

Manufacturing Strategy
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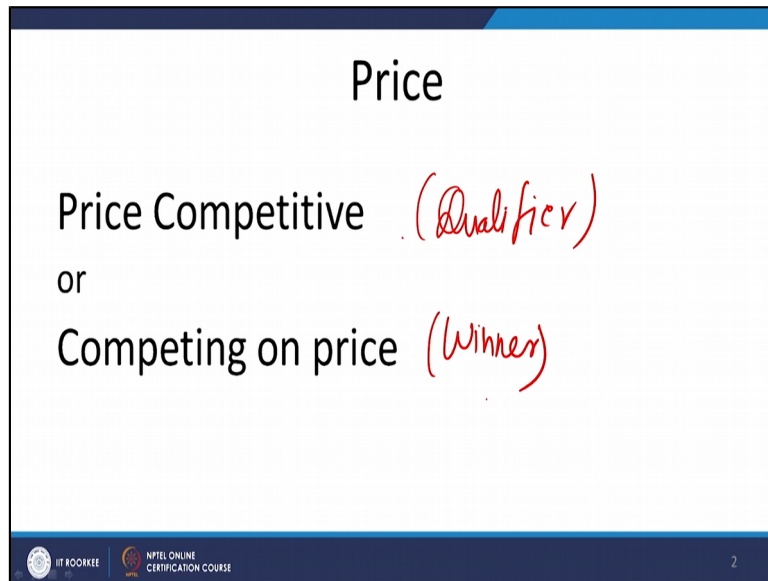
Module No. #03
Lecture No. #15
Some Specific Order Winners & Qualifiers

Welcome, friends. Now we are coming to the end of week three, of this course on Manufacturing Strategy. In last few sessions, we started the process of developing the Manufacturing Strategy. We discussed, that understanding the market, is the first important step, in the development of a suitable Manufacturing Strategy. And, time and again, I am also emphasising, that market, and marketing, are two different things. We need to be, market-oriented, not marketing oriented.

And, for that purpose, why a customer is purchasing a product, we need to understand. Because, we need to provide, those type of attributes, from the operations point of view, from the manufacturing point of view. We discussed, the concept of Order Qualifiers and Winners. And, in our last two sessions, we were focusing, on some generic and specific dimensions of, Order Winners and Qualifiers.

In our last session, we discussed that, both, Order Winners and Qualifiers, are highly dynamic. They are market dependent. They are product dependent. They are time-dependent. And, we discussed, these concepts, with the help of different examples. We were discussing, a very specific Order Qualifier and Winner, which is coming, from the operations. And, in our last session, we started discussions, about this important order winner qualifier, that is known as, price.

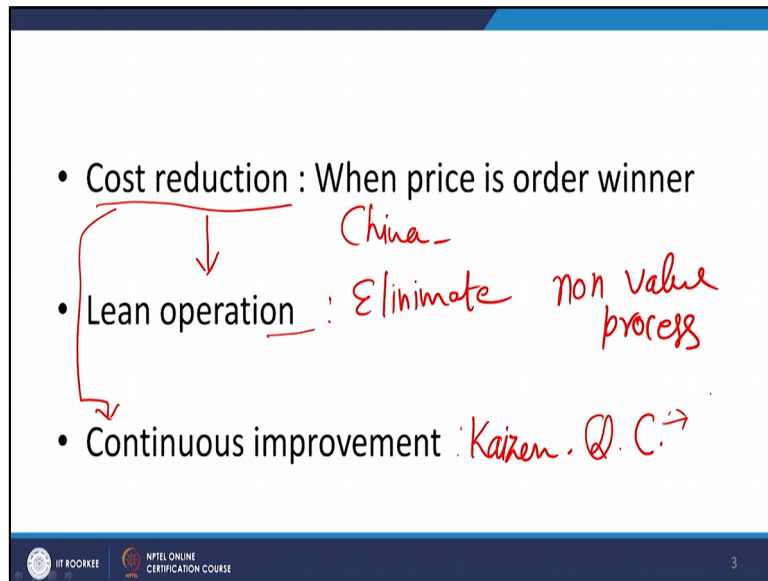
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Price can provide you, two types of advantage. Either, you can be a price competitive organisation, or you can compete on price. When you are a price competitive organisation, price is acting like a, qualifier. And, when you are competing on price, when price is helping you to, give a competitive advantage, that is the situation, when price becomes winner. So, you see, that it is the same attribute, that is price. But, in some cases, it is a qualifier, and in some other cases, it can be a winner.

Many organisations around us, we can discuss it on forum, that whether a particular example, is competing on price, or it is price competitive. So, we discuss this particular aspect, that price can act, both as qualifier and winner. Then, it is important to understand, that if price is winner, or price is qualifier, then what type of operation strategic role, will be there. And, in this particular case, price is order winner.

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In that particular case, one of the important thing, which we need to do, which operations need to do, is the cost reduction. Because, when you are having, price as your order winner, when you are competing, on the basis of price, you cannot charge higher margins. And, when you cannot charge higher margins, you continuously look, that how to reduce the cost. Because, reduction in cost, is the only phenomena, which is going to help you, in the marketplace.

And, the example of China. That, large number of Chinese products, are competing on price. Price is the order winner for them. And, they continuously look, that how to reduce the cost. Whether, reduce the cost, at the raw material stage. Whether, reduce the cost, at the processing stage. Whether, reduce the cost, at the finish good stage. Whether, reduce the cost, at the distribution stage. So, at all different stages, they look for cost reduction. Because, price is an important order winner for them.

But, if price is an order qualifier, in that case, you just want to keep your price, within the range, in which your competitors are offering the product. So, you will not look, that I continuously try to, reduce the cost. But, if it is an order winner, then certainly, we need to go for cost reduction. And, Chinese examples, are just in front of us. Then, if price is, either qualifier or winner, in that case, Lean Operations. Lean Operations means, how to eliminate, non-value processes.

That is important thing, when we are talking of, Lean Operations. So, whether price is order winner or qualifier, we want to eliminate, the non-value adding things. And, as a result of

that, it will be easier for us, to remain in that bracket, if it is a qualifier. And, it will help us, in reducing the cost, if it is a winner. So, Lean Operations are essentially, you can say, a way to reduce your cost. Then, another way, to reduce your cost is, continuous improvement, Kaizen.

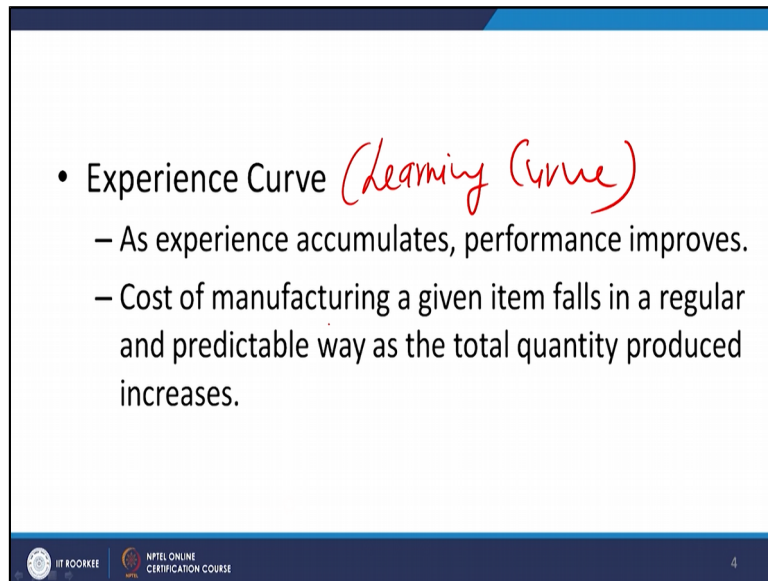
When we are regularly updating, when we are trying to regularly improve our processes, the objective is, to make the processes more efficient. And, we all understand, the meaning of efficiency is, inversely proportional to cost. So, we try to reduce the cost, by continuous improvement. We try to bring, more and more efficiency, into our processes. And, Japanese manufacturing system, has given us, large number of tools and techniques.

Kaizen, is one such important technique, which is available to us, from manufacturing literature of Japan, that how you can do, a small incremental on a regular basis. And, these small incremental on regular basis, will help us, in reducing the cost. Similarly, the concept of quality circle, is also responsible, for giving us, this continuous improvement. We develop a small group of employees, who are well-versed, about their area of work.

They identify the problem. And, on their own, they develop the solution. And, these solutions, help us, continuously improve our processes. So, this way, we are trying to empower our employees. So, quality circle helps, not only in cost reduction, but also in achieving the objective of empowered employees. So, our employees become empowered. They feel that, they are contributing, into the decision-making activities, of the organisation.

So, that is one part, of quality circle. On the other hand, we take the inputs of quality circle, for continuous improvement. And, that continuous improvement will help us, in achieving the objectives of cost reduction. So, cost reduction, becomes one major angle, one major point. In the case of price, you are becoming, order winner or qualifier.

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• Experience Curve *(Learning Curve)*

- As experience accumulates, performance improves.
- Cost of manufacturing a given item falls in a regular and predictable way as the total quantity produced increases.

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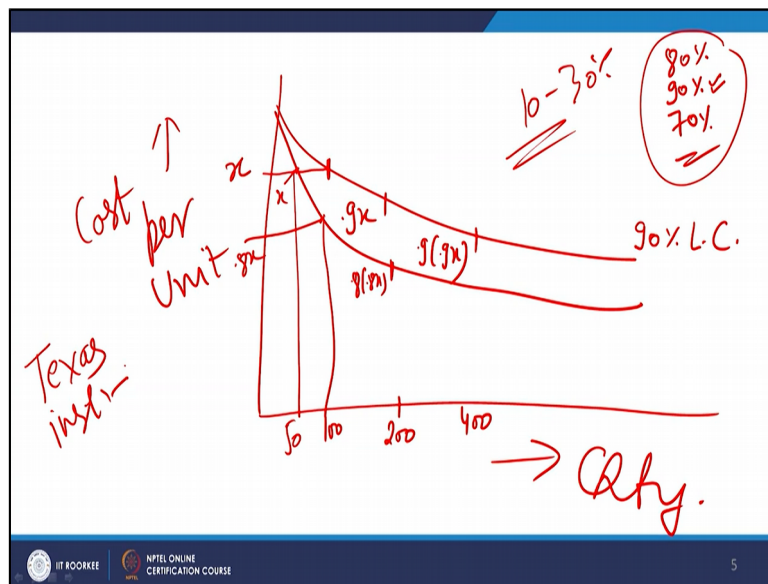
Another important thing, which is not so much discussed, when we talk of cost reduction. Because, whenever we talk of cost reduction, lean and continuous improvement, are the most talked about phenomena's. But, one more important thing is available, that is experience curve. Or, the other name, you may know, is the learning curve. These learning curves, are also equally useful, if you properly, strategically, handled them.

Learning curves, experience curves, can also be a very useful source, for cost reduction, or for using price, as Order Winner and Qualifier. Now, what is this learning curve. Learning curve, is basically the idea that, as you learn more, your performance improves. Performance means, efficiency improves, as you become, more and more expert, you are able to achieve, higher outputs, with minimum efforts.

So, that is the idea of, learning curve. And, it is not with individuals. With individuals, it is very easy to understand. That, when we joined teaching profession, in the early ages, so at that time, we need to work very hard, to make a lecture of one hour. But, when you grow, when you become a senior professor, so with minimum efforts, you are able to contribute, to the larger audiences. Same thing happens, in the organisation.

We can do, this learning experience, or the experience curve phenomena, in any kind of manufacturing setup, that if you start producing more and more, so your cost of production, will decrease, as your production output increases. So, that is the phenomena of learning curve. The definition can be said, that cost of manufacturing a given item, falls in a regular and predictable way, as the total quantity produced, increases.

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So now, if I say this, learning curve phenomena, so over a period of time, as we are producing more and more, cost of producing per unit, will decrease. So, like this, it can be one idea of learning curve, on where, this side you have, cost per unit, and on this side, you have quantity. So normally, we represent learning curves, as 80% curve, 90% curve, 70% curve, like these things, we represent our learning curves. So, meaning of an 90% curve is that, if I am producing the 100th unit, so cost is, let us say, x Rupees.

And, when I am going to produce, 200th unit, the cost will remain $0.9x$. And, when I am going to produce, 400th unit, the cost will remain further, 90% of $0.9x$. So, this is, a 90% learning curve. If I have, 80% learning curve, so in that case, what will happen, that initial cost is x here, for the 100th unit. And then, let us say, it is for 50th unit. And then, for 100th unit, the cost will become $0.8x$.

Then, for 200th unit, the cost will become, further 80% of $0.8x$. So, this way, my learning curve will go, that as I have 90% learning curve, 80% learning curve, or 70% learning curve, so by doubling the units of production, the cost of production will decrease, by that percentage. If it is 70% learning curve, so if 200th unit is costing me, x per unit, then 400th unit will cost me, $0.7x$. So, that is the meaning.

And normally, the learning curve, the broad idea is that, the learning curve ranges, between 10 to 30%. So, you will find, organisations learning curve from, 70% to 90%. So, these are the idea of learning curve. Now, since I am able to plot, these learning curves, so this says,

that the point, that cost of item falls, in a regular and predictable way. I know, that if my initial cost is x Rupees, so the cost of 1000 unit will be, $0.5x$. I am able to predict it.

And, when I am able to predict it, then I can use this phenomena, right from the beginning means, I can average out, the cost for my entire lot of production. That, I am going to make 2000 units. And, if the unit 1 is costing me x , that 2000 unit will be costing me, $0.6x$. So, what will my average cost. And, I can take the advantage of that phenomena, right from the beginning, if I am competing on price. Because, I know, that today my costing is coming, x . But tomorrow, the costing will reduce to, $0.6x$.

So, let us take the average. Today, I may go for some losses. But tomorrow, I will earn the profit. And, that will compensate my losses. So, why not, compete on the prices, taking the advantage of the knowledge of experience curve. So, some of the organisations, particularly, if I mention, organisations like Texas Instruments, they are pioneer, in using the learning curve knowledge, for pricing of their any new product.

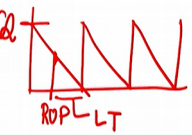
Any new product, whichever they are launching, they use the knowledge of experience curve, that how to price that product, initially into the market. So, organisations, can take advantage, of this learning curve knowledge, for competing on price phenomena. So, that is another very important way, that how you can handle, this price, as your competitive weapon. Then, after completing this discussion on price, the second important order winner qualifier, is the delivery reliability.

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2 Delivery Reliability (On Time Delivery)

(JIT) *Quantity (EOQ)* *Date (L.T.)*

- Supplying products in full and on agreed date.
- Many a times it is important qualifier. *Q* *"QQ"*
- Important for consideration of capacity, *(i)* *"QQ"*
(ii) scheduling and inventory, particularly *(iii)*
 regarding WIP and finished goods. *Q*



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This is, second important order winner qualifier. Or, delivery reliability means, on-time delivery. You are delivering, on the promised due date. Now, there are two particular phenomena, or you can say, two dimensions, of this delivery reliability. Now, in this two, one is the quantity. That, you are supplying products, in full quantity. Whatever is the order quantity, you are supplying this, in full quantity. And, second, on the agreed date.

So, quantity and date. Or, if I convert this, in my language of operations management, I am giving, complete EOQ, with agreeable lead time, if you recall our discussions, of basic inventory models. So, if you go to that basic inventory model, of EOQ type, so in that, this is the important assumption, that whatever is this Order Quantity Q , you are supplying this order quantity in full. And, whenever like, this is your ROP, Re-order Point, and, this is your Lead Time.

So, you will supply, complete order, on the due date, so that, there is no short supply, and there is no oversupply. Now, this delivery reliability type of order winner qualifier, becomes very, very important, in case of, we want to follow things like, JIT. If you disturb, your delivery schedule, if you are not able to deliver in full quantities, it will be directly impacting, your performance of just-in-time. And nowadays, we know that, our entire supply chains are, agile supply chains.

So therefore, it is very, very important, to understand the very preciseness, of your on-time delivery. Now, many a times, it is very important qualifier, I am saying. It is not only simply important qualifier, rather it is, order losing qualifier. If you are not able to meet, due dates, it

is quite possible, that you will not receive, subsequent orders. The customers will look, for some alternative suppliers, or they may cut, the order quantities given to you.

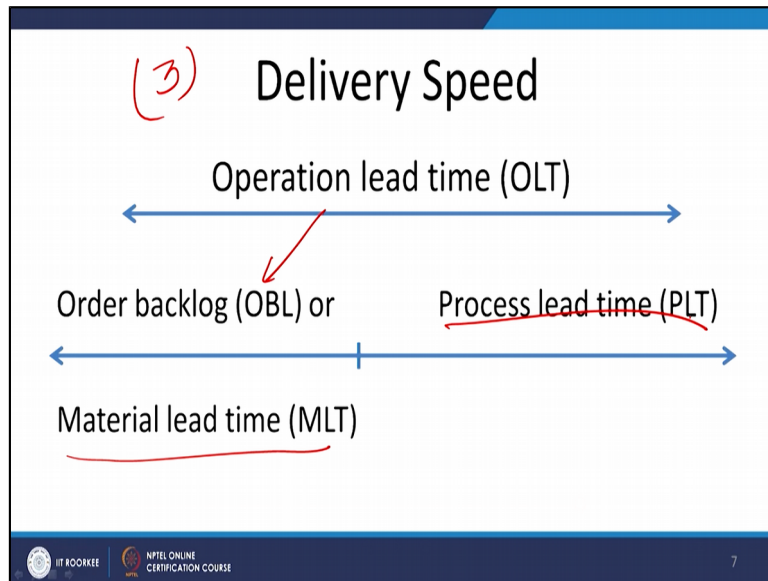
So, it is not only an important order qualifier, rather it is, order losing sensitive qualifier. So, if you remember, in our discussions, yesterday in the last sessions, we discussed qualifier, with Q, and some of the qualifiers, we discuss with QQ. This delivery reliability, many a times, written as QQ, which represents, that it is order losing sensitive criteria.

And therefore, the importance of delivery reliability, that how do you design your operation system, so that you can give orders, on the due dates. Very, very important. Now, what are the operations consequences, for delivery reliability. Now, operations consequences are, one is related to capacity. You need to decide, how much capacity of your plant, your warehouse, you need to have, for meeting the, customer's due dates.

Then, scheduling of various orders. That is another important thing. Then, your inventory policy. Whether, it is FIFO, LIFO, Random, Priority Based, what type of inventory policy, you are going to have. And, these three things, capacity, scheduling, and inventory policy of work in process and finished goods, will help you, to design a proper system, to achieve on-time delivery.

So, you can understand, that point number 1, that what is the optimum capacity, so that, you have readily available stocks, or stocks you can produce, whenever customer is requiring. Then, scheduling of your various production activities, operations activities. And, third is, inventory of work in process and finished goods. So, these three important items, are responsible, for achieving the objective of, on-time delivery.

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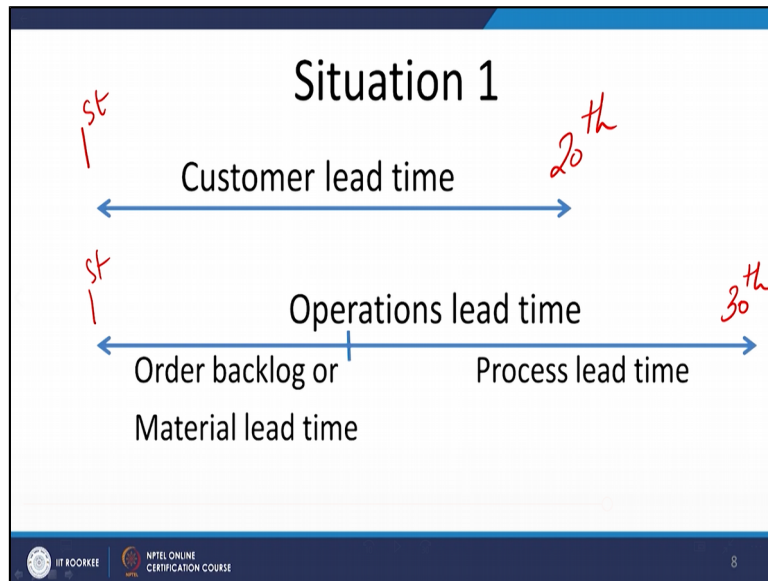
Now, another important Order Winner and Qualifier is, Delivery Speed. This is, third in our list, which is coming from, operations background. Now, when we are talking of on-time delivery, that is one particular aspect, that whenever you have promise, that I will deliver on xyz, and you are delivering on that xyz. But, nowadays, we all understand, that customers want, products at a faster rate. Now, delivery speed is basically, depending upon your operations lead time.

And, this operational lead time, the time when you receive the order, and time when you supply the order. Now, the time between, receiving and supplying the order, is known as lead time. Now, this lead time, is composed of, two different types of time. One component of operational lead time, is the order backlog, or material lead time.

Let us say, there is no backlog. We take this assumption. So, in this case, the operational lead time, is coming from, material lead time, and process lead time. You will procure raw material, you will procure some subassemblies, components, etcetera. So, part of the time, is spent on procuring the material. And then, part of the time, is spent on, processing, assembling, fabrication, of those materials.

So, this is the total operational lead time. Now, many a times, you are able to complete all these things, means, material lead time, and process lead time, in less than operational lead time, or customer requirement time. But, sometime, your operational lead time, is more than the customers lead time. So, let us see, what are the possible situations.

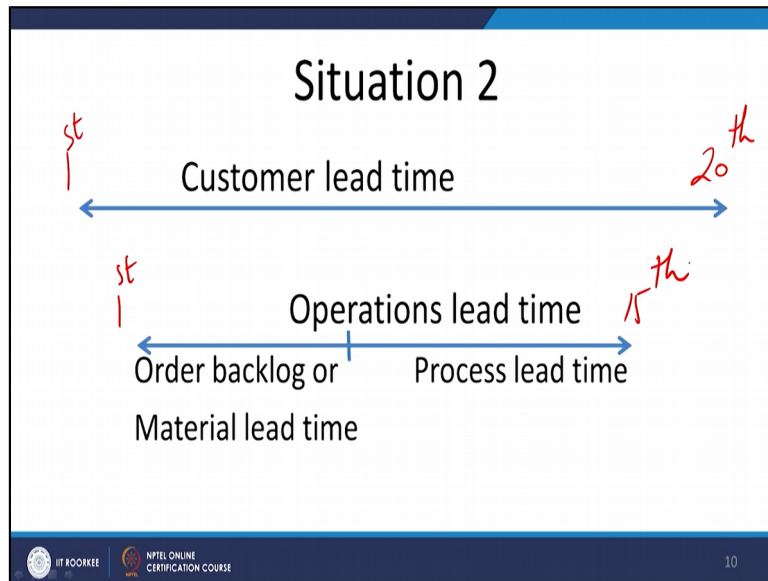
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Now, the situation number 1, where customer lead time, the customer wants product, from months 1st date, and on 20th of the day of the month, customer wants the product. But, for you, it is taking, 30 days, to provide that product. So, customer lead time is, 20 days, and your overall operations lead time is, 30 days. And, in this particular case, if you want to remain in competition, you need to reduce your overall operational lead time, by at least 10 days.

So, you need to shorten, your operational lead time, by 10 days, so that, you can achieve, the customer's expectation of getting products, in 20th day. Otherwise, your competitors will be there. And, they will do something, to meet the requirement of the customer. And, you will not be able to win, this order. So, this is the importance of delivery speed, that how quickly you can deliver products, within the customer lead time. The second situation, is like this.

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In second situation, you have a customer lead time. Customer is requiring product, giving order on 1st, requiring on 20th. But, your operational lead time, take only 15 days. Now here, customer has more time, to procure the product. And, you are ready to offer product, in less than that time. And, in this particular case, this delivery speed, which you are offering, will not give you, or in this type of situation, when customer is ready to wait for more time, and you are ready to offer products, in less than that time, will not give you the advantage of winner or qualifier.

Because, almost all other competitors, will be able to offer products, in the same slots. So, at best, in this situation, in situation number 2, delivery speed can give you the, benefit of qualifier. Because, you are offering in 15 days, your competitors will be offering in 16 days, or 17 days, or even in 18 days, but customer is ready to wait up to 20th day. So, all these competitors, and you, are providing products, in less than that time, in which customer is ready to wait.

So, here in situation 2, it is acting as a qualifier. But, in situation 1, it is acting as an order winner. Because, your operational lead time is more, customer is requiring in less time. And, if you can meet, the requirement of the customer, obviously, it is a winning proposition. Now, when your operational lead time, is more than the customers lead time, so how to reduce, or how to match, the customer lead time, that is an important point of discussion.

Now, if this is not a frequent situation, that customer lead time is less, and your operational lead time is more, only for 1 or 2 customer, it is happening in a year, so you can do, some

kind of short-term measurements. You may not like to go for, a permanent solution of this problem, rather you can have, a short-term solution, for this problem. You can increase, some short-term capacity, by outsourcing.

And, by outsourcing, you can take the material, from some third party, and can process it, and give it to the customer. So, these are the short-term solution, for meeting the customer requirement. But, if it is a regular phenomenon, that your all customers, are requiring products, in less time, and your process time, lead time is more, then in that case, you need to look for a, regular or a kind of a permanent solution, for solving this problem.

And, let us see, what are those type of alternatives. Like, in case of a short-term problem, we need to do, either by outsourcing, or we can invite some of our workers, to do overtime. So, these are the short-term solutions, for 1 or 2 times in a year, if that is happening.

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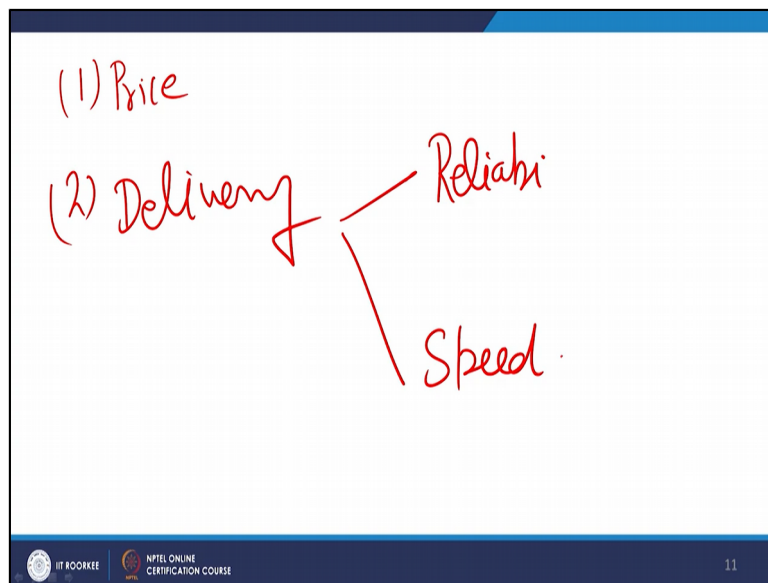
- Increase short term capacity by overtime working.
- Change customer priorities in the existing order backlog queue or jobs going through the operations process

But, if it is happening on a regular basis, then we need to see, that why it is happening, on a regular basis. And, may be, either you will go for, permanent increase in capacity, you may go for, overall change in your manufacturing policy, may be, you are starting this material lead time, once the order has come.

But, if you have a regular requirement of these products, in that case, you may change your philosophy, from make to order, to assemble to order, or make to stock type of policy, you can follow, so that, you can reduce your entire operational lead time. So, these type of policies, you can follow, so that, you can improve your lead time, so that, you can take the

advantage of delivery speed, to get a winning advantage, a competitive advantage, over your customers.

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Now, finally, we see that, we discussed so far, three important Order Winner and Qualifier, where we discuss the price, we discussed delivery. And, in delivery, we discussed two aspects, reliability and speed. Now, all these three criteria, whether it is price, delivery reliability, or delivery speed, can be handled, with respect to qualifiers, or with respect to winners.

If you want to use them as qualifier, you just remain at par, with your competitors. But, if you want to use them as winners, you need to go ahead of your competitors. Then only, these criteria can provide you, some kind of winning advantage. So, with this, we come to end of this week three. Thank you, very much.