Manufacturing Strategy
Professor. Rajat Agrawal
Department of Management Studies
Indian Institute of Technology, Roorkee

Module No. #06
Lecture No. #29
Process Choice: 3 Dimensional View

Welcome, friends. In our last few sessions, we were discussing about, Process Choice. Now, conventionally we have discussed, that Process Choice is based on, two criteria. One is, volume. And, the second is, variety. And, the very popular Product Process Matrix, is already discussed in our last session. But, we also discussed, that this Product Process Matrix, is not sufficient, to take the complexities of current market. Because, the Product Process Matrix, or the way, we are doing the Process Choice, these are mostly related, to our internal capabilities.

But, when we are talking about, Manufacturing Strategy, and we are talking about, Market Driven Approach, in that, we also need to consider, the external environment. And therefore, the conventional Product Process Matrix, is to be developed, as a 3-Dimensional view. And, we discussed about, the development of that, 3-Dimensional view, in our last session. Now, that 3-Dimensional view, of Process Choice, was represented like this, that you have, 3-Dimensions

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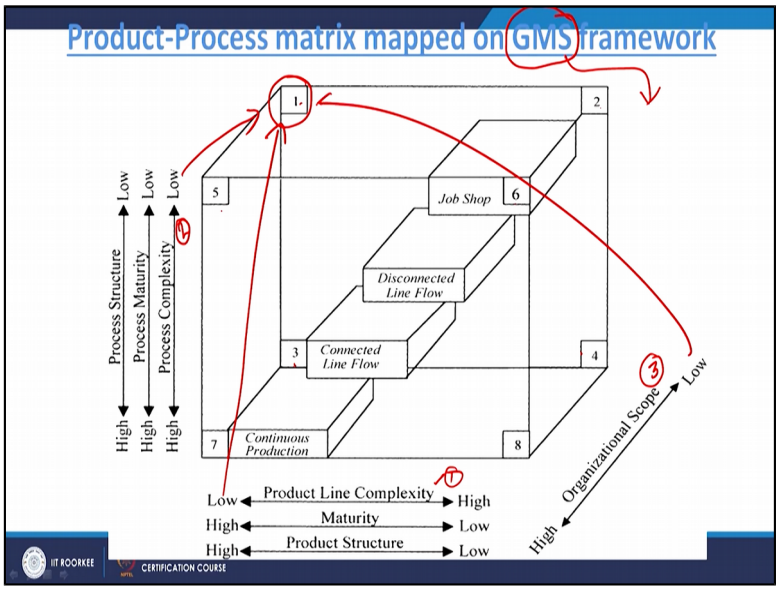

And, one dimension is, Product Line Complexity. That is, one dimension. The second

dimension is, the Process Complexity. And, the third dimension, is the Organisational Scope. So now, we are developing, a 3-Dimensional framework. And, on the basis of this 3-Dimensional framework, we can have, our Generic Manufacturing Strategies. So, this particular session, is going to help us, in two ways.

One, we will be elaborating in detail, about this 3-Dimensional view, of our Process Choices. And, with the help of this 3-Dimensional view, we will develop, some more Generic Manufacturing Strategies. Because, as we discussed, in our previous session, each corner of this shape, 1, 2, 3, 4, 5, 6, 7, 8, all these points, 1, 2, 3, 4, 5, 6, 7, 8, are going to help us, in understanding, different types of Generic Manufacturing Strategies.

Out of these, some may be useful, some may be very attractive, and some may not be very attractive. So, let us see, that what are those Generic Manufacturing Strategies. Though, we have already discussed, in our previous session, that what do we mean by, Product Line Complexity, what do we mean by, Process Complexity, what do we mean by, Organisational Scope, but because of the connectivity, we will like to quickly discuss, that what do we mean by, these three different dimensions.

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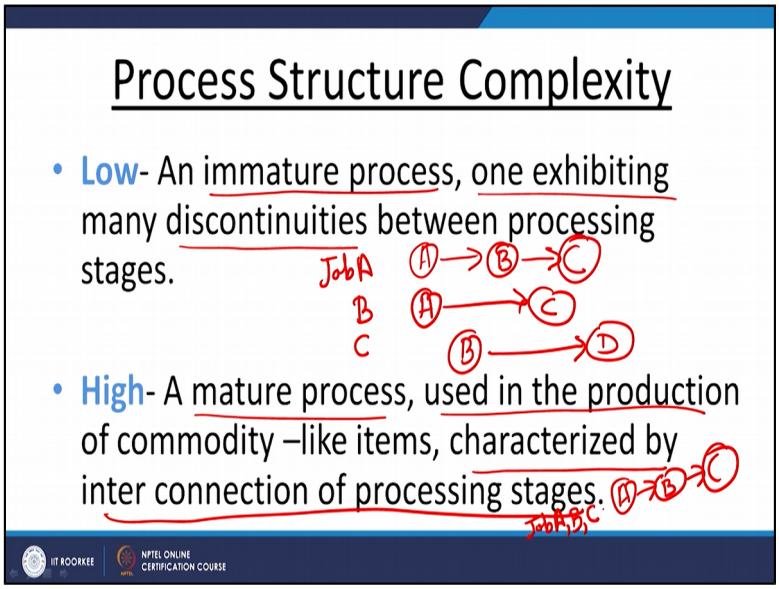

Now, the first dimension, as we discussed, is the Process Structure Complexity. And, Process Structure Complexity is about, whether your process is mature, or immature. So, if it is an immature process, then we say that, Process Structure Complexity is low. And when, a mature process is there, that is, a highly complex process structure. Because, now you have stabilised, your process. And therefore, process is in the maturity stage. And now, you cannot

do, you cannot alter, much with your process. That is the meaning of, Process Structure Complexity.

When your process is not mature, when your process is in infantry stage, you can do lot of alterations, with your process. And therefore, that process is known as, Low Process Complexity Processes. Then, another characteristic, of those immature processes are, that these are exhibiting, many discontinuities. And, many discontinuities between the processing stages, the meaning is that, you are take an example, job shops.

So, in job shops, we have various discontinued processes. For first job, you have a sequence of, Process A, then Process B, then Process C. This is the sequence for, Job A. For Job B, it is quite possible that, you have a sequence of Process A, and directly Process C. For Job C, you have a sequence of operations like, you have B, and then, you have another process D. So, there is lot of discontinuities, between processing stages. And therefore, these are characterised as, Low Process Structure Complexity.

On the other hand, in the case of, High Process Structure Complexity, we have a mature Process. And, the mature process is used, for the production of commodities. And, in that case, you are making this process, only for very limited kind of variety. You are continuously producing, same type of product, using this process. So, you have, lot of interconnectivity. So, now the difference is very much clear, that when it is a Low Process Structure Complexity, you have immature Process. And, these processes are characterised, by discontinuities.

On the other hand, when you have High Process Structure Complexity, you have a mature Process. And, there is, lot of interconnectivity. You have a continuity, from Stage 1, to Stage C. So, if I talk, in the High Process Structure Complexity cases, so for all the processes, we are going to follow, a very similar kind of processes, A, B, C. So, whether it is Job A, or Job B, or Job C, for all these three different types of jobs, we have same processes, A, B, C etcetera. So, if that is the case, it is a High Process Structure Complexity.

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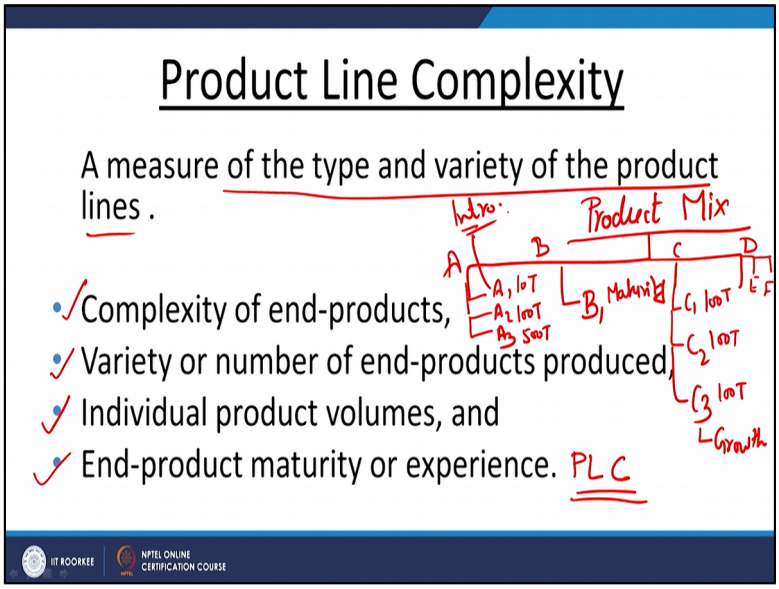

The second dimension is related to, Product Line Complexity. So, we discussed, that Product Line Complexity is basically, the representation of, how many types of products, how many product lines are available, in your organisation, in your Product Mix. So, it is a measure, of the type and variety of the product lines. So, just to give you, the idea, what do we mean by product lines, so there is a concept in marketing, which is known as Product Mix.

So, we need to go to, that concept of Product Mix, to understand the meaning of, Product Lines. Now, the Product Mix are, those complete organisation structure of various products, offered by your organisation. So, like, your organisation may offer, four different types of products, A, B, C, D. Now, it is quite possible that, A, B, C, D, are related to each other. May be, A is shampoo, B is Hair Oil, C is Bathing Soap, and D is Talcum Powder.

So, in that case, all these A, B, C, D are related. But, if A is Shampoo, B is CD's, C is a Software product, and D is, let us say, Cool Drink. So, if A, B, C, D, are these type of product, you have, various unrelated product lines, in your Product Mix. So, there are, whether you have, consistency in your Product Mix, or inconsistency in your Product Mix. So, if product lines are similar, may be, either end users, may be either, because of their production system, may be because of their distribution system.

If, some consistency is there, some similarity is there, in various product lines, we say that, our Product Mix, is a consistent Product Mix. But, if there are, so much dissimilarities, if Product Line A deals, with a different market, it requires, a different type of production facilities, it requires, a different type of distribution facilities, B requires, a different type of

setup, C require, a different type of setup, D requires, a different type of setup.

So, when these different product lines, are having their own peculiar requirements, this is known as, inconsistent Product Mix. So, now, the one idea of Product Line Complexity is, coming from, the consistency and, inconsistency. If you have, a consistent product lines, in your Product Mix, that is, less Product Line Complexity. And, if you have, inconsistent product lines, in your Product Mix, that is, highly Product Line Complexity.

So, that is one way, to understand the meaning of, Product Line Complexity, that what is High Product Line Complexity, and what is Low Product Line Complexity. Then, depending upon, complexity of end products. If, the end products which you are making, you have some typical requirements. Maybe, if you are making a Product A, which requires, 3, 4 different types of variants, A1, A2, A3. It means, your complexity further increases.

But, if you are making a product, where only one variant is good enough, B1. It means, Less Complex Product Lines. So, whether your end products are, complicated, complex, they require different types of variants, so that is another measure of, complexity of your product lines. Then, another measure of complexity of product line, is variety, or number of end products, produced. So, if you have, more products, in your product lines, A, B, C, D. If you increase the width, of your product line, like, if I add E, if I add F.

So, if I add more number of products, in my product line, if I have more product lines, in my Product Mix, that means, I have a complex product line. If I have, less number of product lines, in my Product Mix, that is relatively, less complex product line. So, that is, the second measure of my Product Line Complexity. Then, the third is, individual product volumes. Now, in case of A1, A2, A3, B1, similarly, you can have, C1, C2, C3, etcetera.

Now, in this particular case, if you have, similar kind of volumes, for all the products, that means, you have a less complicated product line. But, if you have, different types of volume requirements, for these different types of products. That is, may be, it is quite possible that, you have, only 10 tons of requirement of A1, why you require A2, 100 tons, and A3, 500 tons. Now, if this type of volume requirement is there, that is further going to increase, the complexity of your product line.

While, in case of C1, C2, C3, if you require, 100 Ton of each. That means, your product line is less complicated. So, on the basis of, variety of volumes, that for each end product, how much volume is required, that is also a measure of, Product Line Complexity. Then, depending upon, the stage in the life of a product, this is particularly related, with the concept of product life cycle. So, if you see, the concept of Product Life-Cycle, so it is quite possible that, in a wider Product Mix, different products are at, different stages in their lives.

For an example, if I have a B1 product. So, B1 product may be, in the maturity stage. And, C3 product, is in the growth stage. And, A1 product, is in the introduction stage. Now, we have already discussed, in our previous sessions, that because of, different stages at Product Life-Cycle, different products may require, different type of Order Winners and Qualifiers. So, since A1 is at the introduction stage, B1 is at the maturity stage, C3 is at the growth stage, so my complexity will further increase.

Because, these different products, due to their, different stages in their product life cycles, will be having, different types of Order Winners and Qualifiers. So, this going to add, to my complexity further. So, that is another measure, that is another way, to determine the complexity of my product line. So, that is about. So nowadays, the idea of this Product Line Complexity, is more market-driven.

Earlier, this type of understanding was not there, with respect to products. So, earlier, the product means, that you have, either volume, or variety. So, that was the only idea, with respect to product. But now, because of more detailed understanding of product line, we are including various market-oriented concept, to understand the Product Line Complexity phenomena.

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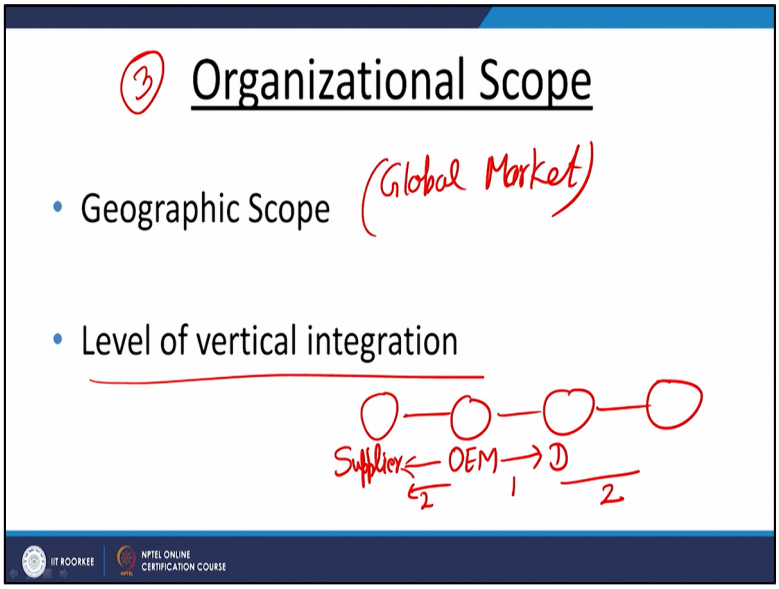

Then, the third dimension, of this 3-Dimensional view, is the Organisational Scope. Now, in the Organisational Scope, we consider two aspects. This is, entirely a new dimension, for our Generic Manufacturing Strategic framework. Now, these are geographical scope, at the level of vertical integration. So, geographical scope is related, to the global market. So, how many markets, are we covering? That is the aspect of, geographical scope.

And, level of vertical integration means, that in my supply chain, where are we. And, whether we are going for, forward integration, or backward integration. So, we want to go, more into the distribution retail side of our business, or we want to start our development of spare parts, development of raw material, development of subassemblies. So, either direction, we can move. We can start, forward integration. We can start, backward integration.

So, what is the level of vertical integration, from my position. If, I am at this position, I am original equipment manufacturer, so I can go for distribution of my product. Or, I can also go, for developing the facilities, for making subassemblies, for my own product. So, I can become a supplier, for my own organisation. Or, I may become, customer of my own organisation. So, in whatever direction I move here, that is known as, vertical integration.

So, I may go for, one stage of vertical integration, I may go for, two stage of vertical integration, I may go, one step forward, one step backward. So, there are, variety of possibilities, in which, I can go for vertical integration. So, that is also one aspect of my, Generic Manufacturing Strategic framework. So, these are the, three important dimensions, we discussed.

And, on the basis of, these 3-Dimensions you see, Product Line Complexity, Process Complexity, and Organisational Scope, we are now going to discuss, eight possible Generic Manufacturing Strategies. Now, let us see, that what are these, eight Generic Manufacturing Strategies. So, you please keep remembering, that diagram.

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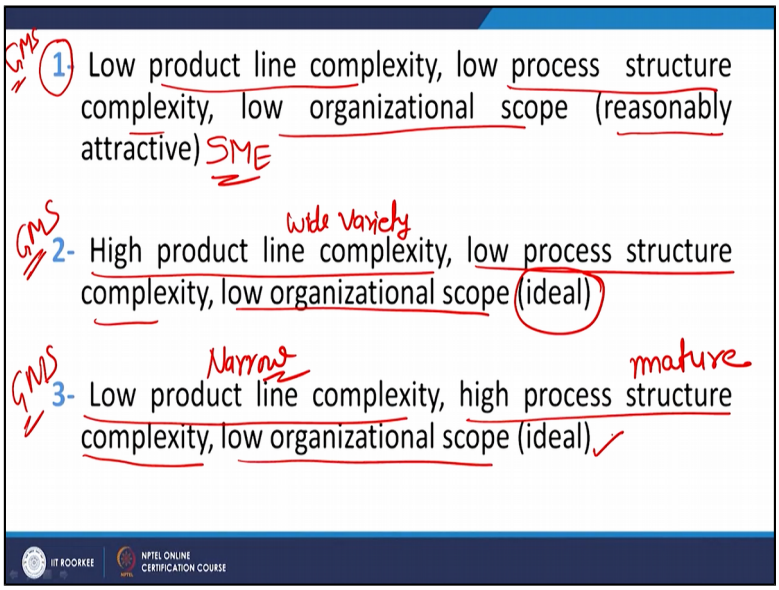

And, now, this is, Generic Strategy, GMS-1. This is our GMS-1. Now, what is this GMS-1. This is, that you have, Low Product Line Complexity, Low Process Structure Complexity, and Low Organisational Scope. So, everything is on the, low side. You have, Low Product Line Complexity, Low Process Structure Complexity, and Low Organisational Scope. So, if I see, if I take you to this diagram, in that, we see that, this is that, Position Number 1.

Where, you have, Low Product Line Complexity, you have Low Process Complexity, and you have Low Organisational Scope. This is that, Point Number 1. And, as we discussed that, since our Product Line Complexity is low, it means, we are not offering many products. Our product, are limited. We are, into narrow zone of product offering. Or, the products which we are offering, are more or less, consistent with each other.

Second is, Process Complexity. So, the Process Complexity, is also low. So, our Process Complexity is low, it means, it is more or less, immature kind of processes. So, when we have, limited variety, and our processes are also, not very mature, and therefore, our Organisational Scope is also, low. Because, limited number of process, limited number of products, and therefore, we are distributing our products, in a limited market.

We have, a limited market. We are not present, in various geographical locations. And, at the same time, because of the, small scope of my organisation, I am not interested, in much of vertical integration. So therefore, this Point 1, is suitable for those organisations, which are particularly, in this SME sector. This is suitable case, for SME sector, where you have, everything, within a small Organisational Scope.

You have, limited number of products. And then, depending upon the requirement of the market, which type of product is more useful, at a particular time, you will like to make, that type of product. So, it is reasonably attractive, as I mentioned, that we will also discuss that, which generic strategy is attractive, and which is not attractive. So, this is reasonably attractive strategy, for the small and medium enterprises.

Now, coming to the, second type of GMS, is the, High Product Line Complexity. Now, this is just opposite to the first, in one particular sense. That, High Product Line Complexity, but Low Process Structure Complexity, and Low Organisational Scope. The meaning is that, when you have High Product Line Complexity, it means, you are offering, wide variety. Here, you are offering, wide variety. And, wide variety is only possible, when you have discontinued processes.

Like, you take the example of, our job shops. So, in our job shops, we have already discussed that, we have large number of products, coming in small volumes. And therefore, you have, Low Process Structure Complexity here. Because, you have, different types of discontinuities, in your process structure. And, these are not, mature processes. And, at the same time, you have, Low Organisational Scope, because of smaller volume of your products, you cannot reach to large market sizes.

So, therefore, Low Organisational Scope means, you are present in a, limited number of markets. So, this is a, second type of Generic Manufacturing Strategy. And, as I say, this is an ideal kind of Generic Manufacturing Strategy. So, you can say that, if you are producing, wide variety of products, you obviously will go for the job shops. And, in that case, you should not try for, High Organisational Scope, or you should not try to reach, to many markets.

You should limit, to only few markets. So, that is a very ideal case, for your organisation. You will be able to take, lot of advantage, with respect to that. Now, the third type of Generic Manufacturing Strategy is, Point Number 3. Now, Point Number 3 says, that you have a Low Product Line Complexity, but now, you have, High Process Structure Complexity. Now, when you have, Low Product Line Complexity, it is possible, when you have, a narrow kind of product lines.

You are producing, some limited number of products. And, these limited number of products, are either in their maturity stage, or their volume is, may be high. But, consistent volume is there. So, there is no fluctuation, in the volume of the product. Therefore, you have, Low Product Line Complexity. And, High Process Structure Complexity says, that these production systems are mature. So, these production systems are, mature.

And, when these production systems are mature, you can continuously produce, same type of product, in that organisation. And, here, the Low Organisational Scope means, the meaning of Low Organisational Scope is that, we do not want to go for, much of vertical integration. We may go for, more number of market, because we are producing, narrow products, limited amount of products. But, the processes are matured, and therefore, we can produce those products, in large volumes.

So, we can go, to different geographical markets. We can go from, Market A to Market B. From India to, many South Asian countries, we can go, to distribute those products. But, we will not like to go, for much of vertical integration. So, in this case, the meaning of distribution is that, you can have your distributors, but you yourself will not like to go, into that kind of vertical integration activity. So, that is the meaning of, Low Organisational Scope here. This is also, an ideal kind of, Generic Manufacturing Strategy.

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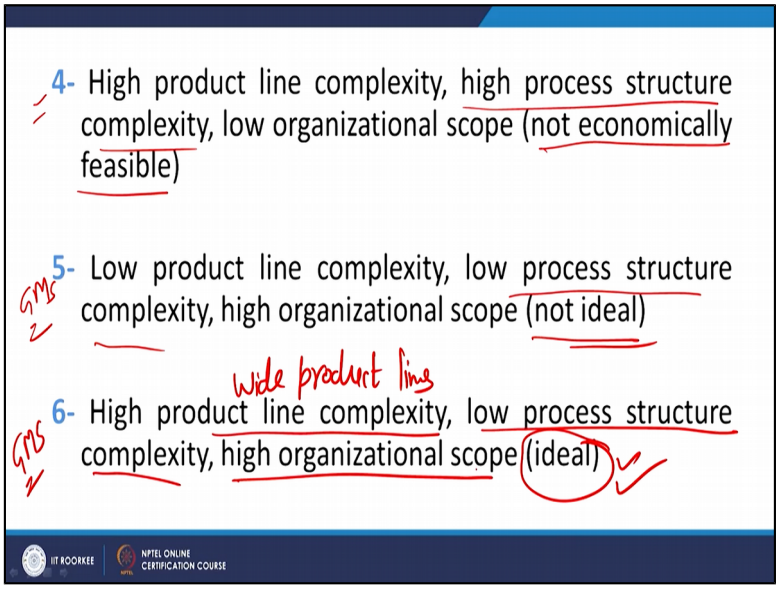

Then next is, the fourth one is, High Product Line Complexity. So, you have, a wide Product Mix, and High Process Structure Complexity. Now, High Process Structure Complexity says, that for each of these product line, each of these products, in your Product Mix, you are going to achieve, a mature product process. That is why, we say that, this is not economically feasible. That, you are having, large number of products, in your product line.

And, for all those products, you are having this, High Process Structure Complexity. So, that is, economically not feasible, because of developing the High Process Structure Complexity, you need to do lot of investment. And, that may be the subject matter of discussion, in our next session, that how it is not economically feasible. Then, another Generic Manufacturing Strategy, the fifth one is, Low Product Line Complexity, Low Process Structure Complexity, and High Organisational Scope.

Now, you have, Low Product Line Complexity. It means, you have, only few products, narrow product lines. And, your Low Process Structure Complexity, it means, your processes are also not mature. You have, lot of discontinuities in your processes. But, you want to have, High Organisational Scope. You want to be in, many markets. Or, you want to integrate, your supplier. Or your customers, distributors, on other side.

So, this is, not an ideal choice. It is not, a good choice, for your organisation because, you will not be able to reap, any benefit out of it. So, that is, not to be discussed much, because of non-idealness, of this kind of, Generic Manufacturing Strategy. Then, another Generic Manufacturing Strategy, sixth is, you have a High Product Line Complexity, and Low Process

Structure Complexity, and High Organisational Scope. Now, what does it mean. Because, it is an, ideal kind of GMS.

Now, what is the meaning of this type of GMS, that you have, High Product Line Complexity. It means, you are offering a, wide Product Mix. You have, wide product lines. And then, Low Process Structure Complexity. That is again, you have immature processes, discontinued intermediate processes, that is the Low Process Structure Complexity. But, you want to have, High Organisational Scope. Now, when you are producing, large amount of products, you are having, large variety of products. You can either go, for large number of markets.

You should have, more markets, into your domain. Therefore, the purpose of High Product Line Complexity, is useful. So therefore, this becomes an ideal type of, Generic Manufacturing Strategy. Because, to produce wide product lines, we require, Low Process Structure Complexity. So, that will make it, economically feasible. And, because, you are offering, wide variety of products, you should be able to distribute, you should go to, different geographical markets. So, that is why, it is an ideal type of, Generic Manufacturing Strategy.

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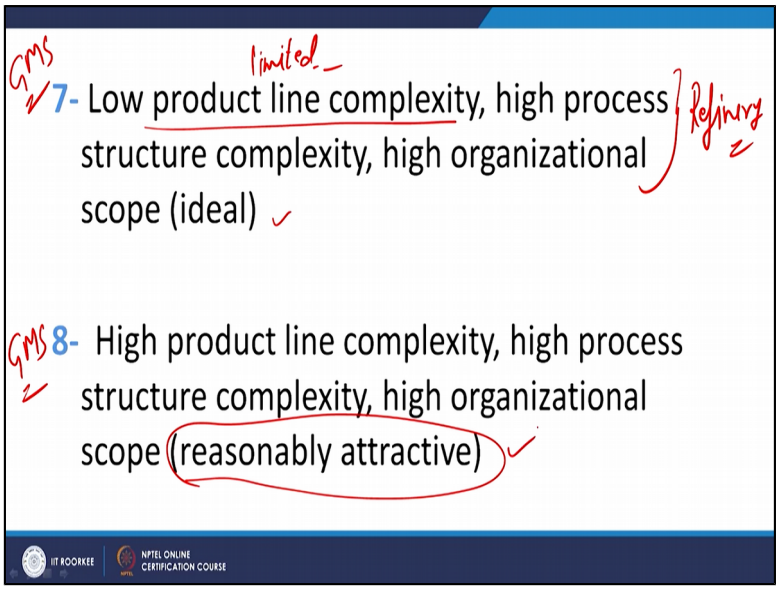

Then, coming to the seventh type of Generic Manufacturing Strategy, we have, a Low Product Line Complexity, High Process Structure Complexity, and High Organisational Scope. So, that is, again an idea type of Generic Manufacturing Strategy. Because, Low Product Line Complexity means, you are offering, the narrow product lines. Some limited

number of products, you are offering, in your product lines.

Then, the second is, High Process Structure Complexity. High Process Structure Complexity means, you are having the, mature processes. And, this is a continuous, production kind of system. And, High Organisational Scope, that means, you should go, to large geographical markets. So, if you take an example of refinery, this type of example is suitable, to this seventh GMS. So, if you are developing a refinery, you should sale your product, you should go to, large number of geographical markets. Therefore, it becomes an ideal kind of, Generic Manufacturing Strategy.

And then, the eighth Generic Manufacturing Strategy, the last one in our discussion, right now, that is the High Product Line Complexity. So, you are offering, wide variety of products, High Process Structure Complexity. So, you have mature processes, where you have, lot of continuous production system, and High Organisational Scope. So, High Organisational Scope means, you are either, going into large number of, geographically distributed markets, or you are going for, large amount of, vertical integration.

So, both these things are possible, in High Organisational Scope. So, because, all these three things are, looking interconnected. Therefore, we say that, it is a reasonably attractive proposition. So, these are, the eight different types of, Generic Manufacturing Strategies. And, now if I see, the comparison of, these eight different types of Generic Manufacturing Strategy, in a single glance.

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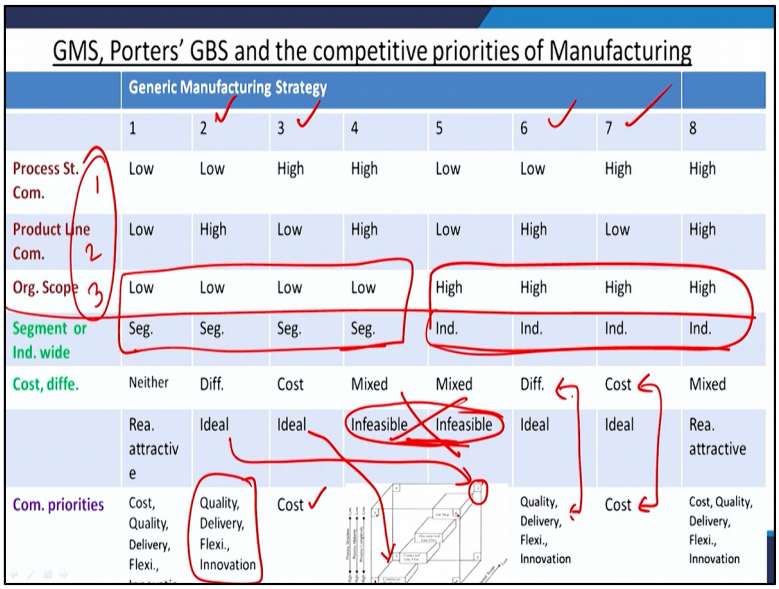

GMS, Porters' GBS and the competitive priorities of Manufacturing

	Generic Manufacturing Strategy							
	1	2	3	4	5	6	7	8
Process St. Com.	Low	Low	High	High	Low	Low	High	High
Product Line Com.	Low	High	Low	High	Low	High	Low	High
Org. Scope	Low	Low	Low	Low	High	High	High	High
Segment or Ind. wide	Seg.	Seg.	Seg.	Seg.	Ind.	Ind.	Ind.	Ind.
Cost, diffe.	Neither	Diff.	Cost	Mixed	Mixed	Diff.	Cost	Mixed
	Rea. attractive	Ideal	Ideal	Infeasible	Infeasible	Ideal	Ideal	Rea. attractive
Com. priorities	Cost, Quality, Delivery, Flexi.,	Quality, Delivery, Flexi., Innovation	Cost			Quality, Delivery, Flexi., Innovation	Cost	Cost, Quality, Delivery, Flexi., Innovation

So, you have seen that, these eight different Generic Manufacturing Strategy, and where we have the, Process Structure Complexity, the Product Line Complexity, and the Organisational Scope. So, these are the 3-Dimensions, on the basis of which, we have these eight different types of, Generic Manufacturing Strategy. Now, the second point, which we are discussing in this particular slide, is that, whether these things are applicable, for a segment of market, or for the entire industry.

So, here we see that, some of these strategies like, 1 to 4, these four strategies are applicable, only for the segment, particular segment. While, Strategy Number 5 to 8, are applicable for the, entire strategy. So now, if you see that, I have a diagram here again, of our framework. So, these Point Number 5, 6, 7, 8, are on the, higher Organisational Scope side. So therefore, you have, these industrywide application. You can, combine this discussion, like this.

And, Point Number 1, 2, 3, 4, are towards the, Low Organisational Scope side. And therefore, these are applicable, to a particular segment of your industry. Then, we have also tried to map, the generic business strategies, given by Michael Porter. Because, that is also a very popular kind of, strategic framework, given by Michael Porter. And, whether you have, the cost leadership, or you have a differentiation kind of strategy, that is the two very important strategies, proposed by Michael Porter.

So now, if you see that, like Strategy Number 1, is not giving you, any particular answer, with respect to Michael Porter. But, if you see the Strategy Number 2, which is one of the ideal kind of strategy, which is coming here, this is like giving you, the differentiation kind of generic business strategy, proposed by Michael Porter. Similarly, if you see the Strategy Number 3, now that Strategy Number 3 is also, an ideal choice. And, this Strategy Number 3, is giving you, the Cost Leadership type of Business Strategy, proposed by Porter.

Similarly, you can see that, Strategy Number 4 and 5, which are infeasible. These are, to be rejected. And therefore, we have not exactly, any kind of clear cut, cost leadership or differentiation advantage, coming from, these two types of strategies. And, then again, when you have a clear decision about, the ideal condition, is when we have differentiation, for sixth, and for seventh, we have the Cost Leadership advantage.

So, the point is that, when we are able to clearly identify, that what type of business strategy

is, this particular Manufacturing Strategy is providing, those are the ideal combinations. When we have a kind of, we are not able to clearly say, that whether it is a cost or, differentiation type of advantage, we say that, it is not a good, or it is a reasonably okay kind of strategy. So, you have four strategies, 2, 3, 6 and 7, which are, our choice of the day, that these are the ideal conditions.

So, out of 8 points, 4 points are giving us, me, Generic Manufacturing Strategies, which are suitable, which are ideal. And, you can also see that, what type of Order Winners and Qualifiers, what are the capabilities, these strategies are providing to me. Like, in this case, second, you are getting the, competitive priority of, quality, delivery, flexibility, and innovation.

In case of generic strategy three, you are getting the, cost leadership advantage. Similarly, in 7 case, you are getting the, cost leadership advantage. And, again, in case of 6, you are getting the advantage of, quality, delivery, flexibility, and innovation.

So, with this, we can finally see that, those Generic Manufacturing Strategies, which are coming ideal, from this discussion, are also giving some type of, clear-cut business strategy advantage, whether it is related to Cost Leadership, or related to differentiation. And therefore, this whole discussion, matches, not only at the functional level, but at the business level also. So, with this, we come to end of the session. Thank you, very much.