Decision Support System for Managers
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Module - 09
Decision Support System for Distribution Network Design in a Supply Network
Lecture - 41
Taxation and the Distribution Network

Hello and welcome to "Decision Support Systems for Managers"! We are into module 9, 'Decision Support System for Distribution Network Design in a Supply Network' and today we will take care of 'Taxation and the Distribution Network'; ok. So long you have learnt the chronology of a decision support system; for example, if you see your business has a; so first we gave you an orientation of: what is a decision support system, what are structured decisions, what are unstructured decisions, what are semi-structured decisions.

Then, we took you through the sequence of decision support systems that is first you will have to do demand forecasting. Once you have finished demand forecasting; that means, once you are sure or pretty much sure and what will be your demand, what is your demand; once you are finished with demand forecasting, then you have to determine the product mix, what combination of products you will produce that mix you will have to determine.

Once that product mix is determined, then you decide on the resource planning. Once you; so all the decision support systems for product mix; then your warehousing, then your transportation, vehicle scheduling and then your entire distribution system.

In between product decision, pricing decision, promotion decision and what we are doing now that is distribution decision. So, this is the sequence through which we are passing and this sequence basically tells you the chronology of a decision support system; ok.

Now, so today's topic is Decision Support System for a Distribution Network Design and there are many phases to this distribution network design and the first phase is taxation and distribution network design. Now, take a very simple; take a very simple logic. You will love to pay tax which is lesser in amount; you it is human psychology that we do not want to pay more tax because we have toiled and if we earn this much and your tax by tax this half of it goes away, we do not want that right; we do not want that.

So, supply chain planning; distribution network designing that is the first point essence of distribution network designing; that while I am designing the distribution network throughout the world, I should skip those countries, where there are high taxation. I should skip those countries which does not allow full repatriation of profit means I am a foreign company, I am an MNC and I have planned or I am planning to set up a base in country X or country Y.

If that country does not allow me to take my profit back and put it in some other country, for some purpose; if that country does not allow profits to move out of their country, then it is very I do not want to be in that country, companies do not want. So, taxation, repatriation of profit; these are very very important questions when you are designing a supply chain ok. So, our topic today is taxation in supply chain; first point.

Second point where, so very by very simple logic, where do you want to set up your distribution chain? At a place where there is zero taxation or very little tax right. Now, now you understand why this free trade zones are set up, these are tax free zones. So, every countries now setting up these tax free zones; let companies come, let them set up business, let them not pay any tax, let them export import do whatever.

At the end of the day we are generating employment for our citizens. And, when we are generating employment for our citizens, in return these citizens are paying us tax out of their income. So, let us not take tax from the corporations from the corporates, but ultimately we gain out of it, our employment problem is solved, unemployment problem is solved; ok.

So, there are different reasons why taxation is a very-very important issue in the distribution system and today we will learn this aspect of decision support system. So, in a nutshell what did we understand? That we will love to be in a place where there is zero tax, if we cannot avoid it; then we should we would love to be in a place where there is very very less tax ok; so, let us proceed.

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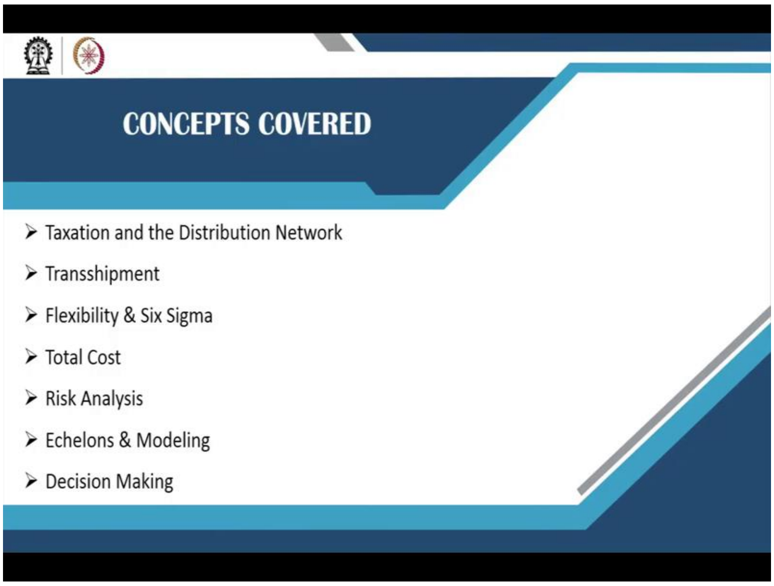

So, these are; this is what we want to cover; taxation, issues of transshipment, issues of flexibility and Six Sigma, total cost, risk analysis, echelons and modeling and decision making; ok.

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So, phase 1: taxation; taxation is very-very simple; ok.

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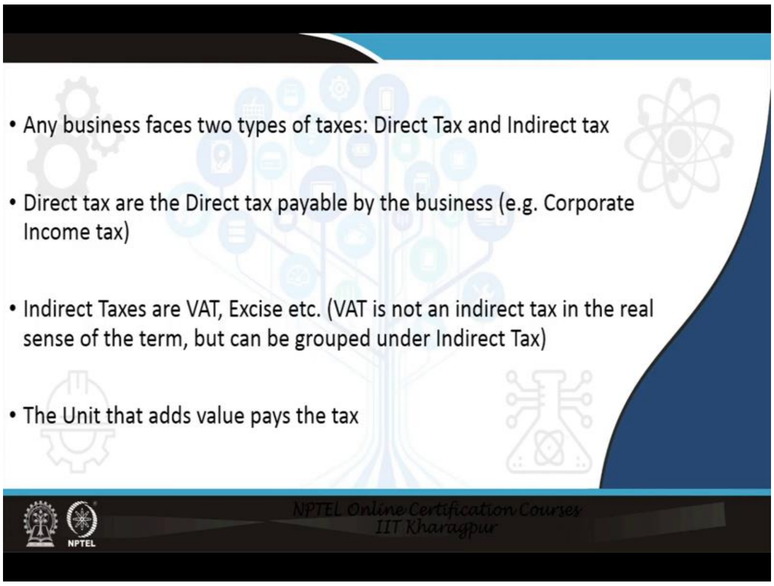

Any business faces two types of taxes direct and indirect ok. Direct taxes are the taxes payable by the businesses that is corporate income tax; ok. Indirect taxes are now we are not considered; we are not considering personal tax; ok; personal income tax. Indirect tax are VAT that is Value Added Tax, excise etcetera. VAT is not an indirect tax in the real sense of the term, but can be grouped under indirect tax. Basically the unit that adds value pays the tax; ok.

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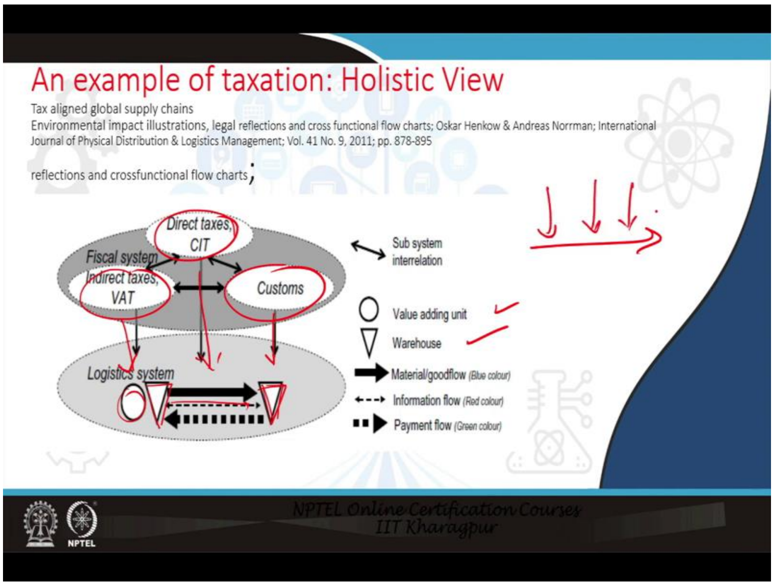

Now, an example of taxation; this is a holistic view of a taxation of a supply chain system ok. Let us explain this ok; these are the value adding units and these are the warehousing systems. So, basically these value adding units are sending products to the warehouses and there is an information flow.

Forget the information flow for the time being, but these value adding units are sending products to these warehouses and a whole set of taxes are impacting this entire system ok, this is what this diagram is all about. So, basically a product movement is basically capturing a whole set of taxes; ok.

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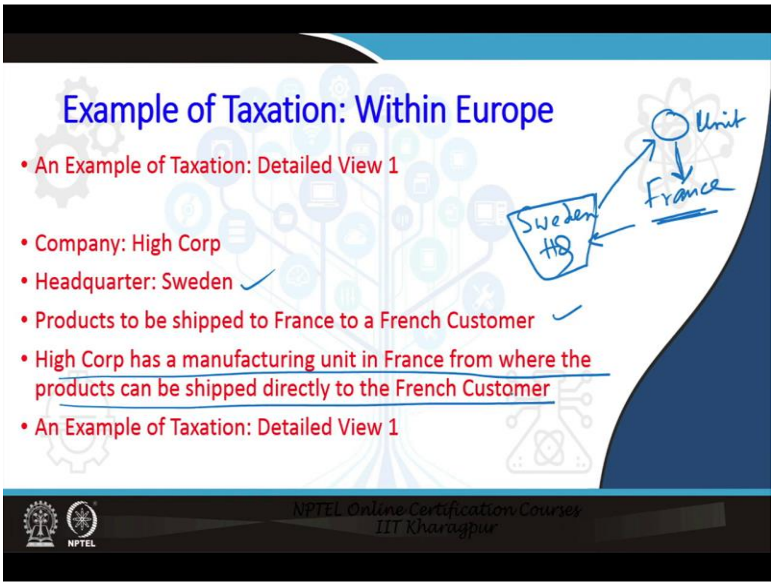

An example of taxation within Europe right; here is a company which is called as High Corp which is headquartered in Sweden ok. Products are to be shipped to France to a French customer right ok. So, the company is in Sweden, products are to be shipped to France to a French customer

So, here is Sweden and products are to be shipped to France; Sweden headquarter and products are to be shifted to France. High Corp is a manufacturing unit in France itself from where the products can be shipped directly to the French customer. Yes, you have a manufacturing unit here; you have a manufacturing unit here and let it transfer the product to the customer right; ok.

So, you see, look at it very-very effectively; this is basically: what? The today's the internet models are; this is the, these are the internet models. Here is a customer; the customer is ordering, assume this is the website and the moment you are ordering to the website, the website is signaling to that particular warehouse and the warehouse is delivering to the customer; right; ok.

So, High Corp has a manufacturing unit in France from where the products can be shipped directly to the French customer; ok.

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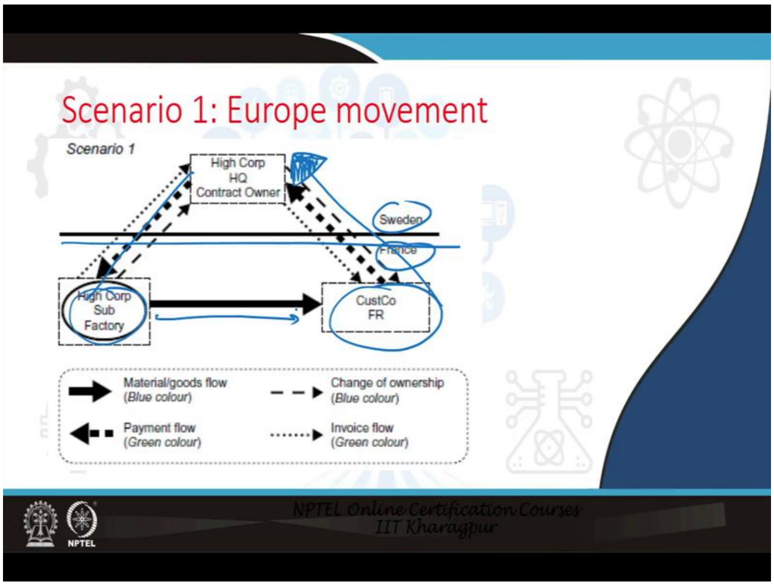

So, this is what we mean by it right. So, here is a customer; the customer is ordering through some means of ordering either internet or something to the company in to the to their company server in Sweden; ok. Here is Sweden; this is the border line Sweden and this side is France.

It is ordering to Sweden; the Swedish company is ordering back to France; the manufacturing unit in France and the manufacturing unit in France is delivering the product to the customer; this should be the movement, agreed?

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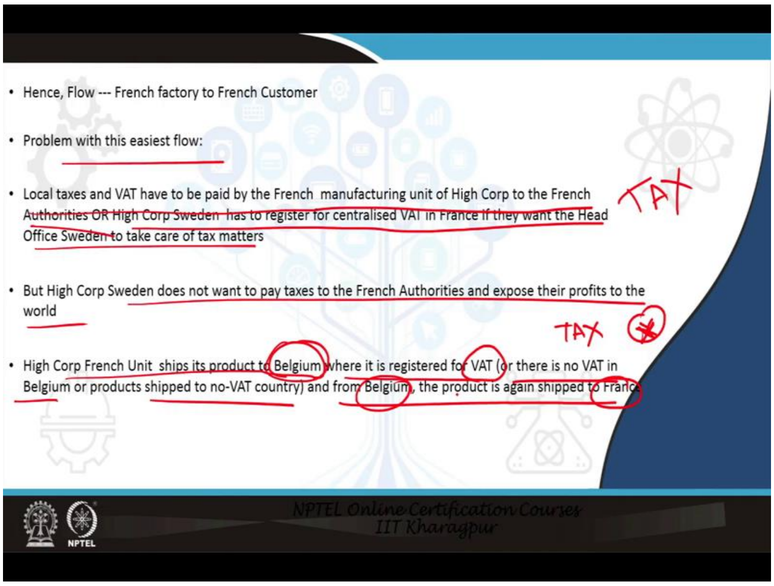

But what is happening? What is happening? Problem with this easiest flow is local taxes and VAT have to be paid by the French manufacturing unit, to the French authorities or High Corp Sweden has to register for centralized VAT in France, if they want the head office Sweden to take care of tax matters.

So, basically what we want to say is that tax has to be paid; ok, but High Corp Sweden does not want to pay taxes to the French authorities and expose their profits to the world. So, the company does not want to pay any taxes; right.

So, what do they do? High Corp French unit ships this product to Belgium, where it is registered already for VAT or there is no VAT in Belgium for products shipped to no VAT country and from Belgium, the product again is shipped to France; ok.

High Corp French unit ships its product to Belgium and from Belgium, the product is again shipped back to France; right.

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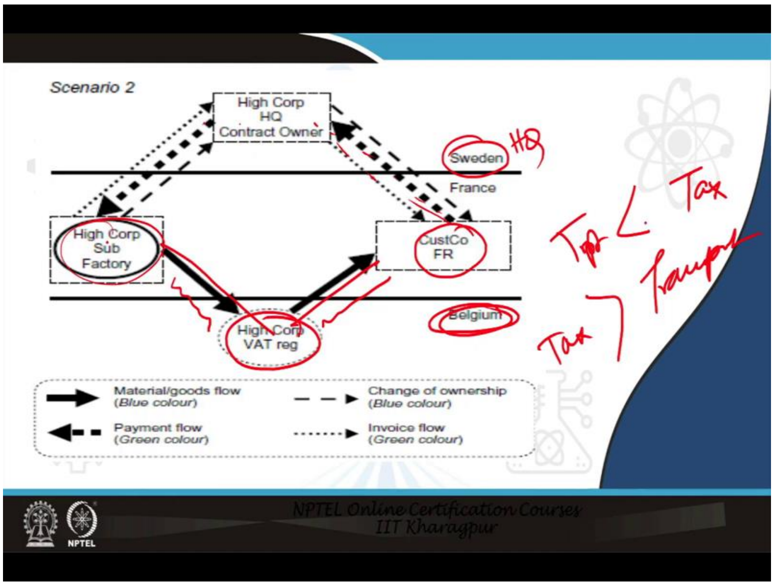

So, let us see what is happening. So, here was my original company headquarters in Sweden, here is the customer company in France. So, the customer has provided orders to Sweden, the Sweden instead of sending the physical goods to the; from the French factory to the customer, they are sending the note to the French factory.

The French factory is physically sending the goods to; sorry to Belgium, the French factory is physically sending the goods to Belgium and from Belgium; it is getting shifted to, it is being transported to France. So, the product instead of going directly from the French factory to the customer in France, it is taking a –via- route Belgium; why? Because Belgium either you are already registered for VAT in Belgium or in Belgium there is no tax.

Now, why is this done? When will this be done? Other than anything else, this will only be done when the transportation cost of this revised system; that is from France to Belgium and Belgium to France again, that is from France to Belgium and from Belgium to France again; when this transportation cost is lesser than the tax cost.

Definitely, when the transportation cost is lesser than the taxation cost; then only the movement will happen or vice versa when the tax is still higher than the transportation cost, then only it will happen right; ok.

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So, this is view 1; ok. Let us go to example 2; China. An example of taxation detailed view to Asia; China, a company based in China orders some machinery from High Corp Sweden; ok.

This company is based in China; it orders some machinery from High Corp Sweden ok. High Corp procures machinery from a supplier company in China; so, we are ordering from Amazon, we do not know where Amazon is getting it from. Maybe, Amazon is getting it from our own country India or maybe Amazon is getting it from Bangladesh; we do not know; right.

So, High Corp procures machinery from a supplier company in China. So, let us again revisit; a company based in China order some machinery from High Corp Sweden, High Corp actually procures that machinery from China. Now, the supplier company in China gets the product manufactured by a local manufacturing company; no harm right. The supplier company in China gets the product manufactured by a local manufacturing company.

So, ideally the local manufacturer can directly ship to the customer company both being in China right ok. So, ideally the last point; so, ideally the local manufacturer can directly ship to the customer company; both being located in China.

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But what is the problem? Internally, in China you have to border controls and the product if moved between districts have to be declared at each border and pay taxes there. So, every district you pass; you are paying taxes. So, you pay multiple taxes, similar to situation before introduction of GST; so, you pay multiple taxes.

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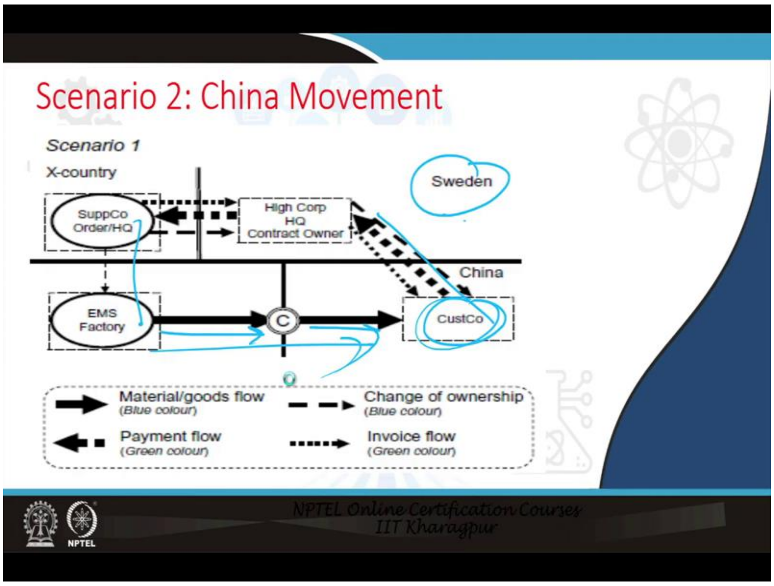

So, what will be; so this is what basically was we meaning customer company orders to Sweden ok, Sweden already has a supplier, who is ordering from China? So, ideally the product should have moved as simple as that; it will move from the small factory in

China to the customer premises in China right. This should have been the ideal one, but what is the problem? It has lot of taxes right; this is scenario 2.

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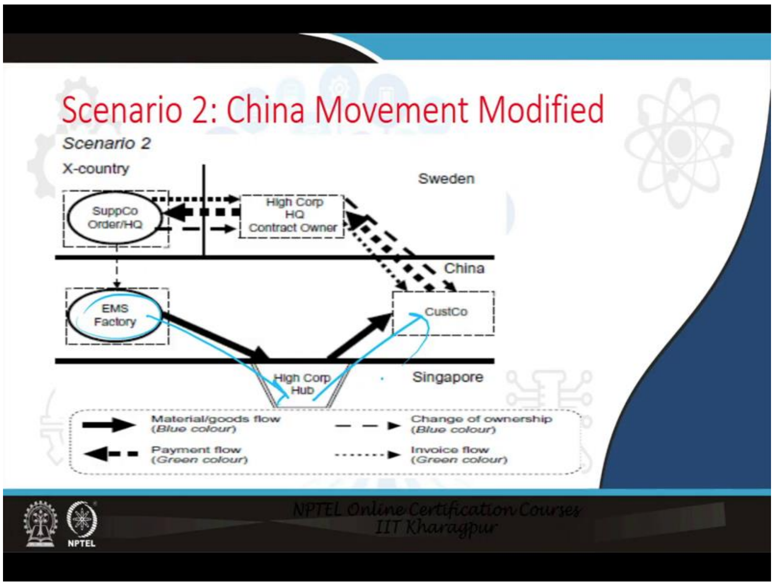

What will happen? The customer company will order etc., etc., they will order the Chinese factory; Chinese factory will shift it to Singapore and from Singapore, it will go to back to the customer ok. So, when it is sending from China to Singapore, the cost is very-very less.

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Example 3, USA; a US customer orders for a product from High Corp; High Corp gets Sweden, High Corp gets it delivered from their own manufacturing facility in US, but that will mean a direct sale and sales tax will be levied which is non-deductible and non-refundable.

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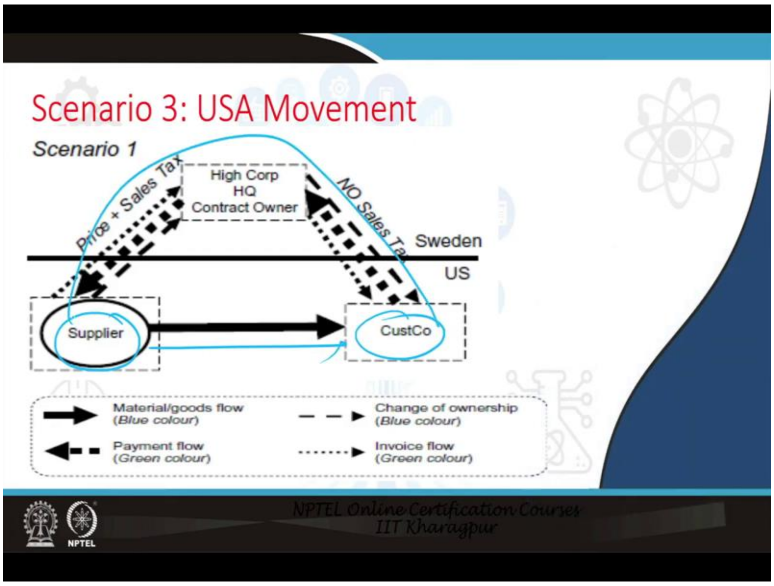

So, here is the US customer; he can easily get it from the US supplier.

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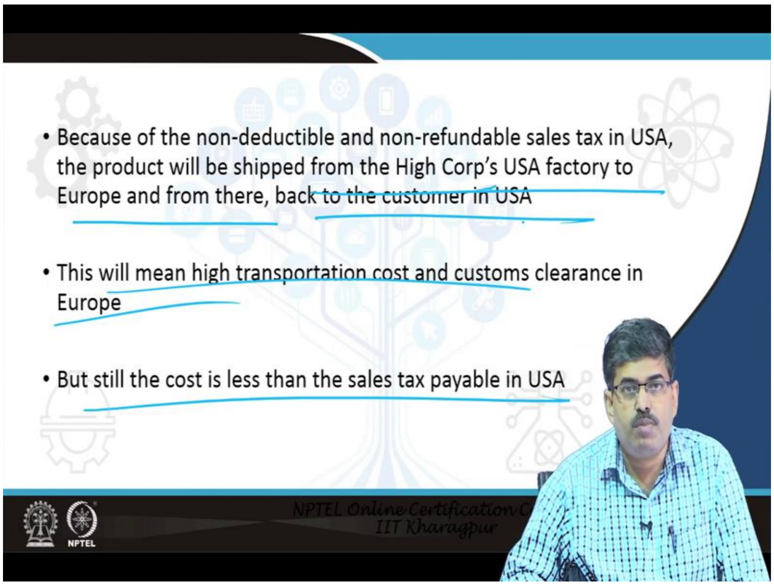

Because of the non-deductible and non-refundable sales tax in USA, the product will be shipped from High Corp's US factory to Europe and from there back to customers in US.

This will mean high transportation cost and customs clearance, but still the cost is less than sales tax payable in the US ok. So, what it will do? What the US company will do? It will be shipped from US factory to Europe and from there back to the customers in US; ok.

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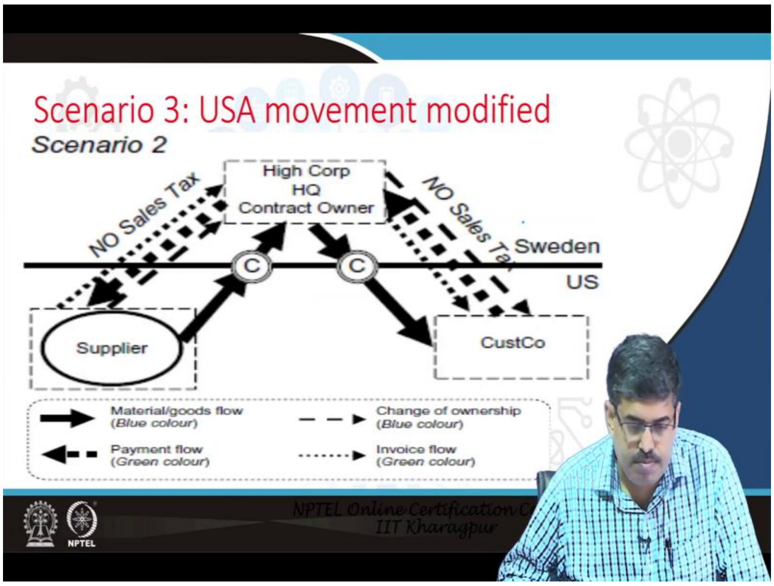

So, but still the cost is less and the sales tax payable in the USA; this is what we mean by is.

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There is a slight modification to this movement now, instead of movement of USA, Europe, USA; the products are shipped from USA to a free trade area along the US border and from there shipped back to the USA.

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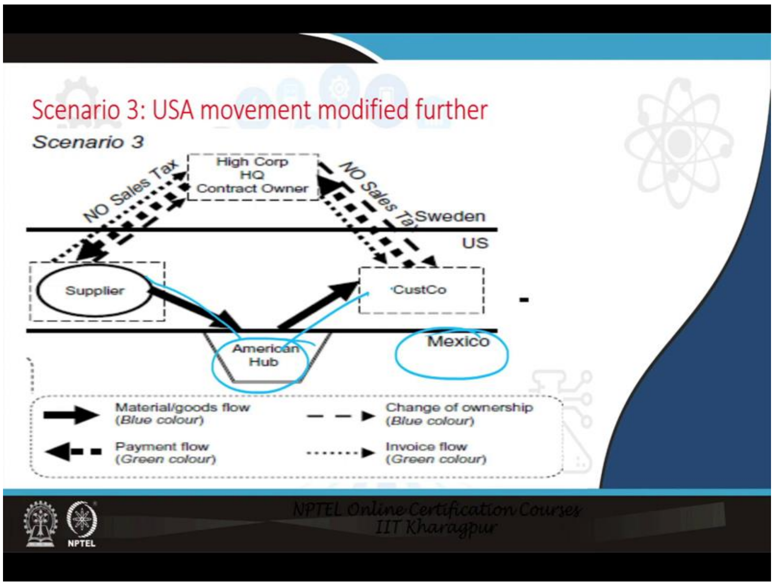

So, the supplier is sending it to an American hub, somewhere in Mexico very near to the border and then sending it back to customers' company. So, these are the three movements that are there in the; that considers taxation and taxation movements for supply chain network design.

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Now, here I want to highlight something in this reference of Chopra and Meindl; 'Designing and Managing the Supply Chain'; ok; there, you will find lot of material on designing the supply chain. These are again you will have to study and these are the numerical or the mathematical models of network design that are there; ok clear; ok.

So, yeah; but and these diagrams are a part of a research paper published by some, published by authors the references of which are given at the extreme end of this module; ok. After we get lecture 5, then these references are extensively given. So, you go through them and if there is any issue, definitely the discussion forums are there, where we can discuss them; right; ok.

Thank you!