Logistics & Supply Chain Management

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Lecture 02 : Logistics Stakeholders and Modern Logistics Concepts

So, hello dear friends. So, welcome again to NPTEL online certification course on Logistics and Supply Chain Management. So, I am Dr. Vikas Thakur, Assistant Professor, Department of Humanities and Social Sciences, IIT, Kharagpur. So, in the first lecture, we discussed about the basic concepts related to logistics and then what are the different elements in the logistics right and we try to somehow we try to relate and we try to differentiate as well the logistics versus supply chain management. So, today we will continue next is the stakeholders in logistics right.

So, this is all the elements and stakeholders included in the logistics. So, you can see here If we will start with the one end where our suppliers are there, so this is not only the one layer of suppliers right, like I discussed about the very basic example from where we are getting the raw material for baking the bread and then we ended up with the with one organization who is extracting ore from the core and maybe some mining industry from where we are getting the steel and then that steel is used as wire in the tire manufacturing and we are getting rubber and we are getting all other engines and other kind of components we are using in the tractor right and so this is completely if you will say so different so many layers are there so suppliers of suppliers are there in the logistics network right so from these suppliers we need to actually we need to negotiate with these suppliers related to the product related to the quantity related to the price related to the delivery right so these all functions are there when we are dealing with the suppliers right so as a manufacturing unit I need to ensure that there are sufficient number of suppliers for supplying these different kind of components now there is always debate is going on whether we should focus on single supplier versus multi suppliers so basically but my personal opinion is if we are going for too many suppliers for the same component then also this is a problem if we are focusing only on one supplier then also there is a problem so we will discuss this in detail but for now if we are focusing on only single supplier so let's say something goes wrong with that supplier it's not only some disaster is happening natural or manmade sometime maybe the equipment are not working sometime maybe there is strike sometime different issues can be there and if we are just relying on the simple very single supplier so then there will be problem right our raw material supply will be interrupted so in that case i should advise that we should have two three vendors

or four vendors depending upon the criticality of the raw material if that raw material frequently facing some problem issues related to quality related to delivery or maybe the raw material used for making that component is not readily available or other issues are there so maybe that number can increase to 5 to 7 but again too many vendors it's very difficult to retain all those vendors for a longer period of time the first point is whether you are able to give them large number of orders because if order quantity is also less how you will negotiate with respect to price. if that quantity is not there obviously they will not be able to target economies of scale so obviously they will be least interested doing business with the kind of organization which is not feeding them large orders right so these are some of the issues with you know multi vendors but then there are pros and cons we will discuss in detail in the later sessions right so this is you need to maintain a relationship with the suppliers as a logistics partner then procurement then procurement obviously will happen with the suppliers this is a process where you will be negotiating with respect to your order quantity order frequency volume and price right and then this is supplied to manufacturer where the final assembly of your final product is happening this is a kind of production line you can say or assembly line where we are usually converting our raw material into FG's finished goods. as a manufacturer this is not only one again like we have multi layers in suppliers we can be having multi layers in manufacturer as well there may be co manufacturer there may be manufacturer who are preparing sub assemblies for that right so let's say if I am manufacturing any home appliances right home appliances let's say we are manufacturing AC So, we are manufacturing AC, but we are not very good with the handling of electronic component, whatever motherboard we are inserting inside, programming control array we are inserting inside, or electronic components whatever we are using inside.

So, because we are not good with that shouldering process, embedding those electronic components on the board. So, what we can do is we can outsource this to some co manufacturer and that will be producing the sub assembly and will be giving one motherboard which we will be placing or fixing in the final casing of that AC right. So, there can be so many manufacturers in this finally, this is that beautiful thing which for which we all are fighting and we are struggling day and night and making this beautiful thing happen and readily available for the customers so this product again how you are designing the features so obviously that information is also coming from the your logistics partner depending upon the customer preferences then inventory you need to keep so that you can ensure the continuous supply to the market now this supply to market obviously depends upon demand as well So, somewhere you need to make the equilibrium between demand and supply and because always there is gap, so you need to maintain the inventory. So, we although we are focusing on zero inventory, but yes that is something is a big question and where we can focus for zero inventory specifically, so that also we will discuss. now the other player in the logistics management is your retail

industry now Indian retail or other retail industry foreign retail industry also it's not always we are getting the organized retail sector right so we have organized retail industry as well and we have the fragmented retail industry small small shops are there right so as a logistics partner it is not important only that you are supplying to organized retail industry because they are the major players carrying the maximum share Indian market they are not carrying the maximum share because maximum share is taken by the fragmented retail shops right so But, yes you need to meet the demand of the both right whether you are going for a local shop through local shop or you are going through some organized store.

So, multi brand store, one stop solution market kind of things are there. So, next important thing which is contributing around 50 to 55 percent to your cost is your transportation and when we will talk about transportation in detail. So, we will be talking about different modes of transportation whether you are going through air, whether you are going through road or you are going through ship or you are going through trade. right all these modes you will pick depending upon first is availability of infrastructure then if all are available then you will see ship is may be efficient economically maybe train is efficient economically but then you need to have that much infrastructure right you need to ensure the delivery also fast delivery so then if you are talking about same day delivery something air which is very expensive can be expensive so you have to go by air as well and road because this is taking the maximum share but it is not efficient it is not efficient because of two reasons because the distance we are covering obviously the fuel cost and all that if we will consider that is also very high but the other thing which is major point is while we are going through road transportation there are so many delays there are so many planned unplanned delays we are depending upon the road condition accidents are happening weather conditions and then there is for documentation or clearing the boundaries from one state to other state all those documents you need to may be tax structure and all that very rigid tax structure is there so you might have seen long queues of trucks standing on the border right so just waiting for clearance so this road transportation since taking the maximum share but so many challenges are there as far as this transportation mode is concerned. talking about distribution network already i told you whether you want your customer should visit to your retail shop or you want to deliver the product to directly to the customer doorstep that is up to you which model you are offering which model your industry is offering you have to be competitive in that way so you have to take that so talking about these small terms already I have discussed quickly will go through order placement which customer will place the order right for goods or services highlighted on your website your portal or whatever interactive medium you platform you are provided to the customer order is processed as a seller you will record the order and you will start processing the order then inventory management obviously to avoid the stock out rate and also the excess inventory is also avoided right

and then whenever you are reaching that let us say this is the inventory level and then you start depleting your inventory because you are meeting the demand.

So, inventory will start depleting. So, you need to decide which one is the safety stock. At this safety stock again you need to place the order and you need to replenish the inventory at this level. So, again inventory will start depleting. So, then that means again you need to replenish this.

So, this cycle will keep on going. And, we will ensure that inventory is always there to meet the either your expected demand or unexpected demand. Warehousing is another very very important element, why I am saying that because it is strategical location we are defining. How many warehouses should be there? so because we are storing that and the other concept is we should locate warehouses maybe near to our final customer so that we can easily and speedily deliver the end the product to the end customer right but then again the efficiency is one part if we have so many different facilities so cost will be there in warehouses instead of one we have five warehouses so obviously that much manpower is required obviously those many instruments are required that much infrastructure is required and all obviously inventory level will also increase because instead of maintaining inventory at one level Now, we are maintaining inventory at 5 different locations and why this is strategic location? Once you start investing into this kind of decision, this is long term decision. You cannot withdraw overnight right because this includes use investment is there in terms of when you are making investment into your fixed assets.

Then picking and packing, obviously your order will be picked from the inventory and your distributing partner will be distributing to the end customer. so transportation so transportation of packed orders from warehouses to the destination will be ensured and again as i told you mode of transportation are important so delivery that depends upon whether you are going for last mile delivery or customers are visiting your location right so as per whatever customers are recording their addresses so usually you might have seen when we are going on amazon website or flipkart so you can quickly check the availability whether that availability is there in your pin code or not right so that is another service point which is being evaluated for any e-commerce player whether you are giving your services in that area or not right so obviously they are trying to cover up as many pin codes as possible But, yes so this is not one day game. So, when these e-commerce website they started operating in India. So, firstly they started collaborating with the other players which are traditionally not into this kind of business, but they have the network. Indian post office because Indian post office can be a kind of delivery

partner which is having offices in almost all the pin codes they are covering all the pin codes right.

So, if you want the delivery to every end customer so then obviously the best may be strategic decision may be you can collaborate but then how much control you have speed quality those all things are there so they these all e-commerce player they started developing their own network distribution network right so then order tracking is something now if you go for indian postal services they are also providing you tracking id earlier it was not there but now you can also track that but you just imagine the tracking speed or the information provided with the amazon or flipkart or ebay or mantra any any e-commerce player or zoomato when you are using your daily items from there right So, though that much level you cannot expect from the very traditional kind of speed post services or the normal post services right. So, order tracking is something these days is very very important. the customers are just clicking the order placing the order and they just want to get the information whether the order has been accepted whether the order has been processed dispatched if dispatched where it is right now because as a customer we have limited time and we are keeping the things for the last hour and then for last hour only who are giving us all those services and making all those promises that will deliver you within 30 minutes will go for only those players right and then customer service i talked about all the services which are providing the product or services to your doorstep but this is something after sales returns so returns can happen because of two three reasons first is you simply did not like the product and then again one click and you are sending it back so this is a big big challenge for us but yes with one click you can send it back another thing is if the product is not functioning properly so it is under warranty guarantee period again we need to provide the spare parts we need to pick the product we need to repair the product or maybe the engineer is visiting the customer site right or the third thing is which is leading towards sustainability so what is happening in the end stage of life so end of life what you are doing with that product if you are promising something with the customer at the end stage will take your product will be compensated in somewhere may be right or will try to may be again renovate that product will try to because any product life if you talk about ac if you talk about refrigerator you are using if you talk about fan if you talk about all those appliances you are using only majorly three four five components are there depending upon the product which are age limited right rest if you talk about all other components screw inside you are using you can use for years together the casing body plastic parts you are using you can use years together the wire you are using here too so the only limited age product components you need to identify maybe the motor of the that appliances or whatever product you are using maybe the capacitor maybe the other very crucial components right so how you can extend the life of those components or maybe you can simply replace

those a those products who are failing because of their age so you can simply replace those many components may not be again we can apply 80-20 rule so those 20% of the components you can easily replace then feedback and improvement you might have seen after every packet we are delivering to you so again customers are being asked whether the delivery was ok whether you served the hot food quality of food all those things even if I am not responsible for the food quality even then I will be rated for that right so that is something some parameters are beyond control but if I am taking only this as logistic partner if I am only the logistics means delivery partner if I am taking this as complete system so that complete feedback is important so now the logistics management if we will talk about it is the planning implementation and control of the movement and storage of goods services and related information already we discussed about it and when we are talking about the movement it should be efficient and effective flow of material we have to ensure the smooth supply right and then It entails strategizing, executing and overseeing the flow and storage of goods and services and related information across the supply chain. So, obviously, in the end we once the system is set up then we will go for the optimization of this movement of goods or the flow of information whatever we are capturing through that network. so logistics management plays a pivotal role in maintaining the seamless operation of supply chains and empowering business to attain their operational and strategic goals right so if quickly we will talk about the advantages if we are managing our logistics effectively first is efficiency obviously efficiency will be improved because we will if we have proper planning we have the plan a plan b plan c we can reduce the impact of the interruptions that interruptions can be in terms of disaster natural disaster floods earthquakes can be anything or maybe manmade disasters like or maybe shutdowns right because of recent covid 19 pandemic so those all things we can manage efficiently if we have that strong network of suppliers manufacturers and our the next stakeholders delivery partners so we can always reach to our customer efficiently cost reduction obviously if i can optimize the transportation route so best route as per traffic best route as per distance right as per road condition as well so if i will pick the best route obviously i will be cost efficient i will be saving time as well during the transportation then obviously warehouse operation and inventory levels this warehouse operation and inventory levels i will show we will discuss in detail about this but now we are going towards where these warehouses will be totally man free there will be no human being involved in the warehouse operation robots will be working will be maintaining the inventory will be updating the inventory so in that way we can utilize the maximum space within the warehouse because that only space will be left out the minimum space for the movement of those robots right or we have the lifts automatic lifts right.

So, those we can use and we can reduce the cost of manpower cost as well and 24 into 7 days those machines can work. Obviously, customer satisfaction if they are manually we

are handling the products we may damage the products right always we are not able to take the precautions right if electronic components sometime we are handling or fragile components we are handling we may break. So, that happens in the inventory also this comes under material handling cost where we are damaging while handling we are damaging the products as well. right so that is also cost and sometimes these damaged products are finally shipped to the end customer so then there is a big question for customer satisfaction right so with that quality of product timely delivery of the goods so efficient logistics management will lead to your customer satisfaction and obviously if they are satisfied they will be loyal customers to us and will help us providing the competitive edge over the others because we are superior in terms of providing the services we are providing the fastest delivery possible and we are also very efficient right so these are some of the advantages then risk management if we have the proper planning logistics management we have inventory in the warehouses so that risk of stock outs we can avoid transportation delay if raw material is coming on the way something goes wrong right so even we have that safety stock we can still continue the production line we don't want that 500 workers who are working on that one production line they will just sit idle just because of we we are not having one screw or maybe we are not having the other component glass we are using inside the car steering wheel we are not having or gearbox we are not having may be the component is very small but until we will plug that component in the final product we cannot say that this is finished right and if it is a kind of product kind of layout is there so if let us say we are falling short of inventory at 15th stage so all the stages after 15th stage will be interrupted because if we will not perform that operation we cannot go for the next one because all other are depending on the preceding one. so that way also we can avoid the risk and then resource optimization will go for proper management we can resources in terms of vehicles because now we have proper routing plans so we can optimize the vehicles in the proper way.

warehouse space we can manage we have automation kind of system manpower we can optimize these resources we can optimize efficiently and profitability so the next point is market expansion so market expansion is one thing if you are going for your product is only possible when you have logistics distribution network up to that market this is as simple as that if you don't have shop to the end point there is no point of expanding the market or maybe advertising your product to that particular market because you those people don't have the access to your product so first to advertise that product in a particular area you should have your distribution network that's why so many collaboration in India also happened just because of foreign companies they came here they wanted to set up their manufacturing hubs here but because this this because huge network is required to distribute the product to the end customer that's why the reason is the collaboration between Hero Honda, Maruti Suzuki so Honda was very good with the technology in two wheelers Hero already they were into Hero cycles so they were having

vast network to cover almost all regions in India so Honda thought it's good opportunity we can collaborate with hero we can just exploit their or utilize their distribution network so this is how you can go for the market expansion so then comes the part of logistics designing and management so again when we are saying designing and management so obviously we need to take care of the first stakeholder who are suppliers how many suppliers you want is the first point then how many manufacturing plants will be there let us say we are having two manufacturing plants now may be the same model whatever model m1 we are manufacturing here we are manufacturing m1 here as well right So, whatever raw material for M 1 is required let us say this raw material is coming from supplier 1. So, this raw material will go to from supplier 1 will go to your plant 2 as well right. So, that means, you need to design the distribution network. you need to take care of your, the first two stakeholders, first is your supplier and which supplier is going to supply which plant, plant means the manufacturing facility. Once you are ready with your finished goods, now they are ready to be shipped.

So, here you are loading those final product and now they are ready to ship to the final destination and final destinations are your warehouses. this distance how you will cover is important right this distance which mode you will pick to cover this distance will define your cost function your quality your speed everything we discussed earlier so now these are the warehouses again because strategic location we have done for deciding the warehouse facilities and not only the location, but also the capacity of that warehouse because again we want to utilize the maximum capacity. So, maximum capacity utilization we need to ensure. what is the customer potential in the different markets depending upon that we will assign that these location will be served using this warehouse right so this is overall distribution network but again we have separate session on designing distribution network we will take care of all the elements in that right So, logistics design and management again involves the strategic planning, coordination and execution of various processes within the supply chain to ensure the efficient flow of goods, information and resources from the point of origin to the point of consumption. It encompasses the activities such as inventory, management, warehousing, transportation, order processing and distribution.

so effective logistics design will say only when we are able to minimize the cost customer satisfaction is maximized and we are taking care of the sustainability parameter and we can mitigate all the risks right on the way already we discussed little bit about what can be the risks right we need to analyze the demand patterns and accordingly we need to decide the transportation mode we need to find the inventory level at different warehouses because that demand patterns will help us to find out how much inventory we need to place at particular storage location and obviously tracking when you are tracking

and monitoring continuously you will come up with the feedback kind of thing and then we can go for the further improvement in the overall supply chain. so now logistics design and management let us explore some key core elements in that so already we talked about strategic planning because it's a long-term planning how you will set up your facilities warehouses mode of transportation that all is called for your top level management and you need to align your business strategies whether you are going for expansion if you are going for expansion so you need to expand your warehouses your facilities right in that way so inventory management is another key element in that we already discussed about we need to balance that supply and demand how we can do that We need to forecast properly and we will see what are the different forecasting techniques in the subsequent sections and we will try to optimize and be cost effective in managing your stock. Obviously, warehouse management we need to manage the capacity of the warehouse more efficiently and maximum utilization of the capacity should be ensured. and transportation depending upon infrastructure, depending upon the mode of delivery, how much fast delivery is required for particular item, how much cost you can bear for that, quality level required, so that will decide your transportation. order processing once you enter the order from the customer side you will start processing and you will start distributing to last mile delivery using your fastest network and minimizing the cost right and then obviously to ensure that you should be equipped with the latest technology and in that you will talk about RFID this is a huge you know intervention technological intervention RFID where you can quickly scan the product barcode and then you can just locate the where the item is whether the item is depleted on the inventory shelf or you need to produce more so that you can easily track with the help of technology.

So, I talked about UABs Unmanned Aerial Vehicles where you can deliver your packets through air space and within 30 minutes that is possible using this and then GPS enabled services to optimize to monitor the movement of your goods through the network. So, continuous improvement obviously, when we will talk about all these parameters elements factors we will develop some KPIs and then we can identify those KPIs and we will work on those KPIs. There are some modern logistics concepts. So, we will not discuss in detail in this session, but yes just a brief introduction about that we can go for first very important is and obviously, requires our detailed observation on that but quickly lean logistics is one concept where we will try to reduce the waste in the logistics part waste of extra transportation waste of inventory waste of extra movement of the material waste of over processing waste of over production waiting time so anything these kind of waste we will discuss in detail and then we will try to make our logistics as lean as possible only will minimize the waste will add directly to the profit this is for sure. The second concept is which is not very new quite old now just in time, but again

we need to define what are those items for which we can go for just in time kind of system right.

maybe if there are small components and the price is not very high you can store those components right but if components are very costly right and adding maybe only those 20 percent components which are adding again 80 20 rule which are adding towards 80 percent of the cost right so then you can go for up to some extent you can go for just in time so for ensuring just in time you need to align your suppliers near to your manufacturing unit and in that way your demand prediction should be very very accurate and then only you can design kind of system where you are not thinking of keeping any inventory. The next concept is agile logistics which is again the evolution of your logistics function. here we are talking about the flexibility and responsiveness right so we need to have dynamic supply chains how we can have dynamic supply chain when we are continuously feeding the information to the supply chain stakeholders who are taking the decisions based on that information only then we can quickly response right if anything goes wrong at the customer and we should record it why the customer received the damaged packaging why the customer is not happy with the product delivered why the customer is not happy with the returns right so this this is only possible when we have quick system of information sharing right and any interruption is happening we have the second plan right so only then we can say we can explore the opportunities and we can grab those opportunities the next concept the modern concept is green logistics because the customers now yeah there are some restrictions from the so many regulatory authorities are there who are continuously focusing on going for green products green supply chain and green logistics and obviously we need to minimize the carbon footprint that is the sole purpose right so in that campaign many customers the common man is also finding their self very relevant only then they can contribute towards reducing the total carbon footprint right so they also want to you know minimize this is the latest one case study I have gone through where if you talk about European market US market 12 nations customers are preferring the delivery partners or the e-commerce players who are doing the last mile delivery using any electronic vehicle or cycles so they are placing more orders with those kind of players right so in that way we have to be maybe eco friendly when we are using fuels vehicles maximum utilization should be there and renewable energy sources we should be using the next thing is collaborative logistics so obviously because so many interaction points are there between different stakeholders like we explored the supply chain of bread right how you are manufacturing bread this only possible when you are having collaborative logistics network right so that is another point collaborative collaboration cooperation can only be ensured when you have very strong relationship with the suppliers not only suppliers but all the stakeholders in the supply chain right for that you should be having very quick in sharing the information so one complete channel of information sharing should be shared with all the stakeholders

omni channel logistics there we are now we cannot say that we will sell our product using our own website right so if indigo will say this that we will sell our tickets through only indigo website that thing will not work right so indigo is selling through make my trip indigo is selling through goibibo through exego through their personal website through irctc through so many different platforms right so when demand is so segregated coming from anywhere right so in the end as service provider you are limited with the capacity maybe seats are 130 seats are there in one plane right how you are then meeting the demand coming from different channels so in that way your information system has to be very very strong right how you are tracking the things should be very very strong so this will happen only when you have the input from the market you have proper inventory with you seats number of seats you have and then you have flexible fulfillment options right and these are ensured through synchronized logistics process then reverse logistics is next concept when the customers are not happy with the products so they can return and i told you the two three things they can return just because they are not liking the product they can return because it is damaged or maybe it is not working properly or once it is used fully they want to recycle remanufacture or reuse that so in that way how you can help that so that it can be as a maybe circular economy kind of concept we can implement for that in the end we will talk about the supply chain visibility and towards the end of this whole course we will be seeing that there are so many different platforms and latest technological developments which we need to be updated with those technology with those technological interventions only then we can survive in the market right so for getting quick information if you have that latest information you can manage all your logistics all around right you can manage your distribution part your transportation part how much you need to store in the warehouse which model you need to store right what are the preferences if you talk about the regional basis if you have that information close connection with the customer and then once you start supplying the product that visibility throughout the supply chain customer wants they want to track where my packet is right now right so that visibility you can only offer if you have the latest technological intervention within you so in the end we can conclude that logistics design and management is a dynamic field requiring meticulous planning and execution to facilitate the smooth flow of goods information the resources among the various stakeholders so all the stakeholders we need to take care we need to integrate and then we need to ensure that all not only the resources or product is passing through smoothly through all those stakeholders but that information should also pass so that we can take the you know information supported decision for further making the further deliveries so these are the some of the latest development when we talk about logistics management and I have tried including one session on each of this because it is very important as far as the latest trends in the industry concerned and as well as the research going on. So, these are some of the reference books you can refer and already I have named these books and the content has been prepared from these slides. So, thank you very much.