Course on E-Business
By Prof. Mamata Jenamani
Department of Industrial and Systems Engineering
Indian Institute of Technology Kharagpur
Lecture 35 Electronic Data Interchange (EDI)

In the last lecture we discussed about the interoperability at different layers different technical layers. In this context we saw that at the lowest level at the we have the communication level. There are certain possibility of connecting the applications inter organisational applications and that what we were doing there? We were actually connecting both the information system at the object level.

And we were saying that each information system is written in some object oriented language and consists of many objects which interact with each other. In this context we saw that both organisms first of all has to have technical network level compatibility that is number one which is not issue in today's Internet world but we also saw that the object level compatibility.

Which has to have in the very lowest level can be solved using various methods which come together under remote procedure calls. But Remote Procedure calls have their own problem and they are not that difficult to implement and when the when there within the same network possibly the network addresses because there if you are communicating with another object like staying in another system.

Each system in the Internet is uniquely identified by IP addresses. So if there within the same network the problem is not there uniquely identified but if they are in distant places then due to multiple address translations in between due to the presence of proxies and all at in your organisation level at your ISPS level and so on such kind of interconnectivity establishing such kind of interconnectivity.

Between the systems through through this the remote procedure calls is not possible that is number one problem. Second problem is if you need to connect to another application at the lowest level at the object level you need to be knowledgeable about the object which is at the other end. That object which is at the other end belongs to another software.

Now unless otherwise you know the details of that software and unless otherwise that other software also implements this corba technology is not possible. So therefore corba is not very desirable technology in today's world.

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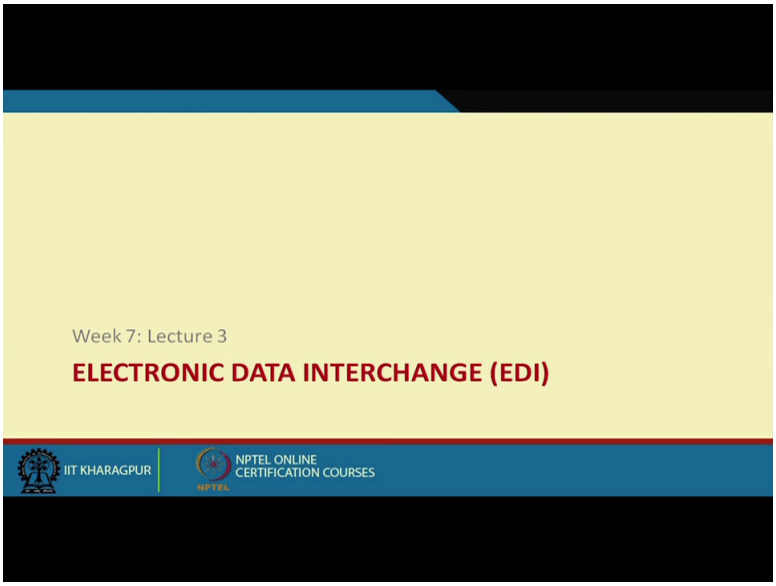

Another Technology which deals at the content or the data exchange level by data exchange level we mean we need not connecting, did not be going in the details of the software that what object is asked? What methods the object has? Whether it implements corba or not? No we don't have to. We simply need to know that both of them follow both the parties between which the data exchange has to happen? Follow the same data exchange standard. EDI is one standard. In fact in this lecture we are not going to learn about EDI only.

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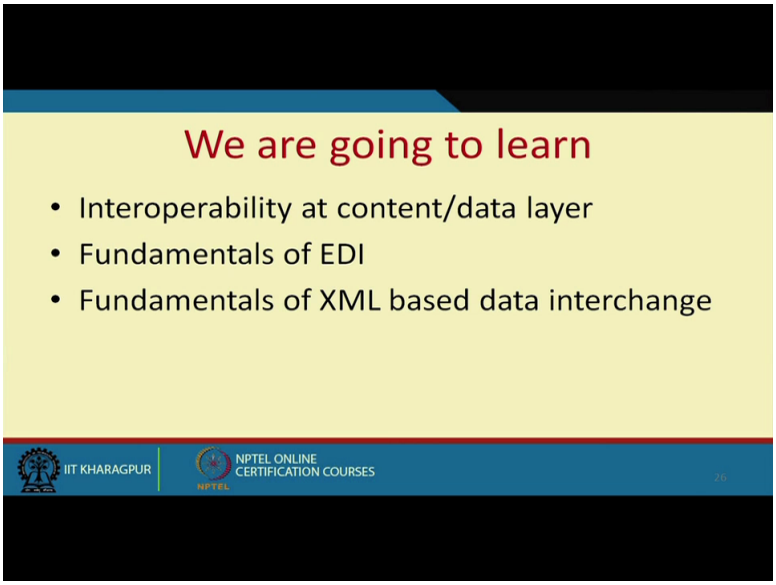

We are going to read about we are going to study about the XML based data interchange which there are some XML standards which are even considered to be more preferred than

EDI. EDI is a very old concept. EDI is not a new concept like XML EDI is as old as a maybe around 1970 big companies. Big companies used to have their own dedicated communication network for exchanging the data using EDI.

But now because of the Internet which is at low cost to even the small companies can exchange small companies are also adopting this but before then lets first try to understand this EDI which is Old concept.

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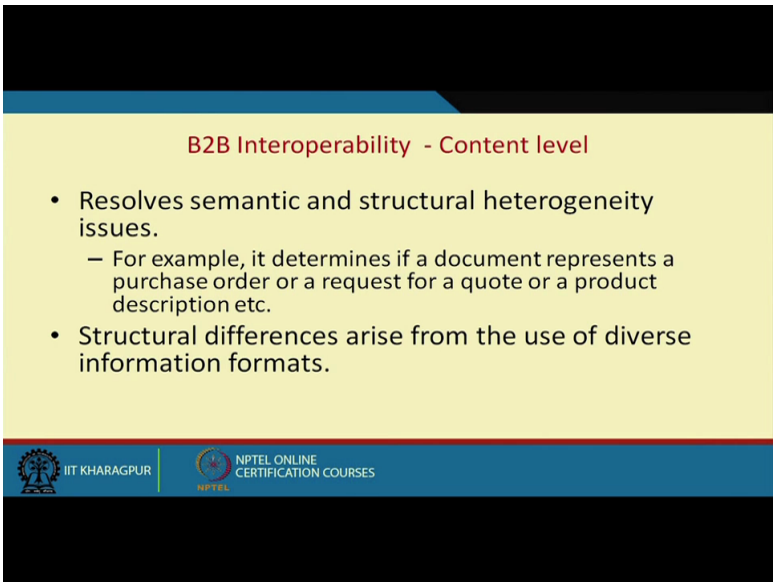

Now while if you would like to solve the interoperability at the content layer we have to resolve both the semantic and structural heterogeneity issues. Now we have already discussed this issues in the context of VMI. So this while the structural structural issues result because of the use of diverse information format.

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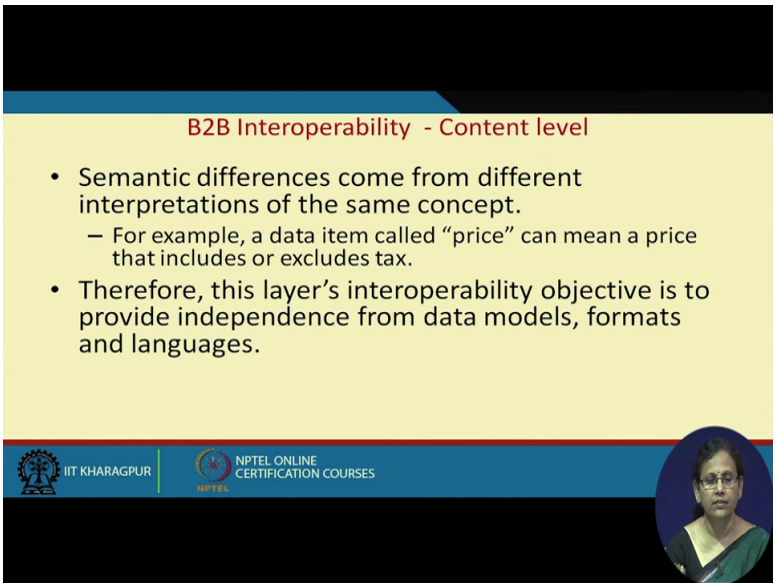

Semantic differences arrive by different interpretation of the same concept. For example in the about the stock level we were discussing while discussing about VMI but here we see another example, suppose data item is called price. It can be in price with tax or excluded Tax. Even if both the parties use the same name for that for that data item called price.

They might be interpreting it in the in different ways is not the date on this up to have different names even if they have the same name the interface that is attached with the data might be different. Therefore this layer's interoperability objective is to provide Independence from data model format and languages.

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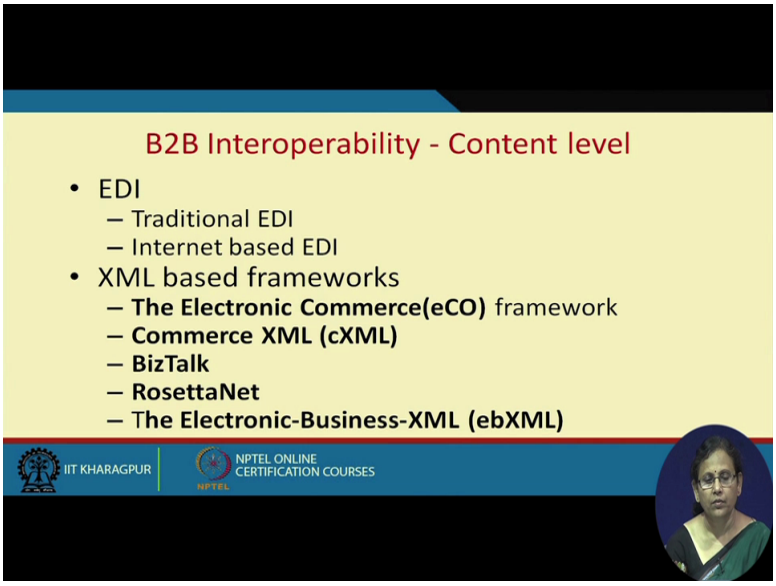

To achieve these two broad classes of data exchange standards are used. One is EDI that is Electronic data interchange in here we are going to learn about the traditional EDI and Internet based EDI. Then there are certain XML based framework. We are going to learn about XML. We are going to not learn we are going to have some idea about the XML shortly. There are some already established XML based framework for different industry categories.

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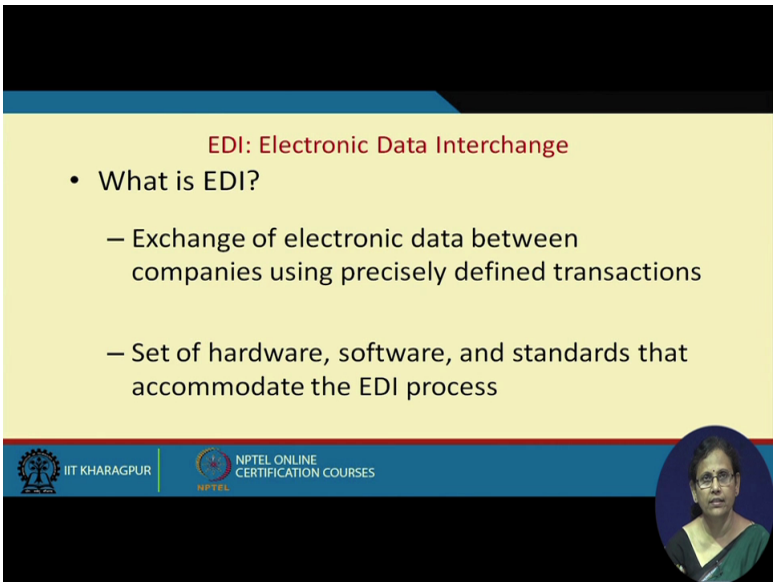

Let us try to understand what exactly is this EDI? This is the exchange of electronic data between companies using precisely defined transactions. For this process of exchange of electronic data you require a set of hardware, software and some standards to carry out this EDI process.

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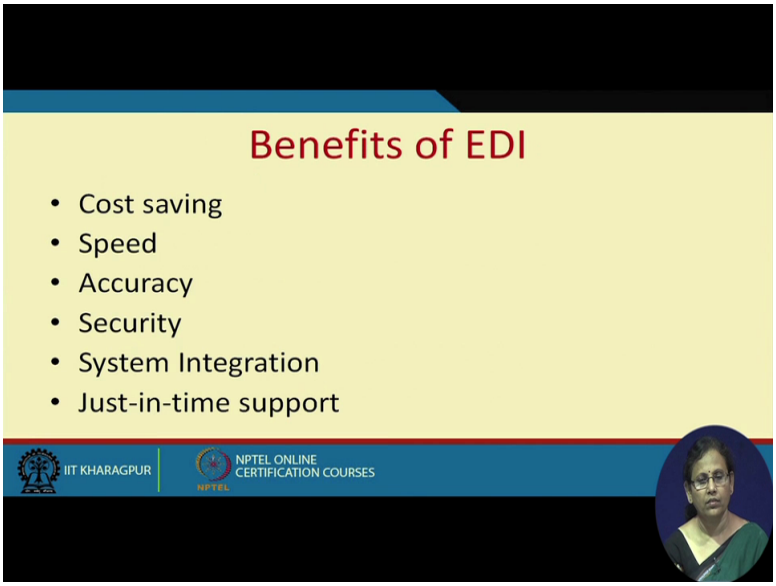

These are some of the benefits of EDI. Of course cost saving, speed, accuracy, security, it helps in system integration, just-in-time support for the data and so on.

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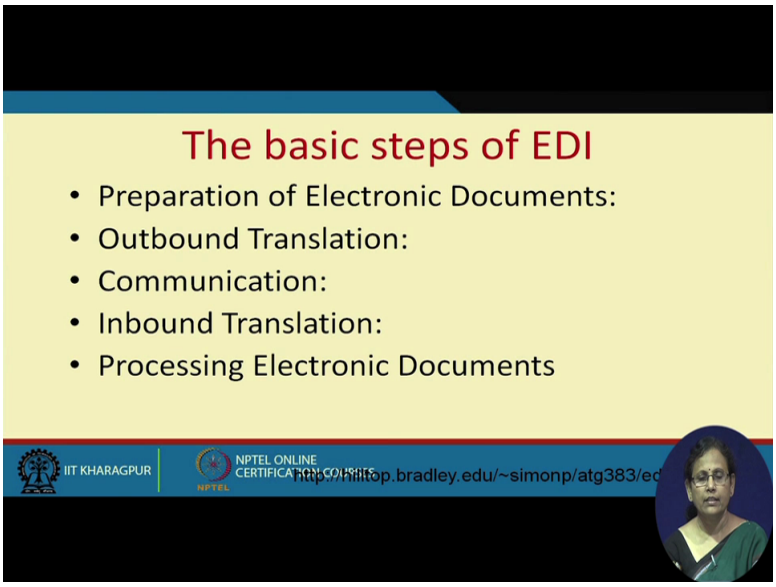

These are the basic steps involved in EDI. First is preparation of the electronic document, outbound translation, communication, in translation and processing electronic documents. Now why all the necessary let us try to figure out.

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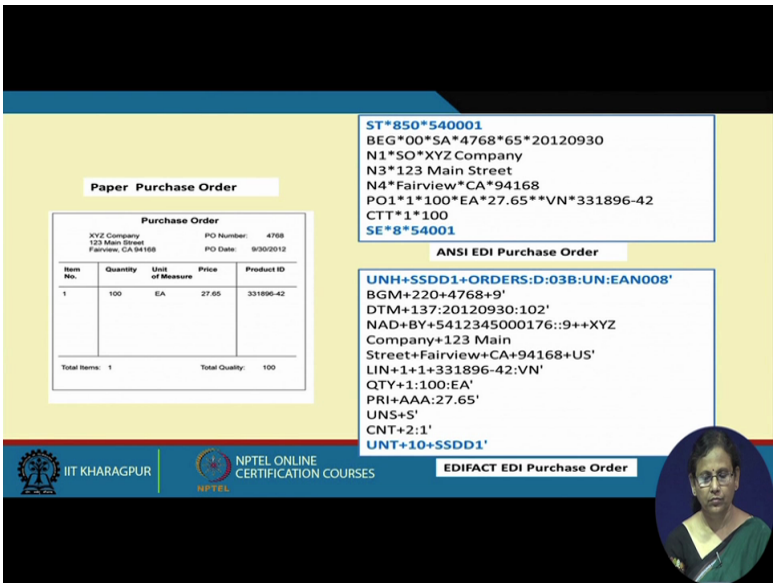

This is one example of a purchase order. So every company has his own way of preparing this purchase order. Here the purchase order is the document. Now imagine that when you would like to keep this purchase order in your database this is no more this is not a flat file. This is a this is a file which is created from many database tables taken together may be customer table, item table and so on.

Now if you would like to send this piece of document to your business partner, to your supplier how will you send? You can send this document by post physically, you can send this electronic copy of this may be scanned copy of this through email. If you send it through email at the other end somebody will receive it, get the data out of it and Internet once again into their own ERP system this purchase order details.

What's the problem? It appears simple. But involvement of human being in between next the process flow inaccurate because human beings can make error during the data collection, data entry while sending this. So if the correct data is sent from the other end, why not we have some method which is faster and accurate as well and and eliminate the involvement of some human being for data entry.

Now what is alternative? Either and if it is from the website also if the person is downloaded from the website also in what format it will be? PDF format? Still somebody has to enter the data. So what if the data comes in a form so that if we provide the data in that form to our

ERP system, ERP system will automatically read it. Which means there has to be some mechanism of conversion of this data which both the ERP systems can understand.

So we need a standard which can be followed by both the parties transacting. Now the question is if we have to follow a standard with both the parties are transacting then why not we have a standard for every two parties so if they individually decide about their standard, their able to but in the world can have one standard. So if there are total N number of parties and there are two parties.

And there are one standard between any two number of parties then you can realise how many total number of combinations you are making. So instead of that if we have a common standard and everybody agrees to abide by that standard then the problem is solved. So EDI is one such standard. Now EDI standard it is a concept.

And the standards name of the standards the actual standards are actually different in different countries different different countries follow their constants. For example here (()) (12:56) standard and the same document when it is converted into LCDI looks like this and when it is converted to (())(13:09) EDI this is another standard it looks like this. If both the companies happened to use the same standard.

Then this particular data which now looks on the table this one is table one this particular one. But this is unreadable data but this unreadable data because of the symbols etc it uses it becomes it becomes readable by the information system some program in information system by extracting what is the what defines the data and what the data itself is? Look at this the name of the company is XYZ company.

Okay. Look with after many symbols here the xyz and company appears. Main Street 123 main street 123 main street Fairview CA all those terms are appearing here. So which means this data which is represented here is they are in this document along with many symbol which indicates the software that how exactly to interpret this data. But this document you are you cannot understand you have to specifically enter individual elements into some formal something.

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There are many EDI standards as I told you. Two companies can exchange data only if they agree to follow the same standard. Which means if one company is following EDIFACT and other company is following EDI, they possibly cannot exchange the data. Now EDI requires companies to agree on standards compatible hardware and software software and agreed upon electronic form format.

Then the standard which exist in this look suppose you are a company and your counterpart you decide that you will following LCDI standard. Now it's not that you have only one supplies and you have you can have many suppliers and Partners. If Every time you cannot decide a different standard with another. It will be costly (())(15:57). So therefore it turns out that a group of companies together as to have 1 standard. So many times a group of company they decide which particular standard to follow.

Look for example here this automotive industry action group is a EDI standard for automotives. So X.12 is an EDI standard in US and Canada. EDI for administration Commerce and trade that a defect is umbrella standard in Europe and India is a member of Asia EDIFACT board. another standard followed in India. In addition to Japan, Korea, Hong Kong, China, Singapore, Taiwan and Malasia all of them follow that Asia EDIFACT

Standards.

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Then this communication for EDI takes place at peer-to-peer level between two companies. Over it can take help of certain third party. So in case it is peer-to-peer which is particular this model is suitable for large companies that trading partners can connect directly with each other. For example an automotive manufacturer might maintain a modem pool that all of its hundreds of supply required to dial into dial and do perform EDI.

EDI is not so far we have not been talking about. Internet based EDI, EDI as as I told you it was already existing. It was existing since 70's. So that time people were not using either they were using their dedicated network or they are using some kind of dial up connection. Now if a supplier does a business with several manufacturer it may need to acquire different modems for to carry out different exchange standards with different parties which is of course not economical I told you.

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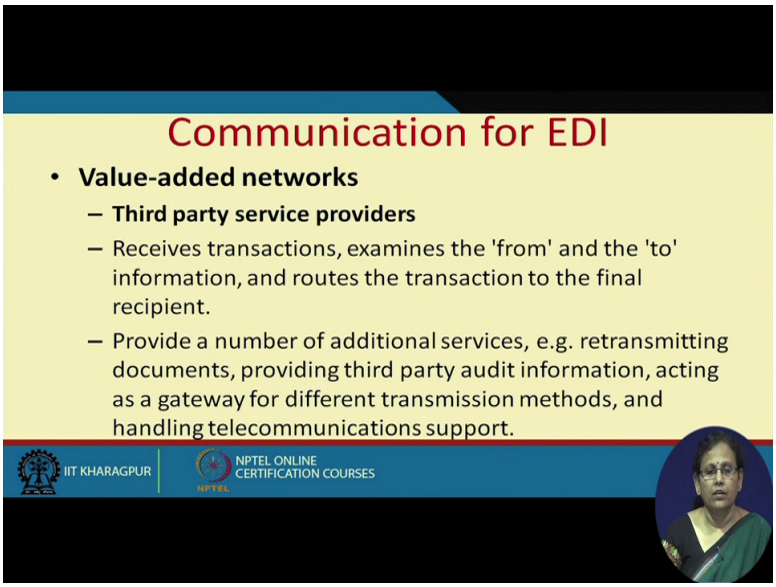

Then this value added networks are third party service providers which acts as a intermediary to carry out this EDI operations. So they receive transactions, examines the from and to information and route the transaction to the final recipient. The provided number of additional services like retransmitting the document, providing third party audit information, acting as a gateway for different transmission methods and handling telecommunication support.

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Now this VPNS can be maintained by various entities. Either one industry group consortia have them or a telecommunication company can provide the support or a large company

interacting with many suppliers can himself think of establishing one VAN value added network.

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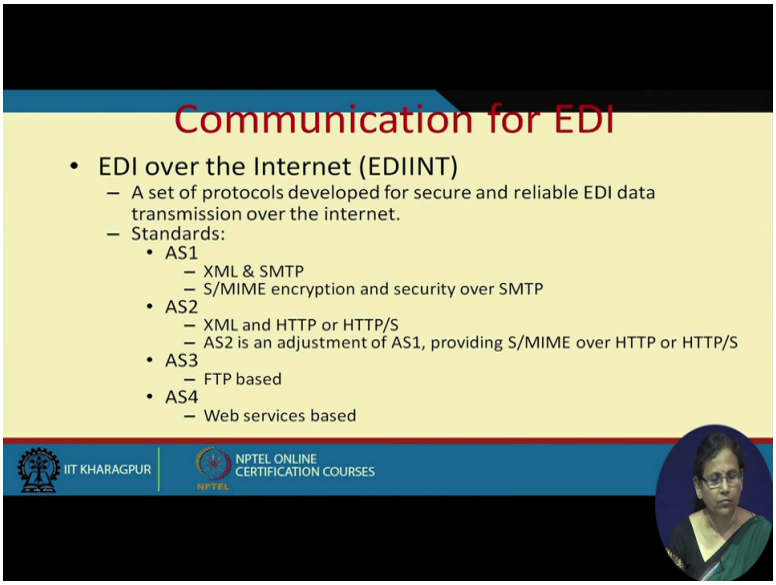

Now let us discuss about little bit about EDI over the Internet. Now the concept behind this EDI does not change when this carried out over the internet. Only the standards changed. So there are many EDI over the Internet standards which have been accepted by many companies is 1AS, 2AS, 3AS, 4AS they are different standards and they depend on and they are differentiated by the way they represent the data and they transmit the data.

For example this AS3 uses this FTP protocol for transferring the data. But anyways those details are necessary to just know the names.

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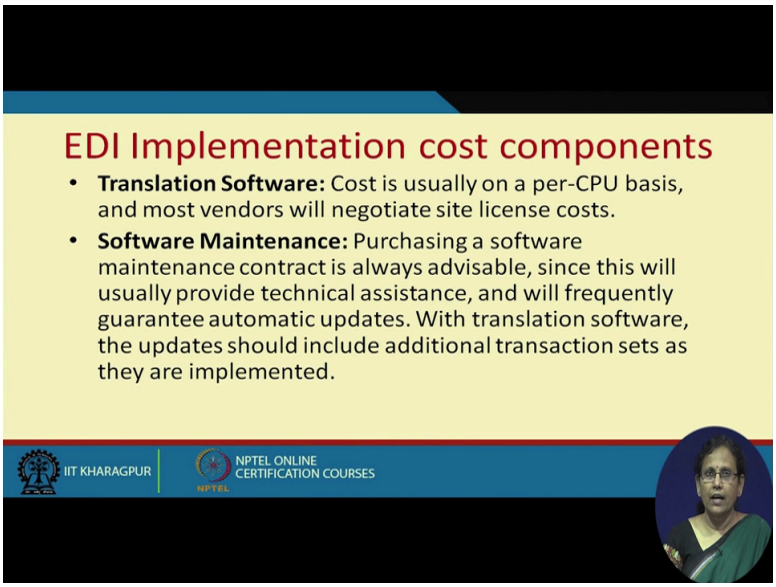

Now if somebody has to implement EDI at his end what on it cost he incurs? First of all as I told you when it gets EDI is sent from one entity to the other. Lets the purchase order we were discussing about the example of a purchase order. Suppose purchase order is sent to be sent from the Internet to the supplier. So retailer has to have certain software called the translation software which will be translating the purchase order into corresponding EDI form.

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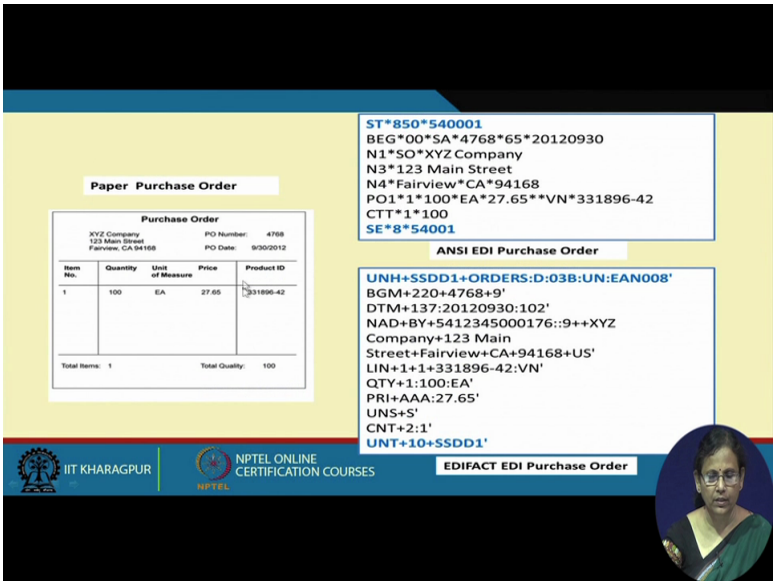

So this is what I was telling this particular purchase order there will be it will be transforms to this form. So there has to be some software in between where once you give this data it can

put it in this format. So you are depending on the Standard it is followed. If you for each standard there will be separate translation software.

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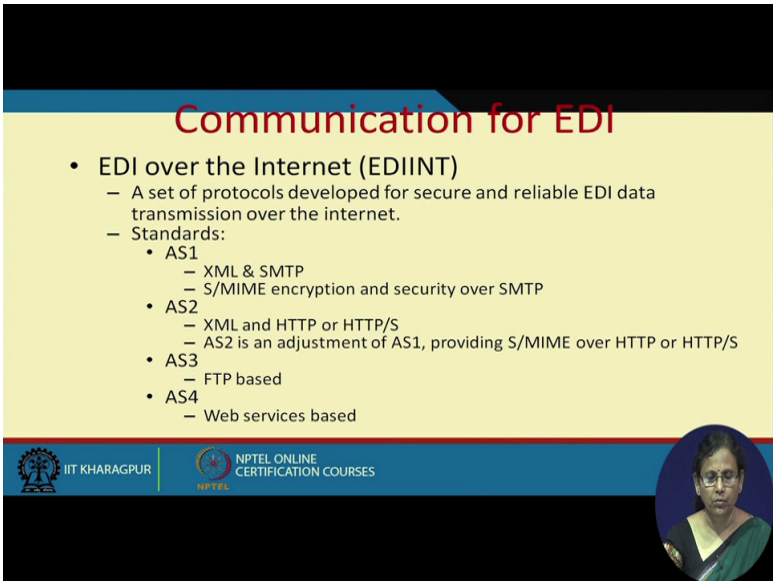

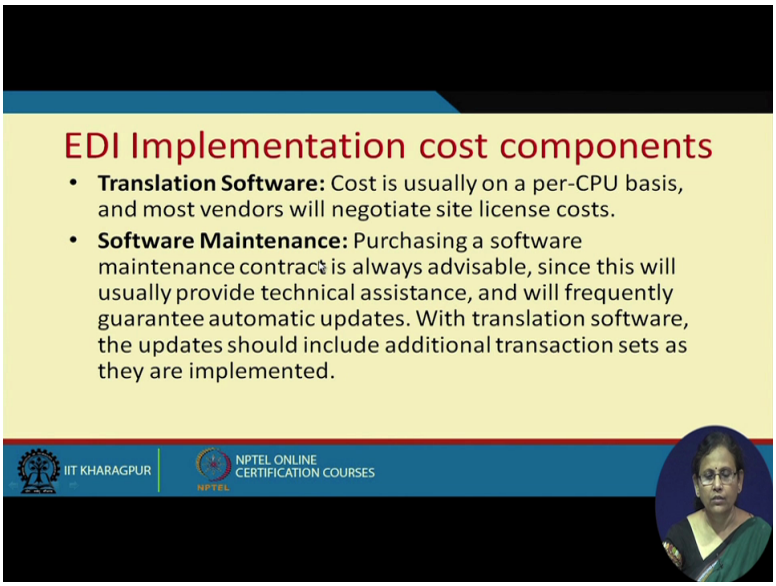

Then once you have the software you need its to maintain it so besides your purchasing cost you have to have certain maintenance cost as well which includes regular updates etc.

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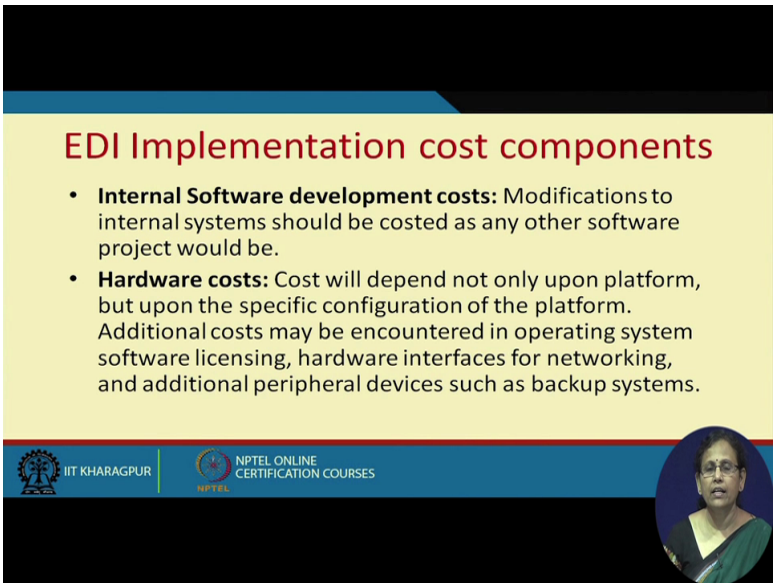

Then internal software development cost. Now where from this internal software development is coming? Now EDI as I told you it is a set of hardware, set of Software Hardware and of course a communication medium. Now that software is not a part of your ERP system or your internal transaction internal information system which you are using to capture the transactions.

So therefore in order to connect to that new translation software for EDI so that in the case of purchase order example purchase order data did not have to be re entered into that translation software. There has to be some grew in between so that the data directly from your ERP or your whatever information system application using would be directly going to the translation software.

So in order to make that interconnecting software you may need some internal software development cost. Then your hardware cost. This cost will depend not only on the platform but also the specific configuration of the platform that is required. Now sometimes the additional cost may be encountered in the operating system software licensing, hardware interfacing for networking and so on.

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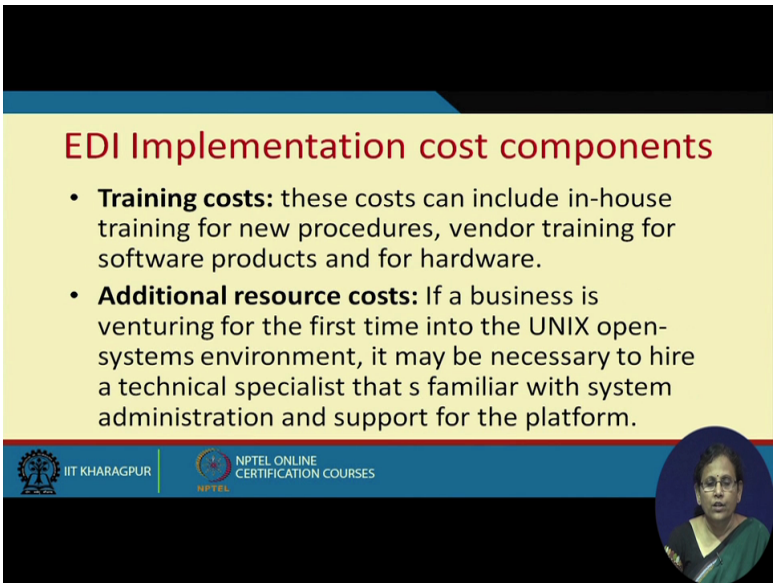

Once you adopt decide to adopt EDI and has to and decided to carry out this translation and inbound and outbound translation etc you need to train your people. So that required certain training cost. This also includes if you are a large company and you are imposing your vendors to adopt EDI you also have to trained them. So it also includes the vendors training Cost.

Additional resource cost. For example the system that is used for EDI software may not be compatible with the system that is used for your ERP or transaction passing. So therefore some additional resources required to make them compatible.

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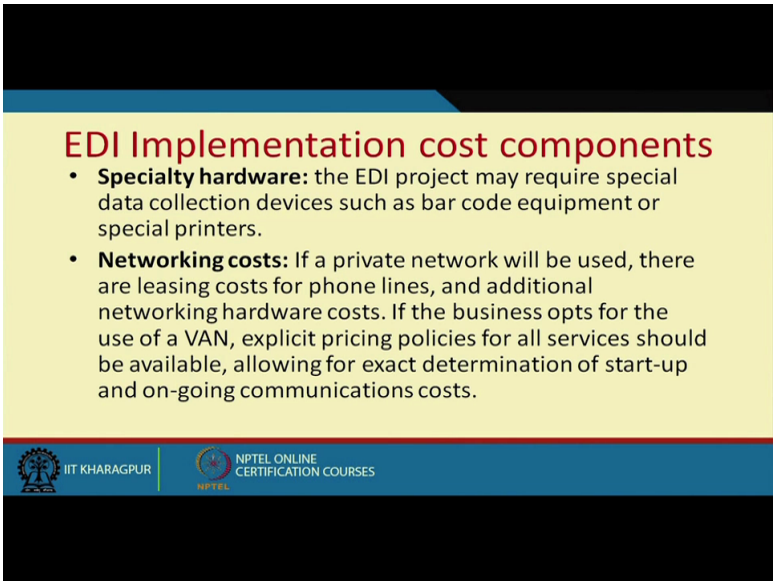

Speciality hardware some hardware sometimes EDI projects may require some speciality hardware like that of barcode reader etc. Then next is your networking cost. If you are using a value added network then you have to pay for this. If you are using your own organizations network and leased lines you have to pay for this as well.

So this networking hardware cost is also important and for VPN for individual one it the hardware networking network network hardwares the company has to buy in case of VAN this value added network. Third party maintains it but you have to pay for it.

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Then the legal cost because it requires EDI requires a contractual agreement between two business partners. Legally they should come up so to resolve the issues you need to be spending some money for getting legal Advises.

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Next is a Consulting cost. The companies themselves may not be knowledgeable to implement EDI. Just like your we were discussing about ERP for implementation of the EDI. Many times the companies will be hiring some consultant because this may intern require the change in the business process of your company.

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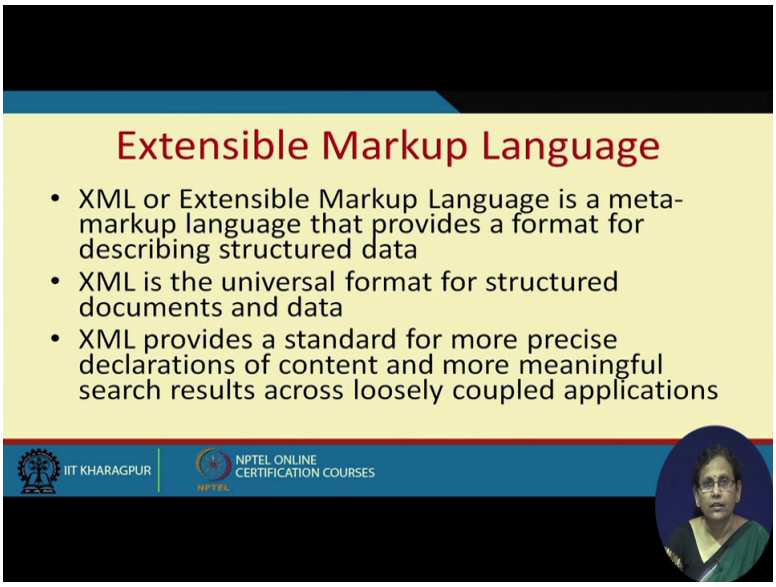

Then the next technology is your extensible markup language technology which is not a standard by itself but standards can be but it is a flexible markup language so that standards can be created out of it if people like. If some two companies like to have their own standard

they can do if a group of companies industry Council they like to have a standard made they can extend this markup language to create their own standard.

So this markup language so that is why it is called extensible markup language. remember I was telling you when you send the data used send what you sent not only the values you send the value as well some name associated with. What is that data? So that you sent both name value pair.

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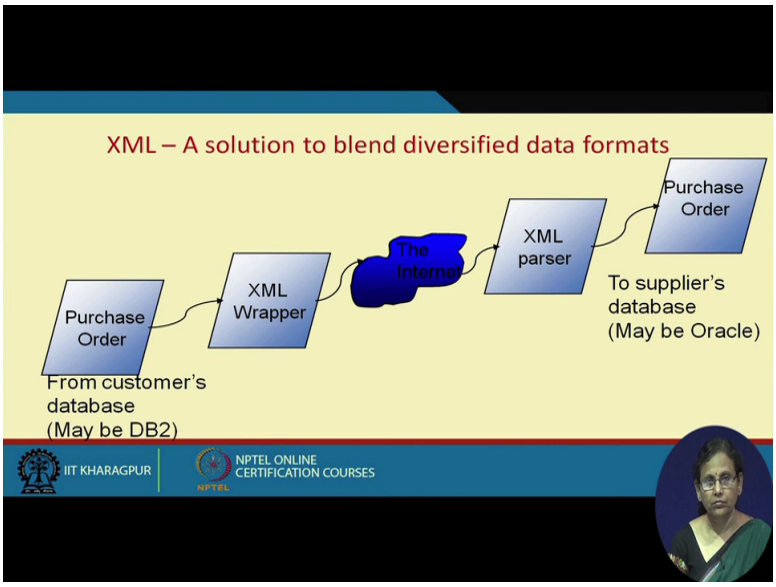

So XML has become so widely adopted that almost all the database management system they use they have they provide some interface to convert the data which is stored in the database in their own format to XML format. Then this XML data can be transferred over the Internet. How it will be transferred? That is also not we are going to discuss. It can be transferred as a file just like an email or something.

But there are other ways to translate it and send this data over the Internet. So after it goes to the internet It will be going to the other party where there in one XML parser in the first part then there is a wrapper which will be converting the data into converting the data to XML format. Where the data will be embedded within the XML tags to keep that name value pair in tag and then at the other end then the XML person who will be taking the who will be reading the data from that embedded format which contain both tag as well as the data.

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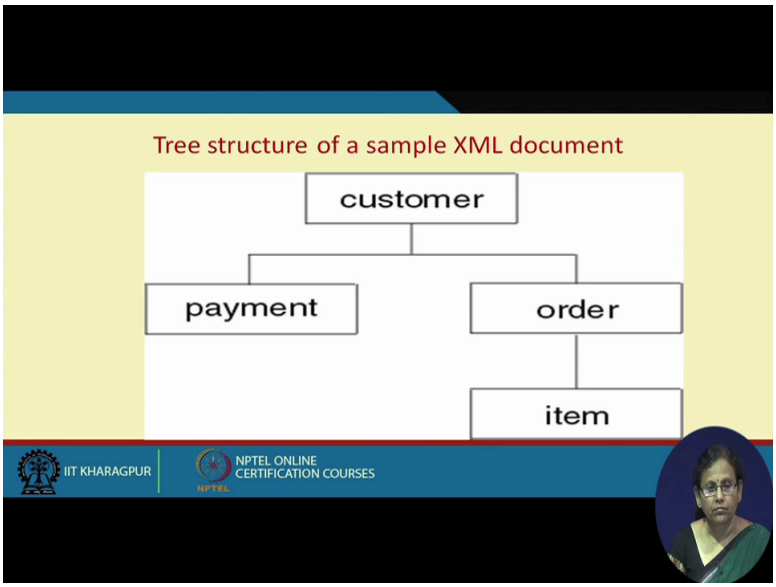

Usually the data will be stored in a tree like format in XML document. For example in that purchase order we saw that a specific customer for a specific customer the purchase order consists of a number of ordered items and maybe some payment information too.

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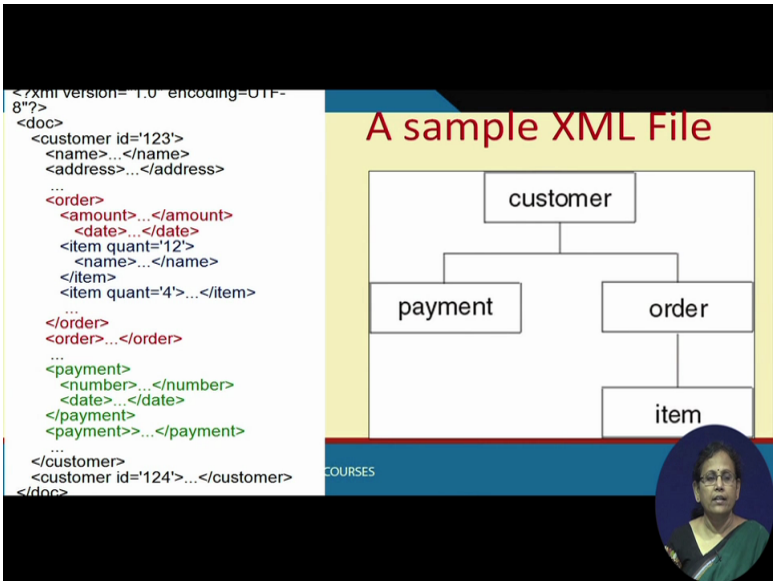

And this customer can have many number of orders and each order can again have many number of items. So when you send the data about a customer, about all his orders, about all these items, possible about the payment that he has made the data has to enter in a name value pair. For example here when you are sending customer data you are writing the name of the data is customer ID and the value is 123.

Similarly you can have name of another the name of the company then name of the customer, address of the customer, then order. Look this order will have an amount that is to be paid then it will have multiple items and each item maybe have different quantities. So this whole tree which of course is shown here has to be implemented the data has to be translated into that format.

Whereas may be in your database they will be representing a tabular format this no but this is within some text tag this values of stuff as entered.

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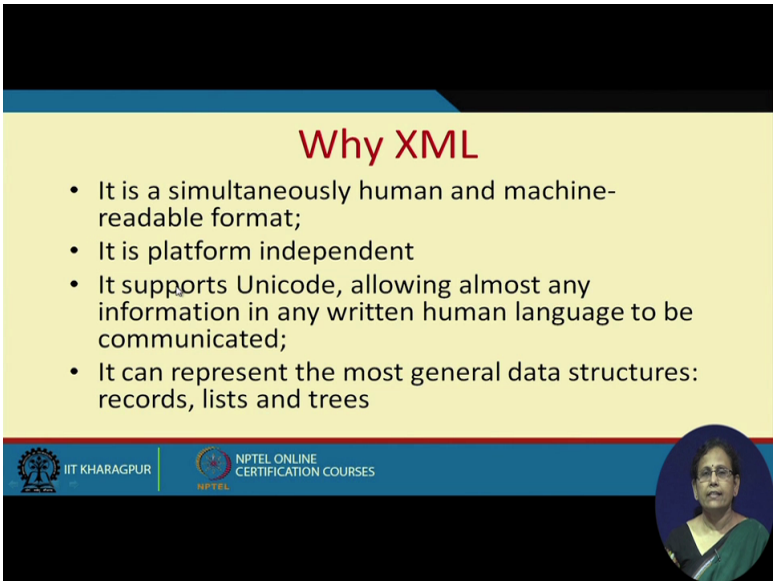

Xmls are often preferred than that of EDI because they are simultaneously human and machine readable. Their platform independent they support Unicode allowing almost any information written in any human language to be communicated. It can represent the most general Data Structure like record, least, trees etc.

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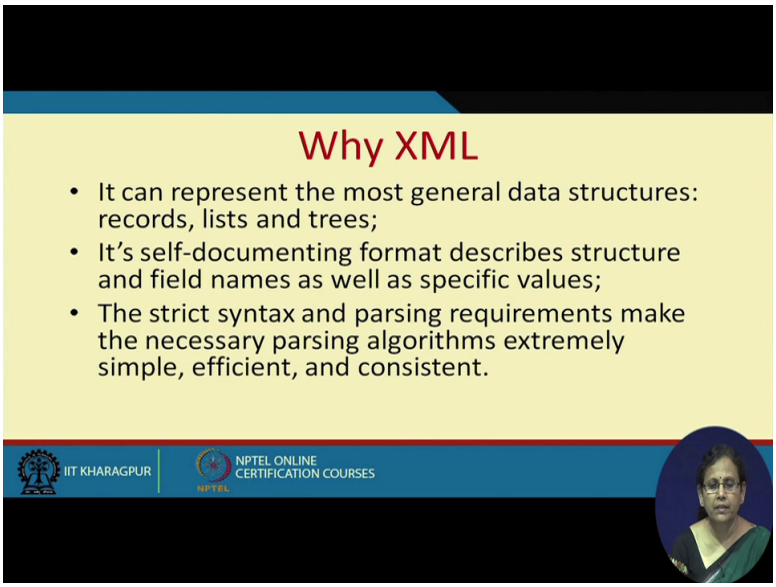

It can represent most general it is self documenting, it is self documenting format describes the structure and the field names as well as specific values. Now it stricts syntax and passing requirements make Syntax and passing requirement to make it very simple, efficient and consistent.

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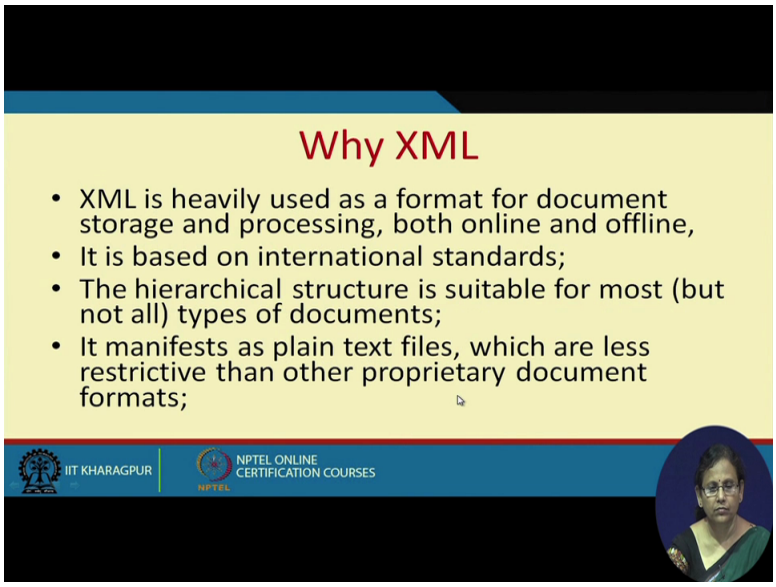

XML is again heavily used as a format for document storage and processing both in online and offline and environment. It is based on International standard. The Hierachical structure is suitable for most type of document. It maintains it manifest all this XML document

manifest as a name text file which are less restrictive than other proprietary document format like that EDI.

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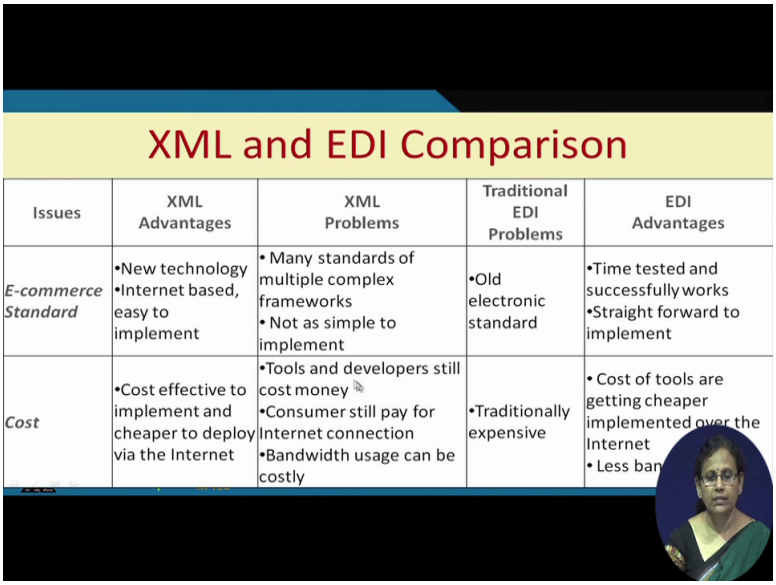

So this is a comparison between XML and EDI. Coming to e-Commerce standard this XML advantages are it is a new technology and easy to implement where as XML your it has few problems like it may not be having some existing standard and may be difficult to implement. Similarly traditional EDI problem is it is a very old standard companies and it is also not very readable so therefore to compress may not be adopting it.

Whereas the advantage it is it is it is since 1997os also it is existing, it is trusted and it is straight forward to implement. Next is your cost, XML is quite cost effective. But XML is a standard and it is free. But while developing a standard maybe it may be costly. Moreover it can be it is a text format and it is bandwidth more it its size is likely to be more than of that of standard EDI document. EDI is implementation because you have to be registering.

You are lf you are paying some money to be a part of the standard meeting but standard to use the standard. So therefore it is traditional expensive. However their implementation cost and tools and getting increasingly cheaper and they use less bandwidth.

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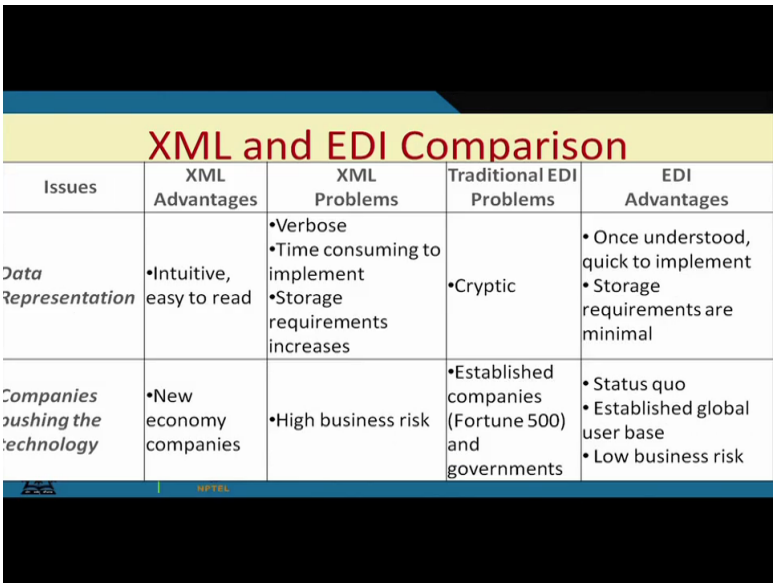

Then representation XML it is it easy to read whereas EDI it is quite cryptic but it is very big, it is very horrible but it is once it if you understand it it is quicker to implement. Then companies in your company in US companies are pushing XML. Whereas it is established quite for sometime.

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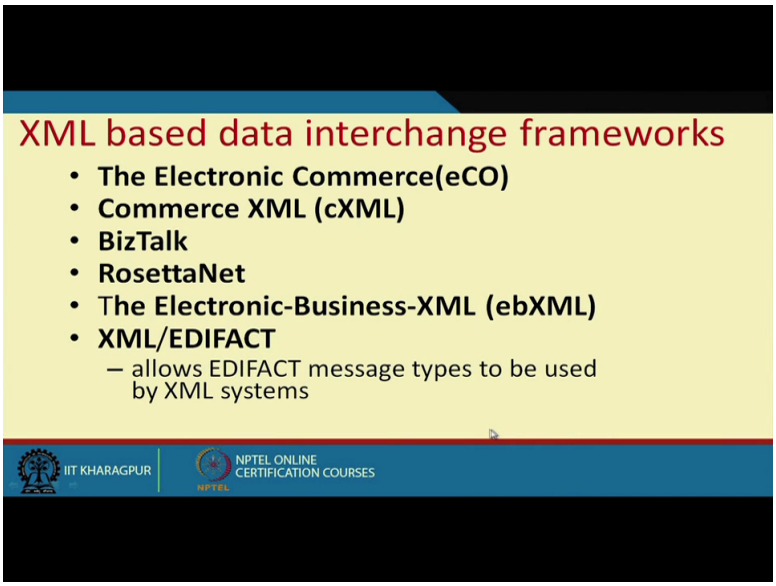

Now again in this XML the companies have many companies have come together to make their own standard that some of the standards are for example here there is it and it is a standards. You can read about all of them. They are readily available. For example rosettanet standard which is followed by most electronic and computer companies. We finish our

today’s lecture and from next class onwards we'll be talking more on this technology part. Thank you very much!