Principles of Industrial Engineering
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Lecture no 08
Organizational Structure: Product Strategies

Hello I welcome you all in this presentation related with subject principles of Industrial Engineering. And in this presentation basically we will be talking about the different product strategies which are available and used to manufacture the products. So that they can be made available to the customers as per their requirements. So, now we will see what are the various aspects related with this.

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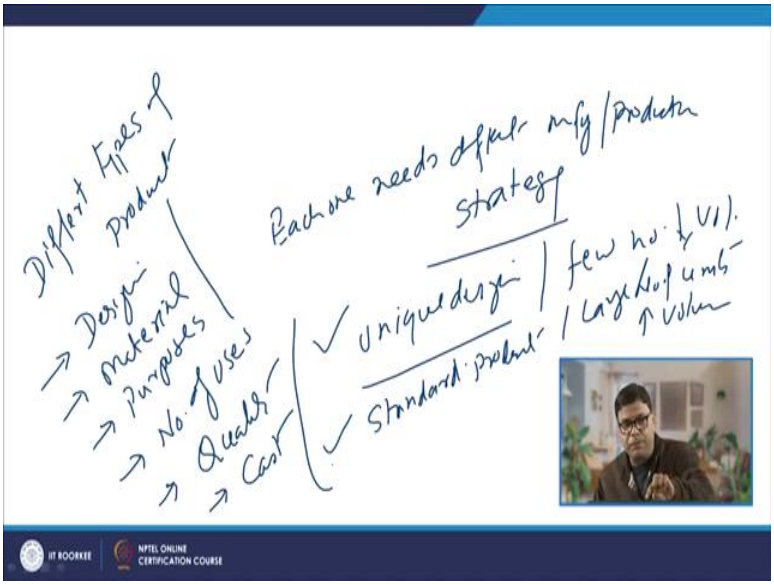

Like whenever we see around us there are different types of the products different types of products that we use for variety of purposes. And these products may be of the different designs, made of the different materials for different purposes. Since, all these things vary and at the same time the number of uses for each type of, for such type of products will also will be different. So, number of users. The kind of quality that they are looking for. All those things are different.

The kind of the cost that they can afford. So there are different types of the products which are made of the different designs, materials, purposes and that is why each one needs different manufacturing or the production strategy. Like the few products are made in a very unique

design. So uniquely designed products are sold in very few in numbers. So the few numbers or very less volume. But there may be another category of products which are sold in very large numbers. So these are standard products, standard products.

And a huge number of the customers or large number of the customers will be using them. So very large number of the units are sold. So, very high volume is used. And since, in one case the unique design, in another case very standard product design and the product material is used for manufacturing them. And that is why the kind of the approach to manufacture the different kind of the product should be different. So it is important that which kind of the product manufacturing strategy we should use.

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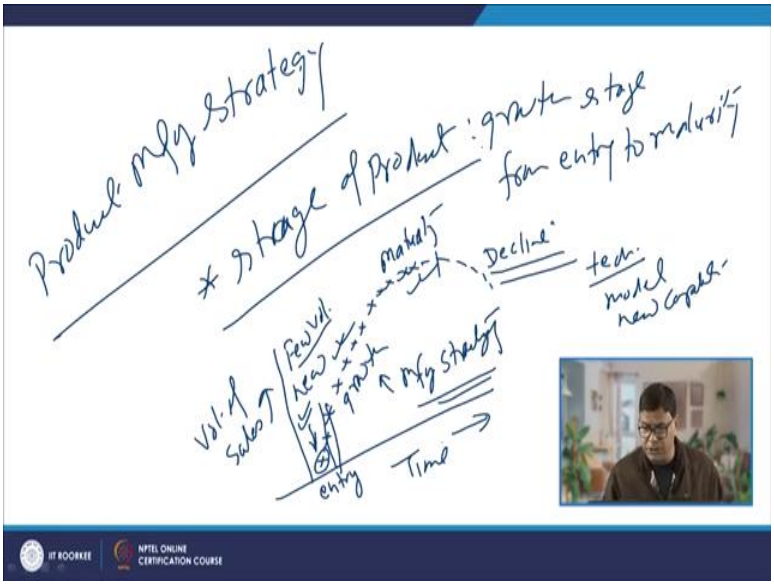

So the product manufacturing strategy is primarily governed by the two aspects, one is what is the stage of the particular product which is to be manufactured, stage of the product which is under consideration with regarded to its growth stage from entry to the maturity. Now, what is the meaning of this? Like whenever any product is introduced in the beginning it is new so the sales volumes are very limited. So few units are manufactured and those are sold.

Gradually as the popularity for the product increases the volumes will be growing like this. So, the volume of sales or the number of users we can say in the y-axis. In x axis the time, the way by which the volume of the sales will be growing for a particular product. So at the entry stage it

is very less, this is the entry stage. And then it has growth stage. And then it will keep on growing, thereafter it will get stabilized. So, this is called maturity stage. In the maturity stage the growth of or the number of units of that particular product that will be maximum.

And as a function, this may continue for a while. Thereafter we may see that there is a decline. So, the next stage becomes the decline. So in the decline stage, so there are three basically stages. In the initial stage it is very new, very few volumes, volume is very limited. And in this case, so in this case the kind of manufacturing strategy that we should use will be different then in the growth stage or in maturity stage. And once the maturity stage is realized, thereafter it is possible that the number of units being sold, that will start decreasing.

And this happens due to the change of technology, the models become very old or the new competitors will come in the market. So, we have to see the product about which manufacturing strategy is being considered what is its growth status? Whether it is in the new stage, in the growth stage, in the maturity stage. Accordingly we try to select the suitable manufacturing strategy. So this is one point related with the selection of the suitable product manufacturing strategy. The stage of the product in the product life cycle from entry to the maturity stage.

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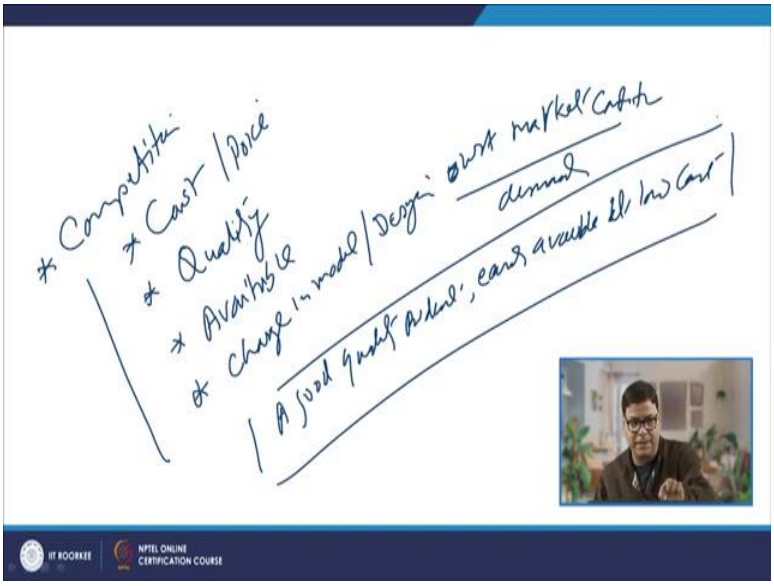

Then we have the another point which is considered which regard to the product manufacturing strategy is the kind of the competition. Competition which is being experienced, which is being

imposed by others, which may be in form of the kind of the cost at which others are making the same product available. So, the cost or the price of the item at which the competitors are making the same product available. So, the second one is the kind of the quality, what is the quality, that the product of competitors. Then we have the availability.

Whether its supply is abundant and it is readily available in the market or and it or it will be available against the order. Then the how fast the change in models or the designs is expected to take place in case of the, or how fast things are changing with regard to the, with regard to the, especially with respect to the market conditions or demand. So these are the kind of the factors also that we should consider with regard to the selection of the suitable product manufacturing strategies.

Basically what customer wants that a good quality product is easily available at low cost. So, this is what is the expectation from the customer. To satisfy these aspects an organization must look into the way by which product should be manufactured, so that it can be made available to the customers at the low cost. So, accordingly the suitable manufacturing strategy has to be selected. So that is what we can see here, for developing an organizational structure according to the kind of the manufacturing strategy we have to adopt. So that we can produce the products which can satisfy the requirement of the customers or the need of the customers.

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So these are the points that we have to consider for selection of the suitable manufacturing strategy.

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Since, there is very large number of the products which are used by the customers. So all these products can be classified into three categories. One is the custom designed products, standardized products and mixed strategy products. So, these are the three kind of the products and accordingly we will be using the different manufacturing product manufacturing strategies.

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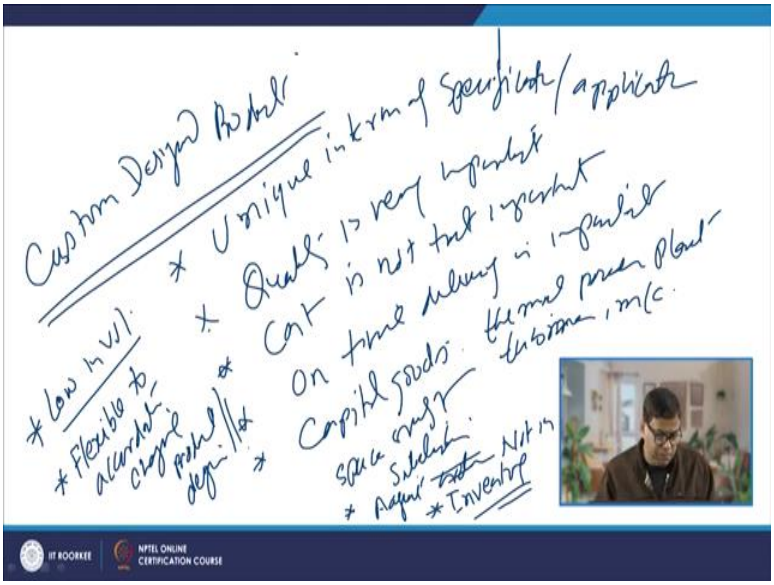

Say in case of the custom designed products, these custom design products are very unique in terms of the specifications. As well as the application for which these will be used. So the working conditions and the specifications of which these products are needed, that is very unique. So, unique in terms of the design specifications and the applications for which these are to be used. And the second one, second feature related with this is that the quality.

Quality is on the top. The very high quality is very important for such kind of the products. The cost is not that important. Then the on time delivery is important. Then here if we see the kind of products usually falling in this category, all capital, most of the capital goods, thermal power plants turbines, machineries, space crafts, satellites. So all these are developed according to the need of the users whosoever is the user of the product.

So another important thing with these kind of the product is, these are manufactured against the order. And these are not available in the inventory. So not in inventory. Because these are manufactured against the order. Since, the number of units of such kind of uniquely designed products, which will be manufactured against the demand of the customers. So the numbers will be very less. So, very low in volume. Number of units which will be manufactured that will be limited.

And at the same time these will be very prone to the change as per the requirement of the customer. So whatever manufacturing strategy we follow that should be in position to accommodate the change in design of the product. So flexible to accommodate the changing product designs. So, these are the features related to the custom design products. The design change is very common and our manufacturing strategy should be in position to accommodate these design changes in the production.

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So that is what we can see here in the custom design products. Specification as per the customer needs, for example, spacecraft, aircraft, capital goods, power system components like turbines or construction of the house. All these are like say uniquely designed and manufactured according to the need of the customer.

These are not manufactured for the stock or these are not available in inventory. The focus is on the quality, uniqueness and the timely delivery of the products. These are very sensitive for change in the design. Normally, the cost is not very important criteria. And that is why it leads to the high profit margins. And the cost is not an important criteria.

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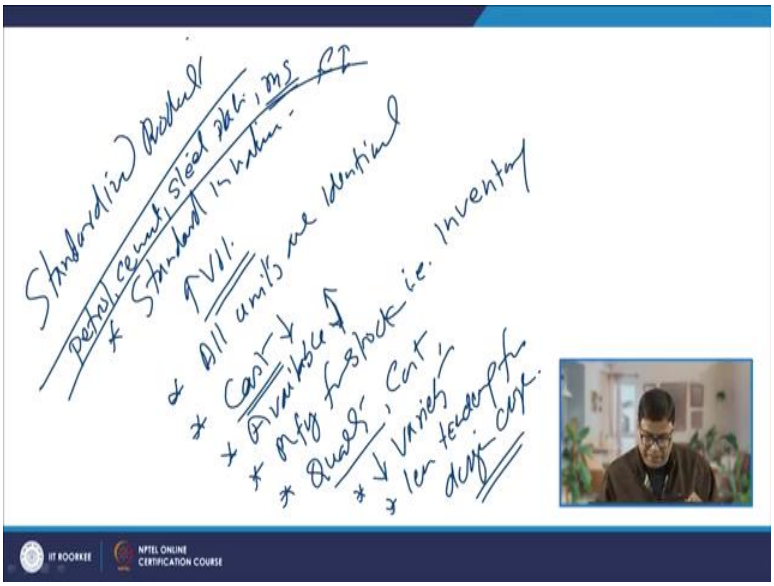

Another one is the highly standardized products, in the standardized products, means standardized products. So they, these products are very standard in nature. And that is why the volumes in which these are sold, the volume is extremely high. All units which are being manufactured under this product category, all units are identical. So common example for this is like petrol, cement, steel plates like commonly used mildly steel, cast iron.

So, all these are things, like say these are things very limited variety in terms of the material we will find. Bars, rods, girders, plates etc. These are like say extended kind of things. This will be sold in a very large number. All these will be identical in nature. So and then here the cost is crucial. Availability of such kind of the product in the market is also very important. So the cost should be less and availability must be high.

To increase the availability, of course, since all units are identical, so they are manufactured for stock which means these are available in inventory. These are available in inventory. And in this category we will find that we cannot do much, actually to change the quality, to change the cost and the varieties or the design change in such category of the product is very less possible. So limited possibility for design change, very less variety and less tendency for design change.

Means the change in design or specifications for such kind of product is very rare. These are produced in very limited variety, but in very high volume. All units are identical, cost is important, availability is important, etc. So, that is about the standardized products.

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That is what we will see all identical like petrol, cement, steel. These are manufactured in very large volumes, continuous production is needed to while manufacturing such kinds of the products because irrespective of the demand, these are manufactured and stored in inventory. So that the demand can be fulfilled as and when it is required, it helps in smoothening the manufacturing process against the fluctuating demands, cost and availability are crucial. And these are manufactured in very limited variety. The chances for the design change. This is a chances for design change are very less.

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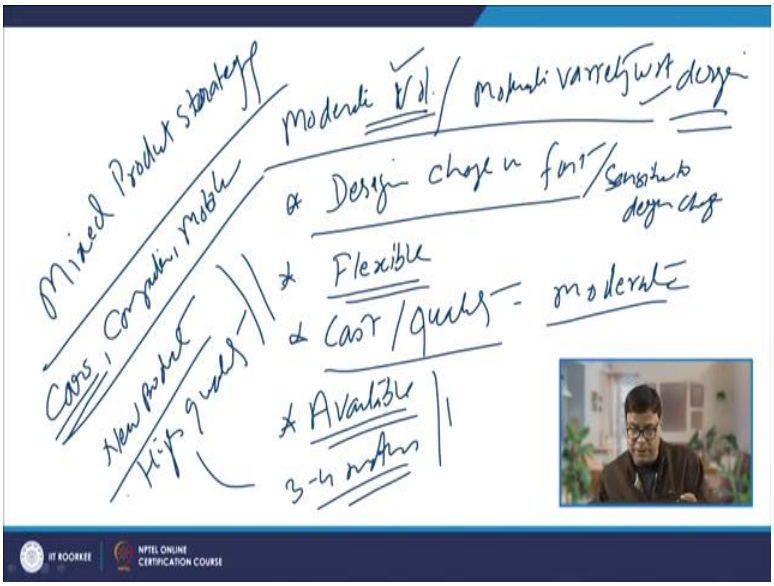

Then we have the mixed product strategy, mixed product strategy. Mixed product strategy, where we will have the moderate volume, not very high, not very low. Moderate volumes and the moderate varieties also. Not very limited, not very large in number of varieties of units which will be manufactured by the company. So moderate volumes, moderate varieties with regard to the, with respect to the design.

And the design change is also very fast. In this category, design change is fast. So to deal with the fast changing design conditions of the moderate volume, moderate variety kind of the products. A mixed product strategy is used and in this category we have the products like cars. A car manufacturer may be manufacturing the cars for the different segments like small size, mid-size, and the big size or large size. And then in each category again it will be offering the various designs. And these models and designs will keep on changing very rapidly.

So the cars computers, mobile phones are the typical example, examples of the mixed product strategy. So these are very sensitive for the design change. Design changes very fast. So sensitive to design change. Now the next one is like our manufacturing system must be flexible for the changing design requirement. The cost, quality requirements are moderate. Not like not cost is not very high criteria like in case of the highly standardized products and the quality is not as high as in case of the custom designed products.

And likewise the availability also availability is also a very moderate parameter, like we will see that if there is a new product which is being launched and it is expected to be high quality then we will see that people will be happy to wait for that for a certain time like the new cars launched, so there will be waiting of the 3 to 4 months. Likewise whenever new phones are launched by Apple, people wait for those phones for a while.

So if the quality and the designs of the new product, quality is high, the products design is high, the reliability and credibility of the product in the market is high. Then availability is not that crucial with regard to the like how easily it is available in the market.

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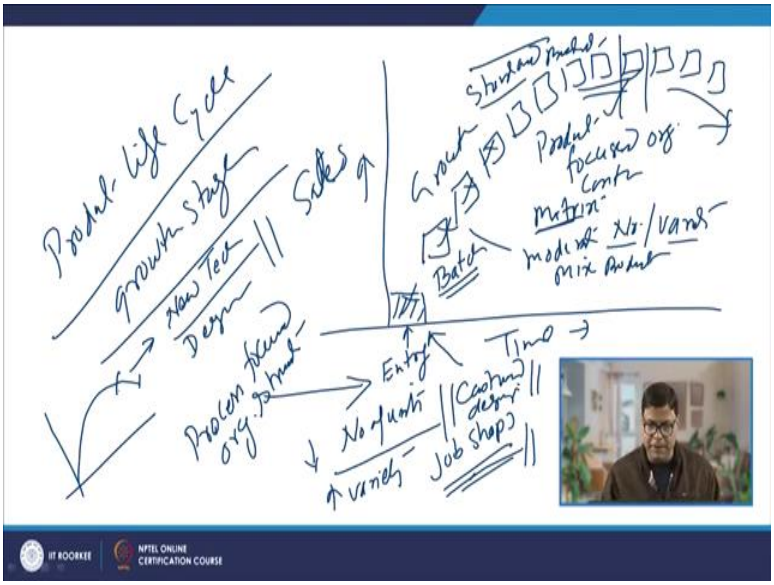

Now we will see the product life cycle especially with regard to the growth stages. So as briefly I have explained earlier, now we will see it with regard to the product manufacturing strategies. So as a function of time, when any new product is launched, so there is a entry stage. At the entry stage the numbers are less and variety. So, at the entry stage, number of units which are manufactured is less and the variety is high. So to manufacture, wide variety of products in fewer in number, we apply the Job Shops principle.

Like so many specialized machines are there, so many multipurpose machines are there which will be used to manufacture variety of the products. So multipurpose machines and the specialized the people will be needed for doing this kind of things. So the Job Shops kind of the

approach. Gradually as the sale volume will be increasing. So, here we have the sales. Number of sales will be increasing, so we need to manufacture more and more. So there will be so this is the initial stage.

Then we have the growth stage. In the growth stage, there will be some intermediate stages. So this is the second one, this is the growth stage. So when the volumes are of the intermediate then we use the, we produce the things in batches. So this is this is you can say for dealing with the job shops kind of situations, when large variety of the products are to be manufactured very few in numbers. The process focused organizational structure is developed.

In between when the numbers increase, things are produced in batches, then we. So here in this case, we have the moderate numbers as well as variety. Earlier, the variety was high and the numbers were less. Now, the moderate variety and numbers. So this is the stage of the mixed products strategy. Further with the increase of the growth when we find that we will not be able to sustain the variety. Then the numbers of the, the variety is reduced and we go for the product focused product focused organizational structure. So here continuous production is done.

So initially, process focused then mixed product strategy and then the. So in the initial stage, basically this is the custom designed product strategy, mixed product strategy and then now we have the standardized product status, when it reaches to the maturity and then this stage will be maintained for a while, thereafter it will start decreasing. So this is the maturity stage and then decline will start. So here there are two aspects about which I am talking.

One when the volumes are less, variety is high the custom designed stage, at this stage the production is realized to the Job Shop format. Process focused organizational structure is used for this. When the things are produced in batches, mixed product strategy is used for that. This is the growth stage and for that we may use the combination of the both process and product focused strategies. So here this maybe like the matrix organizational structure combines both process and the product focused organizational structure.

And then when the numbers increase significantly, asking means forcing the industry to go for the continuous production of the standardized product, very few in variety. So that is the stage where the product focused organizational structure is used. Once it reaches to the maturity level,

thereafter we may find that the volumes have started to come down. This is the stage when it needs the intervention in terms of the use of the new technology, in terms of the new designs to be used. So that the slipping sales, decreasing sales can be countered effectively.

So this is in the decline stage we need to work on the product designs features technologies, so that it can be addressed properly. Now we will see that why does it occur, it may be the case like technology has become obsolete, the cost that which we are manufacturing, it is not that attractive as compared to the competitors. Or new competitors have come into the market. So those are the things related with the related with the maturity stage.

Now, I will summarize this presentation, in this presentation basically I have talked about the factors that govern the manufacturing industries to follow the different product strategies, and what are the different features related with the different types of the product manufacturing strategies. Thank you for your attention.