

Logistics & Supply Chain Management

Professor Vikas Thakur

Department of Humanities & Social Sciences

Indian Institute of Technology, Kharagpur

Lecture 22 : SC Operations: Manufacturing versus Service SC

So, hello dear participants. Welcome back to NPTEL online course on Logistics and Supply Chain Management. So, as we started discussing on the basic fundamentals of supply chain management and we also discussed about how this supply chain management is different from the logistics management and where the logistics functions are required and very much part of your supply chain management. So, today we will go through again with the supply chain management and because it will divide this overall industry into two parameters one is as providing the product physical products and another one is as based on providing the services. So, we will see. what are the implications, how it will change the scenario when we are talking about the overall supply chain management as far as your product industry is concerned or your services industry is concerned.

So, we will start discussion today on supply chain operations, what are the different concepts under that and then we will see how this supply chain management is different for product industry and for services industry and what are those common points which are you know relevant for both these kind of industries. And we will take some examples also from each of the industry, I will show you one small video where you can see how this services industry is different from the manufacturing industry. and when in the towards the end of this session I have included one case study of Amazon where they are providing you know the product as well as the services. So, we will see that case study.

so starting with just I'll introduce you what are the supply chain operations so if you will go through different definitions many are saying that researcher admissions experts they are saying as supply chain is part of your operation management and many are saying that operation management is part of supply chain management but my personal view is that under your complete supply chain there are many sub functional where your operation management is working right so with that context may be this the very first slide will you know make more sense in that way if I am talking about let's say you are generating the raw material that is one functional area how you are generating the raw material then if I am talking about transportation transportation operation is one other area under complete supply chain management then I am talking about converting the raw material into finished one again operational area we are looking into distribution

again distribution operation how we are managing the distribution how we are managing the warehousing operations right where we are keeping the stock we are rotating the stock we are managing the inventory on the shelves and then retail operations right so how we are providing that so if we'll go through all these sub-functional areas under complete supply chain you can see that this makes more sense that operation management is part of your supply chain management but whatever it is right because many different definitions are there but we will talk about what are the components right so if we'll talk about supply chain operation first is your supplier sourcing now sourcing is for the time being sourcing is different from the purchasing when we are saying that sourcing that means we are setting up the supply chain we are looking the stakeholders we are looking for those long term stakeholders which will be part of our supply chain once your long term that relationship is established then your regular supply of the raw material can be ensured through your repetitive purchase orders right so that is purchasing talk about supplier purchaser collaboration it's again very important because now this is another functional area under your supply chain management if we will talk about these are the raw material suppliers very basic definition we have been considering from the very first lecture So, this is how we draw our supply chain and through your this we are reaching to your end customers and obviously, in between we have the long distribution chain. So, if you are talking about supplier purchaser collaboration here it is very important because if as long as you are running the same product or model you need same type of components you have been sourcing purchasing from the same supplier. so then again that supplier you have to collaborate that take that supplier in confidence that now you need to generate the new type of raw material may be the design are changed may be the parameters are changed may be your the raw material component which you were using may be you need to change the raw material as well. Earlier you were using copper now you aluminum or some other metal if you are using in that if you are in that type of industry right. Supplier information management this is important as far as your order management is concerned because based on this how many different suppliers you have let us say S1 S2 S3 how many orders particular supplier is supplying what is the so that information you need to always you need to process first information is required what is the pricing of that supplier second it what is the quality of that supplier third maybe what is the durability of the material he is providing right fourth maybe what is the how frequently he is making the deliveries how responsive he is if you are changing something how quickly he is changing at his end because your any change in the product will only be ensured when your supplier will provide you the you know new material ok so then again purchase order management this is another functional area where we are doing the operations we are recording the order first we are processing the order in terms of locating where the product is inventory management all those things will come then we will pack the order and we will ship the order and then in the final the final distribution of that order in terms of last mile delivery will happen.

So, this is you know again operational area. we can talk about inventory management again functional area of supply chain management but within that inventory operations are there how you are keeping the inventory of your raw material how you are keeping the inventory of your semi finished goods how you are keeping the inventory of finished goods not only that how you are keeping the inventory of your rejected material then rejected may be your during process you rejected during zero hour rejection we discussed about that right or sometimes if the rejection is coming from the market as market complete in terms of warranty period. So, that how you are managing the inventory, how again you are reselling the product or refurbishing the product or recycling the product. So, those all operations will come under inventory management. Then warehouse and transportation management, transportation management is another functional area in between where you are you know storing the product as temporary location or you are doing cross docking we discussed about that different warehouse operations right.

So, those will be part of your warehouse operations and transportation operation. Supply chain planning, supply chain planning again we discussed at three level in the very first introductory lecture of supply chain management. So, supply chain planning we can divide again as per the level of the management let us say top level management or middle level management or lower level management. so we have seen that top level management is directly interested in you know taking those strategic decisions where we will set up the facilities facilities in term of your may be production facilities may be warehousing facilities right what type of product or services you are going to offer in the market these are long term decision medium term decisions means where the middle level management is involved right then you are you know the time horizon in that way may be up to one year or two year so how you will keep your inventory how you will go for subcontracting these are the decisions which we discussed under your medium term decision making process and then lower level how we are dealing the day routine you know purchase orders how we are recording the orders how we are supplying the orders how we are you know managing those orders coming either in few quantity or number of quantity and then shipping is another operation .where we have you know if you have also so many shipping partners are there shipping agents are there they are taking from your one distribution hub to may be other distribution hub near to the customer and then the last mile delivery is also being done through those shipping partners.

so this is all about your supply chain operations where we have seen different operational area under the same supply chain so operation management in supply chain we can see while producing and distributing goods and services so whatever activities you are doing in between either you are going for sourcing purchasing and then raw

material converting the finished one inventories you are managing warehousing operation all those activity final distribution and then in a effective and efficient way you are reaching with your product or services to the end customer so these all are operational areas so if we will talk about the main function of operation management obviously planning is the first one planning of how you will you know ensure the smooth flow of resources that will only happen when you will channelize your inventory in that way ok scheduling so when you will produce how much you will produce right so that i talked about the operation management concept where we are discussing about what type of product or services you are going to produce where you are going to produce in house or outsource Then how much you are going to produce? When you are going to produce? In what order you are going to produce? Order means if you are having different products under one category. Let us say Maruti Suzuki is coming with Grand Vitara. So, Grand Vitara now so many different models are there. So, in petrol may be the base version is there, the middle version is there, then top version is there. then maybe same are for the diesel variants also same are for the maybe the hybrid version also same for CNG so then in different colors right and different engine capacities are also sometimes coming right so that means this is the total overall product basket So, then you need to schedule when you are going to produce, how much of that particular order, middle level petrol variant, how many units you need to produce today depending upon again the information you are getting from your retail chain then you will process your inventory.

Control, again monitoring the progress and making the changes. So, for any control process, first you need to set up the standards. For setting up the standards, you need to identify the key performance indicators. When you will set up the KPIs then you will see what is the benchmark in that industry. We discussed about these KPIs and then you can say that this is the industry standard may be you are right now you are here.

So, this much gap you need to cover. plan phase wise in the first phase we will cover this much, in the second phase we will try this much, third phase we will go for this much right. So, this is how you will ensure the controlling and your improvement so that you can be more efficient and effective as per your the competition is concerned in the industry. the significance of supply chain in operation management. Now, let us look this same concept in different way where other the you know the other team is saying that where the supply chain is part of operation management.

See, if I am saying that at manufacturing facility we are converting the raw material into finished one. So, this is your manufacturing facility we are getting the raw material and we are getting the finished goods out of this. So, here what we are doing? We are doing some assembly process we are treating that those you know raw material components we

are fixing them assembly is being done. So, then we are ensuring the final good. so this will only happen when you can ensure the smooth supply of the raw material through your supply chain this is the role of supply chain for any operation management even if you are talking about your suppliers may be those suppliers are getting supplies from other suppliers right so within their manufacturing facility, how they are converting their supplies into the finished one, which are going to their finished product is going to this manufacture as a raw material.

so when we are talking about supply chain in operation management obviously we need to tap all these stakeholders suppliers manufacturers distributors and retailer so that that smooth chain can be ensured smooth chain means we need to ensure the smooth flow of the resources right and then you need to focus as supply chain management which if we will consider it right now we are considering it as subset of operation management right so then we will say how efficiently we can ensure the either the material flow through that supply chain or the information flow forward or a reverse or the finance flow forward or reverse right so if we will see impact on operations if our supply chains are efficient so then we can improve efficient in terms of delivering the quality of the product they are taking from one end and then you know distributing to the other end in that process our supply chain should not deteriorate the quality of the product this is one way you can do that another way how they can minimize the waste during that complete supply chain they are not maintaining higher inventory just to you know be on the safe level so that stock out should not be there but then they are keeping so much excess inventory then also then in that way they are adding extra cost how you can be cost efficient in that way how quickly you can respond to your demand from the customer if customer is you know looking for some other preferences other specification how quickly your supply chain is recording that information and is being supplied to your R&D team where R&D team will work on that in that operation management and will come up with new prototype right and then we will source the supplies as per the new prototype right after testing and everything so this is how we can see the role of supply chain management in your operation management so let us now talk about the product versus supply services supply chain if we will talk about the basic differences between the product and your services so product is tangible services are intangible so that means that concept of you know when you are physically touching the product feeling the product and then you are taking that concept is not there as far as you are talking about the services industry right but there are industries who are making their presence right they want as customer they want us to feel their presence as tangible so they are trying to give some tangible experience through that your services only if you are talking about your you are going to any hotel right you are staying there let's say so when you are staying there in terms of you are getting the services only but in terms of tangible experience what extra you are getting right so those those extra experience like maybe how they

have decorated the room maybe how they are providing the other amenities right your swimming pool spa or gym facilities so those kind of experiences they are just adding to perishability so perishability means product today produce you can consume that product later on but services are perishable in nature if you are producing means that cannot happen that you are producing right now and you will deliver later on that concept is heterogeneity in services industry it is completely heterogeneous right product is once standardized we are always targeting to reach at a standardization position so that we can standardize the whole production process and then overall cost can be minimized but in case of services this is not possible so if any barber shop you are visiting from maybe morning to evening 500 customers are visiting the haircut for all 500 will be in some or other way will be different right because there is continuous involvement of the customer customer participation is very very important and this the generation of the services the production of the services will only happen when customer arrives at your location right before that nothing can happen but in product industry there is no as such role when you are producing the product customer is not visiting the your manufacturing facility inseparability so Production and final delivery cannot be separated in case of your services industry, but product industry production is happening somewhere in let us say in Delhi and the product is being consumed here in Calcutta. So, that way it can be separated. So, these are some of the basic points when we will talk about product and services industry and will be very very important as far as the implications of these are concerned. So, just before going further I will show you one video quick video where you can see how these production selling products and you know supplying products through the same supply chain and supplying services through the same supply chain how can it can be different and what are the different challenges. so here I have included some video links you guys can just quickly go through these videos ok so now let's after just you had a look on this video and you can see and you can somewhere relate now these concepts of what I was talking about related to product supply chain and services supply chain and how it is you know making a big difference when we are handling all those operations within that supply chain so quickly going through manufacturing supply chain already we have discussed a lot on you know distributing your raw materials processing your raw material in transit you are storing in the warehouses storage centers and distributing the final product through your end mile delivery right to the end customer so then it is ensured through production assembly packaging and distribution these are some of the activities when we are talking about manufacturing supply chain product supply chain and when we are saying this because we are highly standardized in providing the product as long as you are buying a particular product let's say this marker pen so then this is standardized right so when it is standardized you are not doing anything means variability in the production process is not supposed to be right so you you are supposed to be more efficient effective in terms of quality minimum rejection you should produce and then the profit margins can be So, this you can see main supplier is one stakeholder going to

manufacturer and then we are doing all the quality checks if it is not we are segregating the material whatever is we are finally shipping the material to the retailer.

If all the items are directly shipped to the retailer, if something is coming back in terms of rejection then it is going back to the manufacturer or for may be. they will again remanufacture so different models we have discussed about but the basic thing here is you have suppliers manufacturers retailers and customer is finally taking the product from your retail outlet right so this is one way of looking into your manufacturing oriented supply chain model let's talk about the services supply chain where there is no tangibility of things right and we are just delivering the experience to the customers in terms of services right so talking about different services industry healthcare services industry or lawyer giving the you know the legal advice to you is another service industry you are going to you know property dealer they are giving you all those kind of services giving you you know maps giving you the location of the property documentation all those things again kind of services industry transportation if you are flying through air from one end to other end you are not getting any you know physical product right so yeah that is there that this services industry is also supported by your product industry because no as such that pure services industry can exist somewhere by delivering the services we are using product if taking the example if you are flying from Calcutta to Delhi on the way may be you are consuming something in terms of short meal or beverages or anything you are taking right so that also is adding to your experience of getting the services so if may be you enjoyed that meal so whether while you were rating your you know the service partner you will keep that in mind which product you consumed right and then you are evaluating the player for their services right but actually you is consumed the product right but if you are going to restaurant then again you are getting the services you are consuming the services as well as the product in terms of meal right so these are some of the things but yes if you are taking only legal advice right so then if you are going visiting to lawyer then you are taking only legal advice can be we can keep on the extreme end of your where we can say the pure services industry but then again they are also using many products in terms of you know providing you they are using all the law books they are using all the law records and then preparing those documents they are handling over those documents to you or those things are there right so the basic point here is whenever we are talking about the services supply chain there has to be you know one platform where we are integrating customers and the service provider at one stage both are part of your that supply chain right so you can see this service supply chain where we as suppliers you are getting demand from the customer right and then information is being shared because this is very kind of customized industry So, every order is different. So, accordingly you are preparing your let us talk about the barber shop. So, we visited barber shop let us say for hair cut. right so during that haircut let's say the additional services you are using or that can be one information

for the supplier let's say you are using one particular shampoo so then that product needs to be insured you are using during head massage you are using some oil that product you need to ensure you are using head massager that machine you need to ensure through your product supply chain so that is what I am saying that services industry are also supported by your product industry but as a customer when you are visiting that location barber shop are you carrying any product physically with you no you are not carrying anything what you are carrying with you is only the experience right how long you spend with that service station right so that experience if even if you were waiting during the you know there was long queue and you were waiting in that showroom or that shop right so during that time what was your experience whether they were providing you any extra information or any extra amenities you enjoyed during that stay right where you were waiting for getting the services you were waiting in the queue so that completes supply chain right so this information is directly coming from the customer right and then customer is actually part of this production process and production will start only once the customer is reaching at your door so at your shop so then only you will start delivering the services ok so in that way every service will be unique right so if you will talk about service supply chain so we we need to you know come up with some strategy where we need to you know balance competitive service requirement with cost and investment what whatever value proposition we have right core competencies we have in terms of that so how we can provide that in more effective and efficient way so while talking about services supply chain or any product supply chain we have five different concepts first is plan source make deliver and return if you talk about very basic model of supply chain operation reference model given by supply chain management council right so this is score model that says there are five different stages right first you need to plan so in that case whether you are talking about services industry or product industry you need to plan the for the product for the supplies for the distribution for the storage for the inventory for the production second is source now you need to find out the your sourcing partners the raw material suppliers the shipping partners the co-manufacturers right the warehousing partner the distribution partners so that is source third is make then you will come up with your prototype that this is your model how you can develop that product so then make during production you will ensure and finally you will deliver the product and services to the customer but in case of services industry this make return make, return and make and deliver are not two different stages right you are making while you are delivering so because customer is already there in your shop taking the head massage or haircut so during that time only you are making the services and you are delivering right so before that you cannot produce the services so that means you cannot inventorize the services inventory management is not there but in this case you are talking about long queues in front of your shop right so that you need to manage how you can do under queue management concept there is separate chapter how we are managing the long queues right we can open the temporary you know service channels so that the

traffic can be diverted in that way so but in when we are talking about your product industry this make return deliver all five stages are possible and that way we are delivering the product right so this will help you for decision making and we are getting the information which are developing again we are coming up with the policy and in the end we will be evaluated based on this model how efficiently and effectively we are delivering the product and services that performance will be evaluated quickly talk about the services supply chain health care medical services you are taking the doctor advice you are you know help doctors are helping you to diagnose your problem they are suggesting some treatments again when medical medicines you they are prescribing some medicines again that is pharmaceutical industry product industry so this is again hybrid kind of industry if you are talking about hospitality and tourism so then hotels restaurant travel agent all they are providing you the services right you can travel through their services they are providing you the air tickets and all those things right but in that ah journey you are consuming the products as well financial services you are coming to me for insurance then again they are providing the insurance services investment plans they are coming with or normal your saving schemes they are coming with and providing you those kind of services educational and training so then this is again can be considered as one kind of pure services industry but again then I am using so many products camera is there screen is there this pen is there mic is there I am using all those products lighting equipment are there so all those you know product I am using to deliver this lecture right but in the end you are not you know carrying any of these product right so you are just carrying the experience how beautifully the back end team of NPTEL is working to record that lecture you know to erasing all the errors done by me and then the beautifully they are compiling in the end the you know complete video right so this experience you will carry in the end and then you will evaluate let's talk about you will evaluate for my performance how i have delivered this lecture to you right whether it was informative for you the content was good all those things were there but you are never going to evaluate for the back-end team who are doing this whole operation they have done this arrangement right so means everything if that that recording is done perfectly the material is communicated to you perfectly right so that is another one best example you can relate with this then professional services already talked about if you are visiting lawyer doctor or property consultant you are taking those services information technology again in terms of software you are using earlier we were purchasing simple antivirus so we were purchasing the CDs and then we were installing now what you are doing you go through online and then you buy the key and just download the software you just put your key there is no hardware is involved right so that means again services industry transportation services again we are carrying physical products but those shipping agents are not doing anything value adding activity they are just carrying the product from one end to other end so that means they are providing the services entertainment you are watching movie you are not taking any product out of that but yes you are taking the experience when you

are coming out of that theater or your movie hall right retail you just imagine it's not product industry but providing products retail is organizing all the products ensuring that there is enough inventory on the shelf so that means retail services industry they are providing those services but product is being sold by if you are visiting big bazaar now big bazaar is coming with their own products with the name of i think coroyo or something like that but if you are talking about Vishal Mega Mart and all those they are not manufacturing the products so now because they started backward integration but earlier they were not manufacturing they were selling this is one kind of multi-brand store they are selling all the branded products and then property management another kind of industry where you can see you can relate the product and services so quickly going through manufacturing versus product supply chain if we will talk about supply chain input so supplier material and forecast information right so here customer input will be your customer whatever customer information is providing then you will start processing that customer wants shampoo before going for haircut and this brand shampoo they want right So then only you can source the shampoo, although you are not purchasing at that moment, but that inventory you are keeping with you.

Value add-ins process, the physical production, when you are converting the raw material into the finished one, when you are adding features to their product, that is value adding process. in case of services value adding when actually you are receiving the services that is value adding time but yes during that queue how we can improve your experience so that you should not you know feel bored there so they are providing you magazines they are coming up with so many screens so that you can watch movies or all those things just to keep you engaged very quick example or beautiful example you might have seen in multi-story building when you are going from you know from first floor to the last floor so in the those elevators they have installed some you know mirrors so that it will keep you engaging that you are looking how you are you know you are just looking into that mirror and just you know dressing yourself in that way or preparing yourself when you will be out of that you know that elevator so that lift anyhow obviously you you got the service but during that time the waiting period you forgot the waiting period because you were engaged in you know setting your shirt t-shirt or whatever right so hairs so that that is one kind of experience they how they they are improving this thing very small step but yes still engaging to the customer then demand uncertainty in case of this we talk about inventory management because in product we can produce and keep in the inventory for later sales right but in case of this we cannot produce anything before customer reaches so then only your when customer is there then only it starts so that may be for first two hours there is no customer you are sitting idle with your workstation but then next 5 minutes 5 customers are coming you know at the same point so then they will be in queue so how you can manage those queue and in talk

about supply chain output this is very standardized but this is heterogeneous because customer is part of your services that is why it is heterogeneous taking two different examples manufacturing supply chain and after sales services supply chain although this is not pure services industry because when you are providing after sales services i got the vehicle from maruti suzuki after sales services they are serving my you know vehicle they are putting the engine while brake while they are checking all the bolt nut replacing some of the parts AC filter and all those things so that means that is kind of products right but yes let's take it as services industry right so nature of demand very predictable but it is not predictable right so it can come anytime and maybe for some time there is no demand required response very standardized because in product you can ensure that smooth flow by maintaining inventory but in case of services as the customer is reaching at your end I want my bike or car should be serviced immediately I am reaching there right and then number of SKUs may be in terms of product limited only one service station sorry retail outlet you will get when you are in that particular city one or two but if you will see how many you know service centers garage are there local or may be from the same brand you bought that vehicle right so in that way if you will talk about product portfolio it is largely homogeneous it is always heterogeneous we talked about in services industry delivery network depends upon the nature of product and multiple network necessary that is obvious with same supply chain you cannot deliver all the products maruti suzuki now coming with two different supply chain one is under nexa another one is your traditional maruti suzuki supply chain so because they want to change their brand image so that's why their luxury products are coming under one chain under nexa and the traditional are coming under the other chain inventory management we talked about here we are managing inventories of all those supporting products which are required to you know deliver the services reverse logistics if it is forward supply chain we are not handling but yes in product industry reverse supply chain is important but in services industry reverse supply chain is not important but because we have taken here your after sales services then we need to handle the repairs as well if your bike is coming under warranty and something goes wrong with the engine something goes wrong with the clutch plates something goes wrong with some other part of the component so it will be replaced right so performance metric how quickly you are filling it the inventory and product availability your services availability right inventory turns usually we the more inventory turns that means we are more efficient but in case of services we need to be limit in that way only 1 to 4 a year can be considered but then again that depends upon the services right so we will talk about the factors production system it is push system you will keep on producing and finally you will push in the market but it will be pull system pull means first i will record the information from the customer their demand then i will sell the product and suppliers responsiveness here it is not critical but here it is very critical as soon as i am asking for some special shampoo so then supplier need to provide the special shampoo right customer relationship here we are maintaining the relationship but

not that level but here we need to maintain the relationship with the customer you talk about airlines industry how they are maintaining the relationship you talk about the hotel industry how they are maintaining the Labor intensive, it is low, it is high because you are directly interacting with the customer. Customer involvement is nowhere when you are producing the product, but it is very high when you are producing the services. We talked about the heterogeneity level, we talked about quality because it is easy. Why? Because here we have standardized the product design.

standard product design, standard process design. So, we can talk about that, but here it is very hard because the variance is huge and inventory exist here, here inventory does not exist, here we talk about the queue. So, here are some of the examples of manufacturing and services sector. You can see all this list of manufacturing, automotive, food processing, electronics, heavy engineering. We talk about these kind of services, hotel industry, third party, logistic services you are taking, heat treatment, hardware retail you are doing.

Those are the things. We talked about the value adding activities. where we talked about how you are converting the raw material into finished one packaging right so all those things are value adding activity but in case of this when we are distributing the services when the part that customer is part of your service network then we talk about the value adding activity so quickly we'll go through this very famous case of amazon why i have included amazon because here they are selling products as well as services we'll see how beautifully they have converted some of the product into services so that they can reduce the transportation cost right you can just imagine if i'm producing something here you are placing order from some other part of the world so I need to ensure the supply of that product what if that same I can provide you through online the antivirus example I quoted so now I need not to ship the CD from my manufacturing facility to your location simply I'll provide you the key right so through your email which is again password protected so that safety can be ensured and then you are installing through our website and then it can be done so this is all the products you cannot you know digitalize but there are some things we can digitalize so quickly going through Amazon so you know based in Washington earlier what they were doing they were filling orders from the distributors so they were collecting the orders and then they as for as the order is coming they were routing it through their distributor but the problem was it is time taking obviously so when they realized that this is time taking they started their own warehouses they set up their warehouses inside united states and other countries as well where they started you know building up the inventories now the order is coming as soon as it is coming i can ship the book right this is one thing they did and they then they introduced some courier partners as well right but the next very amazing step was they with kindle now delivering

physically those books they converted those books into digital books now you can see they were offering now they are offering more than four lakh sixty thousand digital books that means that physical delivery is not required and just to increase the customer experience they are adding audio and video content in that same way I have also tried to add some videos so that it will make more sense you can relate the concepts with the actual practical things which are happening in the real world so same way they tried to engage the readers in that way and provided the content so after that beside books they started selling music through online and then product categories are always there so you can see by just digitalizing those things books into digital form now easily they can provide and if you talk about the product industry they acquire zappos and online shoe retailer so then you can see how many product directly they added then again they acquired diapers.com so they diversified into different field so the point here is how you can manage the product and services so that you know just by doing this converting the physical product books into digital records how easily they can provide the uh information to the customer to the readers and in that way they are not in physical book you cannot provide the audio video video visuals right so that you can provide in a better way So, you can just we can conclude here we have seen so many differences between you the basic differences when we are talking about inventory management in product industry and we are talking about the queue management in services industry, but yes both are parallely working towards how we can you know go for inventory management process optimization and customer satisfaction with you know effectiveness and efficiency that is the ultimate objective of any supply chain when you are talking about the product industry or services industry. So, these are some of the references from where the content has been prepared. You can go further for better understanding.

So, that is all. Thank you very much.