Manufacturing Strategy
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Module No. #04
Lecture No. #20
Developing an Operations Strategy

So, friends, welcome again. We are now, coming to the end of week four, of this course on, Manufacturing Strategy. And, all through these sessions, we were discussing about, the development of operations strategy. And, in that, in our last few sessions, we described, if ((I whisper)) (00:48) process, where analysing the market. And, based on those analysis of market, we are developing the operations strategy.

In our last session, we discuss the characteristics of, analysis of market, where we particularly focused, that we need to identify, that which markets, we are going to serve, currently. And then, which market we are going to serve, in future time. Then, we also discussed, that for each of these markets, our current market, and future markets, we need to specify, Order Winners and Qualifiers. And, Order Winners and Qualifiers, again and again we are emphasising, are time specific, product specific, market specific.

So, you need to continuously keep an eye. This is one very important activity, in the development of this whole operation strategy process, that you continuously need to keep a watch, need to keep an eye, on the changing Order Winners and Qualifiers. Because, whatever is the order winner and qualifier today, tomorrow it will be a different order winner and qualifier. And, if you could not keep an eye on this, probably, you will lose the market.

To start the session, we can discuss some examples. One of the example, which is available, from India, is from the automobile sector, two wheeler sector, where we had, a very popular two-wheeler, scooter, Bajaj Scooter particularly. And almost, most of the Indians used to have, pride in driving that Bajaj Scooter. And, more than 80% of two wheeler market in India, was captured by, Bajaj Scooters. But, Bajaj Scooter, could not identify, could not anticipate, the future markets.

That, how customers in future, will have different Order Winners and Qualifiers. And, slowly and slowly, the whole Indian market, shifted from, scooters to motorcycles. And, the Bajaj,

the leading company, lost its market, to Hero Honda Motorcycles, and then to Hero MotoCorp. Another example, from India is, Fiat Cars. When we talk of Indian cars, only two cars were available, in 70's, 80's. These were, Ambassador cars, and Fiat cars.

But, Fiat and Ambassador, both these cars, could not recognise, could not anticipate, that what type of Order Winners and Qualifiers will be there, for Indian car users, in future. And, as a result of that, now if you see Indian roads, you will hardly find, any Fiat car, or any Ambassador car. They lost their market. Their 100% market, to many other companies, including Maruti, Hyundai, Tata Motors, etcetera.

So, it is very important, not only to identify, not only to understand, Order Winners and Qualifiers, for your current market, but you also need to anticipate, Order Winners and Qualifiers, for your future market. If, you are able to anticipate them properly, then we also discussed in our last session, that the expected contribution, from particular product, and the actual contribution from that product, should match to a degree.

If there is not proper matching, between expected contribution, and the actual contribution, we have not correctly identified, our Order Winners and Qualifiers. So, that is also, an important aspect, of our discussion, of developing the operation strategy.

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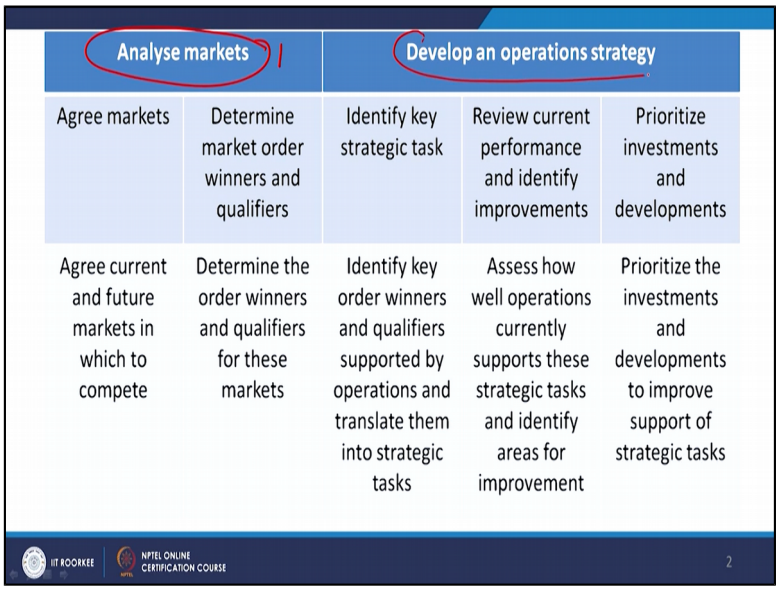

Now, in this session, we will go, from this stage, that this we have already covered, in our previous sessions, that analysis of market. And, now on the basis of this analysis of market, we will do, development of operation strategy.

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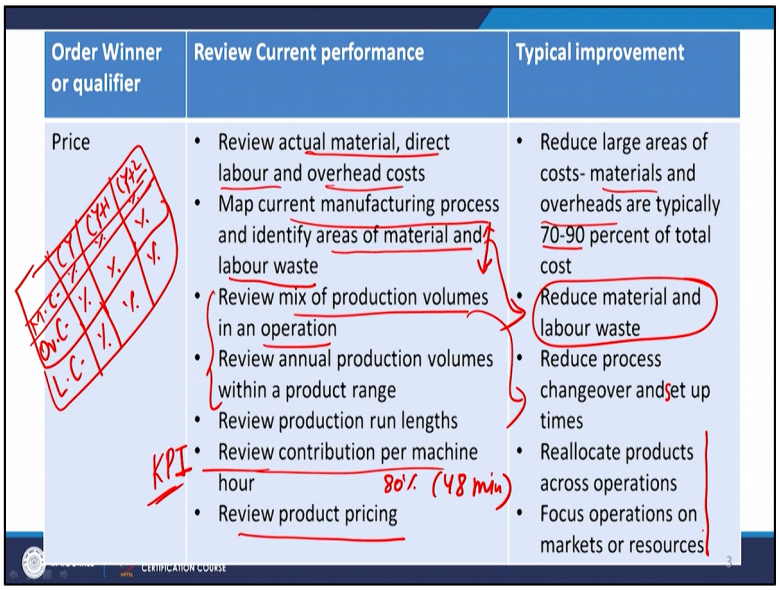

Now, let us see, that what type of, different Order Winners and Qualifiers, will force us, to do different type of corrective actions. What type of typical improvements, we need to do, with respect to these, Order Winners and Qualifiers. One of the most important order winner qualifier, which is relevant to operations, is the price. We have discussed, price as the most important order winner qualifier, for most of the time, in most of the market.

Though, its relative importance may change, it may change from qualifier to winner, winner to qualifier, in winner also, it may change its weightage, but it always remains, as one of the important winner or qualifier. Now, when you are looking, the current performance of price, as order winner and qualifier, what are the different things, you will check. And, you will check in that, I have a list of items available with me, and you will check that, what is the actual material, direct labour, and overhead cost.

That is the first point, you need to check. Because, material, direct labour, and overhead costs, are different. Most of the time, material and overhead cost, are the most important cost, in your manufacturing. And, the direct labour cost is not that much. Because, earlier, we were having more, labour oriented, labour-intensive, industries. But nowadays, we are moving towards, more automation. So, labour cost, is continuously reducing.

And, it is the overhead cost, and the material cost, which is more significant, or which is taking more share, in the overall cost of manufacturing. So, you need to continuously review, that what is the share of material cost. Rather, you can have, a small checkbox kind of thing,

where you can see that, over a period of time, your current year, then your current year + 1, current year + 2, and so on. You can prepare, a small table, where you can see that, how these material cost, the overhead cost, and the labour cost, is changing, over a period of time.

So, out of your total cost, you can just mention them, in percentage. And, this will give you, this idea, that as I am saying, that material cost, and overhead cost, these two cost, should normally contribute, between 70 to 90% of the total cost. So, you need to see, whether these two costs, are within 70 to 90% bracket, or not. If your labour cost is too much, and this cost is not contributing to, large part of your overall cost, you need to see that, there is a scope of improvement.

And accordingly, either, we need to go for new designs, better designs, so that, your material cost and overhead costs, should take the maximum part. And, why you are using more labour, where the wastage of labour is happening, because of which, the labour cost is becoming, taking more share, in the overall cost of production. Then, you also need to see that, what is your current manufacturing process. And, you also need to identify, area of material and labour waste.

Because, the increasing cost, is normally happening, because of the wastages. So, if you need to map, if you can identify, that what are the places, where your wastages are happening, this material waste, the labour waste. So, you need to see, that I reduce these, material and labour waste. You are using labour. So, which work can be done by, single person, you are involving three persons, on that work. So, that is the wastage of labour.

So, you need to see that, labour is also a very important resource. And, resource, in terms of cost, in terms of money. So, if you use more labour, that I will say is the, wastage of labour. So, we need to see that, how many persons are sufficient, for performing this particular job, if one person, can perform that job. If you go to, some of the European countries, if you go to American countries, you will see that, a bus is operated by, one person only.

The same person, acts as a driver, and as a conductor, and as cleaner also. But, if you see, some of the countries like India, and other such developing nations, you will find that, a bus is operated by three persons. Driver is a separate person. Conductor is a separate person.

Cleaner is a separate person. So, it is the wastage of labour, which some of you may argue, that it is providing more employment.

But, if you want, in terms of competitiveness, because of wastage of labour, your cost increases, and then you lose competitiveness. So, the whole idea of getting employment, is no longer valid. So, we need to identify that, where our wastage of material, and wastage of labour, is taking place. Then, you also need to review, mix of production volumes, in the operation. That, what type of production sequence, you have. Because, that also create, some kind of idle capacity, some type of unused resources.

Because, if your production volumes are not appropriately set, you incur additional overhead cost. So, to minimise your additional overhead cost, because, if you have, too many changeovers, too many setups. So, every time, whenever a product is changing, so you need to again, set your machines, your processes. So, your machine processes are idle, during that time. So, you increase your, overhead cost. So, you need to see that, how to reduce, process changeovers, and setup times.

So, if you are able to reduce, the process changeover, and setup times, that will help you, in reducing the overhead cost. So, this is also important, that your production volumes are set, in such a way, your production scheduling should be done, in such a way, that you can minimise the changeovers, and setup times. And then, you also need to see that, what is your annual production volume, within a particular product range.

Your organisation offers, a wide variety of product. You have, large number of SKU. So, within that large number of SKU, you also need to see, that how to arrange, how to sequence, the production of different products. So, this will also help us, in reducing, the process set over, and changeover time. So, both these reviews, will help us, in reducing the changeover, and setup time. Then, you also need to see that, what is your overall production run length.

More production run length, your cost of production per unit will reduce. If you have smaller production run, then your cost of production will be high. So, need to have. Once you are able to do, aggregation of your annual requirement, annual demand, then you can appropriately design, longer production runs. Try to have, as long production run, as possible.

But again, be careful, that because of longer production run, your inventory should not pile up, enough.

If you have long production run, to reduce your cost of production. But, if it increases your inventory, finished goods inventory, then the benefit of reduced overhead costs, or reduced cost of production, will be compensated, will be neutralised, by the excessive holding cost of inventory. So again, you need to have, a careful thought, you need to give that, what should be the optimum production length, so that, your inventory holding costs should also, not increase.

Then, you also need to review, that what is the per hour machine contribution. How much contribution, a machine is giving, per hour. So that, you can think of maximising, the contribution coming from a machine, per hour. So, that is also, you can say, a kind of a KPI, performance indicator, in the case of machine's productivity. That, what is the productivity of your machine. So, machine productivity normally measured, in terms of loading. That, machine is, 80% loaded, 90% loaded.

So, if I say that, machine is 80% loaded, it means that, in 60 minutes, machine is producing products, for 48 minute. For, remaining 12 minutes, machine was busy, either in changeover, or in some maintenance, or in setup, etcetera. But, for 48 minutes, machine was giving me, some output. So, that is the review of contribution, per machine hour, so that, what is the productivity level of machine.

And then, you also review, the pricing of your product. That, how are you pricing your products? What is the margin, and costing coming to you, and accordingly, you will price your product? So, this review of product pricing, is to be done, to be in proper competition, with your competitors. If your pricing is too tangent, then your competitors pricing, it may severely affect your, market potential. So, it has to be in line, with the competitors pricing.

Only in case of, introduction stage of your product life-cycle, you may play with your pricing. But, later on, when your product goes into, the growth or maturity stage, then the pricing should be, in tie, in line, with your competitors pricing. It has to follow, the laws of demand and supply. So, you need to review, the pricing, in context of competitors pricing, for

the similar kind of product, for the similar markets. So, all these things, will help us, in taking some kind of improvement activities.

You can reallocate your products, across operations, so that, different operations may have, different contribution, to the products. So, how to have better production runs, longer production runs. So, for that purpose, reallocation of operations, can be done. Then, you can do focus, on markets, as well as, own resources, that whether you think of achieving more market friendliness, or you want to achieve, more resource optimisation.

So, you need to decide, improvement activity, either on the basis of, one of them. But, it is always advisable, that you do an improvement activity, which can take care, both the things. On, one side, you move for optimisation of the resources. On the other side, you can keep your eye on the market. So, optimisation, with a focus on market satisfaction. Understanding the market, is most desirable thing, while handling price, as your order winner and qualifier.

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Order Winner or qualifier	Review Current performance	Typical improvement
Quality Conformance	Review quality conformance levels for product, orders , customers ad market segments • DPMO	• Reduce quality conformance errors (Six Sigma) • Build quality into the process rather than checking conformance after the event
Delivery reliability	Review delivery performance for products, orders, customers and market segments Analyse and compare customers requested and operations actual delivery lead times Compare actual processing with overall operations lead time	• Improve scheduling of activities • Improve process reliability • Hold inventory at varying stages in the process

The next important order winner qualifier, from the operations point of view, is the quality conformance. Quality conformance, we discussed that, how to meet, the specifications. That is the meaning of, quality conformance. Now, when we are reviewing, the quality conformance, as order winning qualifying criteria. So, we see that, what is the conformance level, for products. So, you see, conformance, from the different point of view.

One point of view is, whether you are able to produce products, as per the specifications, design specification. So, conformance levels for products. Then, another conformance level,

is with respect to orders. The orders, which are given to you, by the customers, what is the conformance level, to those orders. That, may be, not only to the product specification, but to the quantity, delivery time, etcetera. The location of delivery, that can also be the part of, conformance to the order.

So, all these things, are the part of order conformance. Then, customer and market conformance. That, what your customer is requiring? What market segment, you want to serve? So, are you satisfying, with your specifications, the requirement of customers, and market segment, which you are trying to satisfy, or not. Because, many a times, we divide market, on the basis of, some very simple criteria, which is not giving you, the indicator of quality.

Like, you say, market of gender basis. There are, male market. There is a female market. You decide market, on the basis of location. Asian market, American market, African market. But, this criteria, this way of segmenting the market, is not good enough, for my quality conformance. I need to see, that what type of product characteristics, my market requires. Now, if I divide a market, on the basis of, that there is a market, which is looking for a product, on the basis of, let us say, I am talking of laser printer.

So, there is a market, which looks for, 12 pages per minute. There is a market, which is requiring, double side printing. There is a market, which requires, heavy-duty printing for, image printing, the mark sheets. Now, this is the division of market, on the basis of product characteristics. So, most of the time, we divide market, on the basis of those characteristics, which are not relevant for the operations. And, if I divide market, on the basis of, these types of characteristics, this is another important aspect of, quality conformance.

That, if my market is requiring, 12 pages per minute printing. So, whether my product is able to meet, that requirement or not. When my product is required, to perform, heavy-duty colour printing. So, whether that type of colour printing, which is expected by a product, I am able to deliver, that commercial quality of printing or not. So, those things, are the part of, quality conformance. And obviously, in that, the concept of DPMO, defects per million opportunity, that is also to be continuously reviewed.

That, what is the expected quality level. And, because, I am not able to deliver, that expected quality level. So, my defects per million opportunity, will be higher. So, I continuously need to see that, how to reduce, my quality conformance errors. The improvement I need to do, is with respect to, achieving more quality conformance. And, techniques like, Six Sigma, are becoming very popular, in achieving this quality conformance, so that, I can minimise these defects.

And, my DPMO performance, improves. I achieve, the Six Sigma level, in my quality. And then, I also need to see, when I am talking of Six Sigma, the other important thing is, that I continuously need to improve, my process capabilities. And, I need to see that, how can I eliminate, the checking of the products, once the manufacturing has done. If I have, better process capabilities, I can go to the extent, of eliminating the inspection, after manufacturing.

So, one important thing is, to have Six Sigma kind of concepts, implement Six Sigma projects, in the organisations, to reduce the errors. And, second level is that, I need to improve my process capabilities, so that, there is no need of inspection. So, both these things, are my typical improvement kind of activity. Here, I can say like, concepts like Kaizen, can be very handy, to improve the process capabilities. How, you have more capable products, more capable processes, which can produce, defect free products.

Then, another important order winner qualifier, can be delivery reliability, or on-time delivery. Now, when I am of talking of on-time delivery, there are large number of parameters, which you can analyse, which you can review, to see, whether you are achieving the, on-time delivery or not. So, you can see that, you can review, delivery performance for products, orders, customers, and market segments. Almost, for all the things, you can review the delivery performance, for which, we were reviewing the quality conformance.

So, that is our point number 1. Then, you can also analyse and compare, that what is the customer requested, and what is the actual delivery lead time. So, customer has requested 30 days, you delivered in 31 days. So, what is that gap, coming between the requested time, and actual delivered performance. So, that is again, a very important thing, that you can continuously keep a track, whether we are able to achieve the requested time, or we are always overshooting, that requested time.

And therefore, we need to improve, our scheduling activities, we need to improve, our process reliabilities. If more reliable processes are there, then we will be able to give, a more realistic reliable delivery date, to our customers. And sometime, we need to hold inventory, that will help us, to fulfil the customer requirement, off the shelf. So, at which stage, inventory holding is required, to fulfil the customer requirement, with more reliable delivery schedules. Then, delivery speed, is also very important criteria, nowadays, how quickly, you can respond to customer's request.

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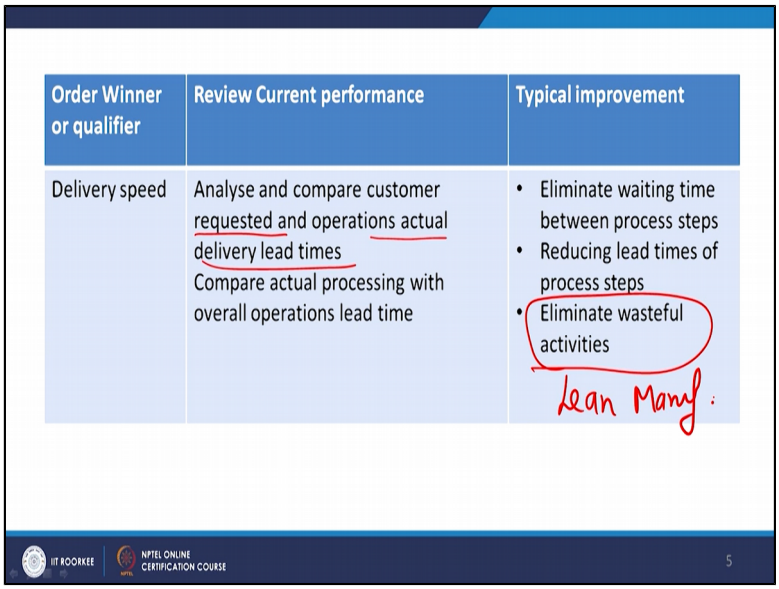

So, you again require, to compare, the customer's request time, and your actual delivery lead time. So, same thing, what we discussed, in the on-time delivery, here also, in delivery speed, we discover that, what is the gap, between the demanded time, and the actually delivered time. And, we do this for, all the operations lead time, that for Process A, Process B, Process C, that how much gap is coming, between the demanded time, and the actual delivered time.

And therefore, we need to see, because we need to continuously improve, our delivery speed, we need to continuously deliver products, on a faster rate. Many a times, it becomes a very important, order winning criteria. And, for that purpose, we need to eliminate, our waiting times. We need to schedule our systems, in such a way, that waiting time can be eliminated, from various process steps. And, also we need to eliminate, the wasteful activities.

We will discuss, in one of the session, about Lean Manufacturing. And, that Lean Manufacturing is all about, how to eliminate the wasteful activities. Because, these wasteful activities, are not adding any value, to the product. Rather, they are consuming your

resources, in terms of time. So, that is also a very important, improvement activity, we need to do, for improving our delivery speed. So, we discussed that, some of the important order winners-qualifiers, price, delivery, quality, and delivery speed.

So that, what are the review elements. And, after reviewing those things, how to improve, based on these review results. And, these things, these improvement activities, will actually help us, in finalising the operations strategy. So, with this, we come to end of the session. And, we will continue, from this point, that how to develop, your operation strategy, based on, these review results. And, how to synchronise, various improvement activities, in our efforts, to take advantage of manufacturing. Thank you, very much.