Indian Institute of Science
Bangalore

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Global Supply Chain Management
Lecture – 21
Orchestration- Example

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So we have been looking at the various kinds of examples we looked at the orchestration.

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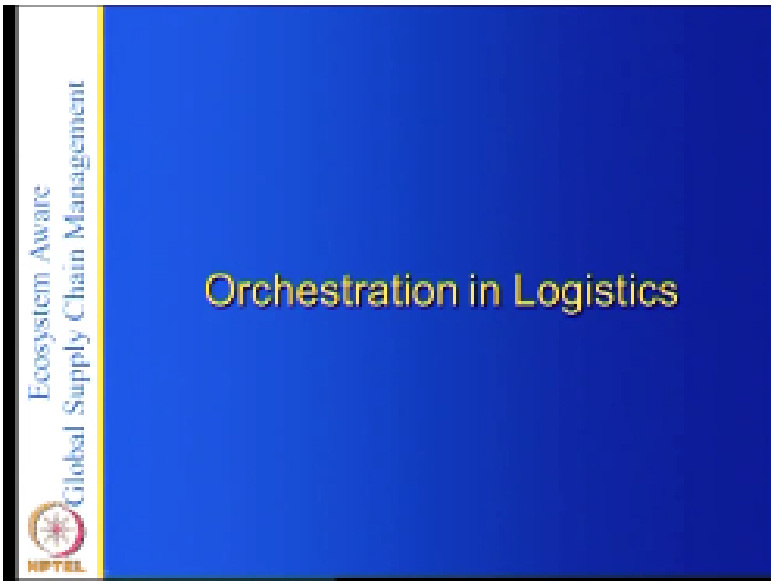

In SMES so where we have saw that.

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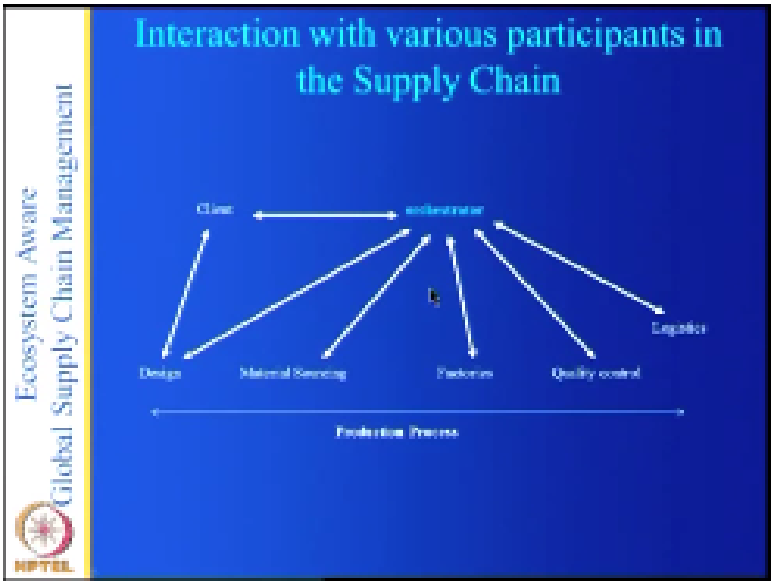

There is the interaction mates participants in the supply chain and how this helps let us.

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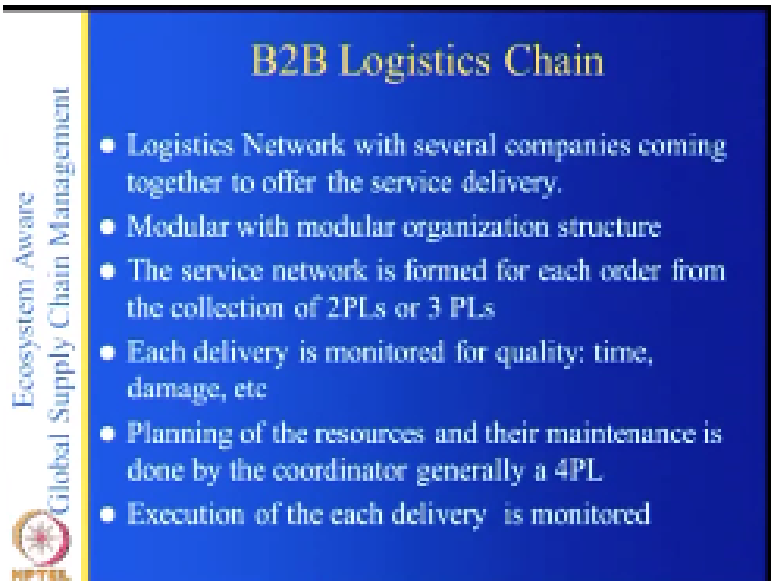

Look at the logistics this one but that is what is called be to be in adjust exchange so what is we to be logistics it is business to business logistics network with several companies coming together to offer service del V in other words there are several suppliers and the suppliers basically have to transfer or to have to supply to some manufacturer and so and not only one supplier by the several suppliers and also this a each supplier may supply to several manufacturing same component.

So there is a multiple this one and they are all modular with modular organization structure in other words if you look at the logistics J there are the warehouses they may want by somebody else and the ownership is different and there are truck companies they may want buy a Ford or tired or whatever there could be there could be different owner and similarly the other things so other services that are needed are all one by different people.

So they are all modular with modular organization structure the service network is formed for each other for the collection of 2 PLS or 3PLS supposing somebody wants to transfer when the company auto company wants to transfer some components from somewhere in the United States to Detroit where this is done from in India from say pulling it to her to go down in the near Delhi so this what is that at that time I know there are no fix it players in this so you try to you have collection of people.

And from that connection you select the tractor I was you select the warehouse places you collect selected trucks and so on and basically you form a network for each of these orders and he is delivery is monitored for quality time and damage etc and planning of the resources and their maintenance is done by a coordinator called before 4 PL is for party logistics one players he is basically his a set free in other words he is like an Orchestrator he does not want any assets but he just manages he is responsible for the delivery but he does not want any assets so if you the execution of each delivery is monitored.

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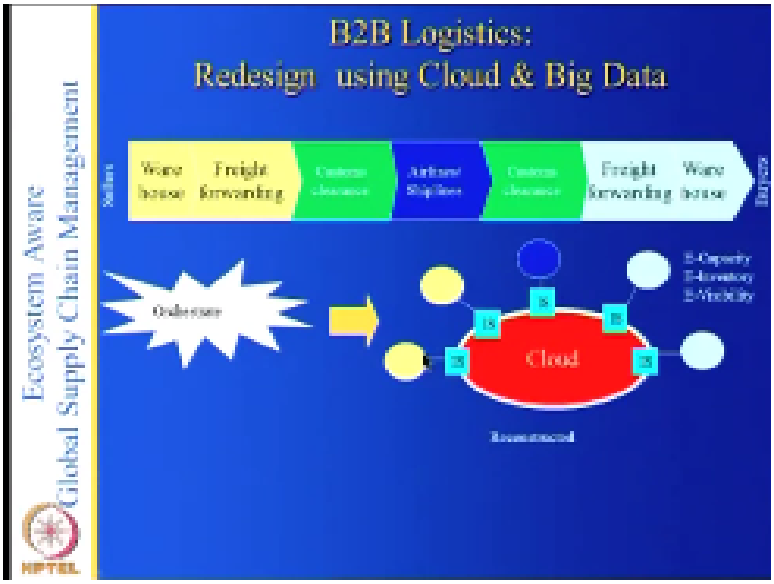

So if you look at b2b logistics redesign using cloud if you look at the diagram say there is a seller there is a buyer and this is a chain of events that usually happen for an international logistics chain you put it them in a bear house or afterwards they are forwarded by from the warehouse for the customs clearance and that go through either airline shipping this is the international travel and there is custom clearance at the other end that they have right forwarding and then to the warehouse and of the buyer.

So from warehouse to warehouse they are joined of players that are there now here there are several of these players now what is their information systems I want I connected you can have each of them have their own information systems and they are all connected by a communication network right there may be in other words for example this warehouse may be

using Manhattan associates warehouse this can be oracle this one and the airline shippers may not be using any customs clearance.

May be using some other software and all that what happens in that particular case is that the information systems either they can communicate but there is interfaces becomes from difficult so what you could do if you want to have an Orchestrator on this you can have a cloud network which is connecting all this so you can reconstruct all this and it is already happening nowadays all companies which are doing in other words trying to put everything on cloud have all the data on this put all the players on this cloud.

And you can have a capacity inventory visibility in all this so you said cloud and big data you could do a lot of visual learning machine learning algorithms low you can do lot of analysis that happens in this one of the things that you could do usually supposing you are sending some the seller is sending something to a buyer somewhere and if he is doing it frequently then it is not going not necessarily to go through go through the optimization route to find.

What is the best route who are the players and all that you have all the data here so you can mine the data and find out what is the best route or the best players and if you have to hire two or three players across this and in some people this some people in this leg then what are the kinds of what is the relationship between the players on this so that they collaborate and your job is done in a more cooperative way rather than you know they do not know each other then there could be problems of this.

So here a collaborative network can be formed with all the data using a cloud and they others this one so the b2b chain can be used to using cloud and big data you can orchestrate of this.

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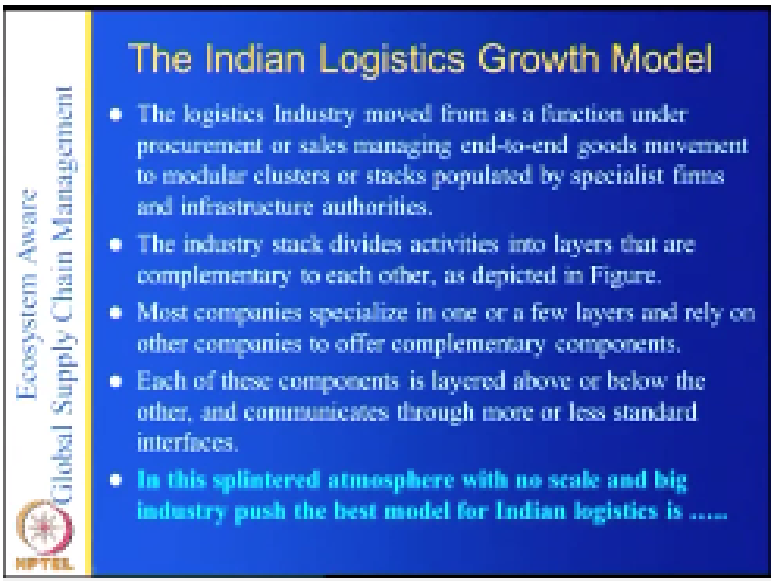

Now that is about to be to be logistics chain now let us look at another logistics chain which is that happens in emerging markets like in India now the logistics industry you basically it moves from a function of another procurement or sales management to end to end goods movement to modular clusters of stacks populated by specialist forms and infrastructure authorities so industry stack divides activities into layers that are complemented to each other as depicted in the figure which I will show you that figure yes.

So what is the lurched what does logistics mean what is what if the logistics this one let us do look at the figure and I come back to this slide now.

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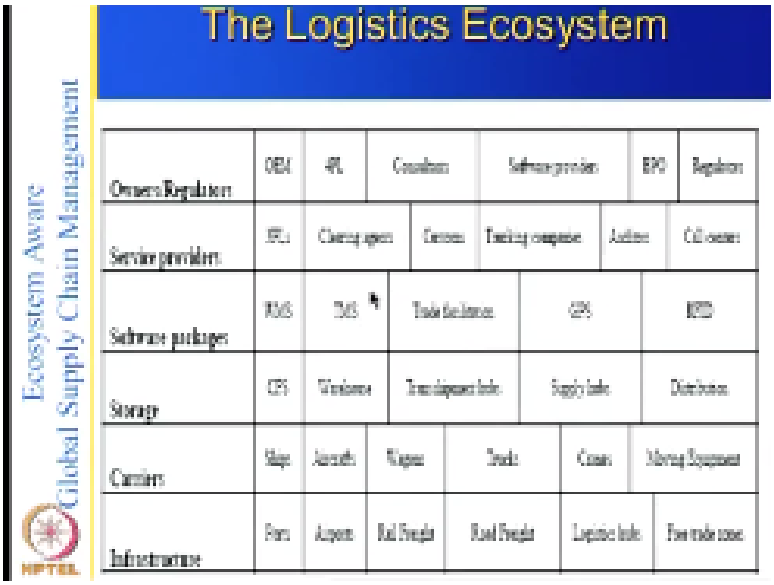

If you look at this figure there is the infrastructure players which are ports airports rail road fly to right flight logistics of free trade zones and all that the second players in this are carriers like ships aircraft like the trucks cranes moving equipment and so on now these 20 of the acceptance and do things and infrastructure I did not put the warehouses here storage is container flush stations warehouse transportation hubs supply hubs and distribution centers of that.

So this is also an assert integer and you have lot of software packages available for the managing this for example WMS is warehouse management system TMS is transportation management system for trade facilitation is in the reports particularly GPS Global Positioning Systems RFID radio frequency identification so all these of the software packages that are available and you have service providers who are three PLS third party logistics place they are clearing agents.

Who does this their customs authorities they are trucking companies supply the trucks and their auditors and call centers now who are the people who basically are the ones who are the bosses here that is the Williams the 4ps consultants software providers before providers and also the regulators so in other words if you get this particular diagram it shows you that there are six layers of people if you want you can make more layers out of this which are some of them or infrastructure they provide the trucks and the storage software and service.

And their regulators these are the ones now you can tell like India what happens is you have no big players in other words it if you want to move some material from another there are only people who are truck owners who won one or two trucks of 10 fire trucks there could be millions of such small players now if you want to move some material from one place to the other how do you do it and this is splintered atmosphere that is the problem that we are discussing here in this splintered atmosphere.

With no scale and big address we push the best model for Indian logistics is orchestration so each of these components layered about Benewah rather and communicates through more or less standard interfaces how do these people communicate with each other.

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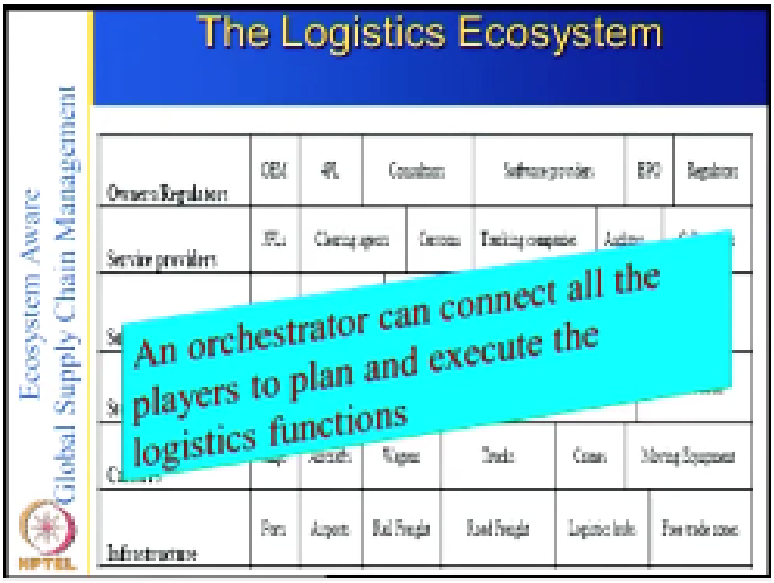

There is there any communication at all they communicate it is standard by letters or by phone or by fax and so are by post so how do you make things work in such as I so in our case traitor can connect all the players to plan and execute logistic functions so it is important to realize I mean I am saying I am not saying this kind of layered architecture for logistics is only in India is the lower torque structure for logistics in any country.

But how efficient of each in each and how efficiently the inter connection between them communication between them collaboration between them so an Orchestrator can connect all

the players to plan and execute the logistics functions so if you are sending the some this one from one place together and you choose 3PL clearing agents and they will put it in some warehouse and from there it will go to a port from that port to another port here and it goes to the warehouse and through another clearing agent and it will go to the particular owner which whoever it is.

So if you if you go through this whole thing your product may go through several of these players like that so for that you have to require an Orchestrator to connect all the layer players and plan for this.

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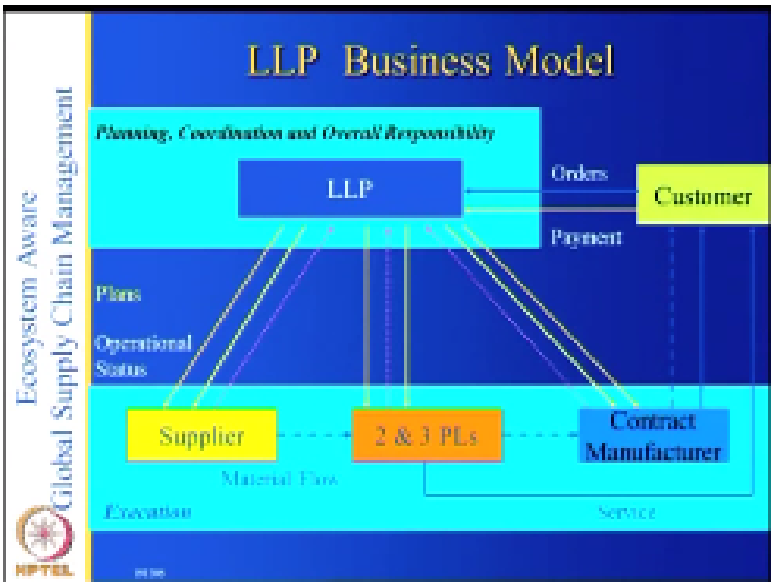

So that what is the business model that we have with like a similar diagram you have you can have here for example you have a customer who has the orders to the logistics provider to transport from the supplier to the contract manufacturer to the customer so let us look at what is the I come here so there are once you receive the order that the operational status is found out then there are the plants are given and the material actually flows through this and the payment is done.

So this suppliers 222 PLS and so on when we say this there is in between here is the ports and warehouses and others and similarly in between other boats and warehouses in all these places so your material actually moves from the all the all the layers and this planning coordination

and overall responsibility is being taken by logistics player or 4pm that is the kind of business model that that is followed.

And there are lots of companies in practice which does this kind of thing but what happens is what is the kind of this you know as I adore shown if you use cloud computing here store all this information in a cloud and if everybody has access to the cloud this and if you can use some mission learning techniques then you can design you can design algorithms which are which makes this business a lot more so.

What is happening with all the advancements of advancement of these technologies in global supply chain is it is becoming more and more technology intensive and cloud computing and big data are entering into the logistics scenario.

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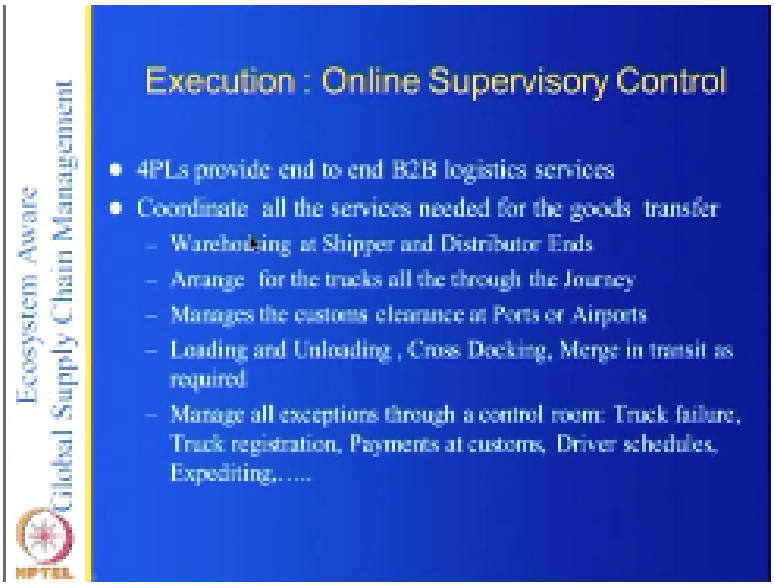

So that is the final is for PLS also do the execution they provide the end to end b2b logistic services they coordinate all the services needed for the good transfer like warehousing at the shipment and distributor ends arrange for trucks all through the journey manage the custom clearance at ports loading and unloading cross docking merchant transit as required and manage all exceptions through a control room truck sell your truck registration payment at customs to our schedules expediting etc.

So if you will look at these functions of the execution this is all what the logistics provider if what the party logistics provider or LLP will do.

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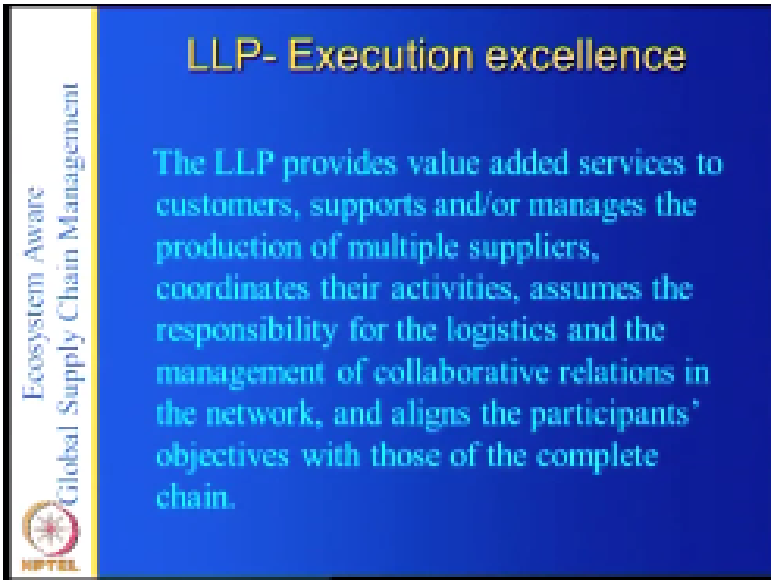

And the LLP provide value added services to customers supports our managers the production of multiple suppliers coordinates their activities assumes the responsibility for the logistics and the management of collaborative relations in the network analyze the participants objectives with those are the complete chain this is the point that is important that all the participants their objective should be aligned along with the complete chain so everybody should feel responsible to get the things on time at the proper places.

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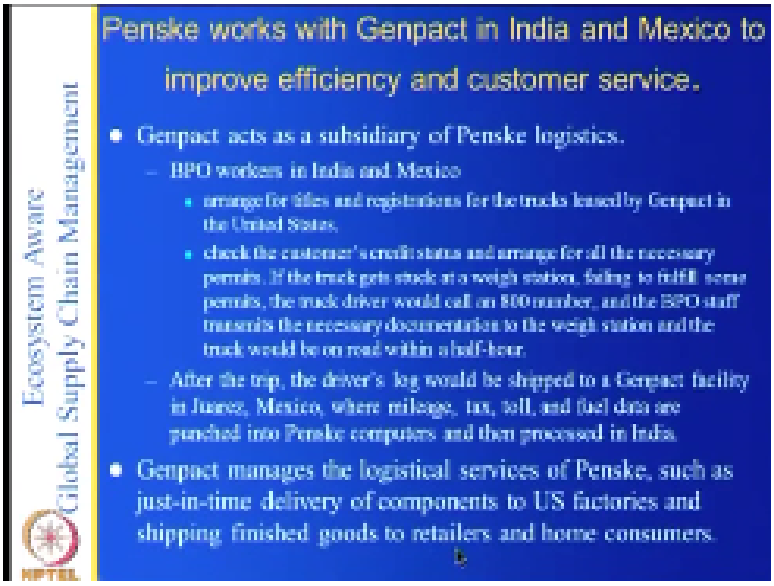

I think there is one example of this there is a company called Penske in the United States and what Penske does is it will leaves vehicles from companies like Toyota afford and so on and it will provide transport services it will provide services trucking services for auto components for various manufacturers who are based out of Detroit so this is basically a United States operation so the components the trucks move from some place some city in the United States to do basically Detroit.

So how do you let densely logistics does one thing and that is the execution of this there is a planning that it does and the planning depends on sophisticated MIP models integer programming models that in addition it also does the institution so the BJP workers people workers particularly from Genpact this process outsourcing workers in India and Mexico they arrange for titles and registration of the trucks licensed by Genpact in the United States in other words they are basically Genpact the tracks released by x 10 scale in the United States.

Check the customer credit status arrange for all lesser a documents if the truck get stuck at a weigh station failing to fulfill some permits the truck driver would call an 800 number and the BP was staff transmits necessary documentation to the weigh station and the truck would be on the road within half an hour so what happens in all this is that there is continuous monitoring of the truck travel by the BP war.

Here now you should understand one thing that there is not one talk from one place to another there are several thousands of trucks which are traveling all over the United States and for Penske logistics for example in a during a day there could be several 1000 trucks which are this one which are taking goods from one place to another in the United States and that basically all the talks have to be monitored and all exceptions are to be addressed that is the point.

So this kind of thing is supposing there if this facility of addressing is not available and they track files it was remind on the road and the it is up to the driver to get it repaired undone go ahead so basically the issue is that there is the company rain Genpact acts as the orchestrator on behalf of Penske logistics or you can call Penske logistics itself as an Orchestrator which uses Genpact services to monitor the delivery of the auto components from all places in the United States to Detroit.

So after the trip drivers log will be shipped to Genpact facility in Mexico and we are mileage tax tall and fuel or punched into Penske computers and then processed in India so this is how the execution takes place and this is a practical example of today Genpact managers logistic services of pence k such a just-in-time delivery of components to us factories and shipping final goods to retailers on home consumers so that is the importance of the logistics this one.

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So let us look at some two other examples yes and these examples are important because they have an Indian context one is a Mandi which is an Orchestrator in Indian agriculture markets now there is what is called a APMC act agriculture act which actually prohibits the farmers directly selling to the retailers or the retailers directly procuring from the retailers in other words this is about agriculture whether it is fruits vegetables and so on so.

The day the retailers in India cannot directly bite from the farmers and the reason is that the government is worried that the farmers were small farmers or to Africa to 3 acre owners they may be vandalized by the big players of the Mandis the international players so for that reason the government has created a place called Mandi that is an intermediary where the farmers go to the Mandi and then they sell their produce there .

And they basically the retailers come there and the transactions happen so what is the mandi.

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In India wholesale trade of applicants of products happens through mandis trade outside is not permitted mandi are established under the agricultural product marketing committee Act APMC act to help small farmers get fair price and protect them from the traders governments are

established to 7000 mandis in India and each Mandi has a lot of real estate these are these are these are mandis are there in big cities as well as in small cities so in big cities there is huge space that is resolved for these mandis.

And fought must bring agriculture produced to Mandis where it is auction and sold to traders or to commission agents classical open cry ascending price auction is the format used in other words there the open cry in the mother but so did all the players are there at one place and somebody manages this one and each people shouting this one it is an ascending auction that is if somebody says some price then the next cry is going to be more than what it is and so on the highest bidder gets the wins the vote thread as later sell to wholesalers a tailors and companies.

So here if you look at this Monday market area this the idea is that there are two problems associated with this one is the mandis are there 7000 mandis but India is large country so all the farmers may not be able to bring to the their projects to the mandi although mandis have very good facilities for stay and so on overnight stay and all that but still you know people have to all their goods over the time and the second thing is that here the open cry auction takes place and is it possible to do all this power Ethernet that is the idea that is.

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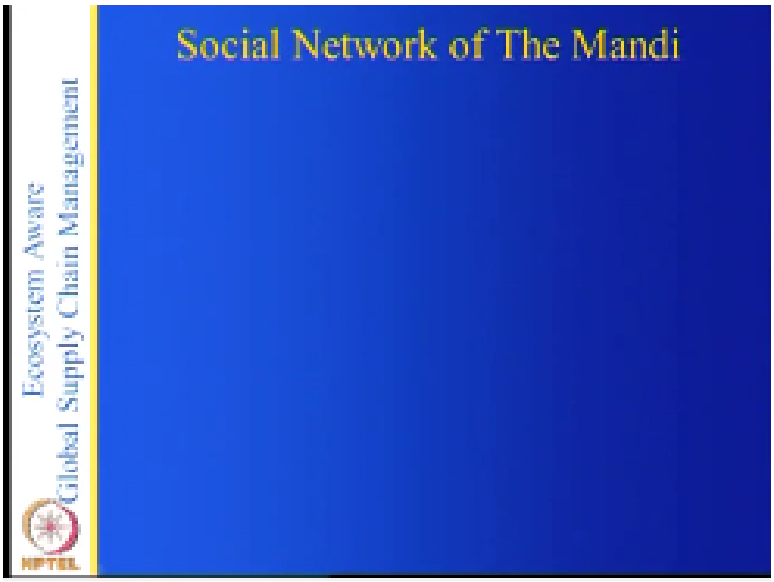

And also Mandi just a meeting place and the mandis would not do as an author stator so what we try to look at here is can the money be an author stator in other words supposing there is a demand in the market for tomatoes or potatoes or whatever is it possible for the money to tell the four potato farmers and ask them to get to the Mandi these potatoes of something as for example there is a cotton requirement somewhere in Mumbai.

And is it is that information transmitted to the mandis all over the country and the mandis bite and transmitted to the requirements and so basically there is a supply from the farmers and there is a demand what at the retailers at the factory level and so on depending on the commodity that we are talking about now Mandis currently or acting as a place where you know it is a meeting place it is nothing else so can it become a more proactive orchestrator where it goes what are the what are the requirements of various players in country.

And we are there which farmers are producing this and connect both of them so that is the issue that that we are talking so social network of the mandi here is you have a traditional mandi.

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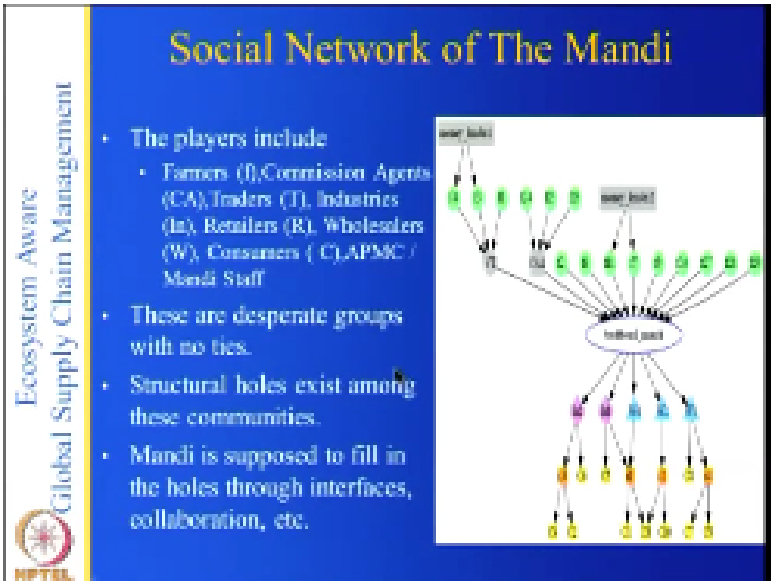

And you have the players include there is a farmers then these are the farmers and there are commission agents you have the commission agents seized and CS and industries retailers wholesalers consumers and APMC Mandi staff and so on so this becomes having a social

network not a not a big one for this but if you take a particular product like coffee or rice or potatoes or onions then you can probably get more focused social network and these are disparate groups it no ties what is happening here is this farmers have no ties at all.

That they come to the traditional mind and this is only this is only the tie is in terms of just coming there and so on there is no connection of our transactions that takes place a structural holes exist between these communities in other words you have the farmers as a community and that says network of themselves and there are the traders there are the retailers and all that that is another community and this Mandi only connecting point between them otherwise they are not connected.

So Monday basically is an Orchestrator which fills the structural hole what is a structural whole structure on hole is between two communities if there is no communication then there is a hole there in terms of communication and an Orchestrator is the one that fills these particular kinds of holes and mandi is supposed to fill in the holes so interfaces collaboration and so on so is the now here if you are doing the supply demand matching in other words whatever you know that cotton is needed in some place.

You know garden is produced by farmers from some other place is it possible to connect both of them so that you have the so
called supply demand matching that happens.

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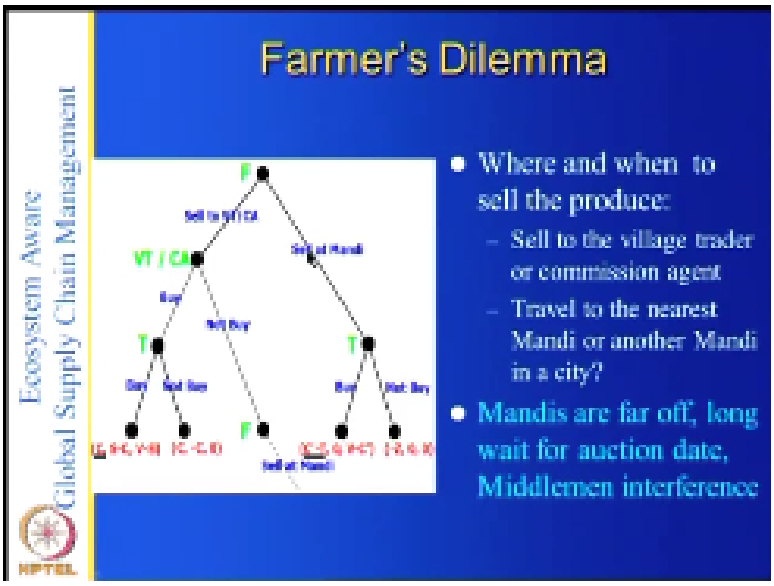

And what is the farmers dilemma the farmers dilemma is whether where and when to sell the produce sell to the village trader or commission agent sell to the village trade or Commissioner agent select the mandi if you want to select at the mandi then you have to travel to the nearest Mandi or another in city mandi is far of log wait for auction date and measurement interference and at the end it may not buy so you have a decision tree where you can you basically can find out whether we want to sow depending on the probabilities here.

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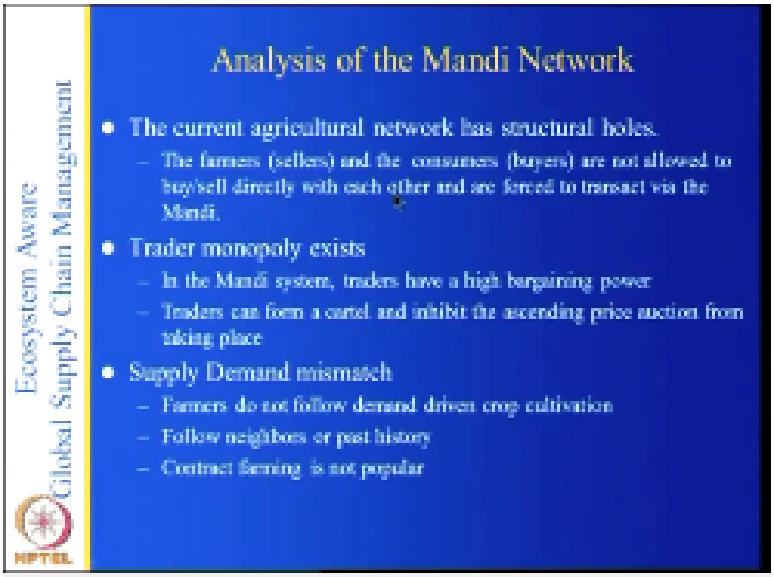

So how do we analyze them at this one current application at work I structural holes the farmers where the sellers and the consumers buyers are not allowed to buy sell directly with each other and are forced to transact why are the Mandi, now the trade our monapulates in the Mandi system traders have high bargaining power traders can form a contrails the cocktail and inhibit the ascending plays auction from taking place.

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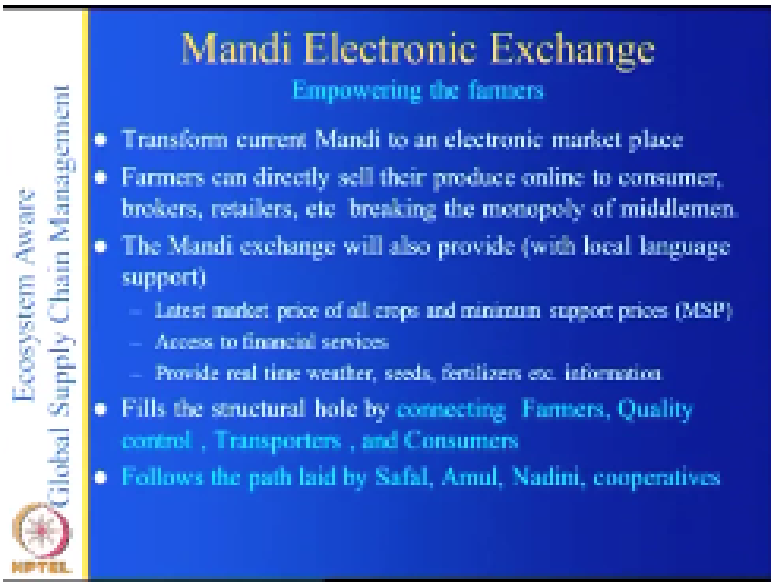

So usual problem and the supply demand mismatch farmers do not follow demand driven crop cultivation follow neighbors our past history and contract farming is not popular so for variety of reasons they said they develop this one and mandi is an electronic exchange transform current money into an electronic marketplace and farmers can directly sell their produce online to the consumer brokers retailers breaking the monopoly of the middleman so why do you have to come a limited in other words you can you can make mandi an electronic exchange and collect their to the farmers.

To this you need order to have the physical exchange the mandi exchange will also provide let us marketplace of all the crops and minimum support price and this is the mandi does even that right now access to financial services provide real-time weather see its fertilizers information and fills the structure holds by connecting farmers quality control transporters and consumers

so if this is done now currently there is a mandi there is an infrastructure that is available but the only thing is just used as a meeting place.

So I think it does not it require some effort to connect this money into an electronic exchange and where people can connect and it will the form of it will be debate to the benefit of the farmers very big reason is the intermediaries are so powerful a former usually gets only twenty percent of the final price we consumer base so the Consumer Price say hundred dollars the farmer gets only twenty five twenty dollars of that.

And there is a lot of food wastage on all that so lot of the ends of the agricultural supply chain can be treated using buy back in the Mundy an electronic exchange follows the path of all there are some private players like a moon which does in this and so fall and other cooperatives.

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The success of the mandi acts as an Orchestrator and connects all the stakeholders in the agricultural supply chain estimates the demand for each commodity and advises the farmers how many acres of cultivation is required for every year now currently how do farmers produce whatever they are producing they are produced this by whatever neighbors are doing whatever their grandfather state.

So they do not have any estimate of what is the market need act as an enabler for four months to become socially connected and help farmers established cooperatives like a moan and to value addition so there is a lot that if mundi the now transforms itself as an Orchestrator there is a lot of benefit to the this one so what we are basically saying is that you know in it is important people look at these governance models and transform the currently operating enterprises and to the operating intermediaries or traders into orchestrators were basically more useful so the I will briefly look at orchestrating a print supply chain.

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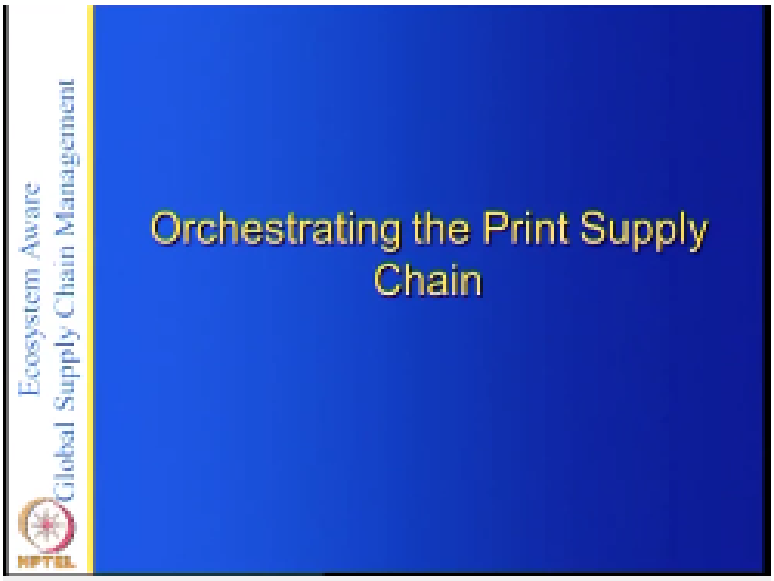

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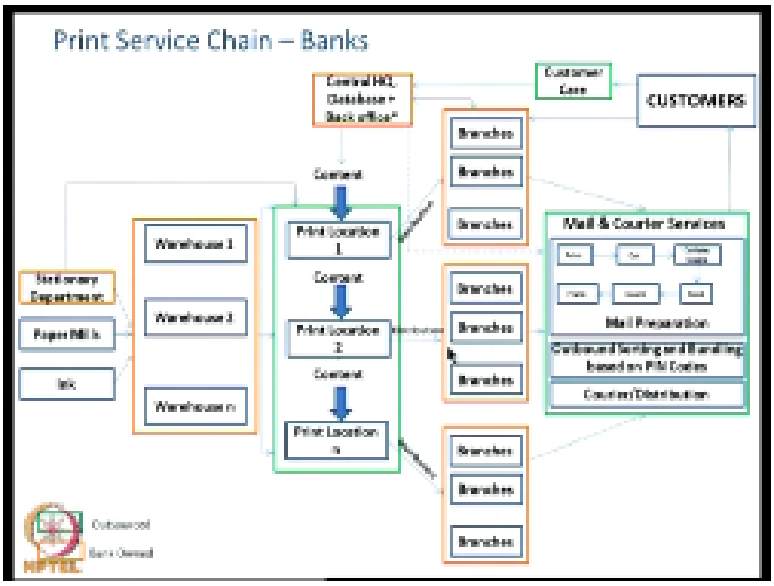

So what have you print supply chain suppose you have a back and the banks basically require lot of printed one supposing most of them do online transactions but if you want to you have to fill in we want to take a loan auto loan or a house loan then you have to fill in some forms get your signatures and so on and these forms have to be basically saved somewhere and these forms and similarly you have to send credit card statements you have to basically send fill in the forms if you want to deposit a check with the draw cash and so on.

So there are several forms that are needed and now how about these forms printed in the in a in a place like in India these are basically if each beef a bank has 1500 branches and it costs like four to five hundred Crores carry annum so basically these are all heavy items that this one what the bank typically does is the stationary Department it has a paper mills and ink and they break all the stationary and warehouse it is in some place and there is a print locations.

And this particularly the stationery that is needed could be forms it could be envelopes it could be brochures whatever is needed but they need to be printed somewhere and this is a small player phenomena but there are 5,000 branches so one thing is to print these brochures these forms these the loan application forms a car loan application house Lord and the ink that is used at different because if it is house alone it has to stay there for 40 30 years 40 years and if it is car loan it has to be it has to be starving for 10 to 15 years.

So basically there are quality issues that are that are there and the branches are located all over India the branches bank branches are located all over India so these are all the black branches that are there and whatever stationery is there it has to be printed and it has to be sent to this one now there could be there could be some specialization or customization that may happen in the printing because India has 28 states and each state has a different language that speaks native language so usually what the bank do is they have English on one side and the native language on the other side.

So where is it depending on where the branches which state the branches it is basically it may depend on that so there is some customization in terms of the printing that is nature but all the content everything has to be legal because it has to be permission undated as a central head headquarters that decides all this so what is the problem here the problem is that this branches require the stationary one thing is they cannot take and they can have small printer and print it for printer protect themselves and they do it that.

But sometimes what the bank wants is and if they can supply the PDF files and they can print it and use that but most banks have printed form sent early printed and they are sent by courier to the bank branches imagine these bank branches or 5,000 of them and so what you have is once the branches fill this then some of it is outbound sorting and bundling into pin codes and career and distribution finally part duly customers partly to headquarters branch and so on.

To the customer care supposing there is a house loan form that form has to go to the headquarters and any other forms have to be there to go and for example credit card bills are the bank statement statements have to be mailed to the customers from the branches afterwards so if you look at the entire print supply chain that is the you take the white paper and then print it and send it to their branches customer fills in our the Bank branch fills in the account statements and then it goes back so several players were in who are there in this particular thing.

And we look at this particular this one because it costs if you back it is a huge expenditure.

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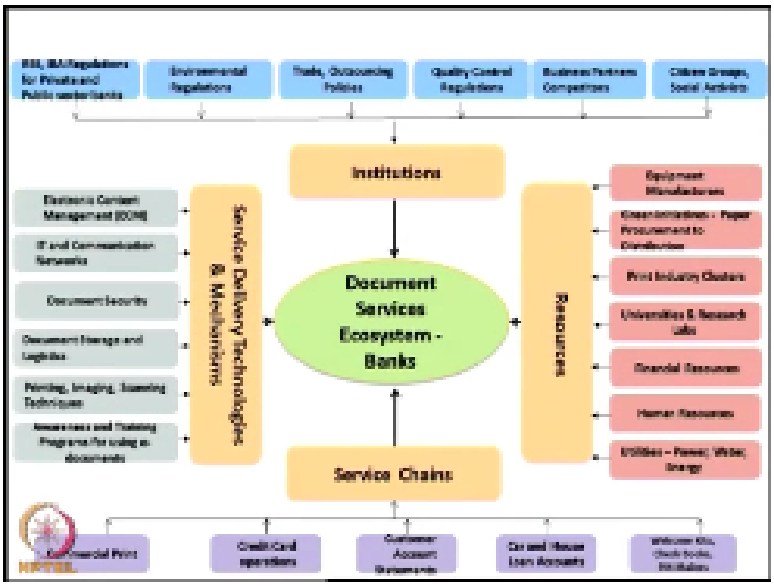

So you can write down the ecosystem purpose but will because of time with this one.

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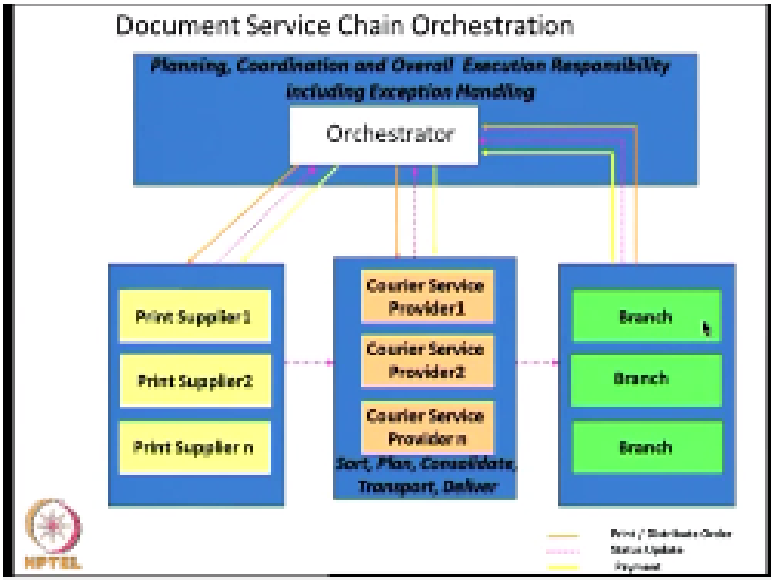

And you can orchestrate the entire this one that there is an Orchestrator which usually can be the back it can be somebody else and there is a prim supplier career providers and it goes to the all

the branches and so on now whatever each branch requires is install the printer print service and so on and finally it goes back.

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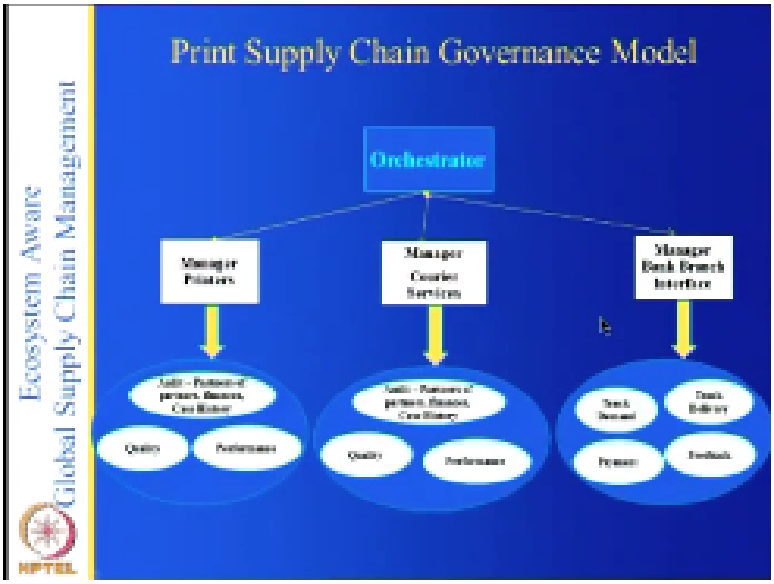

So you can have a principal at you and governance model that manages the entire thing in other words that it manager printers manage your career services and bank branch interface you can you can have this so other the point here is this there why is there a need for an Orchestrator there is a need for an orchestrator because their bags are huge and have several branches in various states and there is the print this one that is required online is possible but it is not frequently used.

So and people require raised printing this one they have to use manually hand right and fill these particular forms so that is where an artist writer is needed to same this one of course this kind of thing maybe for example as in the case of income tax filing the government may say you can file here for you have to do you filing or something and then those kind of technology changes may change this Prince of legend but correctly the prince apply chain needs an Orchestrator to save a lot of money.

This otherwise you know banks always bank branches complain that they are not having the proper this one they have to use is that of the world forms and all that kind of thing.

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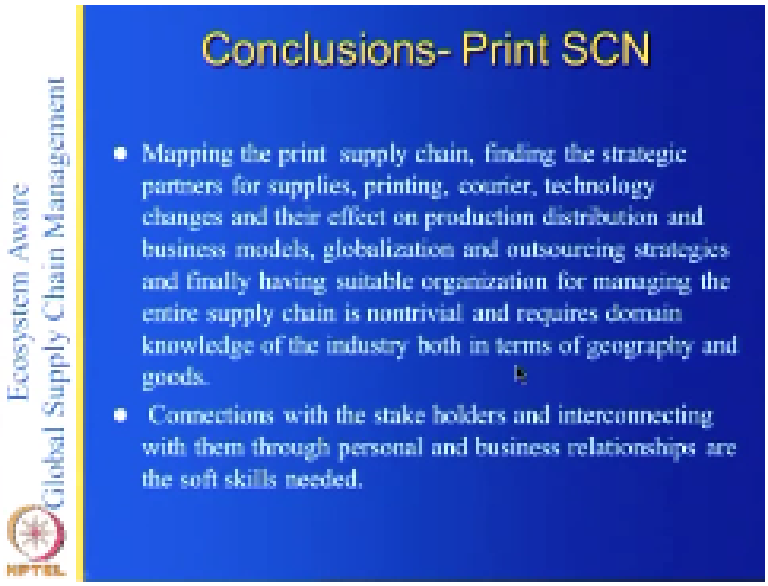

So mapping different supply chain finding strategic Clinton partners and so on is an issue and the connections with stakeholders and interconnecting them through personal and business relationships or the soft skills that are needed so I think so far what we have been doing is I have given you several examples from Airlines to contractors and particularly in the Indian context in the print supply chain the mandis and so on.

Which are very important and people had to properly analyze this and do the appropriate analysis.

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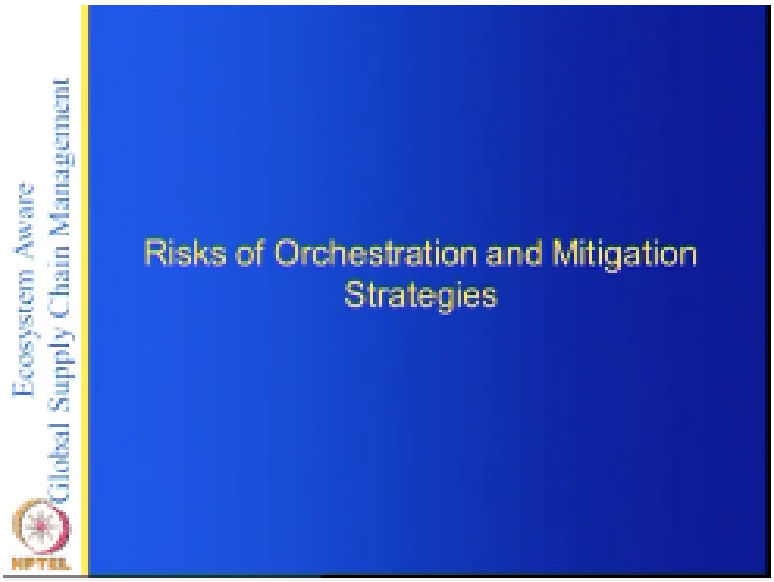

And what the invention butchered somebody important topic is and then what is an orchestration orchestrator basically he does not want anything which is just managers and there is a there is a possibility that most of these manufacturers who become orchestrators because a manufacturer instead of doing everything so he outsources the manufacturing outsource if the logistics the outsources the distribution everything.

And it just becomes a manager of this orchestration so are there any risks of this in other words when you outsource manufacturing is that a risk of you are losing out something you certainly lose the intellectual property as I told you in the risks chapter that there are lots of companies who became big by stealing the intellectual property so there is a risk of this so is it possible to look at what are the risks here in this .

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Orchestration is a high risk mode there is no doubt about that the artist trading company mobilizes may data sets of other companies to support its own growth initiatives right so once a company has chosen to artists to it is difficult though not impossible to go back and reintegrate what I am saying here is that if you are a manufacturing company you just want to outsource everything you are manufacturing and design everything and then you become anarchist return then can you go back and reintegrate no.

But if we have started as I as a orchestrator if you have started as a 4pm and so on is it possible for you to get into the manufacturing and all that so let us look at here is the story of a company called Schwinn the iconic American bicycle manufacturer allowed to orchestrate to haul out its core.

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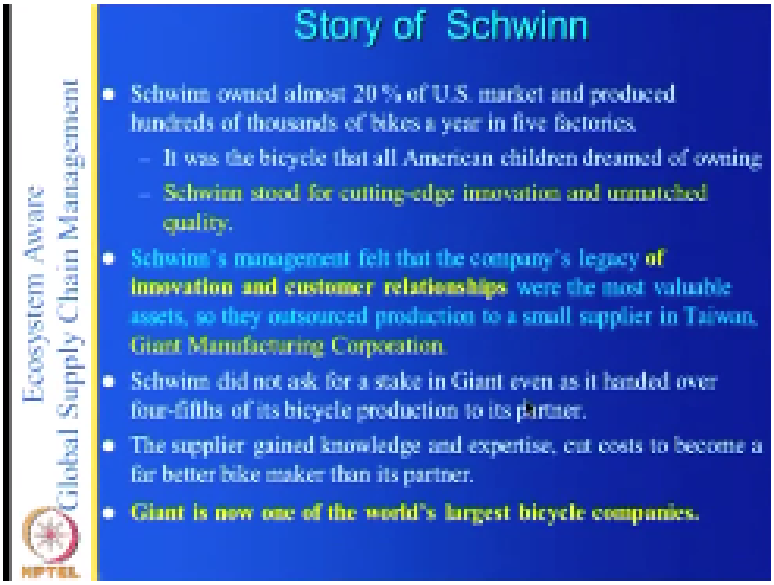

Let us look at this example this story is this Schwinn about twenty percent of US market this is a bicycle market and purchase hundreds of thousands of bikes a year in five factories it was bicycle that all American children dreams of owning and when stood for cutting edge innovation and unmatched quality all right so that is the company that it is and its management felt that companys legacy of innovation and customer relationships were the most valuable assets and the outsourced production to a small supplier in Taiwan giant manufacturing corporation.

So here comes the question of the core competency theory now as I showed you last time infrastructure customer relations and innovation which are the ones that are important and people felt that innovation and customer relationships are the most valuable assets and I also sprach into small supplier that is the joint manufacturing corporation when did not ask for a stake in the joint even as it handed over four fifths of vertical production to the partner four fifths eighty percent and the supplier gained knowledge and expertise cut costs to become a better bike maker than this partner.

And change is now one of the worlds largest bicycle companies so what happened here your partner basically as your intellectual property he made some improvements as he is doing the manufacturing it is a low cost country and this will last its market share.

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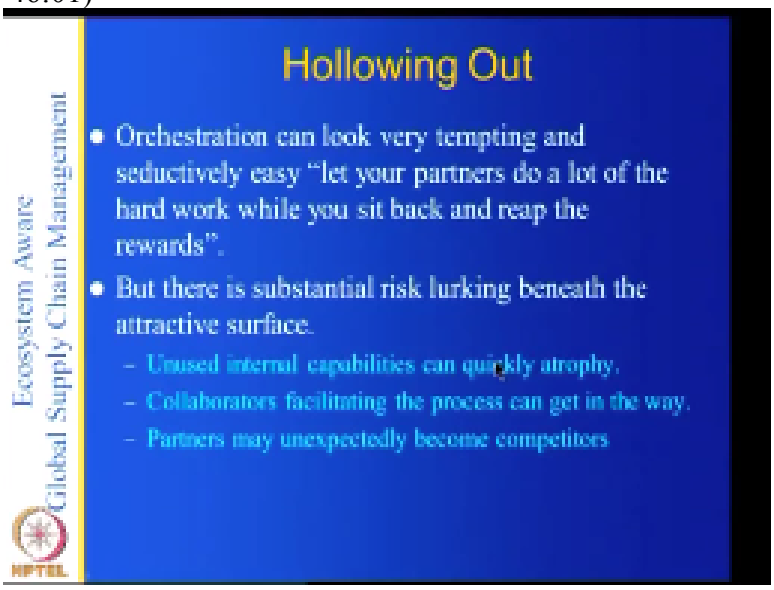

So hollowing out so our castration can look very tempting it seductively easy let your partners do lot of the hard work while you sit back and reap the rewards right that is the one that orchestration should not be misunderstood as but there is substantial risk lurking behind this unused internal capabilities when quickly atrophy, if you do not use our capabilities you may lose them and collaborators facilitating the process can get the get in the way partners man has literally become competitors.

So when you are trying to manage something then you know there are other people who want to get big also and there is computation everywhere it say it say it is not unfair it is a fair competition but like you everybody wants to make money so you have to be careful then you just want to orchestrate .

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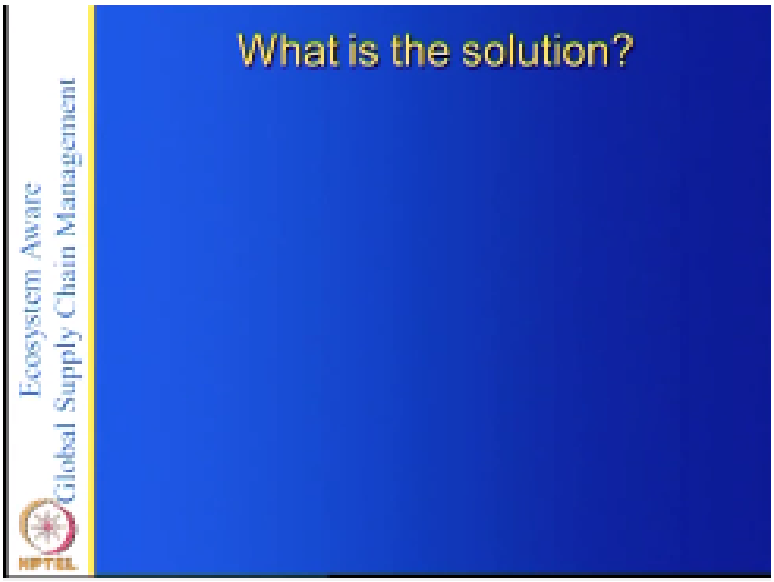

So what is the solution in other words we have been talking in these two lectures that our construction is a good thing that is happening and you know you can orchestrate and so on and all that but there if you look at the examples several examples there are there are several types of orchestration we have we have talked about and one kind of orchestration which is very highly risky is when you are a manufacturer you outsource everything and try to manage then there is the risk of following it out.

But if you are a service provider for example a Mundi who is a service provider who is connecting people and it has a social purpose then it could be an advantage so but in the case of somebody who is hollowing it out what is the solution.

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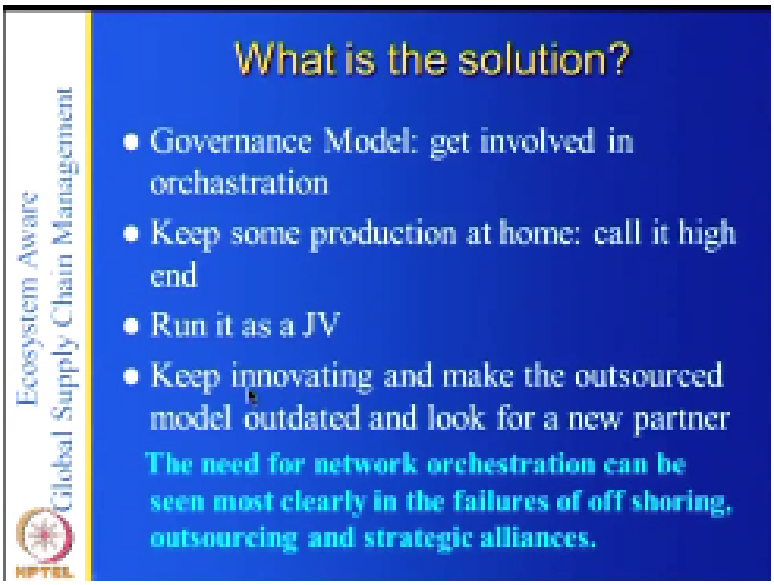

Governance model get involved in orchestration in other words I was carefully defining what is means in orchestration it means connecting it means setting up performance standards it means execution it just not me and just give it everything to everybody and then you sit back and relax so you will get involved in the orchestration so basically knows people know you are asking people questions so they know you are in your inside keep some production at home call it high end a lot of manufacturers are doing this particularly in the fashion business.

Where they keep some production at home what they call it high end but rather than it is a joint venture when you have a rancher with joint venture then you hope your own people in that and you have a stake in it whether it is in foreign or the weather where it is in your own country you know some other country keep innovating and make the oats or someone will outdated and look for a new partner so it is not the strong ties kind of thing where you keep innovating and make the outsourced model outdated and that means your partner.

Whoever is doing things for you is outdated but you are looking now for a new partner the need for the network orchestration can be seen most clearly in the failures of off shoring outsourcing and strategic alliances so what did that follows here we should understand that the orchestration we have projected is that the abundance model for a dispersed manufacture the other words for a social network of organizations which are globally dispersed.

So you are looking at orchestration as a governance model which basically connects all of them and puts them together towards a common goal that is what it is and that if you will basically a company and you want to outsource everything and then try to manage that is a misunderstanding of that to a calculation in which case you may get into the problems of the risk.

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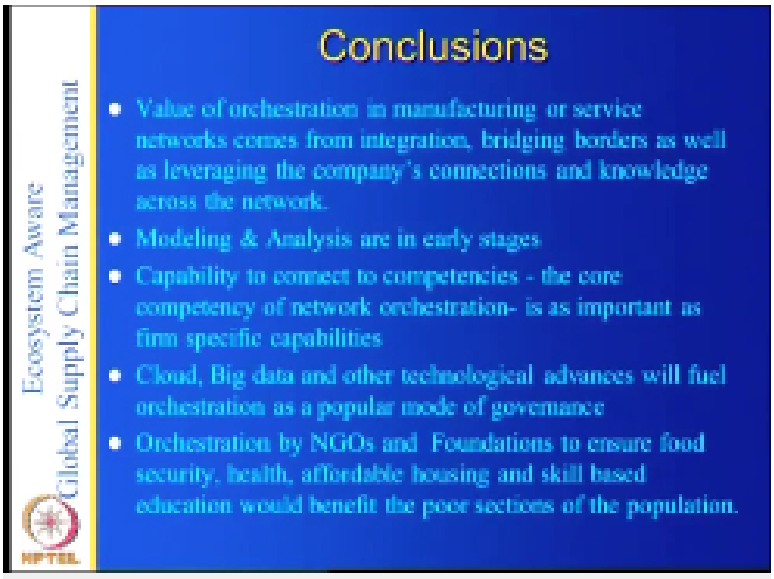

So what is the conclusion what is that we have done in these two lectures we have looked at orchestration is one of the governance models so in these governance models we looked at the orchestration they find it what are the talents that are required what does mere orchestration means and we looked at several examples and in particular in logistics in supply chain as a Mundi as a principal I chain which are small enterprises how orchestration can really help.

So in two examples I have given like different supply chain or are an agricultural mandi or logistics you are basically a new player connecting with others but there are examples like the hollowing out the example of a manufacturer who outsources everything and he wants to just manage then there could be rough some risk so people should see what but what they are in and then implement orchestration understand it properly the value of orchestration in manufacturing service comes from integration.

Breaching borders as well as leverage and companies connections or knowledge across the network that is the important point modeling and analysis or in early stages you know I what I have presented here is all the heuristics or no kind of qualitative presentations of principles here which are important capability to connect competencies core competency of network a space station is an important for specific capabilities you know so in other words a firm has a capabilities you are very good in the design you are good in manufacturing you are good in some services and so on.

But like that you are good and connecting to good people that is also as good an important thing and cloud be paid another technological advantages will fuel or castration as a popular model of governments the future because current thinks is that you have to communicate with your partners how do you communicate now cloud computing and also big data analysis and the mission learning algorithms they basically come into in a big way orchestration by NGO foundations to ensure food security help affordable housing and skill based education would benefit poorer sections of the population.

So this orchestration can be used for social purposes where you have for example help you can collect all the hospitals the doctors and the patients and a security food security for example you can connect all the players like the hawkers and the NGO and are the others do this and affordable housing and others so basically that is what we stop and we will look at some more things on orchestration in the next class thank you.

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