Logistics & Supply Chain Management

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Lecture 12 : Reverse Logistics

so hello dear friends welcome back to NPTEL online course on logistics and supply chain management so till now we discovered about what are the various elements of logistics and then we talked about the logistics industry and obviously, the Indian scenario, Indian industry structure, and international industry. When we talked about e-commerce platform, then you saw that there is no boundary. So, whole world is one market. So, then we talked about what are different KPIs, key performance indicators, if we talk about logistics performance, overall performance of this distribution network. And then we talked about some of the tools we can use to improve those KPIs and how we can benchmark the best practices in the industry and we can go further for the improvement. Now, there is other aspect of this logistics distribution network that is reverse logistics.

This is equally important as we have seen when we discussed about the industrial scenario, we talked about so many different facts and figures and we talked about that, the return rate is very high which is around 25 to 30 percent in some of the cases and maybe more than that also. So, this reverse supply chain is also equally important and which is we can say another parallel system like we were initially delivering the products from the raw material suppliers to the end consumer now the reverse flow will be there and it is equally important so we have to be equally efficient in the reverse supply chain as well right so challenges are used in terms of that because you cannot charge anyone for this managing this reverse supply chain okay so this is additional cost but yes how you can explore this area further you can do more research on that where this reverse supply chain can be one of maybe the very efficient source of income how efficiently you will use your or recycle or remanufacture your maybe unused products or used products or maybe we will talk about different scenarios how when we require this reverse supply chain right. So, this is also a kind of opportunity. So under this session, we'll try to cover the basic concept of reverse logistics.

We'll see how reverse logistics is leading towards green logistics and somewhere to the

sustainability dimensions as well. And then we'll talk about reverse logistics versus your traditional logistics supply chain. So already I talked about the forward flow and reverse flow we need to maintain. So, why it is important? We have seen in the previous sessions why reverse returns, managing the returns is so important in these kind of scenario. Then we will see key aspects and process of reverse logistics.

types of product returns what are the types of products we are handling when we are talking about the reverse supply chain and what are the factors responsible for reverse logistics factors improving the efficiency of your reverse logistics right and then we will see the performance measures overall kpis in that case we i have included a couple of case studies small case studies how they are managing beautifully this reverse supply chain and the brand image they have developed using this reverse supply chain concept is marvelous right and not only the brand image they have added to their revenues as well right so we'll start with the very basic introduction of reverse logistics as I mentioned is the flow is in the opposite direction right, where we are handling the waste and returns. So, it is not only always the waste right, it can be the fresh product as well. If I am ordering something from Amazon, Flipkart, eBay, I simply did not like that. So, then it is another kind of you know the journey will start which the product will take the reverse route and will be shipped back to the seller right. So, in that way that is unused product and if you will talk about used products.

So, then it is waste how we can handle those waste it is not only the disposal of that the waste is the ultimate alternative right. So, we will try to explore what other things we can we options we have where actually the opportunity lies and we can you know explore those areas right. So, other terms used for reverse logistics is retro logistics, reverse supply chain, reverse logistics flow, reverse flow, backward supply chain, return management, after market logistics, after market supply chain right. These are the terms frequently we are using, but yes you need to take care when we are talking about the reverse supply chain and reverse logistics. Logistics, reverse or forward logistics takes care only about your transportation, warehousing, distribution, but supply chain when we are talking about whether it is your forward supply chain or reverse supply chain will include all the activities within that supply chain, starting from your raw material extraction, your packaging, manufacturing, within manufacturing unit, how you are preparing your assembly lines, manufacturing lines where you are converting your raw material into finished one, then final packaging is happening, then marketing of those products, recording the order, selling the order, distributing the, all those things is big picture of supply chain.

So, logistics is part of that, all we have discussed already, this logistics versus supply

So, this can be defined the waste and returns along the supply chain sometimes we are reworking on those waste if under warranty periods we are repairing we are replacing the components and then again we are sending back to the customer or may be we are selling back to the customer. it is not only in the same market sometimes we have secondary market concept as well where may be your product is not available for may be as a fresh product for the primary market then the as a concept of may be primary copy first copy or may be reworked or repaired or may be your refurbished product you are selling those products may be at reduced price in the secondary market as well. So, before proceeding further I will just highlight the concept with some examples or scenario how it is happening. See we have seen we have the raw material suppliers from where this distribution network is starting. These raw material suppliers are supplying that product to the raw material or component to the manufacturer from manufacturer we are having that distribution network so most of the time for distribution I am writing this term so if I am writing this so audience can just take care of this so distribution network is there network usually I am writing like this and then in that end stakeholder is your customers.

So, this is how the product is flowing in one direction from your starting from the your raw material suppliers ending with the consumption point. When we are talking about your returns. So, returns now let us talk about you deliver the product final product to the customer now this can come back from the customer in different options how it can come back from the customer first is customer did not like the product and simply returned it as customer returns right this is simply this is unused product full value of the product is there but product value is there but the problem is that customer destroyed the packaging so again challenge is there So, customer destroyed the packaging let us say I am buying shirt. So, previously also I highlighted for packing the shirt so many components are required, they are using steel pins, they are using plastic pins, they are using card papers, they are using so much stuff in that. just to you know ship that shirt properly to the customer right wrinkle free kind of thing or you should feel that actually you picked that shirt from the retail shop so that feeling just to ensure that feeling we are shipping the product with that care that you are getting that feeling right but when you obviously when customer received that product even in the first instant he did not like that product but even then he is going to try that shirt right shirt trouser whatever you ordered now while trying that obviously you will damage the packaging so those components sometimes some customers are putting back in the packet and that is open packet when we will transport those things so obviously we will misplace so 100% packaging recovery is not cannot be ensured is one big challenge right and then the returns we will talk about how then we will process these kind of things then returns will come under warranty or guarantee period right now warranty and guarantee period how this is posing as challenge sometimes if because most of the times what is happening if it is under warranty period so your service partner or your service employee who is

providing the services will visit on site will replace the components free of cost so that means those components will be coming from the your forward supply chain forward distribution network so you will be replacing those components under warranty guarantee if it is not so maybe then you will ship it back to the manufacturer maybe from this network only or maybe to the manufacturer directly that depends upon the design structure what type of supply chain you are following the third one may be end of life product what if the product is totally consumed right end of life so any home appliances will take as example home appliances so you can see if I'll categorize home appliances as one industry which is not so refrigerator is different industry AC is different industry coolers different industry TV is different industry so washing machines all those different industries are there right but let us say home appliances one industry right so you see end of life the maybe the average age of any home appliances will range around somewhere to 12 to fifteen years right this is the average age so maybe if you are using properly or providing the services using with care it may extend to twenty years eighteen to twenty years if not that much care is given maybe it will end up on maybe in the eight or ten years as well and then depends upon the nature of the product as well right now you see if we will talk about all these home appliances so major major components used in that are may be for long period of time you can use if I will talk about refrigerator if I will talk about AC the outer container part is of plastic all the plastic components all the steel components there will be no wear and tear right very minimum wear and tear so may be the overall life is 12 to 15 years but these components you can use for 30 years as well right so this much time period for means you have not calculated properly the age of every component which is quite obvious because this is a economic structure as well we need to understand because if I will say this AC you can use for 100 years or 50 years so then what as service partner my stakeholders will do and then after then again I have to sell the same product in the market so somewhere they need to maintain that marketing strategy as well right but i am just talking about if we are not looking for if we are concerned about the environment we are concerned about the sustainability reverse supply chain or green logistics then we are talking about these terms end of life how we can extend this end of life this is the concept right now I told you so many steel components or plastic components you can use maybe for 30 40 50 years so but the motor age is limited electronic components age may be limited so what we can do we can go for a kind of maybe a modular design if any problem in one part let's say if I am talking about TV if there is something wrong with the sound panel I'll just take out the sound panel will fix another sound panel it will work properly right so I need to figure out what are those components which got limited life in terms of maybe 10 years 12 years or 15 years and then as a stakeholder providing the services may be I can replace those parts only which are limited with their age and in that way I can extend the life of that particular appliances same is the case of AC if you are using AC may be something goes wrong with the motor outside motor right then again you can replace it you know after

this much of time period it will there will be wear and tear and it will we stop that functionality will be stopped right.

So, in that way you can find out if there is problem with the your circuit you are using inside that board you are using inside you can simply replace that board if it is problem with the inner unit or outer unit wherever right. nutshell we can conclude that the end of life how you are managing of your product is very very important and if I talk about a very good example of your aqua guard who is not selling the products what they are selling the they are not selling the products no they are selling the services now if you will take water purifier from aqua guard they are giving you kind of annual it is there for many other home appliances but this strategy is prominently used by aqua guard and the beautifully they have leveraged on this strategy amc annual maintenance contract they are giving may be for 1 year or 2 year or as long as you are using that product you have to use that till the end of your life we are not talking about the end life of that product we are talking about end life of the customer so as long as you are there you will be using aquacart so you will purchase AMC annual maintenance contract in that if anything goes wrong with that purifier free of cost it will be replaced it's not free of cost because already we purchased annual maintenance contract so in that case you can use it without you know any hesitation or if something goes wrong with that you need to replace the product. So, then that much waste you will be generating what you will do with those electronic components right that will be directly waste you are throwing in the environment there is no reverse supply chain right. in that case aqua guard is what they are doing anything goes wrong with your purifier they will replace you free of cost as long as you are under AMC you can imagine same if AC industry because every other day when there is season you can see sometimes cooling is not properly sometimes you know water is coming out of the inner unit as well sometimes your remote is not working sometimes so many issues with the outer unit with the inner unit right so that those how because as a customer you cannot be so aware about that product and technology or you know the components and pricing and all that so let's imagine if AC company some AC companies are there they are coming with the proposal that it's our unit we are fixing as per the requirement size whatever cooling requirements are there size of the room will fix the unit and it is completely our responsibility will maintain as long as you are taking our services when you will say we don't need services we will take it out right so because as long as you are in that particular environment you will use that AC so how you can minimize you know your cost of operation that is win win situation for both suppliers also and customer also because they are taking care of your services part and for manufacturer they will be looking for more sustainable technology more sustainable raw material which you can use maybe the quality of even the plastic and steel components which you can use again and again will improve because they will try to maintain it as maybe for 100 years or more than that because as long as you are my customer you are

kind of giving me revenue every day because I am buying your AMC's so this is the concept why this reverse logistics is required so we will just quickly go through some few definitions of reverse logistics is going the wrong way on a one way street which is quite obvious because this is wrong way but yes the importance you can just imagine just I spent some time on explaining why it is required then by carter and elram you see the return upstream movement of good or material resulting from may be reuse recycling or final disposal so final disposal can also happen like we talked about here we missed if any product which you cannot use so that will go for final disposal there is a again debate on this we will discuss separately on disposal there is nothing like that this is totally waste and it should be disposed out completely we should be able to you know get some components out of that product and maybe we can use in the next preparing the next product if not so can we use some part of that product as a raw material for some other industry let's say if you are using steel in maybe in your car right or maybe manufacturing aeroplane or maybe manufacturing these kind of things where you are using steel right so now after using that car for 20 years 25 years maybe now it is of no use now you want to dispose of completely So, even then that steel value you can recover may be that raw material may not be used manufacturing another car, but yes that can be used for may be manufacturing steel rods, steel sheets which you can use for roofing purposes. Where may be the safety parameter in that way is not that much you know important and we can still use that as we can melt that steel we can again use that steel right.

So, this is how may be the after recycling that material components you discovered may not be useful in the same industry, but can be potential source of raw material for some other industries right. So, some other definitions you can see reverse logistics under the umbrella of product recovery management which I talked about how you can recover the product, how you can recover the value out of this. If you talk about council of logistics management they have defined this planning, implementing, controlling in a efficient and cost effective way the flow of raw material in process inventory, finished goods and related information from point of consumption to the point of origin right in a reverse way now we talked about this structure and obviously from here we are collecting all the waste in terms of byproducts in terms of waste in terms of rejected material in terms of warranty in terms of end of life in terms of fresh returns so obviously as return what you will do you will store it in some warehouse and then there should be some refurbishment center where you will be recovering the value of that may be again you will be cleaning the shirt you will be ironing the shirt you will be applying all those components to pack in a proper way primary packaging is destroyed again you will put new packet secondary packaging is destroyed again you will put new package and then labeling and then billing information also you need to provide so that it should be quickly available in your distribution network again for reselling that for reselling that. So, this is the complete

network how you can use this. So, let us see quickly reverse logistics versus forward logistics like the example already I quoted from raw material it is going to manufacturer from this then distribution chain then a retail industry then customer is picking up.

so this is forward distribution network reverse we have collection centers there is consolidation center because if we are talking about let's say twenty to thirty percent returns so if we are selling hundred items thirty are coming back so that amount is not so big right so how we need to consolidate this is very important thing right consolidation and sorting of the packages why sorting of the packages is required let's say when i am going through my forward supply chain i sold today may be one shirt through amazon may be one toy may be one refrigerator may be one ac may be few your grocery items and likewise so many different things are there right so these different see shirts are coming from some clothing industry toys are coming from those kind of manufacture players refrigerator coming from higher hitachi ac coming from hitachi samsung so many different players are there grocery items are coming from amazon fresh and so many different suppliers are there right so in that way it is organized because this flow is coming from one industry all the clothing are coming from one industry may be so many different players in that industry but shirts clothes are coming from the clothing industry but when I am interacting with the customer may be customer 1 2 3 4 this is returning the grocery item this is returning the shirt this person is returning the shoe and may be this person is returning some grocery item right so in the end when I will collect it in the consolidation center where I will ship those items right so your mixed up items are coming so then becomes important that you should have some sorting centers as well consolidation and sorting centers where you will sort industry wise right and then you will try to recover the value out of those products. So, this is again very important to understand it is not that easy to set up as we set up the forward supply chain we can quickly set up the reverse supply chain the obvious reason is because these products are coming from different industries from the end customer right and different customers are there so let's try to address reverse logistics versus green logistics obviously when we are talking about reverse logistics we talked about product returns marketing returns country returns whatever are coming when we are talking about green logistics so we are taking care of the environment while we are distributing the product so end mile delivery we talked about using electronic bikes right cycles right how we can pick the customer pickup locations where we should use alternate resources we should not use fuel as may be petrol or diesel which is depleting the environment right so those many and in packaging also recyclable packaging should be used you should not use plastic how you can minimize the packaging size that all that will take care of your green logistics right where we are completely concerned about environment right sustainability is another dimension where in under sustainability we will not only take care of environment we will take care of social aspect also and we will take care of your economic aspect also all

these three will take care right reverse logistics we are actually adding to green logistics and sustainability in that way but we have to be efficient but green logistics only takes care about your environment and if we will talk about all these three concepts are working towards either we should recycle the material we should remanufacture or we should be there should be reusable packaging right so there are concept of three R's how we can reuse how we can reduce how we can recycle reuse the same product we can reuse if it is not at the stage of end life again how we can ensure that reduce how we can reduce we can reduce the usage of the product or may be throwing rate because like I mentioned you so simply if you are you know purchasing aqua guard services you will not think of throwing out your aqua guard after 10 years, 15 years as long as they are maintaining you are giving them the annual maintenance charges. So, this is all about this concept. So, we will just go through this video and we will see how this concept of reverse logistics is implemented in industries. Yes, so we have seen in this video that how many products are coming back and year and over year this number is increasing and this now is significantly contributing towards taking the share out from your margins.

So, it will not take care about the efficient flow reverse flow of this product that may hamper your productivity in a longer run. So, quickly we will go through what types of products are coming in return already we discussed about the return of unused products. So, we talked about if customer did not like that size was not proper other issues you might have seen the listed reasons when you are returning your products so amazon already listed flipkart why you are returning right even if you are not you are hardly sometime customer bother about giving that reason for that so simply you want to return that is also happening right so then commercial returns if the order is problem is with the recording the order either the wrong item was shipped or wrong order was placed right. So, then also you are returning in commercial returns you can talk about the product recalls as well right. You might have seen Maruti Suzuki they recalled swift desire and baleno just because of there was some problem with the fuel filter.

This is not only with Maruti Suzuki. Even you talk about Volkswagen, you talk about Hyundai, Honda, Toyota, even BMW which is very well known for quality and all that. But they are facing sometimes issues related with the.

.. engine related with the some sometimes volkswagen they recalled the products because they started observing that their engines are producing nitrogen dioxide right so which is harmful and then they had to recall the products sometime related to safety parameters sometime the interior ac capacity was not observed properly that customer is feeling comfortable inside the car right so many different reasons but there are recalls of the product you must be aware about the very famous recall by your Nokia so when you were

charging your batteries were blasted and all those things were happening so after that Nokia was nowhere in the picture but in Indian market before that Nokia you see after every second or third mobile was for Nokia so that was then it was you know overtaken by Microsoft for some time 2-3 years then again Nokia is coming back with their promises but you can just see it's not only the end product or after use or under warranty sometimes even the manufacturer is a manufacturer is recalling the products because they observed some functionality related issues or maybe safety related issues then we talked about under warranty period or waste products if they are coming so you can just see some of the examples are given right and we have discussed in detail this is packaging nowhere related to your product but packaging also in some countries it has been made mandatory for the services or product suppliers that it is the responsibility of the supplier to carry the package your packaging back to your warehouse so that again you can recycle and your packaging should be 100% recyclable reusable we will see how this concept of packaging has been used beautifully by your myntra so the way they have you know done the innovation in packaging why reverse logistics is important first reason is government policies and legislation already I talked about in a Neatherland this is the responsibility to take back the product and recover the value completely So, if you are in car industry like I talked about this you have to take that car back after usage and then maybe you have to ensure the recovery of the material from that car simply you cannot throw it in the outside environment. If you talk about Germany, so packaging ordinance they have passed and you have to collect under that ordinance you have to collect all the sales packaging material. so these kind of things are there that is why reverse logistics is important if you take care of this economic consideration it is not that this is initial investment is there when you set up your reverse logistics but this is misconception then if you will try to you know invest so much into your byproducts into your based handling your based so then you may lose your focus on the main product mainstream no it's not like that because handling byproducts if you are outsourcing someone else is doing on your behalf he is also charging some money for that so why don't you set up your network and try to extract the maximum value out of that because this is a kind of industry in many countries if you are recovering some value out of the scrap So, very relaxed tax structure is there in that way it is very very strategic move and it has been for many of the organization they are doing this business and now after recycling, remanufacturing or refurbishment they are generating revenues out of that right and because handling cost this waste handling cost and disposal cost is also increasing. So, why to dispose it? you are spending energy cost time on burning something why do not we use that product either as raw material for something else or if we have no other option other than burning that part component then let us use that energy coming out of after burning we can use that energy right in we can convert that energy into electricity and we can use that electricity. So, if you talk about some cement players who are into cement industry.

i have seen acc specially acc plant what they are doing in the local community they have developed their reverse logistics network right they are collecting the waste of local community as a part of their CSR they are adding into csr as well just they are collecting the waste they are burning that waste to produce energy and this is how they are running their plants on that energy so their energy consumption also they have reduced and in that way they are taking care of the environment as well if you talk about environmental consideration environmental legislation now policies are coming because government also regulatory bodies are also after the organization that you have to be you know little more conscious about environment how much you are depleting your activities are depleting so that way you need to control the carbon emission so and can be used as marketing tool that you are green product you are green supplier you are green manufacturer so that product customers will also feel you know connected with that and somehow if we will use that product we are adding into sustainability or we are somehow we are not depleting the environment and shift towards buying services instead of product like i told you aqua guard right in if ac in some player will come with these kind of services so obviously if the pricing policy is like that which is a kind of win-win situation for both the players so easily we can you know get rid of this headache of maintaining the acs right and how what we will do with the end of life there will be no end of life of the product right and we can consume it for longer period of time only thing we need to either replace those minimum aged components or we need to find the alternative material which we can use and we will use we will you know eliminate that issue of that material right. So, another example of effective waste management. So, if you talk about electronic industry this is something now we are using more use and throw kind of appliances right. If you see earlier the TV was size was quite big right now it is coming like flat screen mobile screens are very flat right in that way. What is the big challenge? Challenge is that now you cannot repair those components.

So, what we are coming with? We are coming with the modular design. We are fixing the modules in that. Let us say this is a picture control panel will be here, sound control panel will be here, some other may be quality control panel will be here, signal receiving will be here. or transmitting or receiving will be here let us say if something goes wrong with the picture tube right or may be picture panel we will take it out we will fix another panel into that right so repair concept has gone because the very complex complicated integrated circuit we are using where millions trillions of components are embedded on very small chip right so repairing those things is a very big question so and then you see 80% of the mobiles are being replaced every 2 years so our generation is consuming in that way 80% you can imagine where may be 100 crores in mobile users are there so 80 crores are coming after 2 years back right as waste so what are the sources municipality

collection points are there electronic industry waste they are producing retailers are producing recycling sector in India or other developing nations we have informal recycling sector right they are recycling the products they are collecting garbage from here and there and then they are recycling as long as this is not you know dangerous product right or waste you can recycle is ok but if some dangerous like radioactive elements are involved or may be some infectious waste is there and sometimes maybe it is plastic coming from let us take the example plastic coming from hospital so in hospital you are using syringes so those plastic syringes if directly you are recycling without any chemical disinfection so that is another challenge so this informal recycling sector is there which is also a big challenge So, we will continue this discussion on reverse logistics in the next session as well. So, this content has been prepared from these references. Thank you very much.