

Indian Institute of Science
Bangalore
NPTEL
National Programme on
Technology Enhanced Learning

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Global Supply Chain Management

Lecture – 06

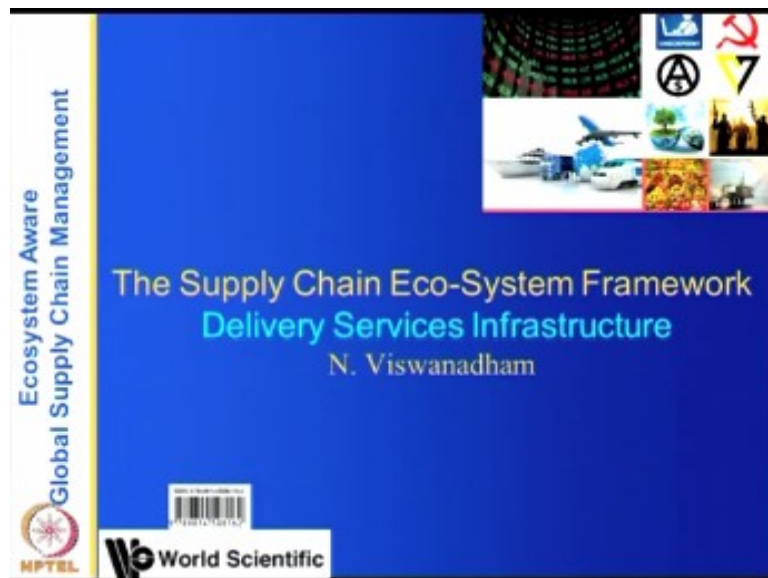
Supply Chain Eco – System Framework:

Delivery Services and Institute

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Now we will look at the second norm of the supply chain ecosystem.

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Contents

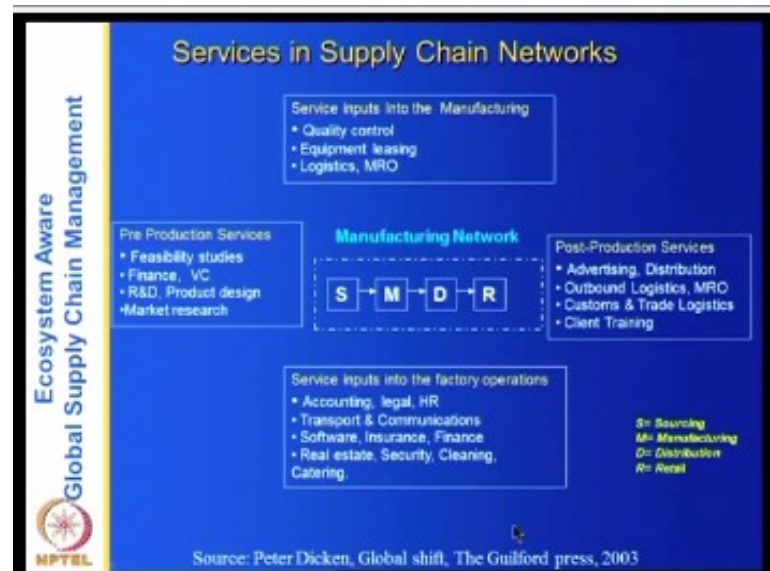
- Manufacturing and services are Intertwined
- Developments in Transportation
- High Performance Trade Logistics
- Some Recent Trends in Logistics

Conclusions



Manufacturing may be the supply chain's primary function, there are several services which are needed in the manufacturing process (we are going to see that in the next slide) such as logistics, finance, IT etc. Hence we cannot say that manufacturing and services are independent but they are intertwined and had to work hand in hand.

We look at the developments in transportation in recent times and also high-performance trade logistics, their features and some of the recent trends in logistics and finally conclude this section.

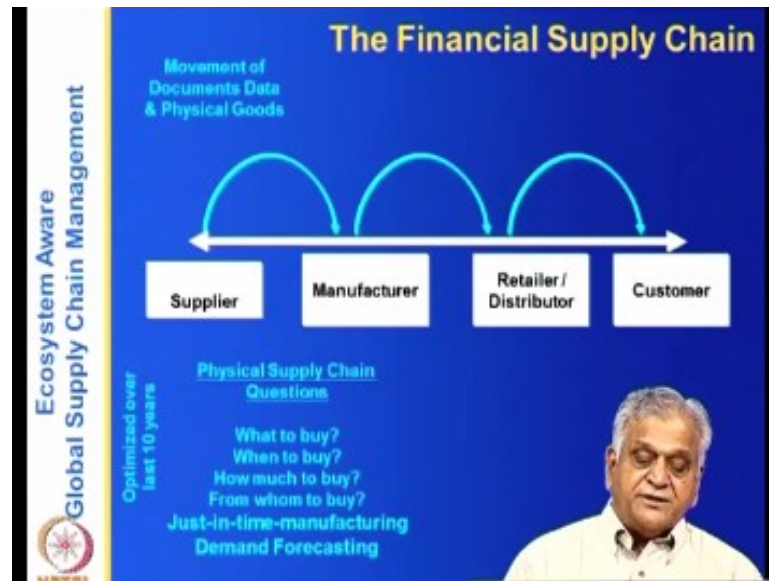


So let us look at the supply chain network which has suppliers (S) manufacturing (M), distribution(D) and retail (R) . The services are

Pre-production services: feasibility studies of the product, finance and venture capitalist requirements, R&D for the product design, market research for the product, etc. These are all the very vital services that are needed before you actually start the manufacture.

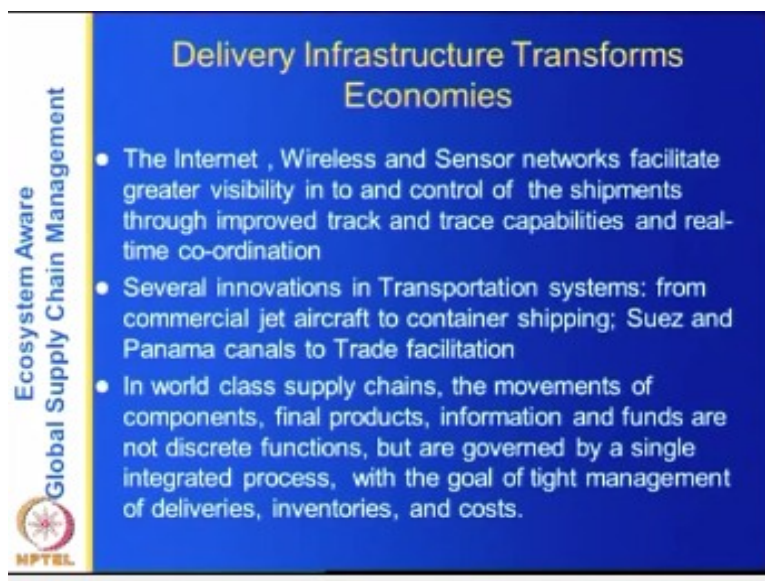
Manufacturing services: quality control of the components and their specifications, fit of the modularity requirements, etc. The manufacturing equipment is highly asset intensive and hence the equipment is leased rather than owned through purchased. Also the MRO (maintenance repair and operations), the Inbound logistics (suppliers to the manufacturers) as well as from the (manufacturers to the dealers) and services inputs for the factory operations such as accounting, legal services, human resources, transport and communications software, insurance, real estate security, cleaning, catering and so on. These are the kinds of services that are needed in the factory operations.

Post-production services are the services needed after the product is made. They include advertising, distribution, outbound logistics to take the product to the dealers and the retailers and sometimes to the customers. Maintenance repair operations and the product recalls, customs and trade logistics if you are doing international shipping. Client training: for some products you may have to train your clients how to use and maintain the product.



As the product moves forward from supplier to manufacturer to retailers and customers, the money moves backward from the customer to the retailer to the manufacturer to the supplier. The financial supply chain is an important part of the supply chain as it provides the requirements such as the letter of credit, credit to the customers to buy the products and the foreign exchange and other requirements in the global scenarios.

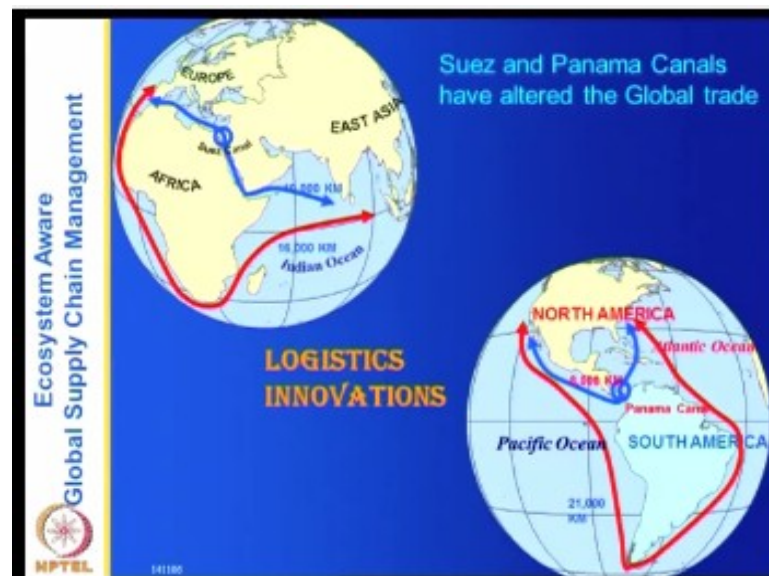
So the point I am making here is that, although you are dealing with a manufacturing supply chain there are several services which are of vital importance to interconnect the supply chains participants. One thing that is recently becoming very popular is the social networking among all the participants including the customers.



The Internet , Wireless and Sensor networks facilitate greater visibility in to and control of the shipments through improved track and trace capabilities and real-time co-ordination. Any shipment when it goes across countries and comes to India goes through several ports, several trucks. The sensor networks facilitate the visibility and this is called track and trace capabilities. In case of container shipping, you can trace the container and you can trace the ship, where the container is and find out where when your shipment is going to arrive to your production site.

Several innovations in Transportation systems: from commercial jet aircraft to container shipping; Suez and Panama canals to Trade facilitation

In world class supply chains, the movements of components, final products, information and funds are not discrete functions, but are governed by a single integrated process, with the goal of tight management of deliveries, inventories, and costs



The Suez Canal and Panama canal are in a way biggest innovations in the logistics paths because they save a lot of distance of shipping while transporting goods. The trade facilitation which is very common now in several ports, is the soft infrastructure used - basically - to transfer of goods in a faster manner. The delivery infrastructure becomes a fundamental innovation that transforms the economies.

The Suez and Panama canals save about 13000 kilometers of ship journey. If the Suez Canal is not operative, you have to go via Africa the Cape of Good Hope covering 16000 kilometers and if you go via Y R Suez Canal it is 10,000 kilometers. You are saving 6000 kilometers because of the Suez Canal and there is lot of traffic that goes via Suez Canal. Similarly if you go through the Panama Canal it is 8,000 kilometers. Otherwise you have to go through South America and it is 21,000 kilometers. So you save something like 13,000 kilometers because of the Panama Canal and the Suez and Panama canals. Also they have altered the global trade and have become highly congested canals.

Along with these innovations, lot of piracy risks have come into force. Somali pirates in the Suez Canal track the ships and they basically create a lot of havoc in this particular region



Transportation networks that were created in the globally you can see from Hong Kong to Los Angeles there are ships sailing direct and you can see from Hong Kong to New York and other parts in the in the United States. You can see how many routes have come live affecting the shipping logistics. Several shipping routes have come during the globalization regime in the 90s and the first decade of year 2000. This diagram is a nice one showing all the routes around the world leading to high-performance trade logistics.

So the quality and performance of logistics and research differ markedly across countries.



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Trade Logistics

- The quality and performance of logistics services differ markedly across countries and significantly affect their trade competitiveness.
- These variations in time and cost stem from the quality and cost of infrastructure services and policies, procedures, and institutions.
 - In Kazakhstan it takes 93 days to export a 20-foot full container load (FCL) container of cotton apparel while in Sweden it takes only 6 days.
 - In Namibia the costs of all trade-related transactions for a 20-foot FCL container, including inland transport from the ocean vessel to the factory gate, amount to slightly more than \$3,000, and in Sweden to a little more than \$500.

The logistics in India is different from in China, is different in the US and different in Africa. The trade competitiveness of these countries basically depends on the logistics.

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So both the time and cost differences determine the trade competitiveness of a country.

Differences In Logistics Performance

- Differences in logistics performance are driven only in part by poor quality of physical infrastructure services such as road, rail, waterways, port services, and interfaces.
- Most inadequacies often are caused by Policy & Institutional constraints— procedural red tape, Poor enforcement of contracts & rules of engagement, delays in customs, ports and border crossings, pilferage in transit, and restrictive protocols on movement of cargo.

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Delivery Services & Competitiveness

- The quality of Delivery services have a major bearing on a firm's decisions about the country to locate in, the suppliers to buy from, and the consumer markets to enter.
- High logistics costs and—more particularly—low levels of service are a barrier to trade and foreign direct investment (FDI), and thus to economic growth.
- Countries with higher overall logistics costs are more likely to miss the opportunities of FDI
- Countries with efficient logistics infrastructure such as Singapore and Hong Kong were targets of MNCs for setting up facilities.

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Brand Logistics Services

- Brand Logistics provider
 - Resources: Warehouses, Fleet of vehicles, containers
 - Support of financial institutions for Letters of Credit, Foreign exchange, Insurance, Credits, etc
 - Skill Development Training Centers
 - Education Institutions for research in New business models, Optimal location of warehouses, Scheduling truck services and maintenance, Freight space negotiation and allocation, etc
 - **Talent with domain knowledge and connections**

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Brand Logistics provider needs Resources: Warehouses, Fleet of vehicles, containers; Support of financial institutions for Letters of Credit, Foreign exchange, Insurance, Credits, etc; Skill Development Training Centers; Education Institutions for research in New business models, Optimal location of warehouses, Scheduling truck services and maintenance, Freight space negotiation and allocation, etc **Talent with domain knowledge and connections are very important**



Some Recent Trends in Logistics

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What are some of the recent trends in logistics?

The slide features a blue background with the title "Piracy in the Seas" in yellow. On the left, a vertical sidebar contains the text "Ecosystem Aware Global Supply Chain Management" and the NPTEL logo. The main content consists of four bullet points in white text.

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Piracy in the Seas

- Pirates have expanded over the years 2006-10
- Many of the world's most powerful Navies are involved: US, EU, India, Malaysia, Indonesia and South Africa.
- The Japanese and South Koreans send warships to protect ships carrying cars.
- It is still cheaper & convenient to pay higher insurance fees and take risk being attacked by pirates than to incur the extra cost of diverting vessels around the Cape of Good Hope.

Some of the recent trends in logistics are very interesting. There is the piracy in the seas. As I said before that the Suez and Panama canals have been the biggest innovations and they saved thousands of kilometers of shipping and that has boosted the trade on this route. The Pirates have seen these opportunities. They capture the ships also take the people in the ship as hostages

Piracy in the Seas has increased. Pirates have expanded over the years from 2006-10. Many of the world's most powerful Navies are involved in safeguarding their ships. These include US, EU, India, Malaysia, Indonesia, and South Africa.

The Japanese and South Koreans send warships to protect ships carrying cars. It is still cheaper & convenient to pay higher insurance fees and take risk of being attacked by pirates than to incur the extra cost of diverting vessels around the Cape of Good Hope.

Performance based logistics
*"Never tell people how to do things.
 Tell them what needs to be done &
 they will surprise you with their ingenuity."*

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We now look at what performance based logistics implies.

Never tell people how to do things, tell them what needs to be done and they will surprise you with their ingenuity.

Most of the times in logistics, you will instruct: go at this particular time, you take this kind of truck and deliver it by evening to that particular factory, you take this particular route

Performance Based Logistics

- Let's assume that XYZ has contracted with ABC 3PL to provide call center and fulfillment services .
- Under a transaction based agreement, ABC 3PL gets paid more, the worse the supply chain performs.
 - If XYZ has forecasted too much, ABC 3PL will make more money by storing the excess inventory. They will be paid to destroy the obsolete product.
 - If XYZ has forecasted too little, ABC gets to charge for expediting. If ABC's products are returned, they make even more money.
- Under performance based contract, the supplier is to assume a more proactive role in managing its customer's supply chain by bridging the supply and demand gap

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Under performance-based contract, the supplier is to assume a more proactive role in managing its customer's supply chain by bridging the supply and demand gap

What people are trying to do is performance-based logistics. The contract supplier is to assume a more proactive role in managing the customer's supply and demand gap. It looks at shelves of the retailers and find out what is selling and it will replace whatever is sold and it will remove once it doesn't sell for more than 15 days. The logistics provider basically becomes a partner in the whole retail business.



The second thing that is happening is logistics execution.

What is logistics? It is basically delivering a product at the right time to the right place to the right customer, at the right time, at the right cost. What will happen if the truck fails and it cannot be delivered or what will happen if it goes via a port and there is lot of delay; what will happen if you have to pay some fine somewhere and so on. So more efficient back office processes and more responsive customer service are needed. We study a logistics company called Penske.

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Penske works with Genpact to improve efficiency and customer service.

- Penske is a US based logistics company. Genpact manages the logistical services of Penske
- Genpact workers in India and Mexico
 - Arrange for titles and registrations for the trucks leased by Penske
 - Check the customer's credit status, Arrange necessary permits, If the truck gets stuck at a weigh station, the truck driver would call the BPO staff who would transmit necessary documentation to the weigh station.
 - After the trip, the driver's log would be shipped to a Genpact facility in Juarez, Mexico, where mileage, tax, toll, and fuel data are punched into Penske computers and then processed in India.

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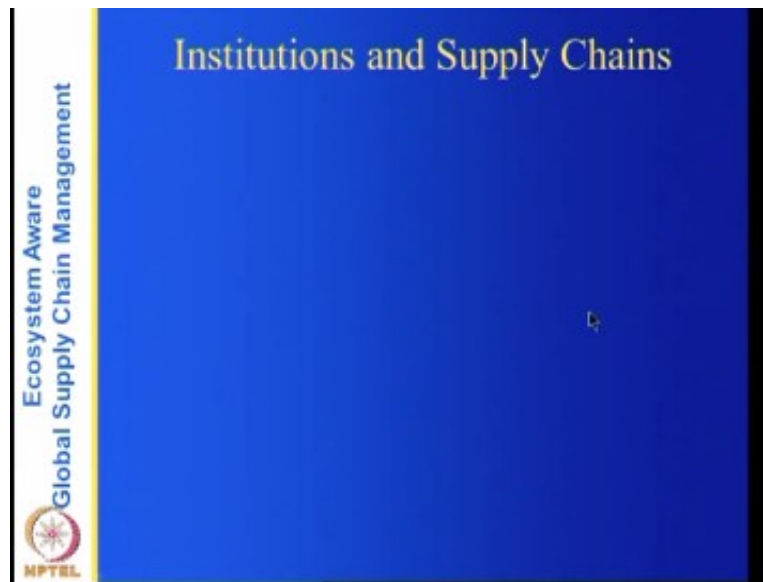
Conclusions

- Logistics amounts to 10-15% of every product produced. It is estimated to be more than US\$ 2 Trillion worldwide
- The quality of Delivery services have a major bearing on a firm's decisions about the country to locate in an also on country's abilities to attract FDI
- Hard infrastructure contributes only 25% of the Logistics productivity and the other 75% comes from soft infrastructure such as trade facilitation & IT based execution

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We now consider the role of Institutions in the global supply chain performance



We now consider the influence of the institutions and supply chains. global supply chains go through inter country entry and exit through the ports and airports and need to be managed to minimize lead times.

Important parameters for the companies to register superior performance include Soft infrastructure such as trade facilitation, Customs duties and clearance, FTAs, FDI restrictions, Business friendliness, enabling attitude and economic diplomacy ; Labour unions, industry associations and other communities and so on. Favorable institutional environment reduces transaction costs

The economic diplomacy is in terms of the foreign investments or the also a the human resource adjustments between countries in terms of the visas for employment of the people and from one country to another and also other people like labor unions which are becoming important this one they can go and strike or they can demand higher base industry associations because there are lots of associations automobile Association industry to industry chambers and other communities.

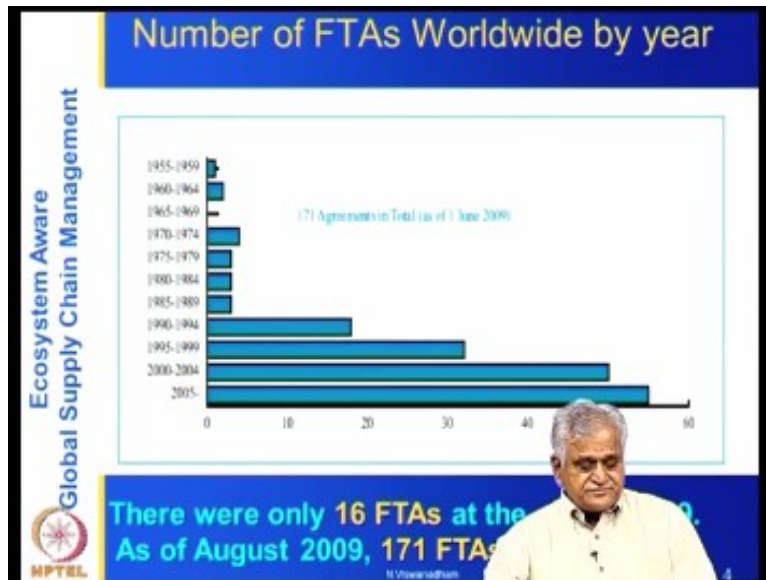


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Economic Integration

- Two countries cooperate so that there are no **legal barriers** to the circulation of goods, capital and persons, and at the same time that there are negligible **economic & social barriers** (transport costs, intermediation costs, social factors)

What is economic integration? Two countries cooperate so that there are no **legal barriers** to the circulation of goods, capital and persons, and at the same time that there are negligible **economic & social barriers** (transport costs, intermediation costs, social factors) . European union is a good example.

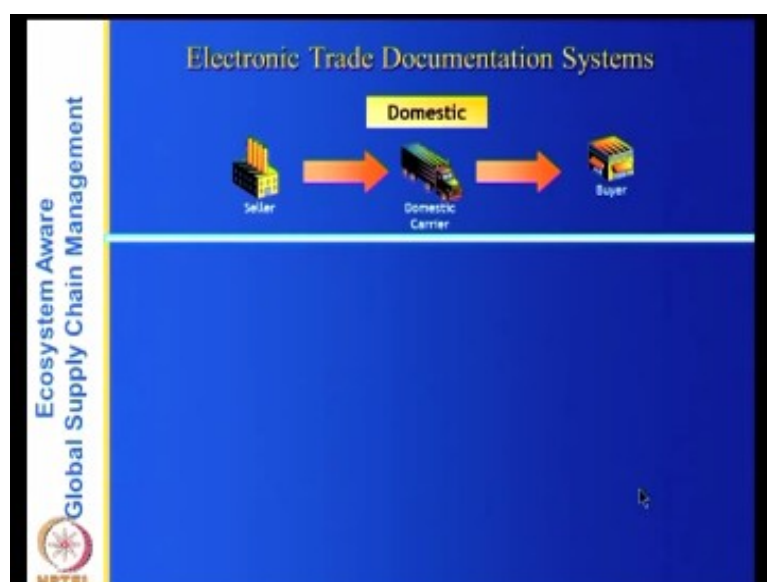


Now if you look at the cooperation between countries over the years there was 16 FES FTAs (free trade agreements) in 1999 and they have increased to 171 in 2009. There is an increase in terms of the agreements between countries because people realize that there is specialty involved in each of the countries. Some countries have natural resources like oil in the Middle East others need oil.

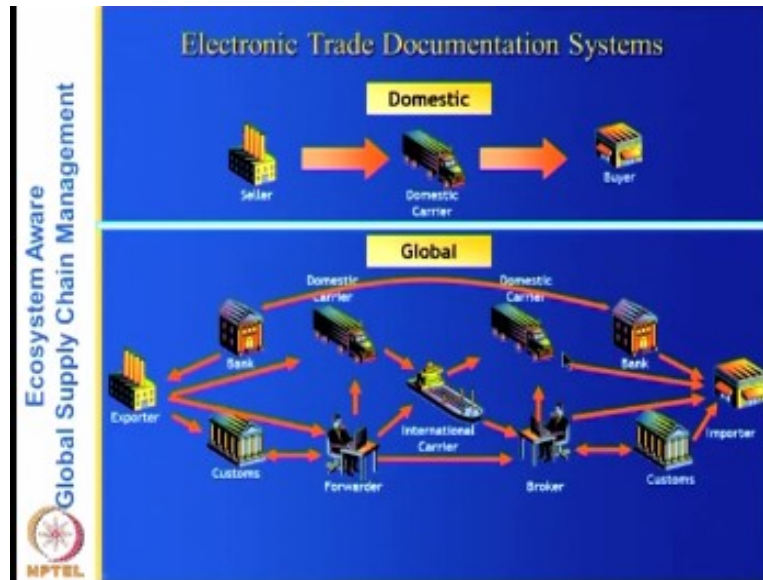
The free trade agreement is basically needed because no country has everything that is needed for the country's people so you have to depend on other countries. The big question is which country do you choose what are terms in the free trade agreement all that depends on the policy



When you are trading across the borders 25 percent of time is taken is determined by the hard infrastructure i.e. port and terminal handling, land transport, etc. The customs inspection takes 16 percent of the time and pre-arrival documents or takes 59 percent of the time so it takes 75% of time for the soft infrastructure. If you follow the trade facilitation and also get the pre-arrival documents, simplify the procedures and the signatures that are needed for the pre arrival documents and you will save a lot of time. Same is true with the customs and inspection. There are ways in which you can use modern technologies like sensor networks RFID tags etc. to basically go to the factory seal it when they're loading into the container and once it is electronically sealed you need not have to inspect again at the customs and you can load it directly on to the ship.



Let us look at the electronic trade documents. If the business is within the same country (you have seller and buyer and a domestic carrier) and it is going from one place to the other and the payments for the documents could be done through the bank . Also, when the truck is moving all that the documents that are needed could be a single document.



If the goods container is moving globally, then you have an exporter, customs officials, freight forwarder, domestic carriers and then international carrier like shipping. All this has to go to a broker. Then once the goods reach the destination, there are again domestic carriers on the other side, Banks, customs and goes to the importers. On the average about 180 documents are needed and they had to be transacted between all these people about 12 to 20 players.

One should look at the trade facilitation and minimizing documents. This does not mean that you allow them free, but you basically streamline the trade processes so that things are done properly as well as simply and efficiently. So we have efficient global logistics is more than brick-and-mortar infrastructure.

Efficient Global Logistics is more than Brick and Mortar Infrastructure

- 7% of value of world trade is trade logistics cost (UNCTAD)
- Trade logistics costs are as important as tariffs
 - Each day saved is equivalent to 0.5% tariff
 - Each additional day in transport reduces the probability that US sources from that country by 1 – 1.5 percent.
- Most developing Nations expand the hard infrastructure: airports, highways, ports etc. overlooking other network components — such as efficient customs clearance and quality trucking services
- Balance between brick-and-mortar Facilities and Policies, Regulations, and their enforcement results in consistent processing times & reduction of inventory levels.

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Most developing Nations expand the hard infrastructure: airports, highways, ports etc. overlooking other network components — such as efficient customs clearance and quality trucking services. Balance between brick-and-mortar Facilities and Policies, Regulations, and their enforcement results in consistent processing times & reduction of inventory levels.

So what are the visible barriers to trade

Visible Barriers to Trade

- **Import quotas**
 - A very transparent means of limiting the quantity of product that can be imported into the country.
 - Some products have tariff rate quotas where in quantities in excess of the quota are charged a higher duty rates
 - Textiles, Food, Steel etc are some of the products that have quota restrictions
- **Voluntary Export Restraints**
 - Quota on trade imposed by the exporting country at the request of the importing country's government

Import quotas is A very transparent means of limiting the quantity of product that can be imported into the country. Some products have tariff rate quotas where in quantities in excess of the quota are charged a higher duty rates. For example Textiles, Food, Steel etc are some of the products that have quota restrictions

Voluntary Export Restraints: Quota on trade imposed by the exporting country at the request of the importing country's governments. The voluntary export restrictions are common in industries like cement, steel etc.

Invisible Barriers to Trade

- Governments are largest purchasers of goods & favor domestic producers.
- Local content requirements, Product safety standards, Import licenses are subjective
- Country of origin: Difficult to identify where products are made when the production process crosses several borders.
 - The country of origin is that country “ where an article is mined, grown or produced or manufactured”.
 - If the production process took place in different countries, country of origin is where goods underwent substantial transformation
 - Jeans were shipped to Mexico and baked in an Oven and returned to USA. Since the baking was done to fix the dye, the court ruled the jeans went through substantial transformation

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Conclusions

- The governments play a significant role in the functioning of the supply chains
- From liberation to protectionism, from low customs duty to quotas, from no tax to service tax, there are multitude of factors that can influence the company finances.

The governments play a significant role in the functioning of the supply chains. From liberation to protectionism, from low customs duty to quotas, from no tax to service tax, there are multitude of factors that can influence the company finances. Company –country relationship is a vital economic growth.

We have completed this there are four factors that is a supply chains the resources the delivery mechanisms and the institutions and their role in making the in the functioning of the supply chain.

Programme Assistance

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