

**Manufacturing Strategy**  
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**Module No. #04**  
**Lecture No. #16**  
**Some Specific Order Winners & Qualifiers**

Welcome, friends. Now, we are entering into the fourth week, of this course on Manufacturing Strategy. In last complete week, we discussed about, the concept of Order Winners and Qualifiers. We discussed particularly, about three very important Order Winners and Qualifiers, Price, Delivery Reliability, and Delivery Speed. We discussed that, speed is becoming, a very, very important criterion, of customer's preference, across the markets, nowadays.

The development of e-commerce, and not only e-commerce, but how to deliver product, at a faster rate, is becoming a key criterion, for the success of many of the businesses. And, that is one particular reason, if I take you, to the history of company known as Dell, that they change their business model, to make faster deliveries, to their customers. Because, on one side, customers are requiring variety, customers require products of high quality, customers require product at lowest possible cost. But nowadays, customers also require, products at a faster rate.

So, delivery speed, is a new addition, in the list of various Order Winners and Qualifiers. Because, as we discussed, in one of the session, that current markets are characterised, by rapid change. And therefore, we want to products, at a faster rate. Otherwise, by tomorrow, it is quite possible, that we may not require that product. Because, a new product may come into the market. So therefore, it is not only from the point of view of the customer, but it is in the interest of organisations also, to make their products available, quickly to the customer.



Otherwise, customer may change, its mind. And, if customer changes the mind, your product will not be sold. And, that it is just going to be the losses for the organisation. So, we discussed, these three important qualifiers and winners, price, delivery reliability, and delivery speed. When we were discussing about, delivery reliability, and delivery speed, we were focusing continuously, on this particular aspect, that how to reduce the lead time.

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## A market driving option

How to reduce lead time? =  $\text{Process} + \text{Material}$  } Op. L.T.

- (1) Capacity
- (2) Scheduling
- (3) Inventory  $\leftarrow$  WIP
- finished.

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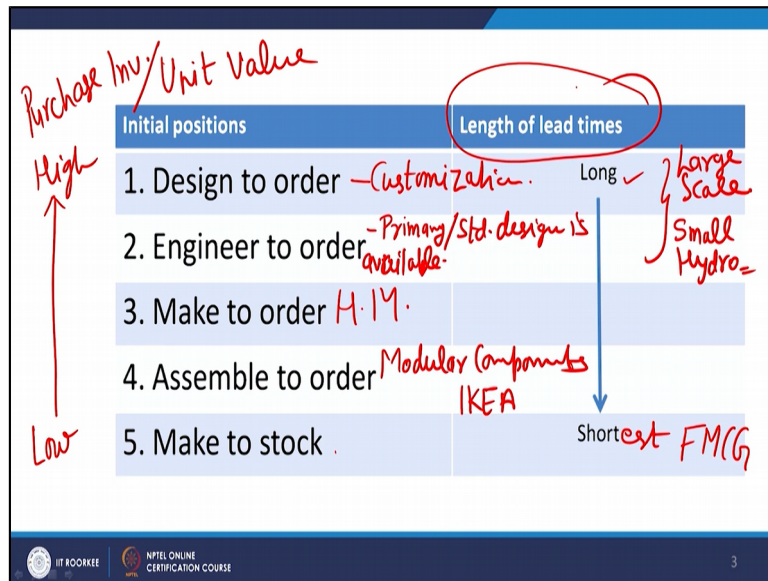
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Lead time, when I say, lead time is, process + material lead time. That is my total, operational lead time. So, how to reduce, this operational lead time, so that, I can meet the expectations of my customer. That, was the point, we initiated in our previous session. And, we discussed, that there are, certain short-term strategies, where we can do some kind of, either overtime to our workers, or we can outsource, some of the requirement from some other parties, to fulfil the customer's requirement.

So, all these are the short-term measures. But, three important things, which are required, for permanent solution of this, reducing the lead time, one is related to capacity, the second is related to scheduling, and third is related to inventory. And, inventory, particularly related to, work in process, and finished. So, these are the three important areas, around which, we need to make some kind of decisions, so that, we can see that, how to reduce the lead times.

We need to see, do we need to enhance the capacity, so that we can fulfil the customer requirements, from in-house activities. Or, our scheduling activities, are not appropriate. We are not able to fulfil, the requirement of our key account holders. And therefore, customer dissatisfaction may increase. Or, our inventory system, is too much based on JIT, and we are not able to get, proper material from our vendors. So, these are three important areas.

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Now, for solving these problems permanently, you can have, different types of design of your system. Now, the different types of designs, which are possible, the one design is, design to order. And, you see, I have arranged these different concepts, design to order, then engineer to order, then make to order, then assemble to order, and then, make to stock, in a way, that the lead time, is reducing from design to order, to make to stock.

As you are going, from position number 1, to position number 5, the operational lead time is reducing. When we are designing to order, in that particular case, we receive the order from the customer. And then, as per the requirement of the customer, we design the complete solution. We design, we produce, we implement, we take the after corrections, and all those things, are the part of design to order.

So, you can understand, that it has a very long lead time. Because, designing of the product starts, only after the order has come. Only after, you have understood the requirements of the customer, so you go for a very high level of customisation. So, it is very high level of customisation, and therefore, customer is ready to wait, because you are designing a product, for a particular customer.

So, maybe, if I talk like, very heavy industrial goods, if I am looking for a turbine. So probably, that will come under, design to order kind of thing. Because, what type of head, I am going to provide? What type of tail is available? And, depend on, what type of power, I need to generate? On the basis of that, the product will be designed. And, once the product

will be designed, then it will go for the production. So, in some industrial cases, where the products, are of very high unit value, we go for design to order.

But, in this particular case, your lead time is also sufficiently long. The second is, engineer to order. Here, a primary design is available to you. And, that design is, more or less a standard design. Primary or standard design available. But, you are not using this design, for making the final products. Once the order comes, you do some kind of minor changes, so that, minor engineering changes, like if I need to do, refrigeration of a hall.

So, I know that, how to develop a refrigeration system, for this hall. But, depending upon, what type of capacity of that hall is, I will add, whether there has to be 4 ventilators, or 5 ventilators, those type of things, I will decide, only on the basis of, knowing the specification of the hall. So, these are the examples, where design is already available, but the implementation of design will take place, only after the order comes.

That type of activity, is known as, engineer to order. Since, we are not doing the initial designing of the product, so we can save, some of the lead time, some of the time in delivering the product. So therefore, it comes at the, number 2. Then, make to order. Here, we do not have, anything to design, anything to engineer. Everything is, very much available to us. We have different types of products, which are complete, in their design, in their engineering aspect.

But, we are not producing those products. We are not producing those products. We are only waiting for orders. Like, for an example, in India, in last few years, a company known as Hindustan Motors, which was very popular, once upon a time, for making a very popular car, known as Ambassador. But, the Ambassador cars, in last few years, were made against orders. So, there was no new design, there was no new engineering, in those cars, but they followed a system of, make to order.

So, if you require, if you are a government servant, if you are a government office, you require ambassador car, so you place order to Hindustan Motors. And, against your order, car is delivered. So, since there is no designing, no engineering, so your lead time further reduces. But, it is still considerable, because the whole manufacturing, processing lead time, is still involved. So, that is the third type of strategy, make to order.

Many companies, in order to reduce the risk at the retailer's end, follow the concept of, make to order. When order come, then only, the products will be manufactured. Then, another possibility is, assemble to order. In, assemble to order, what happens, we keep modular products, modular components, you can say. Modular components are available with us. And, as order comes, we assemble those modular components, to make the final product.

So, in some cases, when we are not exactly making every component, in a new way, we go for assemble to order. Companies like, Ikea, a very good example, for this assemble to order. They keep, various components of their furniture's, in the modular form. And, as order comes, they assemble those modular components, to give the final shape of the product. So, modularity is the key feature, of assemble to order type of organisations.

And then, finally, you have this policy of, make to stock. Fair. You are keeping products, readily available in your stock. You are keeping products ready, off-the-shelf. Customer goes, and purchases it, without waiting for, even a minute. So, that is, where you have the, shortest lead time. It is not simply the short, but it is the shortest lead time, that you are not spending, you are not waiting, to procure the product. You immediately, as soon as you want the product, you procure it. Because, the product is readily available, in the stock.

So, if you see, depending upon, what type of product you are in, you can follow, from design to order, to engineer to order, to make to order, assemble to order, or make to stock, type of production strategy, so that, your lead time can reduce from, long lead times to, shortest lead time. If you are making turbines, so either you will go for design to order, or engineer to order. So, if even in case of turbine, if you are into a small hydro, you can go for engineer to order.

But, if you are going for, large-scale hydropower projects, this is design to order. Make to order, the example like ambassador, is good enough to understand, that how companies, try to reduce their inventory cost, by going for make to order. Though, they are not giving you any kind of novelty, but just to reduce the inventory cost, they follow the approach of, make to order. Assemble to order, again to reduce the space, at the retailer's end, they go for modularity.

And, Ikea is a very good example. Make to stock, to further reduce, your lead time. And, in most of the Fast Moving Consumer Goods, FMCG's, you will see that, we follow a principle of, make to stock. All our cosmetic products, all our eateries, are readily available in the stock. And, you go to the shop, and purchase it. Because, you have, so much temptation, to shift from one product to another product. If it is not readily available, you will purchase some alternative.

So, therefore, you as a manufacturer, we need to follow, the idea of make to stock, in case of FMCG's. So, you can also see that, based on our purchase involvement, our purchase involvement is low. You make another column, that is purchase involvement. And, purchase involvement increases, as we move from 5 to 1. I am not deeply involved, in make to stock type of product. Whichever is conveniently available to me, I purchase those products.

But, in case of make to order, engineer to order, design to order, these products, my involvement is high. Because, they are high unit value products. So, you can also see, that these are purchase involvement. Then, you can also add, unit value. So, these are high unit value products. And, make to stock type of products, are low unit value products. So, your stocking cost, is not very high, your inventory holding costs, is not very high, because unit value of items, towards 4 and 5, is low.

And, items, which are at 1 and 2, or even at 3, their holding cost is high. So, you can do this comparison, on variety of ways, and you will see that, how design to order, to make to stock can offer you, different types of advantages. We discuss it primarily, for the sake of lead time, that how to reduce your lead time. And, in that case, you can follow these alternatives, and depending upon the type of product you are serving, you can choose, one type of initial positions, for your organisation.

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## Quality Conformance

- Making products to specifications
- Fitness for use

Diagram: Quality is central. Mfg. (Manufacturer) points to Quality. Customer points to Quality. Relative points to Fitness for use. A bracket connects Fitness for use to Relative.

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After that, the fourth important order winner and qualifier, is quality. Quality is, a very, very important aspect of, production, operations, management. We, in our course, in the beginning, discussed three letters, QCD, Quality, Cost, and Delivery. So, you already know, that Q is a very important place, in our discussions. So now, we are going to start, the discussions of order winner and qualifier, particularly, quality in our mind.

Now, when we talk of quality, there are two meanings of quality. Two meanings of quality, one is from the customer's point of view, and another is from the manufacturer's point of view. Now, when we talk of quality, from the customer's point of view, fitness for use. The product should be able to fulfil, the intended purpose. That is the meaning of quality of product, from the customer's point of view.

But, from the manufacturer's point of view, the meaning of quality is, to produce products, as per the specifications, as per the design, as per the dimensions. That is the meaning of quality, from the manufacturer's point of view. Therefore, in our discussion here, we are talking, quality conformance. Because, we are discussing this quality, from the point of view of the manufacturer. But, the discussion of quality will remain incomplete, if we do not add, the customer's dimension into it.

And, customer's dimension says that, fitness for use. That, product should be able to fulfil, product should be able to deliver, the function for which, I am purchasing this product. If, I am purchasing this whiteboard, for writing, for making my teaching, more effective. And, if I

am not able to do, that effective teaching, because I am not able to use this board properly, then it is not a quality product.

If, any product you name, I have mobile phones, I have spectacles, I have watches, I have shoes, I have car, scooter, so many products I use. But, all these products are used, for some purpose. I use these products, to make my life more comfortable. But, if I am not able to achieve, those objectives, it means, it is not a quality product. I wear shoes, so that, I feel comfortable, and I look smart also.

But, if I wear a shoes, of some soldier, which are made to provide safety to my legs, that is not going to fit, that is not going to fulfil, my purpose. And therefore, those shoes, may be a very quality shoes, for a soldier, but not a quality shoes, for me. So, depending upon, user to user, your definition of quality, your meaning of quality, will change. And therefore, we say, from the customer's point of view, when we talk of fitness for use, quality becomes a relative term.

It is a relative term. Fulfilling the specifications, fulfilling the conformance, is more like a standard thing. But, fitness for use, is more like a, relative term. So, we need to understand, the very first thing that, quality can be understood, from both these point, customer's point, and the manufacturer's point. Now, when we go further into the detail of quality, so there are different types of dimensions of quality.

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Dimensions of Quality	
Performance	Primary characteristics 15 b p m, 20 b p m.
Features	Secondary characteristics Double side printing
Reliability	The probability of a product malfunctioning within a given period 2 Years-
Aesthetics	How the final product looks
Durability	A measure of product's life in terms of both its technical and economic dimensions
Conformance	The degree to which a product is manufactured to the agreed specification
Serviceability	The ease of servicing (planned or breakdown) to include the speed and provision of after sales service
Perceived quality	How a customer view the product - Marksheet



And, let us discuss quickly, these dimensions of quality that, what do we mean by, different aspects of quality. Because, it is such a common word quality, that we all have, some meaning associated with the quality. And, let us see, that how you can define quality, using these different dimensions. Now, one of the dimension of quality is, performance. The performance means, the primary characteristic of a product. Primary characteristic of a product, that is the performance.

So, if I am purchasing a laser printer, and if that laser printer is printing, 15 pages per minute. That, becomes the performance, that it is printing, 15 pages per minute. You are purchasing a laser printer. That, laser printer is printing, 20 pages per minute. So, that is the performance of, your laser printer. Some other heavy-duty laser printer is there. It may print, 30 pages per minute. So, that is the performance of, that laser printer.

So, the primary characteristic of the product, is known as, performance. But, nowadays, we are not satisfied, just by primary performance. We need, add-on features also. So, that is the secondary characteristics. Whether, it has automated double sided printing or not. If my laser printer has, automated double sided printing, that is a feature. ((if it is nose head)) (23:16) it is do not having, any additional features. So, double side printing can be, one feature.

Then, similarly, in other product categories, you can think of, that what is the performance, and what is the feature. Then, the third important dimension is, reliability. Now, reliability means, the probability of a product, malfunctioning, within a given period. Now, you know that, this printer, has a life of 2 years. So, whether this printer is working, without any kind of trouble, for 2 years or not. If it can fail, within 1 year, within 6 years, so it has low reliability.

But, if it fails, around 1 year, 10th month, then it means, high reliability. And, if it fails after 2 years, it has very good reliability. So, you have, a relative spectrum of reliability, depending upon, when it is failing, on the basis of its given life. Then, Aesthetics. What is the outer look of your product? How the product finally looks? Some of my friends, few days back, make a 3D printer. Now, that 3D printer was made, inside our lab.

So, it was looking like, they have various components, lying here and there. Though, it was giving, much better output than the, purchased 3D printer. But, because, the final shape was not looking appropriate, it was not a commercial entity, for that purpose. So, you need to see,

the final shape, that what is the look of that product. That is also a very important aspect of quality. You go to different types of ((restaurants different types of cellos)) (25:27) because of their aesthetics, many a time.

Because, their look is very good. Then, another important dimension of quality is, durability. Now, durability of a product, is a measure of product's life, in term of both, technical and economical dimensions, that how long a product can work? So, you need to understand, the difference between, reliability and durability. Now, in case of reliability, that the chances of failure, within the life of a product, that how many times, product will fail.

And, durability is, how long a product can work? Though, the life specified life of the product, is 2 years, but sometime, products may work for, 3 years, 4 years, 5 years also. The life of the product is 2 years. But sometime, you may need to change the product, after 1 year. Because, it is giving so many faults, repeatedly, that you find that, it is hampering your work. So, it is better to change the product.

So, durability is the measurement of, total life of the product. Then, Conformance. Now, conformance is very simple, we have already discussed this aspect, that whether our product is meeting, the specifications or not. So, that is the conformance. Then, Serviceability, or Maintainability. Serviceability is also known as, maintainability. If your product fails, may be under plant maintenance, or maybe under breakdown maintenance, how easy it to recover, how easy it to maintain, that is the aspect of serviceability.

We want, products should be repaired, within no time. It should not require, very high level of skills, to repair those products. So, that is the aspect of serviceability, that you should be able to make, or you should be able to re-run, your products, your equipment, easily. That is the serviceability aspects. And then, finally, the perceived quality, the perceived quality, that how a customer views your product, despite all these characteristics.

Perceived quality, is a separate type of dimension. You may be very good in, all these initial dimensions. But, if a customer is not looking you, as a favourable product, these dimensions will lose the meaning. So, you need to create an aura, so that, customer also sees you, from the positive mind set. And, probably, the marketing function, can play some role, in

improving your perceived quality. If you go to a class of branding, they will teach you, that how to improve the perceived quality.

So, there need to be, a very strong communication, from the organisation, and to the customer, so that, perceived quality can be improved. And, if you are having very good features, very good performance, reliability. But, customer feels, no, this product is not good, this product is not up to the mark. So, despite having all these phenomena, all these dimensions, your product will not sell.

So, perceived quality, though it is mentioned in the last, but it is one of the very important phenomena, in using quality, as order winner and qualifier, that you need to have a very high degree of perceived quality. So, quality is understood, in these 8 dimensions. Now, it is important to understand, that all the products, may not have, all these 8 dimensions of quality.

Some of the products, may have many dimensions. Some of the products may have, few dimensions. So, depending upon, what type of product you are, if you are talking of an industrial product. So, maybe, aesthetics will not play, very important role. But, when you are talking of a product, which is to be used by, some individual customer, then aesthetics may play a very important role.

So, just to give this example, you will see that, in physical products, different types of dimensions, will be applicable. And, in service products, different types of dimensions, will be applicable. So, we come to end of today's session, with this discussion of, different dimensions of quality. In our next session, we will discuss, few more Order Winners and Qualifiers. Thank you, very much.