Retail Management
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Lecture – 24
Retail Supply Chain Management

Hello everybody, welcome to this NPTEL Swayam course on retail management. This is professor Swagato Chatterjee from VGSOM, IIT Kharagpur who is taking this course for you. We are in week 5 and from this week we will start discussing about retail supply chain management and operations management. So, what is retail supply chain? So, till now we were talking about the marketing side of retail and we started with what consumers want and different kinds.

So first we started in the strategic side, what kind of different strategies under retail that you can take. Then we took a little bit of I would say it is sometimes strategy, sometimes tactical decision like the location decisions or where to put your retail store. Now, we will be talking about basically where to get your products and what kind of operations that you will do within the retail store.

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So, retail supply chain is one of the very important factors in the retail world. So, Wal-Mart is one of the biggest retail companies in the world and Wal-Mart has become one of the biggest retail company or probably the biggest company in the world because of its sustainable advantage. And what kind of sustainable advantage Wal-Mart ensured that it has? Wal-Mart

success in its information and supply chain management system is actually what led them to be the most profitable or most successful organization in the world in the context of retail.

So, what did Wal-Mart do and what the other companies did not do probably in the last 20 years and now they are again picking up on those drawbacks is something that we will be discussing. So, Wal-Mart made a sustainable investment in developing in systems and as a scale of economy to justify it. So, it had made a lot of investment in the systems. Now systems mean many things.

When I say systems, it means the IT system which runs in the background which basically provides information based on which you can take right decisions in various steps. It also means the supply chain system, the logistics system and the operation system. So, supply chain and logistics are external and operations is internal. So, both comes under broad domain of production and operations management.

But one thing will come the external to an organization which is how you are bringing in the products and etc., and another is internal operations. Now, under the supply chain which is external there comes also logistics, but which is a part of the travel plan, means from what to where, in which mode he will go. Now, what is supply chain? Let us talk about that what is the supply chain system. Supply chain system is consisting of a manufacturer and warehouse, probably distributor and then retailer.

So, these are the four major people who are there in their supply chain and they form a chain because from manufacturer to warehouses, warehouses to distributors, distributors to retailers the product flows and in the opposite direction the money and the information flows. Now, if that is the case, then one important decision in supply chain is if I am a retail organization and if I have a big retail organization, often times the supply chain will be managed by me.

So, we discussed about this where vertical integration happens that you in the whole supply chain, the retailer becomes the most prominent factor. The retailer has the highest negotiation power or the retailer controls the whole chain. So, if that is the case like in case of Wal-Mart or many other big retailers that happens if that is the case then it becomes a very crucial decision that from whom will I take my supply?

Let us say I am retailer and I have to sell good quality rice or grains. The rice or grains can be available from various parts of India from various kinds of farmers, big farmers, small farmers and etc. So how will I ensure that the supply of this raw materials which is these grains is intact? It does not get changed and it is in terms of my suitability. Like whenever I want more rains more grains will be supplied, wherever I want less grains less grains will be supplied.

Ad also the same thing will be done in a through a very well managed logistics that means that I will be able to choose the most profitable and most cost effective version of logistics in terms of let us say it can be unimodal logistics, it can be multimodal logistic. Unimodal means only one mode is there, let us say from the manufacturer to the retailer or from the distributor or retailer, there is only single mode that is let us say a truck or something that comes up.

Multimodal means there are multiple modes that are there. Intermodal means when one mode is in sync with another mode, that means up to a certain distance you come in mode A, then from distance from some point x to point y you come in mode B and then from point y to ultimate delivery point you come back again in mode A or mode C or something else. So, all these kinds of different modes are decided.

So, this mode detection or this activity will be part of the logistics part and where you will put your warehouse, from whom will you take the supply, at what cost, etc., will be part of supply chain other than logistics, other supply chain. It can be like a network design problem and etc. So, overall both these problems are not working in silo, you have to work them together and this is a crucial decision and these decisions cannot be taken without the help of computer.

Generally, any basic level if it is just basic strategic sourcing kind of decisions, we can take it with our own calculations, simple Excel based calculations. But often when the supply chain becomes complex and in the retail context supply chain is actually complex. In a manufacturing context, if I am on it's a factory, I might have few number of products which I take the supplier on, let us say that can be 10 or 15 strategy products. strategy raw materials.

But in a retail setup, there are thousands of such materials for which you need supplies and that is where you need a computer-based system and that is where the Wal-Mart investment. Walmart invested on the IT system so that the computer-based decisions of the supply chain can be taken prominently. And the software is unavailable elsewhere that is one of the competitive advantages that they gain and is constantly upgraded and improved based on new technologies coming up, new situations coming up, so they were constantly upgrading it.

So this was Wal-Mart's advantage for a very long period of time, probably even now, which led to a huge economies of scale for the company because they could grow a lot. They invested, they could invest also because the size was big and because they invested on this supply chain along with the size, they could improve the efficiency like anything which improved their ultimate profitability and that gave Wal-Mart an age over many other retail organizations were competing with Wal-Mart.

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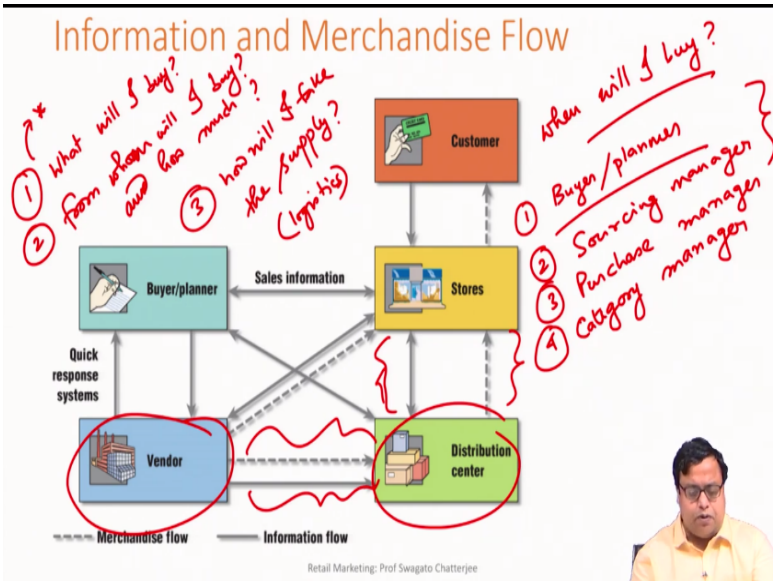

So, in general, this is the flow of supply chain of retail stores, where there are stores and there is a buyer and planner. So buyer and planner, this person will see it in the head office and there will be a store which is actually on the field which will be close to the neighbourhood or different locations as I was discussing that they can be different locations. But buyer or planner will sit in the headquarters. Now there can be multiple stores under this buyer planner.

So, there can be store 2 in another location, this is store 1 and store 3 in other location and that is why it is stores that is written here. So that is one way where buyer decides for

planning or buying of multiple stores. Now when he is deciding how much to buy, he has to have two or three things in mind. One is that who is my vendor that is the first information from whom what will I buy, the key decisions. From whom will I buy?

And this what will I buy a single product can be actually bought from multiple vendors as well and that is where the strategic sourcing comes up. There can be risks associated with purchases, we will not go up to that depth. But in a normal supply chain management course you will know that. Whenever you have to purchase you have to also make sure that if one particular supplier stops supplying for any reason.

Because of let us say strikes or because of some natural calamity or because of taxa Young's you might want to have a backup who will supply in the absence of this particular, your probably the biggest vendor. So, that is why from whom will I buy and how much is also a decision which is vendor level decision. And then the distribution centre level decision is how will I take the supply.

How will I take the supply this is basically logistic decision and in this logistic decision lots of things come up. For example, let us say whether I will be responsible for the travel of the raw material from the vendor side to the stores. If I am responsible, then the cost will be different. If vendor is responsible, generally vendors become responsible because vendors have their distribution centres in various parts of the country.

Now, you might be already responsible for the travel of the raw material from the distribution centre which is warehouse let us say in your store. So, if you are only focused on that, only this much travel is something that you directly spent and this travel is something which is basically shared by many stores. It can be your company stores, it can be some other company stores, then the cost comes down. So, how will you take the supply?

How much part will be shared? How much is your individual? Whether the vendor will be responsible? Whether there is any clause on the time limit in which it has to be delivered and accepted? This is also an important problem. Then fourth important factor and probably that comes here probably that when will I buy. This is also a very important decision, which comes under operations management.

I would say inventory management kind of decision, which will not come exactly in supply chain management, it is operations management decision that when will I buy. So, if I add one level of stock, I will repurchase my product or give my order. These are some of the classic decisions that a supply chain manager will take. Now, in a retail management this plays a very important role because ultimately all the retailing activity that you are doing is relying on supply of availability of products.

If you do not do all these things properly, then stock outs will happen. The costs of buying the product will go up unnecessarily and you will not be able to meet the customer's needs or customers price expectations, which will ultimately impact. Now, to do all these things seamlessly what is very crucial is information sharing, information sharing not only within the stores and the buyers or between the customer and the stores, but information sharing in all level that you are talking about.

For example, let us say information sharing between the vendors and the stores or the distribution centre and the store everything, every buyer; buyer means the decision maker or the purchasing manager or the sourcing manager, also sometimes a category manager and the vendor. So, this buyer has different terminologies. They have some basic role difference, so buyer planner or sourcing manager. Sourcing manager these people are majorly focused on the buying part, the purchase manager.

These are people who are majorly focused on the purchasing part, but a little bit more generalized a little bit more senior decision maker will be a category manager, so who will not only see the supply he will he will also be focused on the sales, so both sides he will see. So, any one of these four or five different kinds of roles will be actually doing this kind of stuff, but the information sharing is very important to take the right decisions in these problems.

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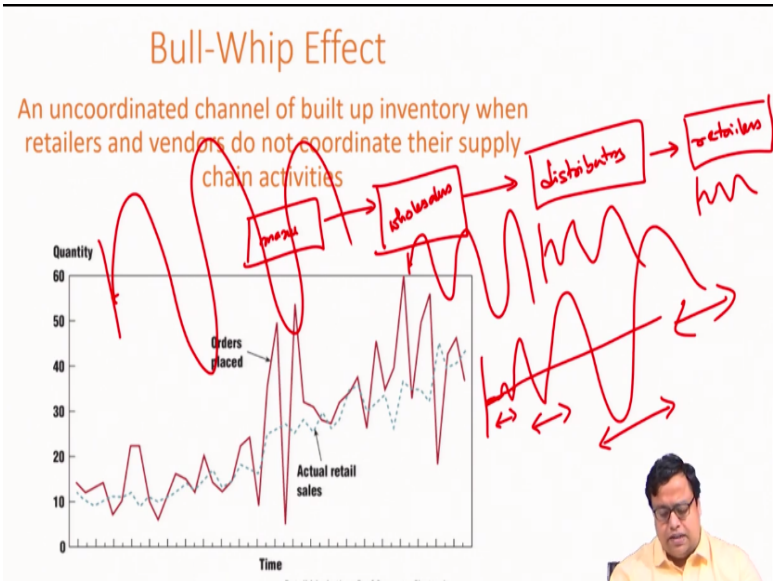

What happens if information sharing does not happen or why this is a very crucial effect? So, there is a something called bullwhip effect we call it. So let us say basically it is saying that if I have let us say a manufacturer who is giving it to wholesalers who is giving it to distributors and who is giving it to retailers it is basically saying that a small undulation here in the demand let us say will lead to bigger undulations here.

And further bigger undulations here and a huge undulation here in the manufacturer's side. This is called bullwhip effect. If there is a bullwhip and if you give a small shake on the bullwhip, how does it look like? So, if the bullwhip is like this, let us say this is a bullwhip, you give a small I would say small undulations in this at the very initial part wherever you are holding this bullwhip, at that part if you give a small whip, it will take a huge shape as you go ahead in the last part.

It might not be this big but yeah, so that is what happens. So if this is the retailer's case, this is where the distributor is playing, this is where the wholesaler is saying and this is where the manufacturer is playing. Why does that happen? Because you see your error in basically predicting the current demand is actually contributing on the demand of your manufacturer or your distributor, let us say the demand is around, so you have an average error of plus minus 2.

Whatever is the actual demand you are somewhere between plus minus 2 you are giving your orders, you are predicting that much will be the demand, based on that you are giving that order. Now, your order which already have plus minus 2 kind of an error, now on the top of

that the distributor is thinking that this person will do plus minus 2, this person will be doing plus minus 2, s will probably try to create enough amount of inventory.

And predicting how much order you will give he has given certain kind of order to the wholesaler, the distributor is given to the wholesaler. Now, if distributors will also do some kind of error, he is not also accurate predictor. So, if his error is absolutely 0, then whatever error you are doing and he is doing will be same, but he is also contributing to the error a little bit because his prediction error is not absolutely 0.

So, then two errors actually get multiplied, it is not an additive error. So, somebody's error, on the top of that somebody else's error creates a multiplicative effect. So, if these things keep on going, then this becomes a huge error at the end of the day. Now, as I told you just now that how will I ensure that this multiplication factor does not happen? This multiplication factor will not happen if this individual like distributors and wholesalers and manufacturers do not add up anything on error.

That means their prediction error is 0. And what will happen? How will I know that their prediction error is 0? If the retailer shares the information, there is absolute level of information symmetry between the people, then the error will be 0 and then whatever error that is happening, exactly same error will be happening in the distributor's space, wholesaler's space and manufacturer's space.

Now, this is impossible to happen because you see that if the retailer has to give an order of 5, retailer will not be able to guess what the order this person he will be giving to the wholesaler two days ahead. He will only know on that particular day how much is his order, but the distributor should be ready with item two days ahead. Because if the distributor is not ready, then the delivery time will take more time than what is expected.

So, the distributor must be ready two days ahead before the retailer has given the order. So then distributor also needs to predict something. So even if there is absolute level everybody talks with everybody still there will be some amount of error, so bullwhip effect cannot be absolutely removed. But what can be done is through information sharing, through talking, the prediction errors can be reduced.

And if it can be reduced in each of this level in the whole supply chain, then the manufacturer is safe and giving safety to manufacturer that is something that is an important goal of the whole supply chain, specifically if the retailer is controlling the supply chain, then it becomes the responsibility of the retailer because if he cannot give that kind of cushion from the uncertainty to the manufacturer, then the manufacturer will not be interested to supply the product to the retailer.

The retailer has to give that cushion in some way or other. So, coordination is required. An uncoordinated channel of built up inventory is something called bullwhip effect, but retailers or vendors do not coordinate their supply chain activities, so that leads to this kind of result.

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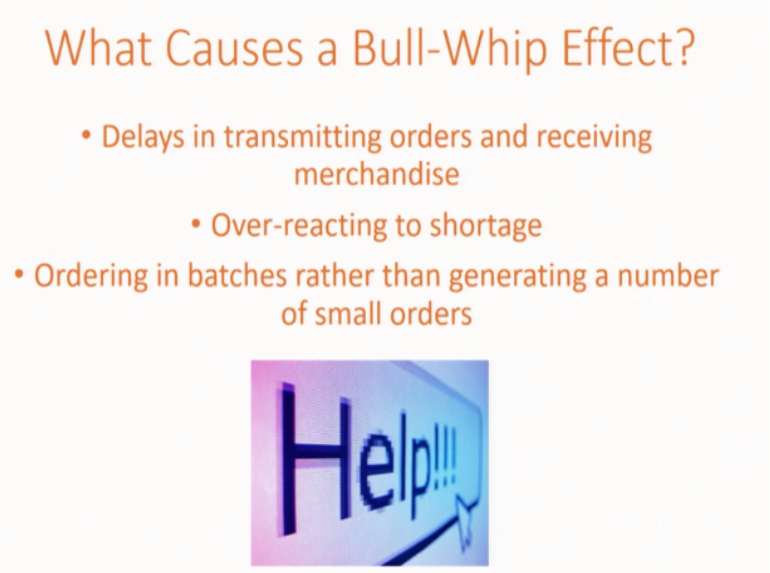

What are the causes? Delays in transmitting orders and receiving merchandise. So, this you see, this delay is something that will anyway happen, but whatever is the required delay, whatever it is an avoidable delay beyond that if you do that delay that will create bullwhip effect. Overreacting to shortage, this is a very important issue. So, sometimes if there is a shortage, if there is some stockout happens, we sometimes become very reactive.

And quickly we order a lot which creates a whip basically, which creates a small undulation. So, we should not react very quickly to any kind of undulations because ultimately demands are ups and downs, ups and downs, so, you have to be smooth. There will be some times when you will have inventory, there will be sometimes you will be having stock outs. You obviously should be trying to remove them.

But if you try to over exercise your behaviour, over react to any kind of changes then that will create a bullwhip effect. Ordering in batches rather than generating a number of small orders. So, instead of small orders you order in a group in a batch that means you got hundreds that is instead of ordering 5, then 7, then 2, then again 5, which is not very continuous or not very predictable.

Give predictable orders like 100 in a month and then you store in your inventory for a month and by that margin try to sell them off. So, these are some of the things that can create bullwhip effect, basically it is better to give small orders rather than a batch order to avoid bullwhip effect.

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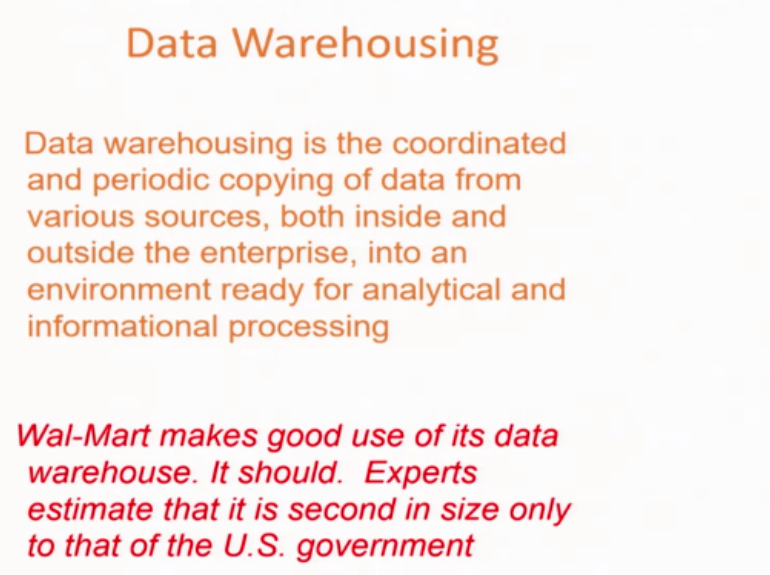

Now, one of the important things that I just told is information sharing. Now information sharing becomes very important problem and that becomes further challenging because retailer has huge amount of information is a customer data. Many retailers do not even know that what part of this information will be important for my wholesaler or distributor, so what to share to them. So, that is a very important decision.

And that can be taken while you were sitting together and discussing what kind of problems that wholesaler or distributors face. But before that, retailers should take certain steps to store the data. So why to store that data? Generally, we store it, it is like your houses let us say kitchen storage, so where do you put the food raw materials? If it is not being used, it has to be stored.

Let us say rice or spices or some other items, sugar, salt you will put in jars and those jars where will you put it? You put that jars in cupboards. And those cupboards where will you put it? Sometimes you put that in kitchen, sometimes you put that in a storage room if you have a storage room something like that. So, similarly in the context of retailing a particular data set is generally stored in an Excel file or a CSV file or any tabular file that will be something like the jars.

Then you put those jars in the cupboard, similarly here you put those tables in a database. So, a database is generally a collection of various tables of various forms in one space. Now, if you have too many databases, then you might want to store those databases somewhere else. For example, if you have too many cupboards, you might not be able to put so many cupboards in the kitchen itself, so you need a storage room.

So, data warehouse is like a storage room where in databases raw tabular data is stored, it can be tabular, it can be unstructured also. Unstructured tabular takes a little bit of more space, tabular data takes less space, but those are stored. Data warehousing is the coordinated and periodic copying of data from various sources, both inside and outside the enterprise into an environment ready for analytical and information processing.

And this becomes very important in supply chain management as well. Wal-Mart makes good use of its data warehouse, it should. Experts estimate that it is second in size only to US government. So, data warehousing, storing of the data is a very important factor.

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And then another thing that can happen is that you may be interested to share the data. Now, you might not be aware what is the data that your supply chain members will be required, but if you have a data warehouse and if you give access to certain views of the data to the data warehouse people, they can directly know exactly what is the condition of your inventory or your demand, they can do their maths based on their expertise.

And they can take informed decision based on that math instead of relying on whatever information that you are sharing or whatever orders that you are giving. So that can be done through something called electronic data interchange. So, it is a computer-to-computer exchange of business documents between retailers and vendors. What kind of documents can be shared? Like merchandise sales, inventory on hand, what kind of orders that are coming up or will be some orders.

Let us say if you have given an order that order will go to multiple places within your organization to get sanctioned before it is given to the vendor. But if the vendor knows that only see 90% of the cases when the purchase order, I would say draft is created, they get signed, they get approved and they will ultimately be placed. But that takes two days' time. Now, if the vendor knows that this order, the indent has been created and it will just require signing.

But with 90% probability or more probability it will be passed and I will get the order then he can plan accordingly. He can take that risk and start preparing the product. So orders and advance shipping notices, receipt of merchandise, invoices for payment, all these details, the internal documents, if they are not very sensitive internal documents if that can be shared with them without promising that.

So there is no legal binding that whatever document is there is true. But it might be a case that if 90% of them does not get changed over time, 90% of them is something that ultimately get passed, then it helps the distributor and warehouse people a lot. So that is why it is sometimes better to do this electronic data interchange, more so if there is a very strong data sharing agreement and privacy data security agreement between the supply chain members.

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And then comes what? Then comes the logistics strategy. So, basically we will stop here this particular video, and from the next video we will start from this particular point. But in the supply chain, I talked about information sharing, what kind of logistics strategy that can be taken by the retail stores. Thank you very much. See you in the next video.