

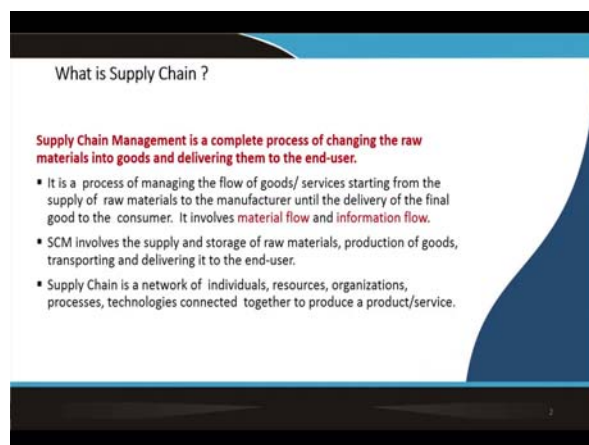
Management Information System
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Week - 04
Supply Chain Management
Lecture - 16
SCM - Part – 1

Hello everybody, this section we will cover another very important subject Supply Chain Management part of them overall resource planning scheme what we have been discussing. Like CRM this is another very important extension. So, many of it is a part of ERP you can think again extension of ERP and it can ride on ERP or it can be inbuilt into ERP.

And supply chain management is something what every organization is doing; because it is ranging from a vendor on one side, the organization itself in the middle and the customer is on the other side. Supply chain management encompasses the area from vendor to the OEM to the customer.

I will cover this in two sections, because it is a very detailed subject.



So, today in this section we will say what is the basic definition, what is supply chain. It is a complete process of changing the raw material, which has been supplied by your

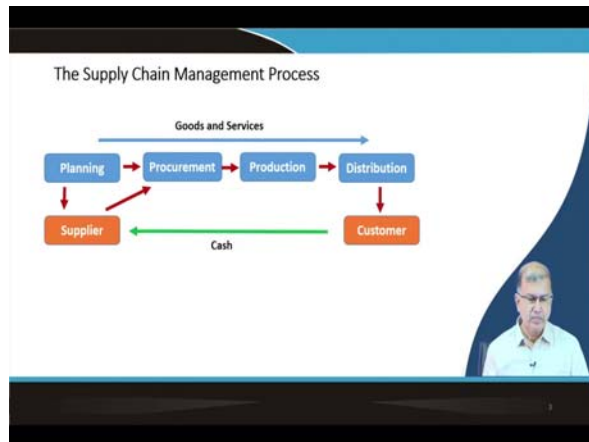
vendor into and developed into goods and delivering them to the end user. This is a very simple definition.

So, it is a process of managing the flow of goods and services starting from the supply of raw materials. So, it starts from the supply of raw materials, to the manufacturer, where the vendor is involved until the delivery of the final good to the consumer. It involves material flow and information flow. So, why are discussing it as part of our MIS course? Because of the information flow part of it, so that is the scope here mainly.

So, we will not talk much of course about material flow, as unless the material flows, then only the information you know either before or after or whatever; before material flow would be created and along with the material flow there will be an information flow. So, they are all interlinked. So, primarily ,we will not be discussing much about the material flow part; our focus from MIS perspective is of course related to information flow.

SCM involves the supply and storage of raw materials, production of goods, transporting and delivering it to the end user. So, this is all about the material part and supply chain is the network of individuals, resources, organizations, processes, technologies connected together to produce a product or service and get it delivered to the customer.

So, here is the information part; because now you are talking about individuals, resource, organization, processes, technologies all connected together to produce a product of service. So, that is all information.

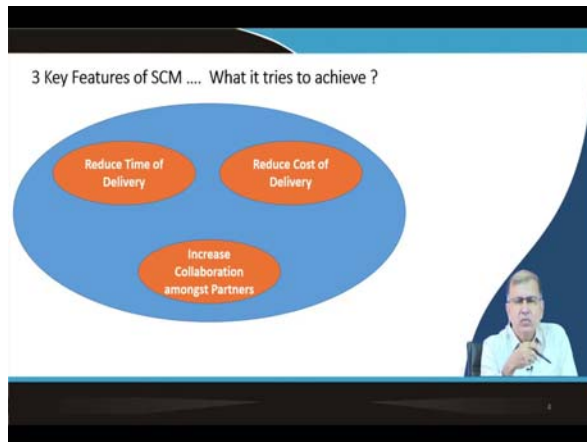


The supply chain management process, very simplistically speaking it looks like this. Starts with Planning right? When I want to make something first we Plan, then we Procure; when we plan to make something, we need the raw materials, components etcetera, so we reach out to our vendor and we do the procurement. Once the materials are there we Produce, as we are the manufacturers; so we are producing it, manufacturing it. Once it is manufactured, then it has to be Distributed and it goes out to the customer.

So, the planning sends an input to the supplier, supplier gives the material, the procurement part; this was the arrow pointing here the supplier dimension and the distribution finally the product goes to the customer, now that is the end of it.

However, there is a cash flow which happens, because the customer is paying it to the organization and then organization also has to pay to the supplier; because the supplier supplied material so they want cash and the customer has bought something, so they have to pay cash, so that is how the simplistic diagram overall looks like.

So, goods and services move in one direction (left to right) and the cash movement happens from the other way; the customer pays and based on the customer's payment, the company also pays to its supplier.



3 key features of SCM and what it tries to achieve? So, these are the 3 key features of supply chain management and what is it trying to achieve? So, number 1 is Reducing the Time of Delivery, 2) Reducing the Cost of Delivery, and 3) Increasing Collaboration amongst Partners.

So, if you just deep dive little bit in each of these, so reducing the time of delivery again through software driven systems like a ERP etcetera. I gave you an example in the ERP class, where I had showed this gear wheels if you remember, where there is an OEM let us say a truck or a bus manufacturer. Let us take the name of a company, so that it helps you to understand better - it could be any truck/bus manufacturer like Ashok Leyland or let us say Tata motors.

One end they have the customer, that is the state road transport corporation or the truck fleet owners etcetera and the other end they have their OEM vendor's or suppliers, the people who are supplying them components.

So, we took an example say, State Transport Corporation is ordering say buses, hundred buses on Tata Motors and for that hundred buses Tata motors needs hundred batteries; so other side is there vendor say Exide or Amara Raja or any other battery manufacturer.

Now, what happens is, as soon as that order is released, the purchase order from the State Transport Corporation for 100 buses, they also have a software system probably an ERP

e.g. SAP. Tata Motors uses SAP and Exide also uses SAP and they also have their systems connected, like they can talk (communicate) to each other without any manual intervention.

Now, that 100 bus orders purchase order will be released and that will come in as a sales order for Tata Motors into their system and then they will execute the MRP run. When the MRP run happens automatically at the background, as it keeps happening whenever it receives a new order. The material requirement planning will explode the bill of material for those hundred buses and it will tell the planning group that, for making these hundred buses you need whatever quantity of components. So, you need 100 batteries for example, and each bus probably uses 6 tyres or maybe 7 with the stepney. So, 100 into 7, 700 tyres and then all those things you know gearbox, engine, seats, etcetera and hundreds of such other components which are a part of the bus.

Now, many of these things are made inside the Tata motors factory, so MRP will create internal production orders for all components which would be manufactured inside the factory, for example - the gearbox, engines, axle, body, chassis etcetera.

And many of the components they buy it from suppliers; like battery example or the tyres for example. The tyres order will go to Apollo tyres, MRF, J K tyres, Bridgestone etcetera while the battery order goes to Exide, Amaron, Amara raja etcetera.

Now, during the MRP run, the Bill of Materials explodes and it converts everything into production order or purchase order. For the bought out materials, it will be purchase orders. So, there will be a purchase order release on Exide for hundred batteries, that will get electronically transferred immediately to the Exide system. So, that will be a purchase order from Tata motors, which will come and hit the book of Exide as a sales order.

So, for Exide, they will get a sales order of 100 batteries to be delivered to Tata Motors within say 7 days' time. So, then that becomes an internal order for Exide and then they will do their own MRP in their SAP system, which will explode that bill of material for 100 batteries. Then their internal manufacturing production order, purchase orders will get created because a battery needs lead plates, acid, plastic containers , separators etcetera, which goes into the making of a battery.

So, this whole thing from the State Transport Corporation to the battery supplier, you can see is connected electronically through this software's. And this results in reducing the procurement cycle time, because it is all electronic transfer without any human intervention, and hence no scope for any delay due to somebody not being in his seat or is on leave or he is busy with something else etcetera. All communication is done electronically, helped by the ERP software.

So, that is what it is saying - reduced time of delivery. The whole thing is a supply chain management exercise – right? Supplying of battery from Exide to Tata motors into their bus which gets delivered to Maharashtra State Transport Corporation.

Reducing the cost of delivery- You can realize that the whole thing gets linked and so the things move fast. Everything is electronically done and information comes very quickly. So, things can be produced and delivered in less time. So, overall cost comes down, because there is no delay. Or there is less chances of delay. We said no delay is not the right word maybe; probably there are very little chance of delay, unless there is some major breakdown in the factory etcetera. But from an information flow perspective, things have speeded up a lot; so the cost of delivery also has to come down.

Increased collaboration amongst partners is also again very visible, because they have linked their the ERP software's, and they have collaborated on this platform. The platforms are being shared by each other, so that is a collaboration.

No manual intervention is required at all. So, as soon a customer decides to buy 100 buses, they create their own internal order; that is a purchase order to Tata motors to supply these 100 buses. Once this PO is released, then everything gets done electronically and automatically through these collaborations.

What is the collaboration? They have collaborated their technology platforms. So, it is not required for the MSRTC purchase manager to call up over phone to Tata motors' sales representative that, "Look mister so and so, I am placing an order can you supply by such and such date etcetera, please confirm" etcetera. Nothing like this is required, because it is taken care electronically through the software's and this is what is meant by increasing collaboration amongst patterns.

Now, you can just imagine, this thing extended to a multinational company which is working across the world. So, the same thing can be done executed in that scale; a company in Europe or company in US is ordering something from a company in India, because we export lot of things like garments or whatever etcetera or say China which is a manufacturing hub for the most of the world.

So, we also make lot of products and those ordering is happening like say pharmaceutical products. Like this what I have simply explained to you with an example of Tata Motors within India; the same thing you can just think of a company in Canada or US or Australia or Europe ordering and that same information is flowing into this company's system.

Between Europe and the Indian supplier, information flows at electronic speed. Maybe there could be a time zone effect. Maybe our sales department or purchase department is not working due to night time. So, they will come to the office next day at 9 o'clock in the morning and they will see on the screen, a new order has come in for such and such quantity.

But there was no human interaction nor there is a telephone call etcetera or a fax message. So, on the screen as soon as they log in, this person sees a new order of something, from such and such company for such and such quantity and such and such date delivery. And he gets on with it, because it is going to his ERP system and then you know the whole thing again starts; the **planning** part and procurement of the material etcetera.

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So, this is what we are saying is meant by collaboration. We are collaborating all technology platform, sharing information, seamlessly. Whatever business need is required, the data, and information flow from one organization to another organization smoothly, seamlessly, without any barrier, without any wall, without any interface. So, there is no delay. All of that collaboration results in reduced cost of delivery and of course reduced time of delivery. When you reduce time of delivery, you also reduce cost of delivery. So, that is the net result outcome of this increased collaboration amongst partners.



What is supply chain management? - Manager forms relationship with suppliers, vendors and customers; again another way of looking at it, is, managing a firm's relationship and sharing information about orders, production, inventory levels, delivery of production, services etcetera. And the goal is to deliver right amount of product to the destination in least amount of time and lowest cost.

Again the same thing in a different word; the right amount of production goes to the destination means, it goes to the customer, because customer needs the production in least amount of time and the lowest cost. So, again in the previous slide we were talking about cost saving and time saving.

Sharing information, we are saying about the collaboration part; this order and production, inventory level, delivery of production, services this is done electronically by sharing information. We do not mean that you have to keep calling somebody or sending letters or emails; no, this is done electronically through the connected ERP systems of the partners.

Or you can design also that the ERP can send out mails. So, if they are not electronically connected, we do not want to connect your system; because for some security reason or whatever, you can decide your ERP will send out mails to different agencies. Your purchase order goes by mail, as a mail attachment.

Again the mail is sent electronically meaning that the email works as an interface with the vendors ERP. Similarly, on the customer side, you connect with his ERP through

email services. So, that is also a collaboration platform using emails, because you are seamlessly exchanging information without human intervention. So, there is no manual phone call or fax or whatever.



Supply chain is a network of organizations and processes for producing materials, transforming them into products, and distributing the products. We have already discussed this.

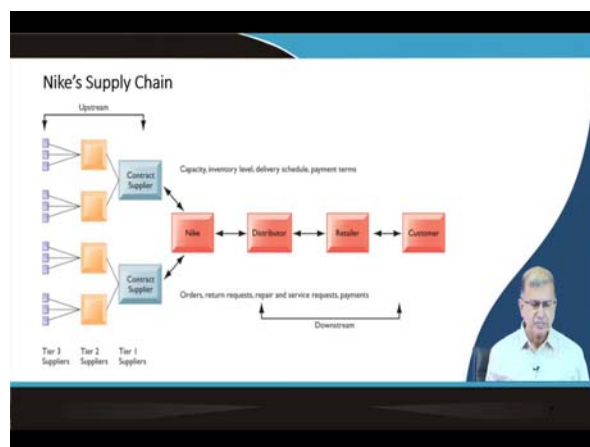
Upstream supply chain deals with the company's suppliers and suppliers' suppliers, and includes processes for managing the relationship with these partners. Up streaming is when you are receiving things from your vendors. And downstream is the opposite part when you are delivering material to your customer. So, there is an upstream supply chain, and a downstream supply chain; so vendor side is upstream, while the customer side is called downstream - just a nomenclature.

Internal supply chain, - Now in between these we have internal supply chain. Within your factory is also a supply chain involved, because material comes in, comes to the security, goes to the store, gets quality checked, goes to your shop floor and then from shop floor you finally, produce your finish product and that goes into a warehouse or a finished goods store and then from there it goes to the customer.

So, within the enterprise itself there is a supply chain; which is called internal supply chain. Or you can have multiple factories for example. Complex manufacturing industry like an aircraft for example, Airbus or Boeing Co. Now, it will receive various finished

items from various suppliers like the wings of an aircraft or the Landing gear. For Airbus Ltd. Most of the major components are manufactured in UK, Belgium, Spain, Germany although the final assembly is done in France. And those wings are shipped to Toulouse in France, where the airbus, aircrafts are assembled. So, it is not just one factory, but it involves multiple large factories belonging to the same Airbus Company. In other words, they are part of Airbus Ltd. And not Vendor organizations. They are all Airbus companies, but physically located in different countries of Europe. And they are supplying their things to the headquarters where the final aircraft is getting assembled.

So, it is all a part of that internal supply chain, because there are no vendor or supplier etcetera; because these factories are Airbus companies, but they have different factories at different locations for different components.



So, we have three kinds of Supply Chain, namely, Upstream, Downstream and Internal. If you take a pictorial view - Nike for example; Nike is famous for making of sport goods, shoes etcetera. So, here it is Nike, has got you know tier 1 (contract supplier), tier 2 and tier 3 supplier. So, the tier 1 are the main suppliers, supplying the final components. The tier 1 supplier, offloads to tier 2 supplier, some of the activities and some of the sub components and then tier 2 also off loads to tier 3.

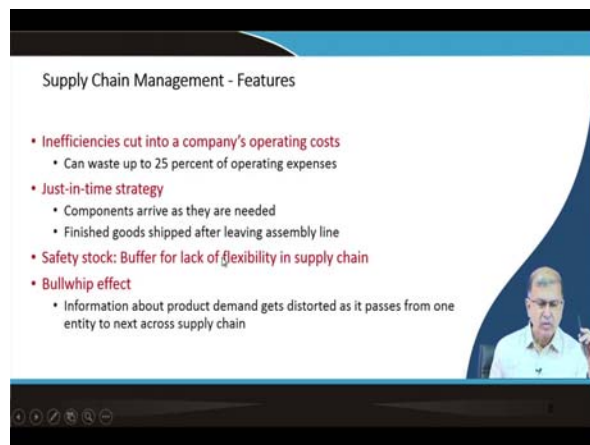
So, there are three levels for Nike. In shoe manufacturing thing probably the tier 3 supplies the soles etcetera, whereas tier 2 would be doing a sub-assembly of the shoe soles with shoe upper and then finally, tier 1 (contract suppliers) probably, would add the

logo and other finishing stuff to the shoe and doing overall quality checking before delivering it to Nike.

And they could be at very different countries; probably these tier 3 suppliers are located in say Vietnam, Malaysia, Indonesia, Bangladesh or even maybe India; tier 2 also can be here or maybe somewhere in US. And then the contract supplier (tier 1) will be in US and Nike main headquarters assembly centre is in UK, US or it could be in China.

The same example, the same picture if I show you for Apple; the Apple I-Phone final assembly is done in China and components are coming from various places including India and Taiwan and Korea from tier 2 or tier 1 suppliers. They are all supplying it to a Apple factory which is located inside China; in China not in US, that is where the final iPhone gets assembled and then it goes to the distributor, retailer, finally customer. The customer could be anywhere in the world.

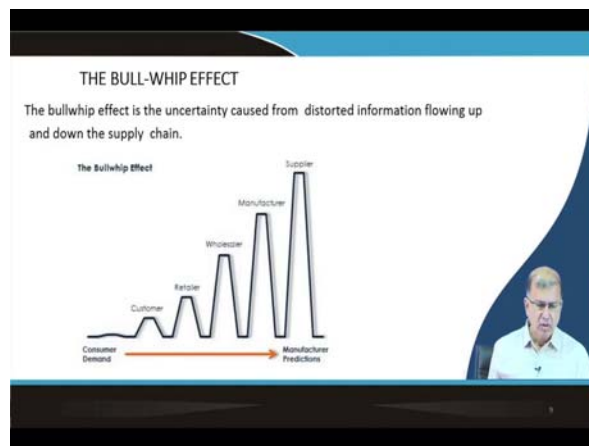
So, this is the downstream, which involves orders, return request, repairs, service request, and payments. Whereas in Upstream we have factors like capacity, inventory level, delivery schedule and payment terms, etcetera. Upstream and Downstream scenario is shown in the Nike picture and similar thing you can imagine for Apple iPhone also. Supply locations in today's world you know it could be anywhere.



Supply chain management features; - inefficiencies cut into a company's operating cost and can waste up to 25 percent of operating expenses. So, this is the scope. 25 percent of operating expenses is the scope of reduction of cost; if you have good software for

supply chain management system, if you use MIS, good MIS for supply chain that is the extent of cost saving you can achieve.

Just in time strategy - we will talk more about this later; components arrive as they are needed, finished goods are shipped after leaving assembly line. There are various advantages of this strategy which we will discuss later. We will be talking about Just in Time, Safety Stock buffer for lack of flexibility in supply chain and Bullwhip effect. Safety stock is you keep to adding buffer stock, you know in case there is a supply chain problem, but the more buffer you keep, it is again blocked inventory and that is blocked money which is a kind of wastage.



The bullwhip effect looks something like a whip when you move oscillate that whip it, you know the small oscillation here; but then it goes on increasing towards the end where it is more. What it shows is that, is an uncertainty caused from distorted information flowing up and down the supply chain.

So, the customer here has demanded say a quantity x and this is the customer demand. Now sometimes, the customer says that ok, I might add something more, because the supplier might fail, there could be some rejects, which might be 5 percent or 10 percent defectives and I will fall short of my requirement, so let me add some excess quantity to the order. So, if I actually need 100; I will say order for 110, assuming that 10 of them will be defective and rejected.

Now, when the information goes to the retailer; the retailer now also add some buffer. So, 110 maybe I do not know let me ask for 120, because something can go wrong here or maybe I can sell something more to the customer. So, let me ask for something more may be 120 or 130.

Now, when it goes to the wholesaler, the wholesaler similarly thinks that this seems to be a popular material, he is asking for 120, so maybe let me ask for 150. So, I can keep something 30 as a buffer and I can push him (retailer), pressurize him to buy more and maybe giving a discount, so I can sell more volume to this retailer. So, this is an opportunity for me to sell more, so let me add some more and order for 150 numbers.

When it goes to the manufacturer, the manufacturer feels 150; maybe I should plan for bit more again, because maybe there could be some internal wastage, there could be some quality failures etcetera. So, instead of 150 probably let me plan for 175.

Now, when he plans for 175, then to his suppliers, vendor's etcetera; he goes slightly more, because whenever they supply, there will be some defects 100 percent would not be ok. So, I will then plan and do my MRP for the vendors to supply material for maybe 200.

So, what it means is that finally, while the actual demand from the customer was 100, but when the vendor is actually supplying the basic raw materials for that item, he is doing it for 200 as requested by the manufacturer and this is known as the bullwhip effect.

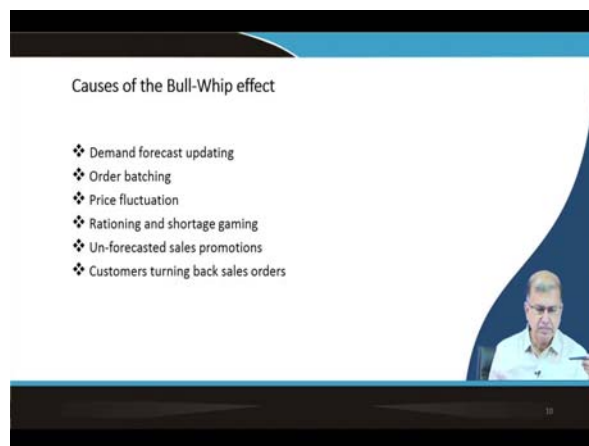
So, actually they are producing; almost double the requirement. Now suppose everything was ok and there was no defects anywhere in the chain, in the value chain. So, 200 nos. of that material will be with the wholesaler. Now he has to push it to his retailer, the retailer will not agree, he will say no I want only what I ordered, i.e 150, so give me 150. So, he will take say 150. So, that 50 extra will lie with the wholesaler or the wholesaler will give it back to the manufacturer. And the retailer out of 150, he will try to push it to the customer; customer will say no I ordered for 110, so give me 110.

Because he says his order was 110, assuming that 10 will be defective; but now all are good, but he has to accept 110, fine. So, he accepts 110. So, the retailer is now left with 40 extra pieces. So, this is what happens when your information system is not right and

where everywhere you are trying to have some buffer to manage some exigency which can happen and that something can go wrong.

So, you are building an unnecessary buffer. So, what happens to that extra? Almost 100 materials was produced extra and he could finally sell it to the customer only 110. So, 90 are remaining somewhere, from the manufacturer–Wholesale-Retailer-vendors. So, that is a waste till the time the next demand where you can supply it. That is your money blocked. So, this is the importance of a good information system –MIS which can be used to avoid such scenario where you use information and not guess work to make decisions.

When you have proper information, then you can do more accurate planning; so that we can minimize the bullwhip impact. So, instead of 90, probably you could have just 10, 20 or 30 etcetera. So, that much money of yours, you could have saved; otherwise that much money is blocked due to unsold finished goods.



So, this is a very important feature of supply chain management, the bullwhip effect. Causes of the bullwhip effect is demand forecast updating; so if demand forecast is not updated you are trying to batch orders and make small lots and everywhere you try to add a buffer. Instead of the whole order batch, I break it up into smaller batches is another cause of bullwhip effect as every batch I tend to add 10 percent buffer.

Price fluctuations can also cause, Bullwhip effect because of price fluctuations you might think that the prices might go up and so, you tend to hold more stock for making more sales. However the demand may not pick up and you are left with unsold stock.

So, it happens in this economic situations, when people hoard material and they are expecting that the price will go up and then they can make more money. But sometimes prices do not go up; so he is now holding on to his stock and nobody wants to buy it, because prices have fallen.

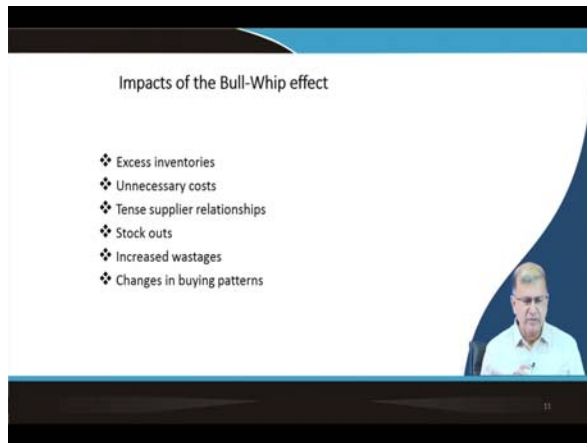
Rationing and shortage gaming:- Again this shortage gaming is typically when hoarders, when there is a shortage of material, they try to hold up; so that because of shortage people are desperate, they want to now pay more and then you release your things later.

Un-forecasted sales promotions- When you have sales promotion and then their forecast was not right. So for your expectation of selling more, you plan and produce much, but finally you may not be able to sell this quantity and so you are now stuck up with so much of unsold inventory.

Customers turning back sales orders - if customers refuse sales orders and they do not accept and you cannot force them, because after all they are your customers. So, you are stuck up with some unsold inventory.

So, these are the various factors which can result in unsold inventory which is what we are discussing here as a part of bullwhip effect.

Impacts excess inventories, unnecessary cost, tense supplier relationships, stock outs, increased wastages, changes in buying patterns.

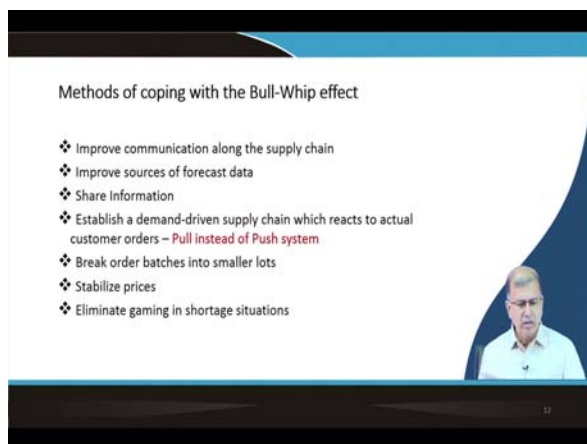


Impacts of the Bull-Whip effect

- ❖ Excess inventories
- ❖ Unnecessary costs
- ❖ Tense supplier relationships
- ❖ Stock outs
- ❖ Increased wastages
- ❖ Changes in buying patterns

11

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Methods of coping with the Bull-Whip effect

- ❖ Improve communication along the supply chain
- ❖ Improve sources of forecast data
- ❖ Share information
- ❖ Establish a demand-driven supply chain which reacts to actual customer orders – Pull instead of Push system
- ❖ Break order batches into smaller lots
- ❖ Stabilize prices
- ❖ Eliminate gaming in shortage situations

12

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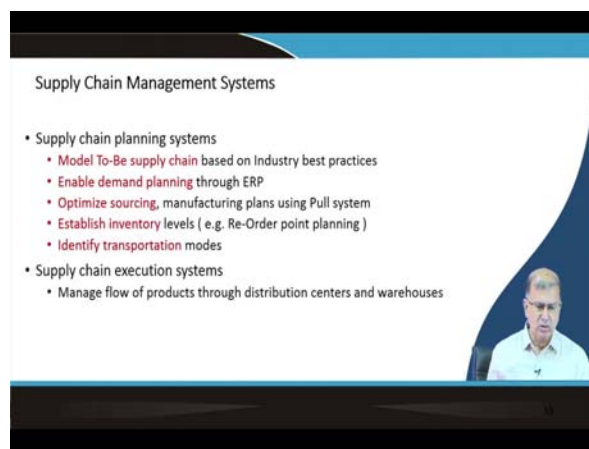
And the method of coping with the bullwhip effect is improved communication along the supply chain; because the whole thing was communication across the supply chain which went wrong. You saw that everybody is adding something extra without talking to their suppliers.

Improve sources of forecast data. The forecasting quality is very important here. Share information, talk to your suppliers, you know upstream or downstream wherever you need to find out what they really need. Establish a demand driven collaboration that is where collaboration comes in.

Establish a demand driven supply chain which reacts to actual customer order, Pull instead of Push; we try to Push, but you should think of Pull. We will talk more about this pull and push system and how it works.

Break order batches into smaller lots. So, we can make it into smaller lots also, so that you have less amount of safety. I will order in terms of 5, 5, 5, 5 pieces, so I do not tend to lose much.

Stabilize prices- if prices do not fluctuate much, chances of that your inventory will not be piling up; because people will be buying with a smooth buying pattern etcetera, and you would not be 'gaming' in the shortage situation. Eliminate that gaming; so if there is a shortage and you are hoarding up but then government can decide to import to meet the shortage and your will be left with your own unsold stocks.



Supply chain management system:

Supply chain planning systems; - Model to be supply chain based on industry based practices. Use industry best practices as suggested by ERP type software's. As I said earlier, they capture the industry best practices and when you implement this ERP software; you are actually bringing in these best practices which will help you to improve your supply chain quality.

Enable demand planning through ERP. ERP when it does planning, it considers lot of factors like existing stocks in stores, stocks in warehouse, stocks in transit, the customers

demand, open orders with the suppliers etcetera. Many such factors are considered before the planning results come out. It may not be possible to do manual planning as you might miss or forget some important factors. But in a software driven planning nothing can be forgotten or missed out. So, your planning obviously will be of much better quality.

Optimize sourcing, manufacturing plans using pull system. So, try to have a pull system; I want to order for exactly the quantity I need, not any extra quantity, I do not want to produce more thing and push it on to my unwilling customer.

So, if once you get into that, there will be lot of stock pile up and that is not benefiting anybody. Like the automobile manufacturers, you manufacture more car and it is not selling; but they keep pushing it or dumping it on the dealer, so that it ends up with the dealer having lot of stock and he is not able to sell. And if the dealer is not happy, finally in future he will not order cars from this manufacturer; probably he will shift his dealership to somebody else. So, it is not a win-win situation, it is a lose-lose situation, nobody wins.

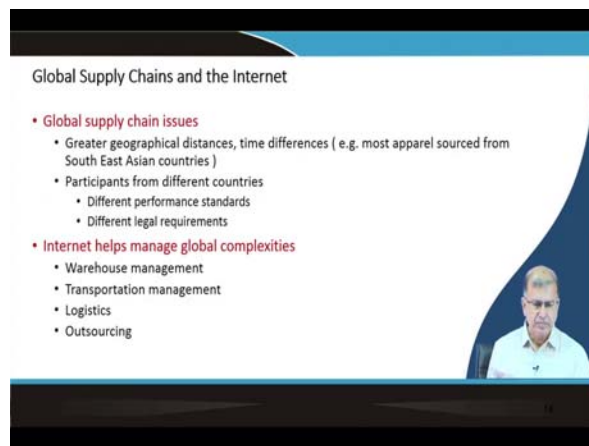
Establish inventory levels using reorder point planning. So, this is another thing we will discuss later. Reorder point planning is when you order the quantity exactly you need to reorder to a targeted stock level , so that we can have an optimized safety stock in store. So, we are minimizing our inventory cost; the whole idea is to minimize inventory cost.

So the main advantage of ERP software is that it helps you to minimize your inventory cost; Inventory cost as I told you in a manufacturing industry is almost 70 to 80 percent of your working capital gets blocked up in your inventory. So, any saving there is directly adding to your profit.

And identify transportation models; - In supply chain, the whole thing is shifting material goods from on source to another and so it is all dependent on transport. So, look for more efficient and cheaper transport like sending it through railway for example, is cheaper than sending it through trucks or maybe using water transport. Waterways, river based transportation system for example; which is heavily used in Europe, is more efficient and less polluting and much cheaper compared to road transport.

But in India we are dependent mostly on trucks for moving lot of things; not a very efficient way and environmentally also is not very good. So, we should think of alternative you know better, cheaper, more efficient transportation modes.

Supply chain execution systems: - Manage flow of products through distribution centers and warehouses. So, you have localized warehouses; Amazon, for example, the way they are delivering, you ordered something it comes tomorrow in one day. How does it come? Because there are warehouse somewhere nearby and at all these metro cities they have warehouses and they utilize that to give you very quick deliveries.

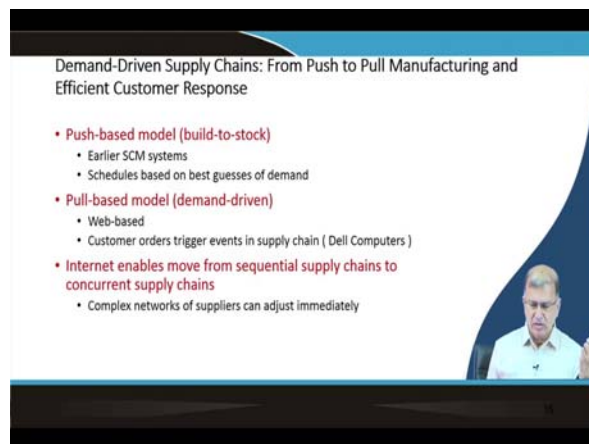


Global supply chains and the internet,- global supply chain involves geographical distances and time difference. For example, most apparel dress materials sourced from South East Asian countries you know say Indonesia, Malaysia, Vietnam, Bangladesh, even India are delivered across the world. We are making and supplying all the clothes, fashion clothes etcetera to all the clothes dealers' brands across the globe in US and Europe specially.

Customers and suppliers are from different countries, different performance standards, different legal requirements; so these are some of the things which you have to handle when do you global supply chain . Like different performance standards and legal requirements of course; every country has their own typical legal rules and regulations, which you have to comply with.

So, that is a challenge. So, that is the thing which we need to learn. So, how to export things to different countries? So, those are the things where these software's help. They have those knowledge built in their systems.

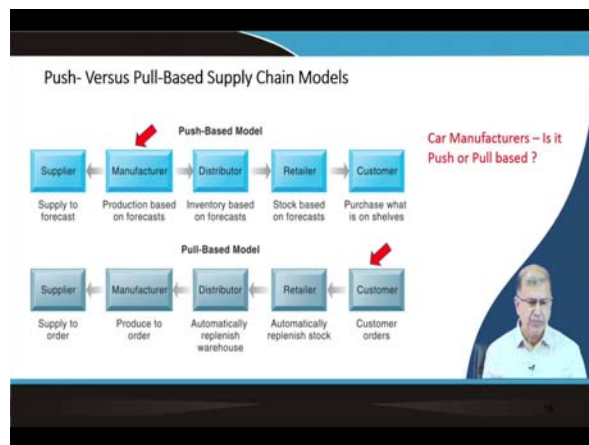
Internet helps manage global complexities, because of internet you know warehouse management, transportation management, logistics, outsourcing all of these standard functionalities are helped through internet; because you can send mail, you can communicate, you can do information sharing, collaboration everything. Communication is improved and better when you are using internet for obvious reasons as information gets shared in real time.



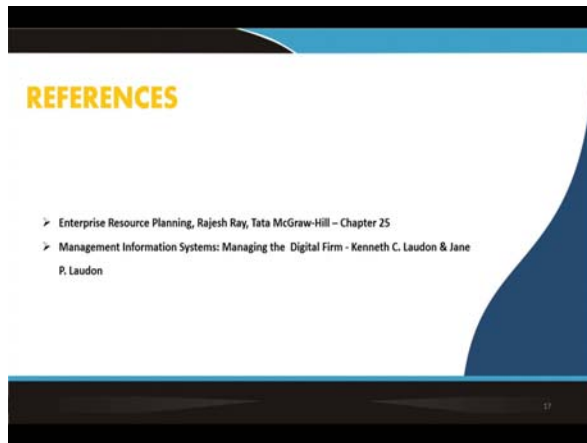
Demand driven supply chains from push to pull manufacturing and efficient customer responses; - Push based model is built to stocks which was practiced in earlier days. Pull based model is demand driven. Once you get an order, then only you make; like I was telling you, the car manufacturers there is no order, but they will make and push to the dealers, which is not a good solution. The other way is Pull; when customer places an order, you make it and supply. Web based customer orders triggers events in supply chain. And one example I gave you was Dell computers, which made it one of the most efficient computer manufacturer and sellers in the world. They very quickly rose to the top position from a new company, with this unique business model.

Internet enables move from sequential supply chain to concurrent supply chain. So, complex network of suppliers can be managed in parallel. So, it is not one after the other;

but with the help of internet, you can collaborate with multiple suppliers simultaneously in a network mode. So, everything is now networked. We will talk about networked environment later.



Push versus pull based supply chains - is an explained very simply in the slide above. I talked to you about the car manufacturer; it is a push system, not a pull. So, we do not place order and then they manufacture; they actually order cars before and we just go and buy it from the dealers. Factors like lead time to manufacture influence whether to use Push or Pull. These days, customers for cars do not want to wait long for getting their car. They expect to visit the dealer and drive out with the car. In such business models, Pull system will not work.



Thank you very much.

