hello dear friends, welcome back to NPTEL online course on logistics and supply chain management. So in the last session we started discussion on your trends in logistics industry. So in this session we'll continue this discussion and we discussed about some of the stakeholders in modern logistics and some modern logistics concept we discussed about. So in this session we'll find out what are the factors which are forcing us to you know to go for updating your logistics not only one time every day we will find out what are the trends and when we will find out the challenges for modern logistics . we will talk about some performance measures as well and we will end this discussion with the two or three small cases right so these are the factors we will go through these factors one by one right so first is your supply chain agility see now we are operating in that environment which is very very dynamic very very fragile right every moment it is changing so if we will stick with your old school of thought and we will say that this is legacy we are carrying so that will not work right anymore so how constantly you are coming up with the technological advancements and in that way how quickly your supply chains your distribution networks are updating will define your agility right so this is required because if you will not change your approach your competitor will change so obviously when your competitor will change they will be providing the same services at lesser cost problem is not with the services or the product for that moment the product quality may not change right but how they are delivering the product that experience customer is getting extra right and then they are taking away the whole market share from you because both are still providing the same product but how they are adding experience into that so those that basket you need to take care what are those positive points the customer is clicking in his mind space whenever he is evaluating any you know e-commerce website or even the local supply chain.

So, then if you are talking about agility, so this can be more ensured when you are having self-managed. See this is something I am talking about little you know in contradiction with what we discussed for outsourcing. Let us say if very simple example, if you just go through you want to on google you just search you want to install tata sky at your home right this is new installation new connection you just record how quickly they are responding and then the another request is you at the same time you put another request that your tata sky installed earlier not working properly signal is not working

properly then you see how how much time they are taking to respond to your request right so when you are outsourcing this to let us say to third person so now if the new request is coming or you are complaining for the old connection right because this is now also to third person he will just generate the token numbers who came first will be processed first who came second will be processed second third fourth like this right so that means that much attention is not given which is required when you are onboarding the new client right so special care initially you need to give that so another very very good example if you just in your whatsapp you just connect with the jio right and you just type one message one line that i want to import my connection from one other player to jio within 20 minutes they will come to your home and then will take within 2 minutes they will process every document take your picture and then process the document and then within 2 days it will be ensure that your thing is done right so if that platform how responsiveness they are how quickly they are doing that right but if you talk about Jio fiber you are facing some issues may be because you are old customer so that much immediate in attention because this is a part of strategy right so when new customer is coming so that welcoming you know we should give that welcoming note to that new client right so that he should feel that now he is connected to some you know really responsive player in that industry right so the another thing is global labor shortage right this is a in the modern logistics industry we are facing this issue of global labor shortage right so third party logistics they are now if you talk about we need it's not that anyone can work on that right we need special skills to you know to ensure the proper packaging proper handling of the products right in that particular industry right so if you are training people and then the other day they are leaving because of maybe any reason there can be so many reasons right so that is another very big problem so this factor is forcing us to go for automation right let us remove the human intervention but then If now we are going for human complete automation, but still some human intervention is required. So, now the skills required are at different level to operate your automated warehouse, to operate your softwares, to keep the digital track of the transactions, digital track of the inventory.

So, everything so that expertise now required may be very earlier you were working with 100 man power, now may be only 10 are required. So, but companies are now moving with that you know perception in their mind that now we want to completely cut down this because we will be more efficient and that way we can avoid all those labor related problems. So, they are coming with driverless truck now initially what they are doing they are connecting two trucks first truck is manually operated the second truck will mimic the first one. track can track the pattern and accordingly will take the decision on the road. So, another factor which is forcing is the complexity we are generating through automation that is clear because now .

we have different platforms for maintaining suppliers we have one software which is dealing with the negotiation with dealing with the quality of incoming dealing with the quantity of incoming assigning different vendors one software is there then transportation handling we have another software platform technology which is you know on the road or intermodal it is deciding automatically deciding the best route deciding the best mode of transportation as per the requirement of the shipments units size deciding the container size everything another software in the manufacturing within the manufacturing we have another software to keep the track of the inventory how it is moving on the production floor in the warehouse again in the distribution center we are again having another warehouse management software so these many different platforms we are having right so This is complex network now. So, if I am always going from one software to other package, to other platform, to third platform, fourth platform. So, it will be very difficult to get that last information which is decision driven. So, how I can get that platform which can integrate all these different platforms right and then will give me one option one alternative right. So, that I can just click on that and will go with that and that information should be passed to every player in the distribution network right.

So, that quick information sharing will also be there right. So, it is not that on policy document you are preparing and then what you are communicating that may. take some the vendor may take another way right so that information same information without any your manipulation in that information right so that should not any bullwhip effect should not be there right. So, another factor which is you know affecting the today's innovation in distribution logistic network is the what these players are saying 2 day delivery, same day delivery, within 30 minutes delivery. So, how this is affecting the expectations from the customer.

And, then we can only do this if we are using those updated software which will help us to track where the product is right now and how long it will take and what are the alternatives if that is not reaching on time can be source from somewhere else any other vendor is ready with the final delivery. So, those all things we can take care. So, warehouse management system kind of ERP platform also we are using sometimes you know to create that visibility platform, we have some project like project 44, 4kites these are kind of another platform which are helping us to you know keep the track of your every activity you are doing with the shipment with the tracking of the return then also information to the customer that your return is accepted your refund is processed today the refund will be credited all those information should be shared supply chain transparency and collaboration mandate Now, this is now mandatory to every player to if you are part of that supply chain you should be integrated through that network. And this we can do either by electronic data interchange or we can have APIs kind of application

platforms. So, programming interface where we can share this information without having any bullwhip effect.

So, if I am saying the order is required at the retailer and is for 10 units. So, that should not be replicated as 15 units in the retailer distributor and that should not be go like 20 units for the wholesaler, 25 for the manufacturer and 35 for the raw material supplier that should not happen this is known as bullwhip effect. So, throughout your supply chain this information is this is how it is inflated. So, whatever information is there 10 that should pass to the raw material supplier that only can happen if you are having EDIs APIs platform. So, then less than truck load is another factor which is very important I told you if you are a you know very small player right you just you are just starting.

So, whatever you are courier partner you are using you are not able to utilize the full capacity of that container the courier partner is providing you that container right. what you can do you can consolidate the orders from other players in the same industry or may be other industry right and when you will be doing that obviously you will cut down the cost because now you are paying only for the capacity you are using this is the capacity you are using in that container you will pay only for this capacity so in that way you will be cost efficient May be the rest of the capacity, this capacity will be shared by someone else, may be this capacity will be shared by someone else. So, you can consolidate. So, if you talk about e-commerce, so they can efficiently use this less than truck load is there. may be in the cities or major cities you are able to generate that much demand.

So, then you can exhaust the complete capacity, but in if you are going for your urban rural area semi urban area. So, there may be the question of you know utilizing less capacity than available. So, how you can use that. this is this approach is very useful for small business because small business are not having that much demand so they can collaborate with other players and then they can reduce the transportation cost and then in that process you will be environmental conscious as well how because now earlier you were only shipping this much quantity using that much big container so that means per unit cost will be higher in that way and then you are using extra fuel you are not using the full capacity using extra fuel per unit transportation is producing more carbon footprint. instead of transporting 10 items if I will transport 50 items in the same container so per unit contribution of that to the carbon footprint you are generating will be lesser in that way right so this is another factor which is forcing us to go for the automation then persisting with the digital transformation is required throughout your distribution network.

So, either you are talking about sharing your electronic records from the customer to the

warehouse to the distribution network while you are recording the order, how you are completing that cycle whatever steps are required if it is not ready with the inventory you will place order immediately with your manufacturing facility so that information should be shared immediately with the raw material supplier that this much raw material is required because new order has arrived So, then immediately it will be processed, will be packed, courier partner will be getting the alert that now we need to make the emergency delivery. So, that kind of digital transformation is required. We have then API based integration, so that you can process the real time information. It is not that one batch you will process fully and will be shifted to the next stage, that should not happen. Even if you are producing one unit that should be shared with the next stage though so that so batch processing kind of concept will not work so even if you have produced one item that should be distributed right this is the concept right so same should go with the when we are sharing the information if any information you are you have generated that should be shared throughout this network immediately using your api network right so then logistic demand forecasting so when you are designing the demand function right so you need to do the predictive analytics right we talked about predictive analytics how you can use the big data right so that you can plan your production your storage your inventories in that way So, designing demand may be what you will be looking for some of the factors may be historical data you are looking for seasonality whether now the summer season is there, there is huge demand for coolers, water coolers, ACs, refrigerators.

 So, that is seasonality seasonal demand economy. even season is there sometimes may be the economic condition of that particular country or may be region is not like that that they can go for purchasing right so then market trends pricing competition how other players are coming with so you need to track earlier demand function we were saying how much money i am having in my pocket if you can track that somewhere you can find out how much i will buy in the market right and then price of the complementary goods and then price of the competitor these many things we were tracking right but now it's not enough right if it is not only to you know to provide the product to the customer it is that information is being shared throughout your network to the raw material supplier as well how much raw material he needs to produce right if you will keep on producing the raw material unnecessarily you will keep on producing the production products final products so maybe then you will be keeping that in your inventory or sometimes maybe you are coming with the seasonal offers that season off then you are selling those inventory at 50% lesser price or sometimes it is going obsolete in the inventory itself right. So, that you can avoid using your designing this your demand function in that specific very precise way right. Then digital freight marketplaces. we have these kind of platforms as well right where earlier what now what we were doing if you need any product you are going to amazon and you are buying it so let's talk about if you are talking about the transportation industry if you need any transportation services right now maybe you are

shifting from kharagpur to calcutta so you need to transport your household items to calcutta right so what you will do you will search online what are the you know those players who are providing you these packers and movers kind of services and then you will get the quotations and then you will process that maybe four five days you will take it to just collect the information then one day those people will come will do the whole packaging in the evening they will load that full day activity next day they will ship that next day maybe evening it will reach calcutta so calcutta then again people will come will unload that remove the packaging will set again so this is and then maybe after one day that container will be free for utilizing for the next thing and then again maybe that container because of the union kind of things restrictions cannot load from the same point may be has to come back to the base location and then again go further so this is how we are not utilizing the capacity even if they are doing it illegally so even then how much their capacity they are utilizing so just loading unloading transporting we are may be only 6 or 7 hours are required we are taking minimum 3 days and then why that platform like Ola or Uber they are doing so anywhere taxi is available you can just login and within 2 minutes whosoever is nearby will take that why can't this happen in freight industry as well.

right so anyone near to that container can utilize that capacity if unloading is taking time maybe customer requires maybe you need to unload after two days that is their requirement they are paying for it so let us drop the container there only we'll get the new container at the site location and we'll pick that container we will go for. Why manually unloading is required? Automatic container we have seen many videos where it is within 2 minutes full container is unloaded. So, these kind of systems we need to develop. ecosystem only can we create when all stakeholders are involved internal external disparate systems right you need to integrate all those players only then this ecosystem can be created it cannot be that only distributing partner is digitally strong and rest of the players they are avoiding to go for that initial investment in terms of money in terms of training their manpower in terms of installing new systems so that will be unsuccessful activity right if you are going for digitalization it should be digitalized throughout your distribution network only then you can you know make the real time decisions in a better way and then you can reduce the cost drastically this is for sure because you will be utilizing the full capacity where the resources are lying idle in terms of capacity in the container in terms of unutilized capacity in the warehouse in terms of unutilized robot in the warehouse in terms of unutilized shelves in the warehouse in terms of you are taking long route in during transportation right in terms of assigning the order to particular vendor because you pick the vendor which is taking more time because he is not near to your manufacturing facility right so these all ecosystem you need to create and integrate all the things So, talking about technological advancement in India, so obviously, it is not that Indian market, it is away from these variation dynamics of the environment. So,

because whole world is one market, so you have to ensure the digital transformation.

and through that how you can ensure the fleet management proper capacity utilization right. So, that the overall vehicle performance you can increase and reduce the fuel consumption because instead of taking 10 items you are taking 20. So, per unit cost will be reduced and even then driver behavior also you can record even if he is not see now in the trucks itself the technology is coming if driver is driving rashly or driving in a wrong way which is you know which is having more wear and tear of the vehicle which is consuming more fuel right and may be accident rates are increasing the way the driver is doing behaving on the road right so that also you can record right so you just imagine how much potential is there in that industry we can improve in that way and the overall you know it is not that we want to restrict the driver but that their quality of life will also improve in that way so when they have the technology related decision making while they are moving the inventories from one place to other place then last mile delivery already flipkart is doing in some of the areas using drones right where they want to you know wider traffic bottlenecks right so maybe in one kilometer area they can just fly the drones and because it is thickly populated so you need not to go for that and then you can drop the packet using your drones So, crowd shipping model is also very famous these days not only flipkart but your other players are also doing that ekart also doing that and delivery is also doing that swiggy is doing that there you are you know partnering with the local service providers and local courier partners. local restaurant local courier partner right so that is last mile delivery sustainable practice how we can go for electrical vehicles bicycles and then we can address the customer points also where customer wants to go maybe in a sustainable manner sustainable customer also they want sustainable consumption of the product so if you can this happen that on the package we are mentioning from raw material supplier to manufacture this much carbon footprint this packet created from in manufacturing this much carbon footprint to distribute your product to your doorstep this much carbon footprint is produced right so may be customer will be more aware in that case and then instead of you know doing multiple deliveries they will be more responsible when they are placing the order so that they can reduce the returns also. So, that how we can ensure that.

So, Amazon is having that this objective that they will electrify the vehicles 100 percent by 2030. So, this is how they are addressing the sustainable practices. warehouse automation when DHL is very prominent player which is doing this and in Delhi they are having this automation sortation center where they are handling 6000 shipments per hour, but you just imagine the DHL main warehouse in US or where they are operating China. they are handling their record is they are handling more than 40000 shipments per hour but because that much demand should be there and only then that much capacity will be generated but this is again they are starting initiating the process in the Indian market as

well but yes once it will be implemented commercialized fully because Indian or Chinese market are like that huge customer potential is there anything you will start selling you will generate something out of that right so how quickly you can sort the product pick the product and pack the product in the inventory and can be shipped to the customer right so here i have included some video links you guys can just quickly go through these videos and then we'll continue our discussion on the topic so you can see it's not quickly they are doing that it is that that we are getting that quality of services as well we are we can ensure that nothing should happen to our inventory to our stock while we are handling those products right then predictive analytics demand forecasting how accurately we can predict that so those many services delivery is doing very very good in that area using their predictive analytics big data analytics cloud computing they are using they are tracking the patterns in the market your forward supply chain patterns as well as your backward supply chain pattern which is starting from your raw material suppliers to your manufacturing house and back forward supply chain which is starting from your manufacturing to your end customer right so they are using predictive analytics to optimize the delivery routes and so that they should cover the minimum distance they should avoid the traffic jam in the populated area urban cities and then it will be cost effective as well so they are providing services to many players right then collaboration and integration this is another advancement now see for all these functional area we are getting the expertise services it is not that collaboration and integration within the within house we can generate something and we can collaborate with them so because we have done every effort to ensure the collaboration but still it is not happening can someone else do for us yes black but a digital freight platform will help you to do that and where all the shippers and truckers can be connected through platform that platform i was talking about can we have that platform where i want one container of 10ton capacity and i can just search on app and anyone who is near to me we can quickly use that right so in that way maximum that's why many taxi drivers are attached to ola uber only thing is the number of rides have increased right for them when see if earlier they were making only 10 rides now they are making 100 rides right maybe they are charging little lesser because this ola and uber also taking their share maybe 25 percent or something like that right but still it is win-win situation for both because that much traffic footfall is there right so the it is kind of economies of scale right so that much you can utilize your capacity if you are just standing waiting for the next ride that also you are you know waiting means is kind of one waste we defined under muda e-commerce logistic focus. So, this industry now we need to find out how quickly we can deliver the products, what is the nature of the product, how we need to deliver the product and return supply chain also equally important.

 E-kart which is the official partner with the flipkart providing all the hassle free and seamless shopping experience today you place the order by evening grocery items you

will get or evening you place the order by morning you will get the grocery items but yes because they are working they have initiated on this but they are working how they can still you know generate that much orders that so that they can be you know efficient also. so these are some of the challenges our modern day logistics are facing supply chain disruptions whatever are happening we will quickly go through these challenges supply chain unforeseen global events covid 19 so then all of sudden shutdown is there how you will handle that russia ukraine war how the other industries are affected the crude oil supplies are coming from that so then also obviously will raise the price of petrol and diesel and other natural gases we are using So, how it will impact the supply chain efficiency? Obviously, the cost will rise up when the fuel cost is rising up. So, in that way how our supply chain can be resilient if anything is happening in outside the environment of our supply chain or distribution network. So, how resilient, how quickly we can find out some alternatives, if that our vendor is affected by this natural disaster of flood. So, how other vendor can respond quickly and can supply the raw material, so that the smooth production can be ensured.

Our 500 workers who are working on that production line should not sit idle just because our one of the vendor hit by your natural disaster. So, that ecosystem integration software. we can handle these kind of disruptions where we can find out when disruption can happen right. Another thing is the another challenge is that trading partners this is report that they are saying that 80 percent of the companies they are having trading partners who are failing to make their promises. 27% respondents are saying that 11 or more trading partner fail and then these many are still looking to set up new business partnership see business partnership is not like something that overnight you are you know just you firing any your business partner and next day you are hiring this is a long term strategic decision and it is the responsibility of the main manufacturer to take care of your you know all the raw material suppliers to train them to you know equip them with the latest technology because if they are efficient only then you can be efficient.

So, how we can develop more reliable trading partners? So, we need to equip them only then our logistics distribution network will be ensured properly. This is another very big problem with Indian logistics distribution because we talked about around 60 to 65 percent we are going through road transportation and that is the reason why we are you know adding 14 percent as logistics cost and if you talk about the developed nation it is somewhere 7 to 8 percent of the cost right so that means this much extra you are paying how we can cut that logistic cost in the warehousing in the distribution in the transportation and how we talked all those measures how we can do that so ecosystem integration will ensure you right so So, this you can see 32 percent said they will invest heavily in that supply chain integration technology so that they can build that platform. so then sustainability targets obviously now manufacturers are moving towards the

sustainability but if the sustainability measures are rapidly changing so initially maybe sometimes government is also little bit fuzzy about taking the decision making the policy they are putting firstly maybe heavy taxes on using those kind of plastic packaging and then they realize that suddenly that now we need to phase out this packaging completely so then if things are changing so quickly randomly so then it is difficult for all the logistic players to you know cope up with those kind of challenges so obviously sustainability there are so many performance indicators for sustainability if you can be efficient. So, obviously, if you are efficient you can be cost efficient you can reduce your cost as well. When you are reducing the cost that means, you are using less resources when you are using less resources that means, you are adding to the sustainability targets right.

 So, this is how you can be more sustainable. these performance measures like i talked about efficiency how quickly you are fulfilling the order cycle time packaging cycle time how quickly you are packaging ah manufacturing cycle time how quickly you are starting the manufacturing ending the manufacturing resource utilization rate how many times you are 100 you are utilizing all all your resources lying in the warehouse all your distribution network resources right cost effective when you are utilizing that properly so operation cost when you are transporting the product first is your raw material cost how you can cut down that cost second is your transportation cost how you can minimize that using proper routing system then your manufacturing cost then your warehousing cost then your last mile delivery cost right so then also if returns are coming that is also cost to the company customer satisfaction how you can you know provide on time services and that basket of services hassle free returns quick deliveries right and then the same quality customer demanded for right so then more customer satisfaction will be there and if customer is satisfied you are doing cost effective deliveries obviously you can reduce the carbon footprint because now you are not indulge into the waste activities which is not generating any value for you right flexibility and agility so to the changing environment how quickly you can change how if demand is lesser how quickly you can manage your resources and if demand is high how quickly you can change adapt to the that dynamic environment. So, innovation adoption, how quickly you are implementing the new technology, adoption rate and whether you are able to recover that initial cost or not. That is also very important point. So, you cannot just go randomly for any technological, you know, upgradation which may not be able to ensure that minimum returns where you can, you know, recover the cost of implementing that technology.

 then supply chain visibility how you can track the order that information not only as a stakeholder you want that information but your customer also demanding that information when my product is shipped when it is packed how it is packed and when it is reaching it is out for delivery right So, these are the some of the cases you can see how

they are doing digitalization their this records and integrating all the stakeholders DHL this much investment they have made and still they are doing this investment to just create a central nerve system for its operation optimizing resource allocation automating workflows and dynamic dynamically adapting to the real time changes in the business environment whatever demands are coming from the customer. If you see Amazon, they are using predictive analytics when, where and which items are required, right? So, that they can find out whether that item is available in the nearby hub or not. If it is available, so quickly they can meet that demand from the customer in a very short lead time, right? So, they are picking, ensuring those orders which are near to that customer, right? So, that efficient delivery can be ensured and last mile delivery can be ensured efficiently. if you talk about swiggy swiggy is you know using hyper local delivery network and they have utilized this concept they are collaborating with the local restaurants and local delivery partners so that on time delivery fresh food hygiene can be ensured minimum time it is taking in the transportation because from the local restaurant you know where is that restaurant you know the hygiene of that restaurant so in that way you will feel flipkart again partnering partnering with the local vendors for efficient delivery right so they are ensuring the faster delivery increased coverage and deeper penetration into remote areas as well where they are you know selling the local items as well and they are collaborating with the local vendors so this is how the wide coverage if you talk about geographically also they are ensuring and flipkart in that way has enjoyed this parameter and they are enjoying almost 60 to 65 percent share in indian market So, in conclusion we can conclude here these three things digitalization innovation and sustainability are the key parameters forcing us to go for your innovating your next age decades your distribution network we should be more informed distribution network and agile if something goes wrong in the external environment how quickly we can adapt that we can switch to the next alternative and switching next alternative should not be with very high cost right it should be cost efficient and resilience should be provided so only we can tap the disruptions in a better way when we know when those disruptions are going to happen right so that will only happen when the complete integration of all the stakeholders are there and you have that ecosystem where you can quickly share the information with the stakeholders. So, that is all from the logistics in the next session we will start discussion your on your supply chain management.

So, these are some of the references you can go for further reading. So, thank you very much.