar, this profit is complete supply chain profit right. It will be shared throughout the supply chain, suppliers or supplier will get some margin, suppliers will get margin, co manufacturer, manufacturer will get margin. warehouse keeping all those people will get margin transportation agencies will get margin and your retail distribution who is keeping your inventory will get in the end some margin out of this 50 dollar right so total concept means total this will be so that means cost procurement cost will be there production transportation inventory storage distribution starting to end so complete supply chain cost will be there Now, in that we need to make the trade off. So, whenever

we are saying we we have seen we are making trade off when we designed our supply chain drivers in terms of efficiency and responsiveness right. So, then we saw that if we are spending more on keeping inventory we are more responsive right because quickly customer is coming we are meeting the demand.

But at the same time we saw that the price of keeping the cost of keeping that inventory was increasing. So, efficiency is compromised right. So, in supply chain we are making traders like that we are having so many different trader cost and quality. So, Amazon divided different customer segments like I quoted the example of P&G. So, for detergent, so may be for Surf Excel is for middle class family, then Nirma is for lower class as per the pricing I am saying, right.

So, they have identified different customer groups, accordingly they have designed the product, right. Pricing is done, but then yes cost and quality, cost is lesser, quality will be compromise somewhere, right. Cost and speed, Amazon if you want one day delivery, they will charge you 25 dollars. If you want 5-6 days delivery maybe they will charge 5 dollars right. So, then if you want standard delivery maybe 10 to 15 days then there will be no charge right.

So, that means, cost and delivery if you will reduce the cost obviously, they will ship when they are getting the economies of scale right. So, that way responsiveness is compromised inventory level and customer responsiveness because I am keeping that much inventory which I can meet may be the daily demand or may be the first half of the next day. So, suddenly if there is more demand right. So, then that means, so I will say no I will be stock out. So, that means, responsiveness is compromised, but I want to save in inventory right.

So, that I can do. So, this requires decision makers to carefully evaluate the implication of different choices. So, on one hand maybe you can somewhere you can say we can afford to be sometimes stock out, but on other hand you can say that yes we always we need to ensure the supply of the product, we need to keep that safety stock, seasonal stock if there is spike in the season we need to meet that because if today we will say no to the customer, next day that customer will not come back right. Another is bullwhip effect we have discussed this. obviously, information delay, forecast inaccuracies and order batching right. So, due to these are some of the factors where you know the bull whip effect is observed.

Order batching means Let us say the example we talked about that our retailer placed order for 50 units. Then manufacturer started producing for 75 units because manufacturer knows that for 50 units again we will change over to some other product. So, change over will take time let us produce may be 75 or 100 items and then we will change over to the next model. So, if we will increase the batch size the cost per unit production will decrease. right because we are now producing more economies of scale after standardization once you are set you can keep on producing right.

So, without any defect that way you can ensure, but yes then if you are producing extra to save that to get the economies of scale then you are spending extra to keep that extra inventory. So, there is again tradeoff between inventory you are keeping and the economies of scale you are getting by increasing the batch size right. So, bull whip effect may be in the best example in markets as when you are you know spending in the market you are buying stocks online right. So, when everyone starts buying the price is increasing right.

So, then if you will start selling. So, others are also feeling may be now because election results are going to be declared on 4th June right. So, then analyst those market analysts they are analyzing the if this will happen there will be you know. again rise in the stock price. So, that means, the demand is increasing when stock price is rising and then demand will decrease supply will be increased stock price will fall down. So, this is how it is working on market sentiments right.

So, means the again the bullwhip effect is there right if you are assessing may be 5 percent change your next player in the supply chain will assess it as 7 percent next you will pass out the information. Every time when we are passing the information that means we have multi stages. So, the many stages long structure you will opt so that means, that bull whip effect will be enhanced right. So, how much flat structure you can opt for your organization for sharing the information the accurate information you will get. If directly if something is happening in the market, if directly you are recording that without any bullwhip effect that means, that whatever customer is requiring you can supply the exact product.

coming to the value chain. See these are time to time I have talked about, but let us go in the structured way these all are non value adding activities and these are value adding activities. Having said that I am not saying that these HR activities are not required, financing, accounting activities, information technology. Information technology can be value adding can be non value adding I will tell you the So, these are those activities

which are supporting your these actions. Like if I will talk about information technology, how you will develop the new product if you are not having information technology to tap the information coming from the So, that means, in that way if we this information technology is helping you to develop the new product new feature that means, this is value adding activity, but if this information is helping you to keep the inventory level in the market at the safe inventory then it is not going to add any value for the customer. So, that means now it is non value adding activity.

Finance accounting will see one by one all these operations new product development. See if I am renovating my product I am providing a new features right. So, that means these new features customer is directly getting the benefit. So, this is value adding activity.

Marketing and sales. Marketing and sales. See, if I am recording your requirement, what is marketing? I am recording your requirements and accordingly I am providing you the customized product and services. That means this is value adding activity. Then again if I am providing you after selling this product, again I am coming up with the promotional offers and all that and in a way educating you may be how you can use that product, how you can after sale services also I am providing, right. So, that is a kind of or I am recording your feedback just to improve the services level, right.

So, then it is value adding activity. operations obviously core value adding activity because here you are doing all those activities which are converting your raw material into your finished one which is creating your you know space in the market profit in the market margins fetching more customers right distribution now distribution earlier maybe distribution may not be the value adding activity for the customer when you are going to retailer and picking up the inventory right, but now if distribution is doing the doorstep delivery so that means, it is value adding activity for the customer. Customer does not have time to visit your retail shop, customer do not want to carry the all the packets right, they want that it should be delivered at the doorstep then distribution is valuing activity because I am driving value out of that. like I talked about after sales services if I need some information related to how to install that how to use that something goes wrong with the functioning of that product how quickly I can get the after sales services how your customer care support is supporting all those points even if I am going for routine maintenance of that product so then how you are ensuring that supporting activity finance now the budgeting part financial planning investment planning working capital management how you will ensure the flow of the finance through the supply chain whatever you are doing whether you are maintaining liquidity ratio or not whether you are maintaining inventory you are investing highly in inventory or technology or not how

as a customer i will get benefit out of that so this financing budgeting all thing you are doing just to keep running your organization budgeting is required so that you can meet the demand you can purchase the orders you can pay for those orders and that part right so that means this is internal management of your organization customer is not going to get any value out of that accounting again if you are doing the you know audits are there why you are doing audits how much inventory is there so that you can keep the track of the inventory that whether we are keeping extra inventory or the whatever is required what are the assets available in the organization whether we are utilizing or not in that way accounting is related with the assets as well how we are keeping the transactions right when we are paying to our customer all these things you are you know sorry not customer when we are paying to our vendors right if 90 days 60 days payment terms are there when we are paying our customer this all you are again maintaining your internal supply chain nothing to do with the customer right information technology already I told you it can be value adding it can be known value adding If you are managing information within the warehouse to ensure the proper stock rotation, to ensure that inventory should not go obsolete, then it is non-value adding activity, right. Human resources, you keep on training, developing, whatever recruitment process selection, everything placement induction is happening. that is just to keep running your organization whether you have today 500 workers or 1000 workers i really don't care as long as i am getting my product with whatever specifications you have designed these are some of the factors we should consider when we are saying that the success of any supply chain will go through quickly supply sense how we can anticipate understand and respond effectively you need to sense the supply market right.

So, having said that that means, now we need to take care of your supply sources because your supply sources raw metal supplier are not only supplying to your They are supplying to may be to your competitors to some other industries as well. So, you need to sense may be there will be your raw material suppliers may be stock out because of there is excess demand or may be other players are keeping the excess demand. So, that they can meet that excess demand coming from the market during that peak season right. So, in that way you have to sense the supply. Then after sensing you need to respond, how quickly market conditions are changing, you have says that supply is also changing right.

So, you need to manage with the vendors, not only with the quantity, with the quality, with the variety, with the different types of grade of material we are using right. So, all those you need to respond to the supply. then deciding and committing this is the part where now you have decided and you start implementing your whatever supply strategy you have fixed or demand strategy you have fixed right so you will go for various strategic options you will set your priorities and make the informed decisions so that you

can you know ensure the smooth supply and demand of the supply chain so having said that we want continuous demand you need to generate demand right you need to sense the demand whether the customer are shifting to my customer group or they are going to my competitor group if so why they are going to my competitor group oh!! they are providing these many extra features or maybe they have lower down the price or maybe they are doing they are providing some promotional offers right. So, in that way we need to understand that their preferences we need to forecast the demand pattern and we will need to align our supply chain activities as per that. and once we recorded the demand we need to respond we need to how you will respond to demand you will start acquiring the raw material you will start planning your production scheduling sequencing everything you will do how many models you are manufacturing different models how many units are required inventory level you will set accordingly you will set up your and polish your distribution networks to complete to ensure the fulfillment processes are happening on time and final end delivery can be done right.

So, we can conclude here that. So, success of supply chain obviously, how quickly you are sensing the market right and then it is not only one end you need to sense your other end the backward integration you with your suppliers you need to sense right because if supply is coming from them only then you can meet the demand of the customer. And, then we need to take care of all the impellers and the customer is empowered, but in that way the manufacture is also empowered right. Manufacturing is having all the access if I am just I quoted one example if I am looking for one ticket. see i can get information from anywhere but on the same time indigo is also getting information make my trip is also getting information that there is need for ticket i need to travel from calcutta to delhi you see if you will keep on searching then you will get targeted advertisement in your social media website whenever you will open you will get that five percent down the price like this and when you will actually start booking the ticket then you will see there will be increase in the price because they know that continuously you are tracking that. So, both way customer is also empowered and supplier is also empowered in that way right and then latest development in terms of sustainability.

So, that also we need to take care because this now the coming era is we need to set up the sustainable supply chain where We need not only to ensure the delivery of the final product, we need to ensure how after the use of that final product can be again utilized, right. So, if I am ensuring that through my supply chain, my customer will be more delighted, they will feel more satisfied, oh this supply chain partner or this services provider is doing these kind of activities, let us go to him and get the services, right. So these all are references for your further reading. Thank you very much.