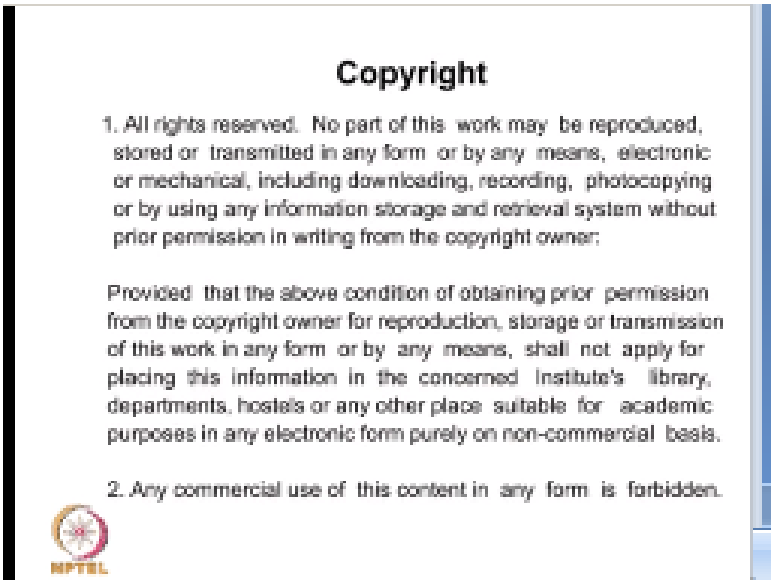
Indian Institute of Science
Bangalore

NPTEL
National Programme on

Technology Enhanced Learning

(Refer Slide Time: 00:07)



Global Supply Chain Management
Lecture – 19

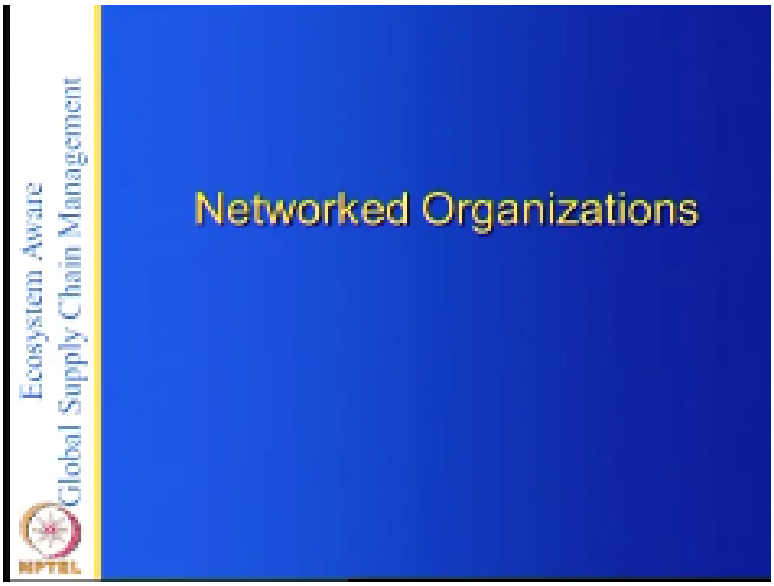
Governance of networked organizations
Prof. N. Viswanadham

Department of Computer Science and Automation
Indian Institute of Science
Bangalore

In the previous lecture we looked at vertically integrated organizations and looked at their governance structures which is like functional product based it can be process based it can be matrix and so on so give several examples in particular we talked about two important examples which is Zara which is all the vertically integrated it is so it follows different lines of business and highly successful company in the fashion industry the other one is sem x which is a cement company it is business model is to supply business building materials rather than just cement.

Now what we are going to look at is networked organizations which are basically organizations of groups of companies which are under independent ownership.

(Refer Slide Time: 01:09)



(Refer Slide Time: 01:09)

So basically a number of independent companies each concentrating on its own business form an alliance towards a specific goal performing activities along the value chain acting together as a single corporation it is odd though it is a single corporation but one is doing this applying another doing the manufacturing another distributing another retailing and so on so they are all

it is a sequential process that is followed and all of them are collaborating to towards the success.

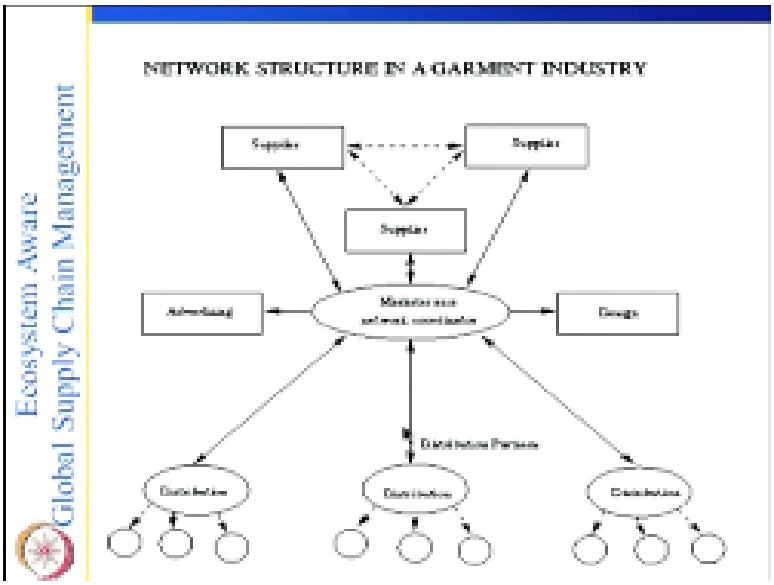
And what the selection coordination and control are three parts of the governance of the global value chains then it becomes important to look at the governance when you have so many independent companies so somebody produces cotton somebody does so in somebody produces jeepers and so on but who will put them all together who tells them to what super for what is it is it for a trouser is it for a short or is it for a quote whatever.

So basically one need to find out depending on the design depending manufacturer and so on you have to select the partners and coordinate their activities who does what and also control them whether everything is going right or not you have to monitor and control for quality for the price for everything that goes that goes wrong and so on so that is become so important this one what is coordination in involves deciding and keep out of this one like product definition what is the kind of product if you are producing sure it is what is they design.

What is the what is the color and so on so basically specification technology to be used and production schedules or location quality systems lab or mix its environmental standards and targeted price on communicating to the partner so basically everything somebody has to done in this and none coordinate del to the partner so this kind of coordination is needed in network organizations in vertically integrated organizations they said under it is authority somebody a design team of the organization decides it approved by CUO.

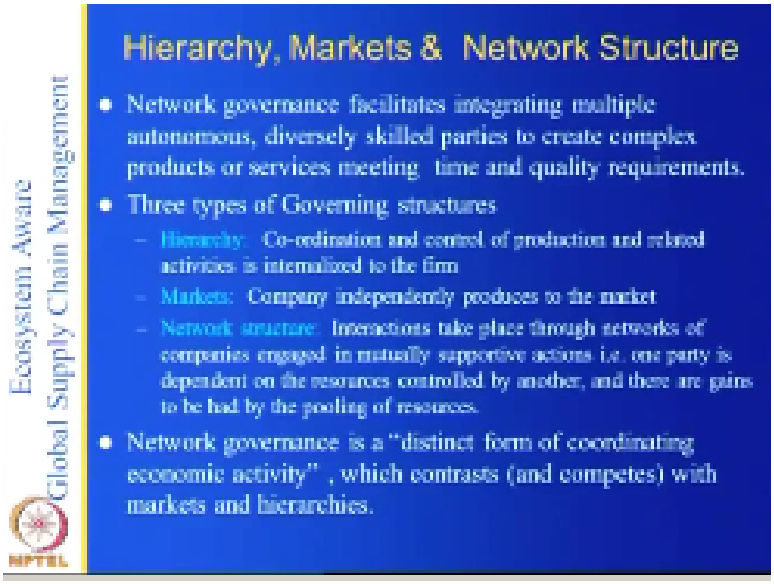
CUO gives an order and everybody follows but here you have independent organizations so that is where coordination becomes a bit risky.

(Refer Slide Time: 03:36)



So here is a picture of a network structure of a garment company so you have all the suppliers around the world somebody does the design according to their this one and there is advertising or marketing and the density distribution and so on so.

(Refer Slide Time: 03:55)



This is a typical this one so there are two kinds of network governance mechanisms that integrates multiple autonomous diverse parties to create complex products or services mating time and quality requirements so what are the network governance there are three types of

governance structures generally one is what is called hierarchy coordination and control of production related to the activities is internal eyes to the fall.

Rather watch hierarchy is like a vertically integrated form the other one is markets you know just leave it do not coordinate anything you leave it to the markets and markets independently produced the park in other words if you have if you have producing jeepers you go and market it whoever buys by city or you take an order from somebody and then you basically go and sell it but there is no coordination here.

In the network structure interactions takes place through networks of companies engaged in mutually supportive actions one party is depend on the resources controlled by another and their gains to be held by pooling of the resources so we are talking of a network structure where which is sequential and they collaborate and cooperate and so on so this is not either markets or something it between comes between hierarchy and markets.

Network governance is a distinct form of coordinating economic activity which contrasts with markets and hierarchies so that is about the theory of this which between the hierarchy and markets and the net was come in between.

(Refer Slide Time: 05:45)

So there are what are called integrators this integrator is either a original equipment manufacturer or a proprietary technology winner or a financial or a trader who basically does he develops strategy consumes a winning products and coordinates workflow among all the parties trains the human resources and helps in the event of trouble well these are the kinds of functions that one need to do and that is what the integrators does.

So auto manufacturers such as Chrysler use their buying power and size to their networks advantage right so basically their advantage is to sell their cars their networks advantageous to give everybody who is in the network their business Apple uses proprietary technology as a leverage and protects itself through non complete or non disclosure agreements and moving rapidly to new technologies so when you are assigning or outsourcing something given to somebody then there is a possibility of somebody stealing your intellectual property.

How do you protect yourself from the intellectual property one of the ways is to rapidly change this property I mean Apple does move from Ron product whether quite rapidly before somebody else imitates that and their financials investment brokers have been traditional integrators and information owners like book stores supermarkets chain stores their closeness to the customers they leverage their closeness to the customers they basically become the integrators.

Sometimes the book stores they tell the authors what to write a book and what topic and so on so then attend IK and Crisco mark and Spencer are best known Network integrators outside the auto industry though there are other integrators in this so basically the idea is to look at these is there is somebody outside when it there is a network one thing is to leave it to the market forces the second thing is there is somebody either inside outside who should tell people what to do and so on somebody who is who takes the responsibility for this.

(Refer Slide Time: 08:13)

So they were basically what are called channel masters I am just introducing all the terminology which is available and then before I get into my own on this one so the channel master is an enterprise within a supply chain that has compelling control over the sales of products like for example general motors for Daimler Chrysler in automotive manufacturing taught three automatic compared seventy three point seven percent of the annual vehicle sales so they become channel masters why are the channel masters why do people listen to them.

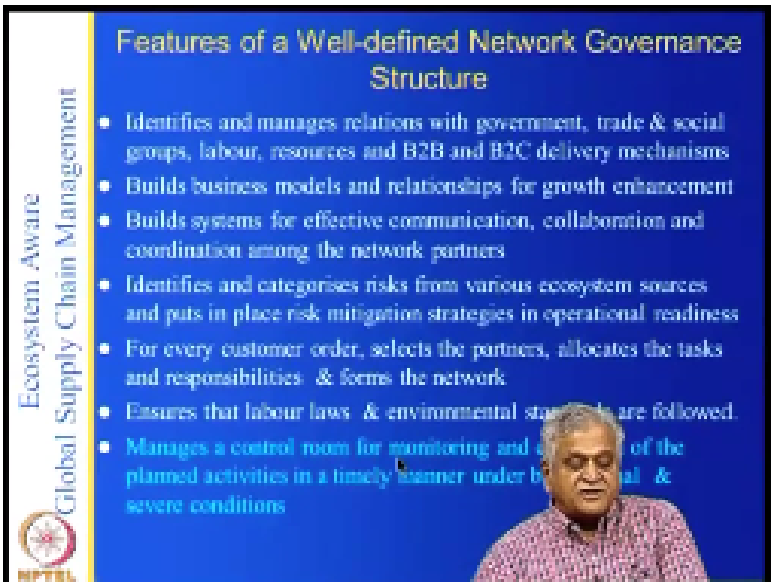
Because they 75% of the annual sales are controlled by them so it is up tires are the logistics providers in the auto industry they because they may command respect from this coca cola Pepsi and Cadbury beverages and soft drinks top three manufacturers eighty percent of soft egg market their computers commands the largest share of desk pieces Cisco leading manufacturer once electronic infrastructure of the supply chain and Wall Mart mass retail because customer account of most CPG companies requires members to operate it and so on so.

Basically these are channel masters they get the power from their market size or the market share so.

(Refer Slide Time: 09:43)

This is just an introduction to do the governance we looked at the integrators markets and so on let us try to get into what is governance and how do you actually give some theoretical underpinnings of governance and how do you model what is the mathematics that is used so let us look at some theoretical aspects of governance.

(Refer Slide Time: 10:09)



what are the features of governance good governance this one so it identifies and managers relations with the government trade social groups labor resources and b2b and b2c logistics companies all right so in other words it is a network having say thousands of companies so you have to identify the relations with the government with other competing the companies with iterate and other social groups labor and so on.

And if you want resources those resources and it has to build the business models and relationships for growth enhancement so what is the business model you are selling direct you are selling through this one or you do it other thing yourself or you were to basically also some of this what are the relationships that that you want to have with other countries joint ventures FEI foreign direct investment or you want to do something.

So there are several decisions that needs to mean build systems for effective communication collaboration and coordination among the network partners the other thing that is done has to be transparent and shared among people so you have to have the common ways of communicating with people identify some categorize as the risks of various ecosystem sources and puts in place the risk mitigation strategies and operational readiness well.

So I mean everything goes well it is fine but there is there sometimes there is a the risk of something happening from a truck failure as simple as that to some earthquake in one of the supplier countries to sovereign debt of another country and so on several things which are unforeseen can happen high probability a low probability whatever events can happen so whenever these events happen you have to take care of them .

What is it put things in place and for every customer orders and active partners allocate the tasks and responsibilities and form a network and ensures that level of environment standards are followed you know their loss regarding women a lab or the child labor and so on and also you cannot pollute the atmosphere the carbon GHE gases and carbon footprint these are all important things that one need to follow and he has a control room for monitoring and execution or the planned activities in a timely manner both normal and abnormal conditions.

So under normal conditions to check the quality of the product and abnormal conditions to check about expediting and doing other things and so on so these are all the features of a network governance model so you been above whatever you the one you to suggest or whoever is the one who is to follow all this.

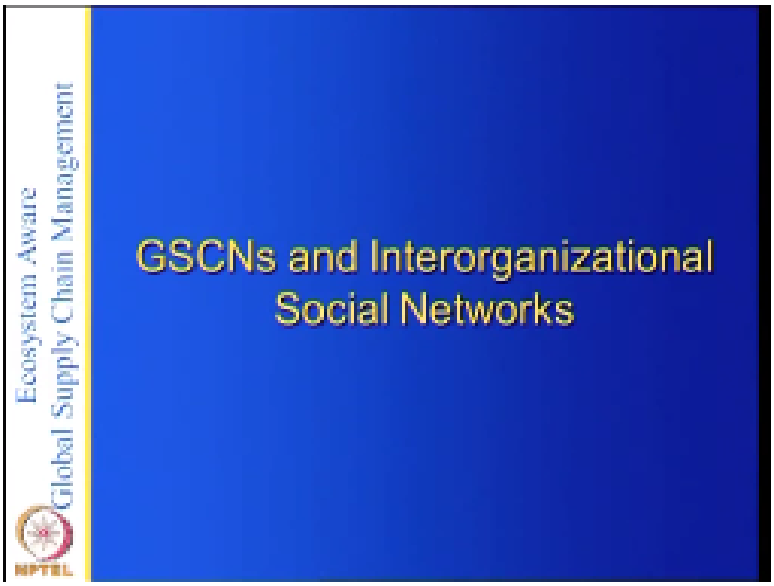
(Refer Slide Time: 13:17)

And talent so what are the talents that are needed can anybody be a see you oh no this deep domain knowledge though you are treating of your network you are considering a network which is globally distributed and it this technique has to be technology enabled so that and also whatever is the vertical whether it is oil gas or steel or auto or electronics you have to have deep understanding of the processes and also intellectual property relating to the products processes and so on.

You should know and management of procurement acquisition partner selection monitoring supervision visibility across the supply chain of course relationship management in other words you have to have good relationship with your suppliers with your distributors with your retailers with your customers big customers governments and all their so suppliers like electricity what are human resources education institutions but all that and in this is a huge task.

And the capabilities to identify continually the design and manage processes to change market needs this is an important thing particularly if you are a technology oriented company technologies changes so as they change your products get outdated so you have to think of new products and so on and human resources training mentoring and performance evaluation so these are the kinds of talents that are needed in the supply chain governance.

(Refer Slide Time: 14:58)



Let us look at the global supply chain networks and inter organization that works now there what are called social networks now social networks or usually we study we look at social networks like Face book Linked In and so on which are person to person networks now all of us have a council on later in your link to one person to the other but what about companies can the company's oil transport companies are they on this order.

So that they can communicate they can exchange information well the state of the art they can also collaborate this one and all that is it a transport social stand what face book this one it is possible but it is in third or the nitration that is called inter organizational network like peoples network is a social network you have inter organizational social networks like you have

hospitals small hospitals big hospitals they link together you have largest accompanies all the trucking companies and so on.

The third party for party logistics players they link all these people talking warehouses and all that and that becomes an intern organizational logistics social network that similarly supply chain is an inter organizational networks so instead of persons you have organizations which are involved in the social network.

(Refer Slide Time: 16:31)

So into global networks network of companies forming a girls role of this one inter organizational social network with strong or weak ties you know in a social network you have two kinds of ties either weak ties or strong ties the strong ties or courage to share ball and work seen in these are all strong ties in a sense with supplier and the manufacturer or the distributor and the manufacturer they are basically having very close ties in other words the manufacturer unless in the supplier it provides intellectual property and probably the suppliers people.

Or there in the manufacturing this one to find out the requirements and so on so there is a close relationship between them and this is the one that is followed in several countries and there are lots of advantages to do this you have a long standing relationship so trust builds up between these two people so there is no theft of intellectual property and all that but the strongest disadvantage particularly with so many disruptive technologies coming they the outer the suppliers may soon get updated their products may become outdated.

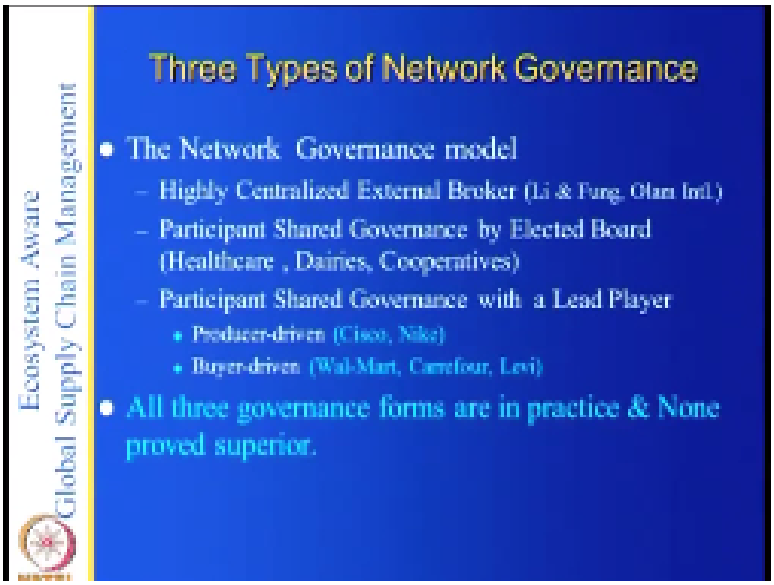
So either you have to train them to become update or update them and help them to become to become modern and so on to there will be new technologies or you have to move out so that the buyers may feel socially obligated for the partners so that means you are thinking that since you have a strong relationship we hope to update them are still keep buying from them and so on and it glowed more competent newcomers so that is one thing that usually happens particularly when technologies are shown changing so fast.

It becomes almost which is like having a cottage handloom versus a machine controlled handloom and so on so basically you so the social obligation is one issue with strong ties but on the other hand if you are buying from the market well you have one length relationship in others as long as somebody supplies that is why but if you do not supply high quality ones and if you do not have the technologies then I will move to somebody else so this is the kind of weak ties arrangement that you have and consider your ties if not competitive.

So what happens to the partners it incentivizes the partners to be on the cutting edge the cost of innovation otherwise they will be fired so when we were looking at this global supply chains from Nippon smack you know social networks you get very interesting results because in the intern organizations social network literature you know which was bus basically concentrates on small linkages between small hearts hospitals because petals and also the educational institutions and so on they are called loosely coupled systems.

But here when you apply to supply chains it gives you interesting results so you have strong ties like the Japanese model or a weak ties that is it is entirely up to the market if you are not competitive I would not buy it is like buying it on the web or through an exchange and so on so tension between weak and strong ties so what do I follow should I have a trusted relationship or who I have arm length relationship so what do I do so that is attention.

(Refer Slide Time: 20:34)



That the people had the three types of network governance that is followed so what is the network governance model highly centralized external broker well was there is a fellow and a Li & Fung is this one well I am international in agriculture he is highly centralized external broker in other words he does not own anything any manufacturing or anything he is not a part of this but what he has is the connections he has the connections with the retailers to get the orders he has connections with each of these suppliers in each of these countries.

He has government connections he has connections to choose the logistics players he has connections with the banks to get the financial help if needed any of these partners need that is one model that we have so this is this is a highly centralized broken modular and orchestrated module that is gaining importance now and there is another one is participants shared governance model by electrical board health care is one example this group of hospitals come together and they have a board which is one dairies usually because there are small players as well as this one.

And cooperatives are the ones where they have an elected board there are lots of members who are partners in this but they have an elected board which manages the entire thing participants shared governance with a lead player so instead of an electric board so one of them becomes a late player like an integrator so either it then here there are two types one is producer driven or bio driven producer driven or the manufacturer dribble which means that it is like Cisco Nike a General Motors or something where you have this producer driven participant governance models.

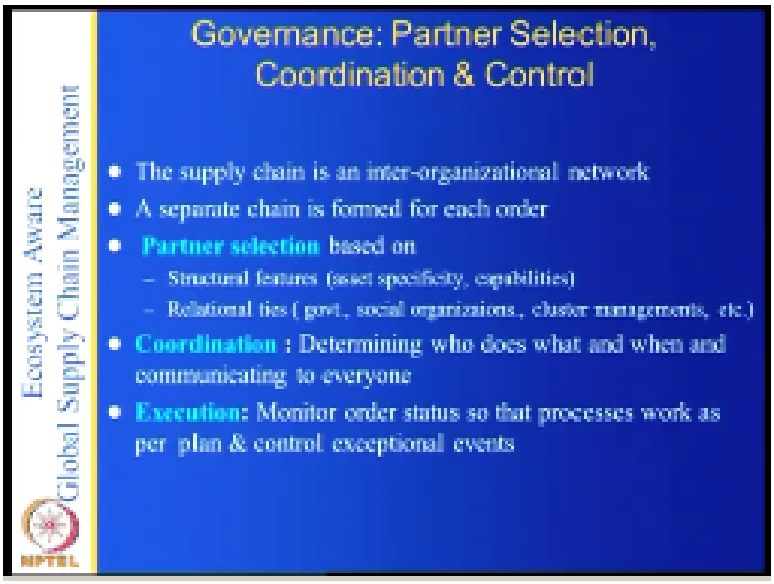
And this can be bio driven like Wal-Mart Levi carry four or something so these retailers basically are the ones who dictate to the supply us what to do this and so on so basically these governance models are interesting of this these are the three things that you have all three governance ones are in practice as I gave here is examples here first of all the first question is are this or there is only these three this one in terms of the networks or there are others you can search for others but I do not think there are others and which one is better is it possible to basically either qualitatively or quantitatively assess.

In a particular situation which one should I use well the answer is none approval superior.

(Refer Slide Time: 23:45)

So what we are leading to here is what is called multi layer governance coordination and execution so what is what is here is.

(Refer Slide Time: 23:57)



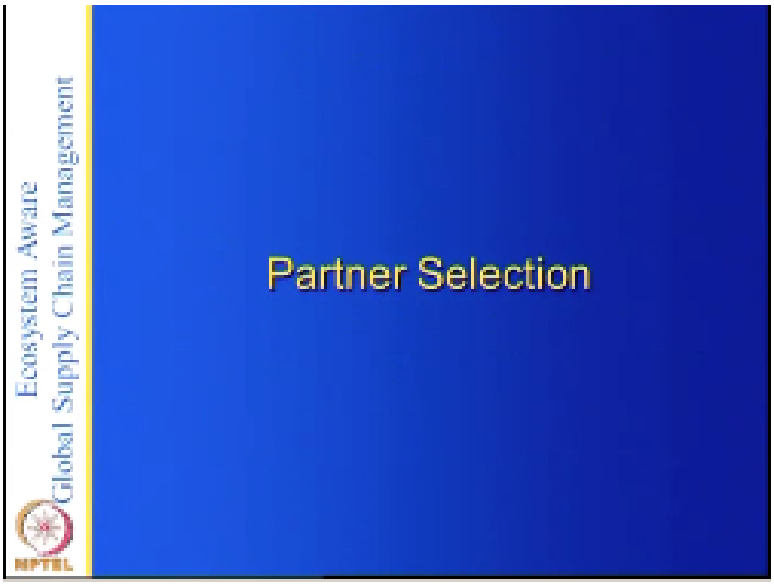
The governance is what does governance mean is partner selection coordination and control so first of all the supply chain is an entire organization network a separate chain is formed for each order so we have basically the several of these suppliers and put the orders as the orders come we will choose these people and partner selection is based on the structural features what are the structural features what is called SS asset specificity and second thing is the capabilities.

Now when you select a partner now supposing you have a requirement that you should have separates as certain specific types of machines or he can have he should have separate kind of trucks which will fit a big boiler which some electric company wants to buy so that is called it becomes a sex specific in other words and those are the features that you should take into relational ties will be government social networks cluster management cetera so if you everything being equal.

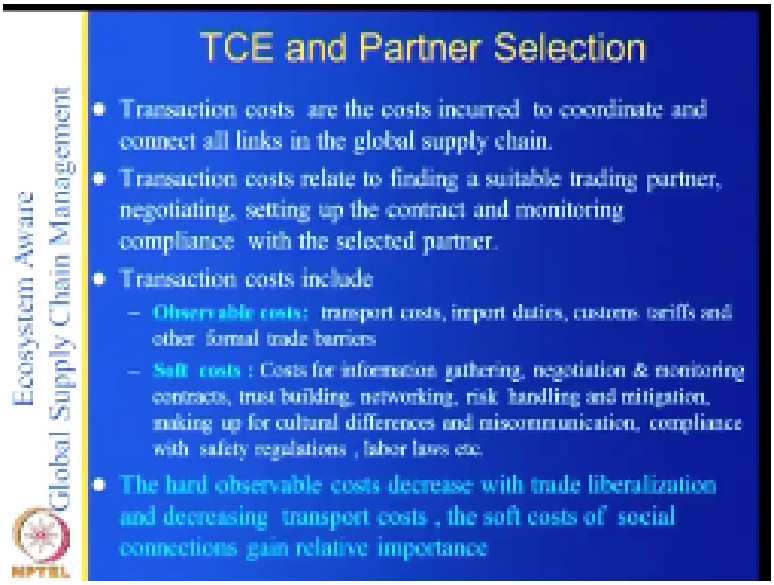
If somebody has very good connections .then you may choose them and coordination that is a partner selection has two features one is structural and relational and coordination is determining who does what and when and communicating to everyone that is mathematical and execution is monitored the order status so that the process is working as per plan and control exceptional events right so you have three things which is governor governance means one is partner selection based on the structural and relational features.

And of course what you want whatever you want to do a third one is coordination determining who does what and when and having good communication with others and execution so these are the three things in the in the governance .

(Refer Slide Time: 26:20)



(Refer Slide Time: 26:21)



Let us look at what is the partner selection so how do you select partners usually the partner selection if you are in the ordinary case how do you select partners it based on low cost now somebody says lemon rupees and somebody else is nine rupees you select a nine rupee one that is the cost issue then there could be other issues that are that are needed supposing you can add the transportation costs.

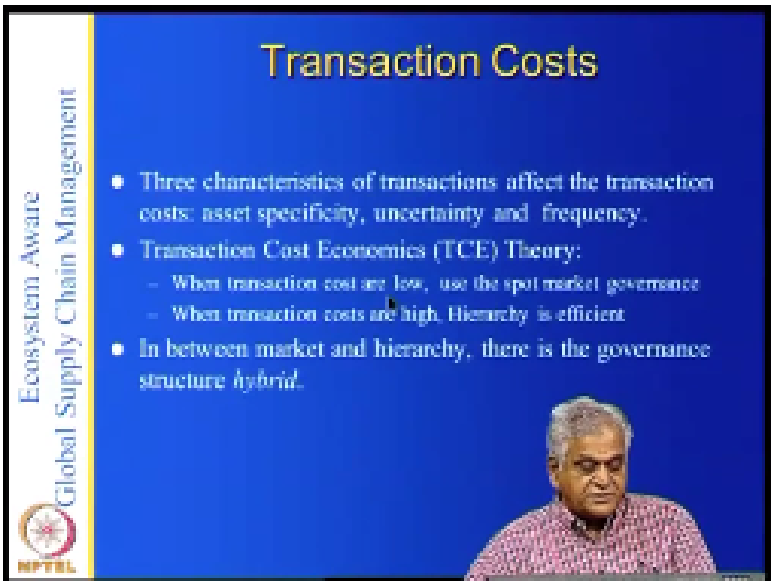
Somebody is far off of the product quality everything being the same then if somebody is in China and other fellow is in is in India and if the manufacturer is in India then you source from India that means then you are worried about unit cost plus transportation costs all right now if your if you are basically supper getting nice and from China or from Taiwan or from Hong Kong then you add the duties and also the shipping times so what are the kind of safety inventory that you need to keep and what is the kind of distribution that the travel time has.

So all these things matter and what is the kind of infrastructure delivery infrastructure that they have at that particular port so the issue becomes complicated it becomes based on the ecosystem so the transaction constant code to coordinate connect all the links to the global supply chain and transaction costs related to finding suitable trading partners negotiating setting up the contract monitoring the compliance with the selecting partner so basically all these costs will come in so translation costs include observable costs which are what are the observable costs transport import duties customs tariffs and other formal trade barriers.

Thats what I was talking about they are also hidden costs like information gathering negotiation and monitoring contracts trust building networking this handling mitigation making up for cultural differences in miscommunication compliance with safety regulations labor laws and so on so they are all this off caustic so the observable costs decrease with trade liberalization the observable cause our transport cars import duties and so on if two countries have some kind of a trade pact so then the thread costs can come down we exchange this one.

But the soft cause may increase so the hard observable costs decrease we trade liberalization and decrease in transport costs the soft cause of social connections gains importance so but usually people do not they look at only hard costs but they are brokering and other costs under scheduling another cause people do not take it but it is important to take both hard as well as this off costs while getting the easy partner selection.

(Refer Slide Time: 29:43)



So what are the transaction costs three cause of transactions affecting the three characteristics of transactions affect the cost one is what is called asset specificity the second one is uncertainty and third one is the frequency urban frequency is easily explainable how frequently do you need it you want to only once or you want it every week so if the frequency increases then you know that is a is a thing that you should is not a once in a lifetime kind of activity but it is a daily activity or a weekly activity.

And also uncertainty is what is the uncertainty that is involved in terms of the cause in terms of the practices in terms of the economy and other things that matter a lot and also yes a specificity for the particular product under consideration other any asset specific machine structures you need do you need for example if you want R&D you need specialists say in biotech you need specialists in software engineering so all those things cost money .

So basically you have to look at those transaction costs 1ms TCE theory so the TCE transaction cost economics theory says when transaction costs are low use this part or text evidence in other words you can easily connect to somebody who is the best supplier for you and you know what is the cost of transportation and all that you can evaluate when it is low you use this part market when transaction costs her high hierarchy sufficient in other words this is transaction cost is used as a as an example to find out whether you want to outsource our do it yourself so if the transaction costs are high that is outsourcing is expensive do it yourself.

And if the transaction costs are low then use your outsourced do not do it yourself this is the kind of thing that you choose but then it depends what is the transaction cost visit the unit cost or is it unit play transport costs or is it the unit plus transport plus the trade cut-rate cause or is it

for the any pilfering theft and so on in what we add the cost so the cost evaluation becomes a bit complex so in between market and hierarchy there is the governance called structure called hybrid.

(Refer Slide Time: 32:39)

So three four types of SF such specificity in other words when you are looking of Assad specific physical asset specificity refers to the mobile and physical features of assets such as specific dice molds tooling for manufacture of the product so the supplier some manufacture wants a particular product to be supplied from a supplier well it is one of those products with the supplier already doing his the missionary that is why but on the other hand it may be a new product and the supplier need to buy new machines or this and if he buys that machine after if this particular product this disappears this order disappears.

And he supplies it hit man the mission may be useless after that and supposing you want to you want to have some other warehouse of something which is a set specific which is temperature sensitive products and all that and when this business goes away and the temperature cells to warehouse becomes a waste so nobody else may need that the other one is dedicated offensive stated represents discrete or additional investment in generalized production capacity in the expectation of making significant sale of the products to a particular customer .

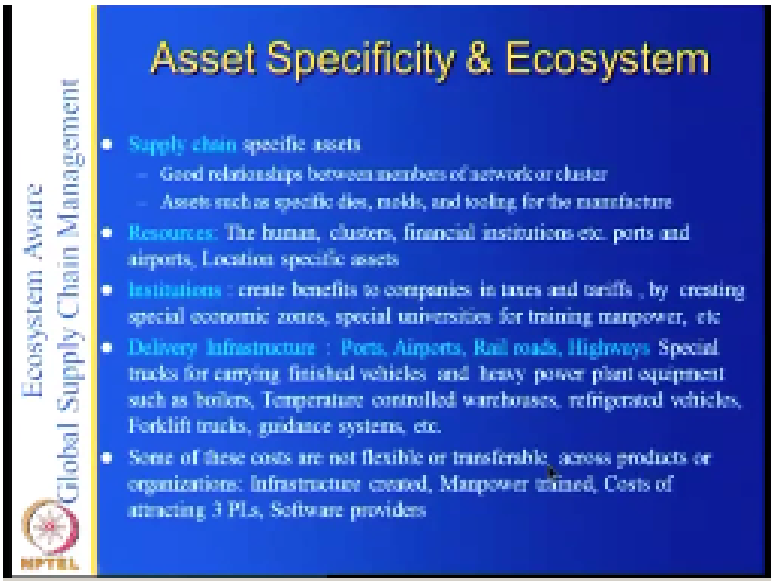
So what happens is usually in a you know in the in this development you expect suppose you are making a green product okay so then you supply this to the market and if the market accepts it then you have an immediate raised in your demand so within so you can say this particular

product sensitive screen people are going to buy it and you want to have asset specificity in other words you want to have capacity much higher.

This third one is human asset specificity and unguents and learning by doing fashion through long-standing customer specific operations in other words you want for example the IT companies used to have C++ programmers or Fortran programmers that is but those programmers once now Quadroon is absolute and may not be useless off towards and site-specific its assets refer to successive stages that are immobile and are located close proximity of one another so as to economize on in entry and transportation.

So basically you can you want to have a warehouse we want to have a supply hub and but what happens you know if the market goes down and there is no demand for that particular product whatever supply hub you have had for this particular product whether it is automobile or electronics and it becomes a waste so this asset specific is an important thing.

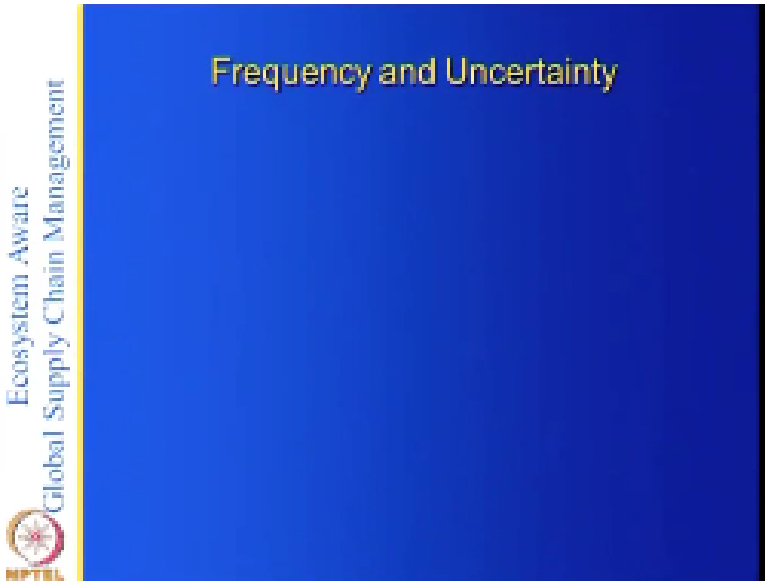
(Refer Slide Time: 35:59)



But there are various kinds so supply chain specific assets the other thing we are talking about is an important concept is supply chain specific assets good relationship between members of network or cluster assets such as specific guys morals and so on resources the human question clusters financial institutions boards etc institutions create benefits to companies in taxes and tariffs by creating special economic zones special universities for training manpower etcetera and delivery infrastructure ports airports railroads .

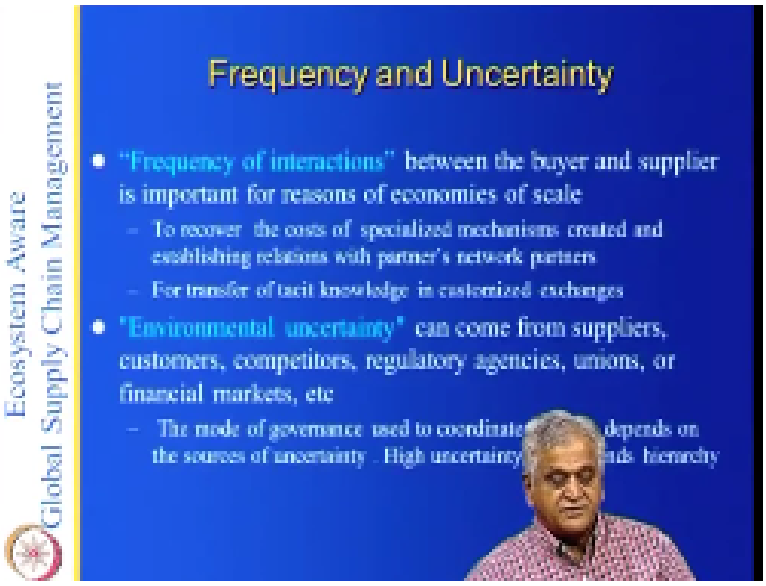
I means special trucks for carrying finished vehicles and heavy power plant equipment such as boilers temperature control warehouses refrigerated vehicles work lift trucks guidance systems and so on so somebody are not flexible or transferable across products or organizations infrastructure created man power train cause of attracting 3pls and software providers etc.

(Refer Slide Time: 37:15)



So they put the point here is this what we are interested here is in this supply chain asset specificity or supply chain transaction class so you have the supply chain resources institutions delivery mechanisms all these things give to cost so we basically based on the ecosystem will get the this one frequency and uncertainty.

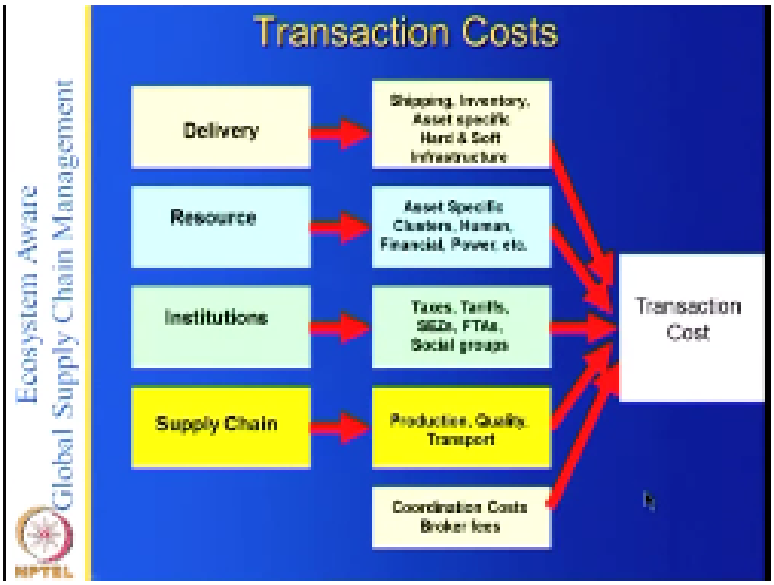
(Refer Slide Time: 37:41)



Frequency of interactions between the buyer and supplier is important because they create the economies of scale to require the cause of specialized mechanisms created and establishing relations with partner network it is important to have scale if it is a onetime transaction then your cost will be high but on the other hand if the cost can be the capital cause or the sunken costs can be utilized to over a scale of several per product sales and it is different but transfer of Trezit knowledge to customer exchanges.

Environmental uncertainty can come from suppliers customers competitors and so on the mode of governance used to coordinate partners depends on the source of uncertainty I uncertainty recommends hierarchy so basically this.

(Refer Slide Time: 38:40)



So let us look at what are the transportation costs that how do you calculate in other words we said the transportation a transaction costs are high then you either you do it yourself or you know you go to the market and so on so first as action cast is the direct product cost production quality transport and so on as comes from the supply chain the second one comes from the delivery shipping inventory asset specific or and soft infrastructure.

Now there is a specificity comes from for the delivery as I said if you have a boiler which is which does not break the ship or the truck then you have to make special arrangements a special trucks and so on and also the hard infrastructure is the report the forks the forklifts and so on the soft infrastructure is particularly in terms of delivery is the is the connections and so on and the resources of course you have the clusters humans financial power etcetera now the clusters for example for electronic this one they had there is a specific on electronic or Auto and so on.

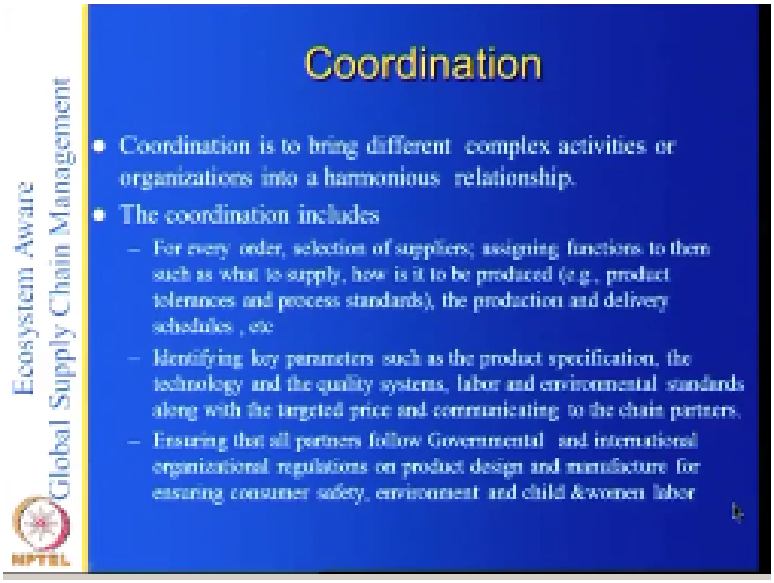
So the human also if you are trained for a particular job then you may not be you are one laudable for once the particular company disappears and so on and the financial and power but of course institutions which depends on taxes terrorists and special economic zones free trade agreements and social groups all these things add up to this one so we know that these are these four or the ecosystem parameters but one more thing that adds is the coordination cause of the broker fees.

Because to coordinate all these activities and have connections with all of them it requires the cutter so you calculate your transaction costs so if you remember why are we doing all this we are doing all this to select our suppliers so you go to the supplier and say what is the production

cost where is averted the delivery costs depending on his location what are the resource costs and what are the institutions cost and what is the coordination fees and for each supplier.

If you have say 50 suppliers Oh some in China some in Hong Kong some in India some in Bangladesh and so on for each of them you can see there is all different and so you can add the squad nation another broker fees and so on and get at the transaction costs.

(Refer Slide Time: 41:53)

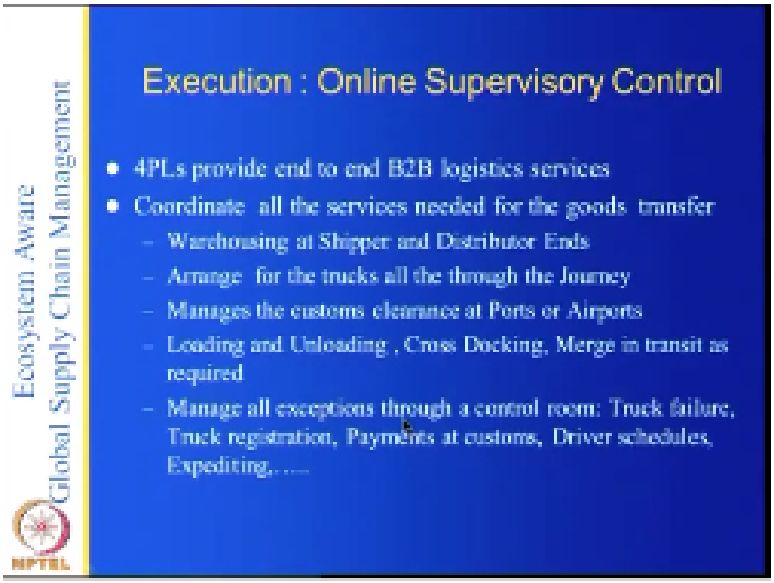


And select with the lost with the low this one once you have selected all these suppliers and group them then you have to do the coordination these two coordination is to bring different complex activities or organizations in to harmonize relationship so coordination is when I will order select the suppliers aside functions to them such as what to supply how it is to be produced and product tolerance is standard search entre and the production and delivery schedules right.

And identifying key parameters such as the product specification the technology and quality systems lab or environmental standards along with targeted price and communicating them to the child partners ensuring all parties follow governmental and an international organization regulations on product design and manufacture for ensuring consumer safety environment and child and women labor.

So the coordination activity is basically he has to take all the international regulations into account and it should be it should be fall because whatever happens this particular coordinator is responsible.

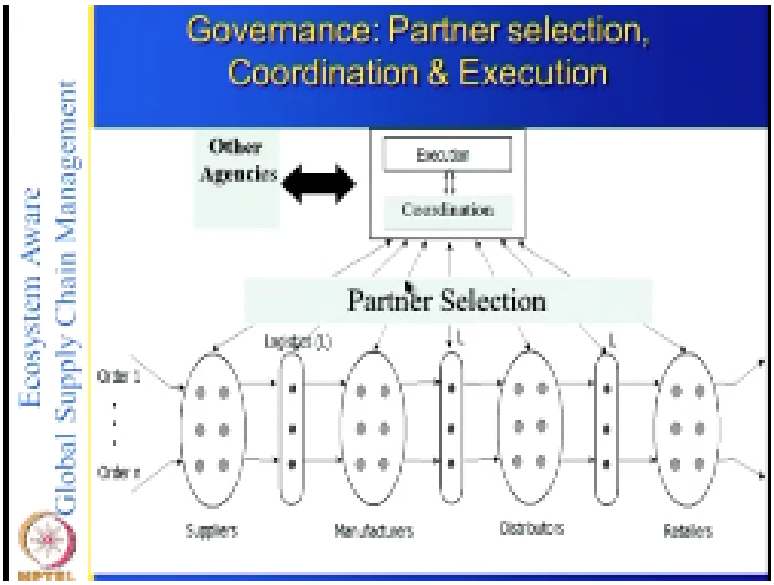
(Refer Slide Time: 43:06)



An execution or online supervisory control is for example if you take us out for party logistics providers who are basically managing end-to-end be to logistics a coordinate all services needed for Google transport and warehouse a shaper and distributor ends arrange the trucks for all through the journey manages the customs clearance at ports our airports learning and unloading cross docking merchant transit as required manage all exceptions through control room truck sell your truck registration payments at customs travel schedules expediting etc.

So execution for example is one of the things that brain function of logistics provider that is why I gave this example and a for 3pl does all this but this has to be done for the entire supply chain that is what we as we see here so the issue is you have.

(Refer Slide Time: 44:10)



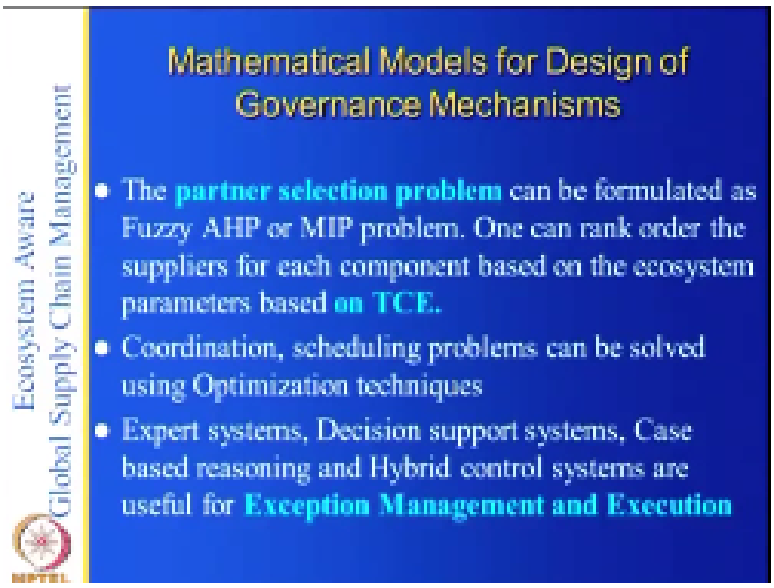
You have three functions here one is partners in action that is you have for all the suppliers manufacturers and so on selected partners at various groups in various countries for example the supplier this can be a group in China this can be a group in India this can be in Bangladesh and so on it is similarly when you want to transfer this manufacturing may be single or multi site manufacturing and you have logistics providers for b2b and b2c the distributor's could be all over all over the world and similarly there is a logistics which transfers to the Detailers retailers could be in US or Europe or it could be all over world.

So what happens here you into partner selection this one you have selected all these people and then put them as groups in other words you have one through whether I some kind of a certification procedure and there are a lot of interaction costs that are involved in searching for them and then putting them all together but you have them so if you are if you are saying I want something to be done in China I know these are the group of people who do it in China and so on.

So and if I move on to move some product from China to Singapore come to Singapore or something then I know the logistics providers so this is an excel sheet which gives you all the information and while doing so I have also calculated the transaction costs for selection of this now for coordination what we had better head to do I have to select for each order the partners so I select the partners for each order and based on their transaction costs since I have all the transaction cause I can select the one that is that is the best.

And then tell them what to do and when what to do look at look at their whatever facilities they have and so on and execution of course is control of this so what I have here in this diagram is a model for the governance of a global supply chain which involves all the three now whoever does this whether it is done by a broker or it is done by a participant governor buyer driven or retailer driven whatever you have is he has to follow all the three steps in this particular given in this diagram so this is called the governance mechanism for this.

(Refer Slide Time: 47:03)



So I mean to frequently what is the question that is asked is what are the mathematical models for the design of the governance mechanisms the partner selection problem you can follow as a fuzzy AHP or a integer programming problem or one can wreck order the suppliers for each component based on their ecosystem parameters on the TC in other words I has told you how to calculate the transaction cost economics you can rank order them based on the transaction costs.

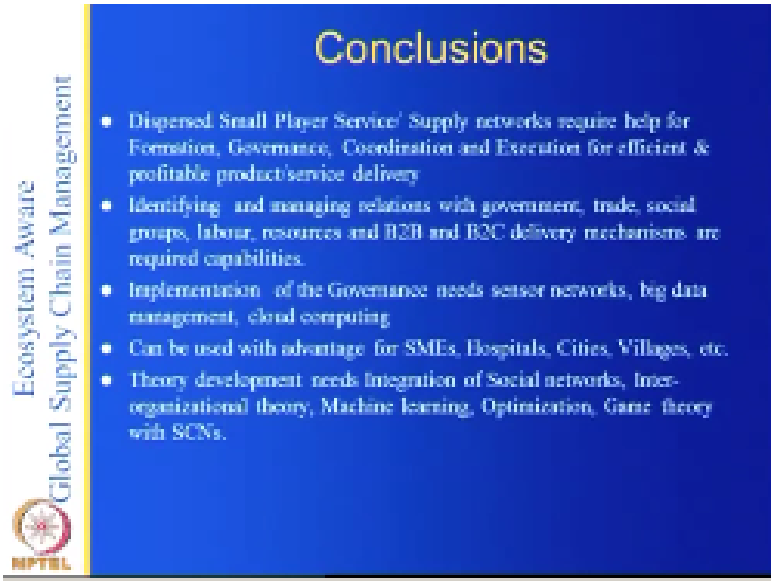
And coordination scheduling problems can be solved using optimization techniques these are standard techniques that are available to solve this particular problem but expert system patient support systems case based reasoning and hybrid control systems are used for exception management and its use execution is one of the things it is a call to what is also called real time control in other words you have this entire process you have to visualize the process and try and execute the entire thing.

So that becomes a very complex thing usually BP was business process outsourcing outlets are used for this and one of the examples that we have is Zantacs it is an outsourcing company in India based out of Hyderabad and Gorgons and they do it they are monitor and do all the things

for the for a company called truck company called Penske which is in out of US, so all the things if there is a truck value they handle it from here if they the scheduling of the trucks for picking up auto components from Minneapolis and deliver them to Detroit.

How many trucks who is a driver and what is the route attitude it is all decided by Zantacs so the issue is that this kind of this one it will give you confidence into this one rather than just leaving it open one thing is to do plan for things and think that everything happens according to plans but most often they do not so it has become important to have this exception management and execution function into this that is called execution in the governance this one.

(Refer Slide Time: 49:39)



So to conclude we have dispersed small players the service net was to require health information governance coordination execution for efficient profitable product now what we are talking here is we have SMEs either in apparel either on a choice making or anywhere or auto manufacturers and so on so basically they are all the players who require help in governance coordination and execution and so on so the coordinator basically has to act as a mentor also.

And we have to identify management relations with the government rate social groups level resources delivery mechanisms and all that somebody has to be in charge to talk to the government to talk to various people and actually have these relationships which are becoming very important implementation of governance reach sensor networks big data management and

cloud computing there is lot of IT structure IT infrastructure and analysis that is needed to make these things happen.

So this can be used to advantage in small and medium enterprises hospitals and cities villages etc and the development its integration of social networks inter organization theory machine learning optimization game theory with supply chain networks so what we have done and in two days these two lectures is we had talked about the governance means you have an organization or inter organization network and you have to make them collaborate how do you do it I mean they do it within themselves by elected board or there is a dominant player called the channel master who will coordinate the activities for the group.

So that everything works well or there is an external broker so we will look at this but in some situations there may not be any governance of this now for example there is a small scale industry fellow he does not know you are not a part of this but it is important he becomes a part of some global network for his business otherwise it will become small one small so basically this is a very important topic that this one for the governance models which is often ignored in the literature both in the literature as well as in the practice more in practice than in literature.

So what we are going to do is in annex two classes is to look at some of the examples they more detail the orchestration models with practical examples and so on so thank you very much.

Programme Assistance

Guruprakash P
Dipali K Salokhe

Technical Supervision

B K A N Singh
Gururaj Kadloor

Indian Institute of Science
Bangalore