Logistics & Supply Chain Management

Professor Vikas Thakur
Department of Humanities & Social Sciences
Indian Institute of Technology, Kharagpur

Lecture 36 : Make or Buy Decision

Hello dear friends. welcome back to NPTEL online course on Logistics and Supply Chain Management. So, today we will start discussion on whether we should go for making the products in house or we should outsource it right. So, the as the title suggest make or buy a decision right. So, under this session we will talk about the strategic alliance what are different options we can go for and then what what will be there if we are talking about the vertical strategic alliance where we are talking about maybe collaborating with the partners who are working at different stages of the value chain or the supply chain right or maybe the horizontal supply partnership where we are acquiring maybe the same players or the competitors in the industry right. And then we will talk about why we need to go for the strategic alliance what are the positive and negatives of that we will talk about then the outsourcing right and then we will discuss some of the case studies on that.

So, before going into this discussion because now maybe 2 or 3 session will spend on this I will just try to draw the trend line how we will go ah with this right. So, first is we will talk about the strategic alliance right how we are collaborating with the different players in the market right. this is basic concept where we are you know collaborating with the with the different stakeholders and then they will be you know for exploring different markets for maybe exploiting the technology maybe one is having that technology we how we can get the access to that how we can get the access to the different types of resources, financial resources, technological resources, manpower, skills all those things how we can get the access to those resources by strategic alliance. Then we will talk about this make or buy decision and here we are deciding whether we should go for in house production.

or we should outsource this. This should be the next step right this is how we will go for right and then probably the next session once it is done we will try to find out how we can go for strategic sourcing. That means, once we have decided that we will go for I am assuming here that we have decided that for this particular operation for may be preparing the sub assembly for may be warehousing for may be transportation I have decided because this is not my core competency. let us outsource. So, once this decision of outsourcing is done here in the second stage right.

So, then in the third stage we will define what are the different elements in strategic sourcing how we can go for that. So, strategic sourcing that means, now you need to pick the suppliers you need to pick the vendors right. So, that means, vendor suppliers you will find out how many vendors are there suppliers are there operating in that industry and then obviously, after that you will be going for because you will not pick all the vendors you will go will going for selection based on certain evaluation criteria. right once it is done then you will talk about supplier relationship management next step should be supplier relationship management how will manage the suppliers and once you have set up the supplier ah stakeholders throughout your value chain your supply chain the next thing is continuously monitoring them and then purchasing outsourcing is done then now you will purchase in repetitive orders you will raise POS against purchase order against all those vendors right. So, that means, how you will do that purchase orders will be raised based on the vendor rating of the individual vendor.

So, this is the seventh step we will go for. So, maybe 2 or 3 session will cover all these 7 perspectives right. Once vendor is selected maybe you are selected you have selected 4, 5 different vendors. So, who is going to supply maybe ah based on quality, delivery, price all those things will evaluate and then we will say this is the top vendor. ah will allocate the maximum order to this vendor because we are getting the strategic advantage with that vendor right.

So, this is the complete scenario right. So, going through this strategic alliance this is obviously, the legal agreement between two or more companies right, where after deciding that in which area they are going to collaborate right. And then they will after deciding that legal entity they will form may be the third entity where they were not operating earlier, if we will take the Although, there are different scenarios how they are collaborating, but let us take about the example of maybe Hero Honda. So, Hero was doing the cycling business right, non fuel vehicle two wheeler and then Honda was into that some foreign industry where they were producing bikes and they were selling the bikes right. Now, in India they are exploring the hero supply chain and how they can utilize that existing supply chain structure and hero will utilize the technology of the Honda.

So, this is how they come up together and then they. went for the third venture third entity where they were not operating earlier. So, this new reason may be as per your new technology as per new product offering new market then also it is new entity right. So, when you are going for strategic alliance obviously, I told you first is you are getting access to new market now hero was only producing cycles. So, now they were not going into fuel two wheeler market.

So, after collaborating with Honda Hero Honda now they are going for two wheeler market which is operated on fuel right. So, then you have shared intellectual property Hero got the access to Honda technology, Honda got the access to Hero supply chain infrastructure in that way technology or whatever resources you are having. So, mutual beneficial partnership both way means both are having the win-win situation where hero is also expanding the horizon in the Indian market and Honda got the license to penetrate in Indian market. Depending upon strategic alliance we have three options equity strategic alliance, non-equity strategic alliance and joint venture. So, depending upon some factors what is the project complexity, risk how you want to mitigate risk right, do you want to share the risk throughout the supply chain stakeholders or you want to keep the risk with you or do you want to have the complete control over the supply chain or the value chain or you want that may be independently your stakeholders are operating and in that way you do not have the full control over the delivery over the price over the quality over the product offerings whenever you are going for new kind of offering or new strategy you have to collaborate, you have to communicate, you have to develop that trust relationship with the vendors that yes now we are going for new product and this is how we are seeking your role right.

So, quickly we will go through these although this is not related with the directly supply chain, but yes some financial terms, but have implication on the supply chain non strategic alliance that means, minimum resource commitment right. They will work together for may be one temporary kind of project and they in that way they are not diluting their ownership. Company A is having their ownership, B is having their ownership, but they got some temporary project and now they are collaborating on that. So, there is no exchange of the ownership right, but because of the requirement of the projects may be two different software development companies they are having some expertise and for that project you need expertise of both the companies. So, in that way for that particular project they are collaborating, but they are not you know diluting their ownership.

This is the second ah stage where you know little higher level of commitment of resources are required and ah the ownership also diluted. One company is acquiring the other company they are investing they are acquiring the ownership equity right. So, resource in investment will be there in terms of Personal, technology, company might contribute significant financial resources as well because now you are getting the ownership. Let us take the example if car manufacture their there is may be battery manufacturing company because now we are talking about electrical vehicles. So, they may be car manufacturing wants to expand the capacity because now there is trend that people will go for may be more electrical vehicles because of their fuel performance sustainability measures all those things right.

So, then they need to develop strong vendors. So, how they can do that they they can you know you equip their those local vendors who are producing at very low quantity with low may be quality. So, then may be one vendor is producing with the nickel batteries other is lithium ion batteries or may be lead acid batteries different kind of what is your requirement, how you want to come up with that. So, that you know you can ensure that efficiency of the battery and longevity as well right. So, if you are investing into your vendor may be in technology or some other resources that is equity investment right.

Joint venture the highest level of resource commitment you can take the example of Maruti Suzuki right or any other. a company like two pharmaceutical companies they are coming up together for may be R & D manufacturing distribution for a new kind of drug right. So, that is a kind of joint venture. So, dedicated resources where you know this ownership will be both they are they will be owner depending upon how much they are investing into that right. So, they will be maintaining the ownership of that.

So, these were some of the technical terms how we can go for strategic alliance. Now, vertical or horizontal strategic alliance this is important when we are talking about the value chain or supply chain context. Upstream or downstream when you are acquiring when I will start acquiring my suppliers that is vertical. strategic alliance or may be I will strategic alliance sourcing means when you are you know sourcing some of the value adding activities to your state holders right at different levels of the supply chain. Different level of the supply chain may be raw material production you are outsourcing to someone else, may be manufacturing you are doing of your own, may be some sub assemblies you need you are outsourcing to some third vendor.

Then, may be warehousing you are outsourcing to some other vendor, transportation third party logistics you are using. So, that means, a different stages different functions are performed this is a vertical Horizontal integration is when you are acquiring the same players may be one pharmaceutical industry is acquiring other pharmaceutical industry, not the raw material supplier, not the distribution network, not the transportation agency right. So, that is horizontal strategic alliance right. you can just go through this is how the firm that operate in same stage of the value chain one transportation agency is acquiring other transportation agency is a kind of horizontal strategic alliance right so you can you know collaborate in such area like marketing distribution or joint production so if maybe you are distributing you are having your own distribution network like let us take the example of amazon or flipkart they are having their own distribution network but whether they are covering all the pin codes in in the country no it is not feasible because maybe far away locations or rural locations we are very minimum orders or maybe people are not placing order there because there is no access because your delivery network is not providing most of the products you are not selling to those locations right as long as you calculate depending upon your how many orders are coming what is the nature of the product you are buying quality variety level different expectation from the customer from that region because in crowded regions you can easily you know manage the customer requirements but what about the region which are far away. now you want to promise that we are delivering to all the pin cores how you can do that maybe you can collaborate with the indian postal services who are having access to all the rural locations as well maybe the delivery time will be little higher 10 days 15 days or maybe more than that right, but yes you are still promising that your product is reaching to the last location, last pin code right.

So, that is another way how you can this is horizontal strategic alliance you can go for. Now, strategic alliance domestic or international. Obviously, when we are talking about domestic strategic alliance we are saying that may be we want to you know explore in that particular area which we have not explored earlier right maybe you are a local brand you are very famous in western region or maybe northern region or eastern region you want to expand your market so then is you need to go for the domestic strategic alliance with those partners maybe you are looking for distribution you are operating in northern part and you want to distribute your product in the south part ok so how you can do that you need to go for kind of vertical strategic alliance with that some transportation or distribution network agency who is already operating in the south region pooling resources because we are very small organization regionally we are working so if we can collaborate with may be two or three different you know players in the same industry we can pool the resources right and in that way we will be more efficient how we will be more efficient because now earlier we were only one organization we were producing only ten thousand items but if i will collaborate with another organization which is producing or may be having order quantity of may be around 15000 units per day. So, that means, instead of producing 10000 now collaboratively we can go for producing 25000 item that means, economies of scale will also be targeted right. Gain access to complementary resources because different players having different expertise.

So, if I am expert in manufacturing may be my other collaboration partner he is very very expert in R&D. So, that means, we should go for collaboration like Apple, what Apple is doing? Apple is very good with R and D designing the features and software development part. Apple is not at all producing any product which they are selling. So for production, they know China is the best strategic location as for maintaining the low cost. So they are outsourcing manufacturing to majorly China.

Now they are looking at another strategic partner, India, as another big partner for setting up their manufacturing facilities. International strategic alliance obviously, earlier we were having market access to only local market we were talking about, why do not we go for overseas market. So, then in both way either we will get more supplies, cheap supplies, quality supplies and we will get the access to the market as well. So, your forward supply chain also there is scope when you are going internationally, reverse supply chain also there is scope because we can have access to better raw material.

avoiding import barriers. So, very simple example you might have seen. usually like in delhi when they are selling some products like let us talk about the electrical products right so electrical panels or electrical equipments whatever they are selling so because delhi is a size wise geographical size wise very small right so but they are having majorly their distribution center let us say if some demand is coming from noida or gurgaon So, that means, the outer skirt means outside of Delhi ok. So, that is another state. So, how what they are doing may be they are fulfilling the their order customer order from Delhi only, but billing will be done from that state office either UP state or Haryana state because then they will be avoiding you know some tariffs and import duties kind of things will be there when you are talking about overseas as well. So, if you are you know apple is producing in china importing in india then selling products because now in india also the product apple product demand is increasing right the purchasing power is increasing so why instead of you know producing in china and then paying all that import duties and then selling here in india may be costly they are looking for because that huge customer potential is there why don't we produce here only and then we will sell here only International synergies also that way you can maintain because now internationally you have gone.

So, if my brand is if I am bearing something or using some product which is internationally known obviously, you feel comfort, you feel more reliable with the product quality, their safety features and all those things right. And, then you can develop your core competencies because now I am restricted to what I have been you know doing since long right. So, this is my R and D is my core competency I need to develop this further, but let us outsource manufacturing to like apple manufacturing to India and sell in India only right. So, the purpose of outsourcing and strategic alliance. So, till now we can understand when we are going for outsourcing.

So, very basic purpose is enhance your competitiveness. So, now, apple is enhancing the competitiveness not only apple if you talk about your sports industry shoe. So, Nike is another player who is not manufacturing. right they are also outsourcing philips i always thought about they in india they are not manufacturing any product of their own what they are doing they are very good with the r &d they are very good with the marketing they are doing that part and their manufacturing is being completely done by some third party their co-manufacturers are there And Philips have appointed their quality engineers, production engineers, all the this material planning engineers in their co-manufacturing sites and they are regularly they are ensuring that that quality standard quantity variety that can be ensured. So, in that way enhanced competitiveness because you are not good with manufacturing, your manufacturing is outsourced to that partner who is very very competitive in that.

So, that is first point why you are going for that improve competency sorry efficiency and cost effectiveness. the one thing is may be you are small player. So, that much order you are not producing. So, if I am outsourced. So, per unit cost of producing that order will be higher.

So, if I will outsource this to third vendor who is producing may be for two three different players. So, in that way the economies of scale that that person can achieve and then the per unit cost I can reduce that right. So, in that way cost effectiveness will be there because the example if we can quote about the restaurant. So, what restaurant is doing? Cooking food and known for their recipe and I like whatever they are cooking right. So, but because I do not have always time to go there this very basic example we discussed.

collaborate with Swiggy, let us collaborate with zomato, let us collaborate with other Uber Eats and then deliver the product or deliver the food to the customers from wherever your demand is coming right. So, I am not going for transportation here for transportation I am. So, if today I am getting 50 orders I will process that 50 orders and I will pay Swiggy zomato their margin for 50 orders. Tomorrow I am getting 500 orders I will pay for that, so cost efficiency and your that total productivity can be improved. Access to new market and customer, so new markets obviously if you are going overseas or if you are expanding your market from northern part to southern part or western part or eastern part.

So, obviously even then you are getting access to the market instead of producing for those many that those many products for that north part only now you can expand that, but expanding that may be if your manufacturing capacity is not that high and you are not sure about the demand if you are expanding in other reasons even then you are not sure. So, the first decision may be let us collaborate with some partner who will be manufacturing on our behalf and we will just market there we will just distribute there right. So, then you will have access to new market. Foster innovation and learning when you have 2 or 3 different organization you can share your knowledge your innovation skills and then in that way you can develop that environment of you know continuous like Philip , Philips is promoting right innovation and you. So, that continuous environment of innovation can be ensured right.

mitigating risk and uncertainty. So, when you are you know collaborating with the strategic partners like I talked about your restaurant you are cooking food, but you have outsourced to Zomato. So, risk in that way is also lowered if you are not getting enough orders today. So, let us take example of this Kharagpur campus only. So, when there is means classes are going on. almost 20000 or those people are residing inside the campus right but now because vacation time is going on I don't think more than 2000 people are there right so you just imagine the situation of the restaurants working here and then when they are dealing the demand from 20-22 thousand students So, it is better to also to some delivery partner who can share risk ,this is risk right now we are not producing much we are not delivering much.

So, this uncertainty you can share. Enhance flexibility and adaptability. So, again when you are sharing resources with the different stakeholders, so in that way your supply chain will be more agile, more responsive right. Now, only 2000 people are here, so you will be responsive for 2000 people those many orders you will produce and you will sell right. But that fixed asset cost is not there that 500 bikers are they are delivering your orders. So, that cost you are not carrying that may be the those people are carrying or your delivery partner is carrying that cost right.

So, quickly we will go through the benefits of adopting outsourcing strategy right. First is cost saving always whenever we are talking about outsourcing we are talking about how we can save the cost. So, very simple example the title of the this session was whether we should go for ah making in house or we should outsource it. I will make you understand with one this is the very simple reason why always we are trying to go for the. you know outsourcing this is quantity on the x axis and let us say sales revenue on the or profit on the buy axis.

So, we have seen there is some fixed asset investment whenever you are operating in the market there is fixed asset and when we are starting producing that product there is variable cost as well. So, let us say this is total cost like includes the fixed cost plus variable cost right. Now, when we are producing let us say 5 units. So, this is the cost when we are producing let us say 15 units this is the cost right. So, that means, or may be sales and revenue will also increase, but the overall profit will be starting from here only that means, when we are selling 5 units because we have this much fixed investment cost and then variable cost because we need raw material for 5 products let us say 5 car we are manufacturing right now we need how many 25 tyres so that cost 25 tyres in that way you can calculate all the components you can multiply by 5 right because we need 5 products But the fixed cost is whatever production facility you have set whatever fixed equipment the assembly lines you have set right.

So, that is your fixed cost now you can see this we can say is a reason which is fixed no profit means loss reason as long as you are producing quantity less than this let us say star that means you will be in loss. So, this is loss reason, but if you have quantity more than that this is the profit when you will recover your all cost your profit will be more than your fixed cost plus variable cost. So, this is the very basic concept when you should outsource obviously, when you are having you are having order less than this quantity here you should outsource. but you are having quantity more than that then you should produce in house because that many you orders you are processing in house. So, there is margin after that you can make the profit, but it is not only the single criterion you can go for.

Then even if you are producing more than that let us say I am not very good with the packaging and I do not want to go into that even then I will outsource. I am not good with the transportation I know if I will do the transportation part I will be on the profit side, but I am not good with the transportation assets whatever required and that software required and how vehicle routing can be done. So, even then I will outsource. So, this is a very simple example you can go through how why we are going for that right. So, another benefit is specialized expertise let us say I am hospital.

why I am known for providing you the health care services right but there is very important part of health care industry is how you are managing your health care waste so doctors are providing the health care services but it is their responsibility because that infectious waste is generated from the hospital but if I am just you just imagine doctors are always engaging their skills how they can manage the waste And because they are not expert how they can manage the infectious waste, this managing the waste is altogether different industry, maybe they know some measures how they can you know protect the environment from the infection spread of infection, but still still we cannot we cannot just rely on the hospital. So, their main services are providing health care services. So, let us outsource this waste management process to some third party who is already doing that right. So, that means, you will get expertise. Focus on your core competencies, you focus on your core competencies that how you can in-house all the tests required you know to monitor the patient health how you can maintain the patient records how you can maintain the inventory of the medical equipment you just focus on your core capability scalability and flexibility so i told you outsourcing if you are you can scale down your business you can scale up your business whenever required 50 orders you are getting you deliver 50 orders using swiggy network if you need more than that you get those many you process those many orders.

Efficiency and productivity will be improved because that non performance area or non value adding activity sometimes or may be where you are not competent you are outsourcing that right. So, in that way you will be more efficient. Risk will be shared with all the partners risk related may be compliance and regulatory Let us talk about the another this industry only health care waste. So, this waste means again you know so many different agencies are there world health organization is there then environmental agencies within India who are regulating all these waste and So, many you know regulations are there.

So, you need to meet those regulations. So, as a doctor you should focus on treating the patient or you should focus on how you can meet the regulations, but those meeting those regulation is very very important part. So, let us outsource them. So, we can share the risk. Enhanced focused on customer satisfaction because now you are completely focusing on your patients.

So, you can enhance the your proficiency in that. so another limitation you will lose control when you are going for strategic alliance you are outsourcing distribution .so waste management you outsource to some other party so you said within a every 24 hours you should this you should take our waste away and treat it now sometime is coming within 24 hours sometime is coming 30 hours 35 who will keep the track even if you are keeping the track of all those activities but then it is very difficult to push that because many are not there right. So, that way on quality timeliness and overall performance somewhere you are diluting it is not that you cannot push your vendors, but when you have multiple vendors you can push as well, but still you do not control completely them. Communication and coordination is also very big challenge any change you are doing in your manufacturing process in your product design services design you need to collaborate with the partner because partner has to change the raw material as well. right and then whether your if overseas partners are there whether they are ready to change so frequently so then all barriers will come there you know language barrier cultural barriers may be you are suddenly you are going you are into education industry and suddenly you are going into some liquor industry let us say right you are expanding so whether your stakeholders will be ready to do that or they will feel that right because totally two different area quality and performance like I told you somewhere you do not have the complete control dependency for delivery so if anything goes wrong at the vendor end delivery will be delayed right so then you are more dependent for quality more dependent for delivery of the product otherwise if any disruption is there your production line will stop Obviously, when you are collaborating you are sharing the secret of your success, secret of your recipe, how you are manufacturing all those things you are sharing with your stakeholders.

So, that means, that security confidential things you are sharing with the partners. Hidden cost is all initially obviously, this we are doing outsourcing for reducing the cost, but there is hidden cost right indirect cost. it's not only the cost you are acquiring the raw material for acquiring the raw material you are negotiating with the vendors you are preparing all the contractual documents any dispute happens you need to deal with the disputes as well right so that will also carry certain cost negative impact on the internal workforce let's say if we are doing something here right and tomorrow let's say we are recording lectures here tomorrow NPTEL will outsource this something to some other agency let's say right so then then there will be you know dissonance kind of behavior that we were doing this we were doing fairly enough fairly well with the students and they were you know imparting this education to students who are you know ah far away from us they can also get access to that. So, that that means, that dissatisfaction will be there right.

So, if you will outsource something ah to some other partner. So, already I discussed make and buy decision all this is not only these many cost you will consider what if you will make in house and what you will if you will make if you will outsource. So, if that cost is less than this you outsource loss you outsource here right, but at this point For that particular supplier it will not be loss because he is producing for other players. So, for us the quantity is less than the Q star for them this quantity is big enough to produce. So, they can minimize the total cost, shipping cost, inventory cost they can hold that much you know raw material. Then again if we will see make and buy decision on another parameter let us say advantages of making are very high.

and risk tied to buying very high so that means when risk is very high when you are outsourcing risk of sharing your secret you know success strategy so then you will strongly go for making in house when it is very low risk is also very low advantages are very low you buy it outsource it. But somewhere in between when you are there so you can some this is also possible may in northern you are there. So, you can produce there, but in south you are expanding now in south you can outsource to someone that also can happen right. So, moderate outsourcing can also be there. Another thing on which you can go for outsourcing when you need strong control over the product or services what you are offering to the market then you need you know you need to make in house.

So, like if I will talk about Zara, Zara is known as for fashionable products. So, for standard products they are outsourcing to cheaper locations. right to Asian locations. For fashionable products which where they are changing very frequently they are producing in Europe only right. So, this is very good example because for fashionable products they are charging high, they want more control over quality, but for big products they are outsourcing to some other vendor where they can you know cut down the cost.

If we will talk about Walmart we will come here. So, if standardized products if any standardized product is there if you are selling you know any standard t-shirt you are selling those commodity products where you know you do not have much to control. So, you can go for outsourcing in that case. how you can implement a successful make or buy strategy first you need to already we discussed whether you should make or buy what you should make what should you should buy you need to analyze the cost and expertise whether you have that expertise that you prepared very beautiful design let us say apple prepared very beautiful design but that design can you mature that design commercialize that design of your own because sometimes because you need to you know then they are outsourcing to china right so then we need to evaluate the quality right and then for those quality parameters whether you need your own control or you can still believe in your stakeholders your partners right then you need to consider the capacity of the stakeholders right and your capacity as well and what if you need to scale up or scale down the business because of the ah demand fluctuations you can go for a kind of pilot survey case study right where maybe you can analyze some other players what they are doing in the market and then you can go for implementing complete successful strategy. We will just quickly go through couple of cases how they are doing that like I told you apple very good with your you know product design right so and updating the software. So, software development part and they are designing the products in United States, but they are finding the cheap locations in China where they can cut down the production cost.

They are investing huge in R & D, but you see they are. doing the development part in US, manufacturing in China, again selling products in US, right. So, this is the beauty of supply chain still you are managing the cost. Another very good example Nike where they are you know they are pioneer in designing the products if you are bearing Nike shoe the comfort you can feel right and they have developed that image over the time with the customers where they are you know preferring the Nike shoes and branding how they are branding their product but again they don't have those capabilities to produce that to commercialize that much quantity so then again they are outsourcing to some other partner so again they can leverage the strengths and gain the competitive advantage over their you know competitors because manufacturing also they are cutting down the cost and providing the high quality comfort shoe to the customer right because manufacturing they are cutting down the cost but on designing part they are spending high. another example is google you know google is known for as search engine we are most of the you you also can cannot track how many times we are googling the things right so that means anything you need to know you are just entering into the google right if even if you want to know you know some products even then you will enter even if you want to know some healthcare hospitals near to you you are so other than search engine now they are providing so many different They are their main business is not they are providing almost free products right. If you are googling something that is free, information you are getting is free right.

So, if you are checking nearby your hospital that is also free, if you are using Google map is free. They are how they are making money, they are making money by selling apps and then the advertisement cost right. I am searching some product on google that means I need that product now those you know branding organizations can use this data can analyze this data can send me targeted advertisement and then they can generate the revenue this is how google is making revenue they are selling apps to play stores right so this is another very beautiful example what they are doing they are just They have developed that platform where you can search and what you have whatever you are searching is a kind of information and that information is valuable for them. So, in this session we discussed about the different options of strategic alliance, we discussed how we can go for outsourcing vertical as well as horizontal outsourcing. we discussed about vertical outsourcing where we talked about you know forward integration or backward integration right we talked about what are those factors which are forcing us to go for ah outsourcing it is not only forcing if we are producing something out we are outsourcing and we are getting higher margins why do not we go for that right so and then we are getting the expertise right so as a doctor you are all completely involved in treating the patient.

Why do not you means outsource if you are the you know testing part is also there. So, they are outsource all the labs pathologies right. So, and then waste management is another key area which is which requires attention, but then because we are limited to providing the healthcare services, let us outsource this to third party who can you know manage this more efficiently because they will charge us for only the waste today we are generating. Tomorrow if we are generating higher waste, they will charge higher.

day after tomorrow again if waste is reduced. So, they will charge for that only. So, in that way we can you know maintain the economies of scale, scale we can scale up scale down the business right. So, this is all about how we can go for outsourcing right. In the next session we will discuss about how we can develop the strategic relationship with the partners and how we can evaluate the partners and pick those selected partners.

So, that is all these are some of the references you can go for. Thank you very much.