Project Management for Managers
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Lecture - 55
Introduction to Quality Management

Hello friends, I welcome you all in this session. In previous session we were discussing about points related to cost of the project, how to you know control cost. We have also seen about, we have also seen things like should we start our project as early as possible or as late as possible right. And in previous case we have seen that there is nothing wrong in starting an activity as late as possible, unless and until you are completing project in time. But the problem in that case is that you do not have any slake or any float right.

So, it is up to if your organization is a professional one then there is nothing wrong in starting activity as late as possible, because you can save cost at the end of the day right. Cost in the in terms of interest right. So, let us look at one of the important areas of project management and this is quality management. If you look at quality then everybody nowadays talks about quality, if I ask a question what is quality then you may come up with several answers, right? You may say that a product which is available readily is a quality product. If you get product in time is a quality product, if product satisfy you know if product satisfies your requirements then it is a quality product right.

So, quality has got different connotations, and everyone has got different motion about quality. Whatever is a quality product for you may not be a quality product for me isn't it? It is not only about product, but about services as well. So, we will look at couple of concepts related to quality and different a tools and techniques available related to quality management. So, I hope that you would have come up with your answer about this question what is quality right. So, keep in mind that answer and we will try to look at some other definitions of quality ok.

So, let us look at this slide. In this slide I have shown you couple of pictures.

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If you look at first picture, there is a fellow who is who has got sugarcane extraction machine and there are certain gears in this machine right. You know these are different gears right. This gear and this one more gear and you know these are different gears. Now if you look at second picture this a wrist a wrist watch gears. So, these are different gears in a wrist watch right, a mechanical watch. And in third picture I have shown some of the gears which are which you know which are useful in airplane right. And are which are being used in airplanes right.

Now, the question is which type of gears out of these 3 having the best quality? That is the question. I know that some of you would have answered this, and some of you would have answered this. I do not think that anyone of you would have answered that the best quality gears are gears of sugarcane extraction machine right. That is what I hope right. If your if your answer is this then also then I think you are very intelligent right.

So, if you look at all these 3 types of gears, we can not say that these types of gears are important are having more quality or these gears have got more quality, no it is not like that. All gears are having quality why? Because they are serving their intended function, for which those gears were made those gears have been doing their intended functions. So, we will say that they are quality gears right. So, what is the first and foremost definition of quality is? It is the oldest definition of quality given by one quality expert by the name of juran. He said that it is fitness for use, whatever product you make, if it is

serving the purpose for which it has been made then it is a quality product; oldest definition of one of the oldest definitions of quality right, fitness for use right.

Now, after juran there are several experts who have come up with their own definitions of quality. One more quality expert by the name of Deming, he said that a quality is something when you get the product in the market at it is at lowest cost right. So, he looked quality from the cost and market point of view right. Then another quality expert Crosby, he said that the product will have quality if it is confirming to the requirement of the customers right. So, there should be conformance to the requirement of the customers time that is a quality product.

Now, every organization wants to produce quality product. And these experts have said that there are 2 groups of people who are responsible for quality product; the first set of people is those who come those who you know form management. And the second group is workers group right. So, juran said that most of the times it means for 80 percent of the time quality is the responsibility of the management not of the workers.

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For less than 20 percent of the time quality is responsibility of workers.

On the other hand, Deming said that it is the responsibility of management, and 94 percent is the responsibility of management and 6 percentage of quality of is the responsibility of others right. And of course, Crosby did not give any number, but he said

no at the end of the day it is the management who is responsible for quality of the product.

So, these are couple of definitions about quality, you can have as I said you can have your own way of defining quality of a product right. Let us look at some more definitions. There was one expert called taguchi. Taguchi define quality in a entirely different manner. He said that whenever you ship a product to the market it is a loss to society. And he came up with the concept of ah it is called a robust design. So, we will not go into detail, but taguchi was the first fellow who said that let us say if you want to make a soft of diameter let us say 3 centimeter.

Then the diameter should be exactly 3 centimeter. If it is less than centimeter 3 centimeter it is a loss to society, if it is more than 3 centimeter then also it is a lost to society. So, he came up with a quality loss function. And In fact, he his views on quality are completely different from the traditional views. I will give you an example. Let us say if you are making a pen, a pen like this right. Let us say the height of this pen is let us say for example, 6 inches right.

So, if you are making a pen of height these 6 inches plus minus let us say point 2 5 inch right.

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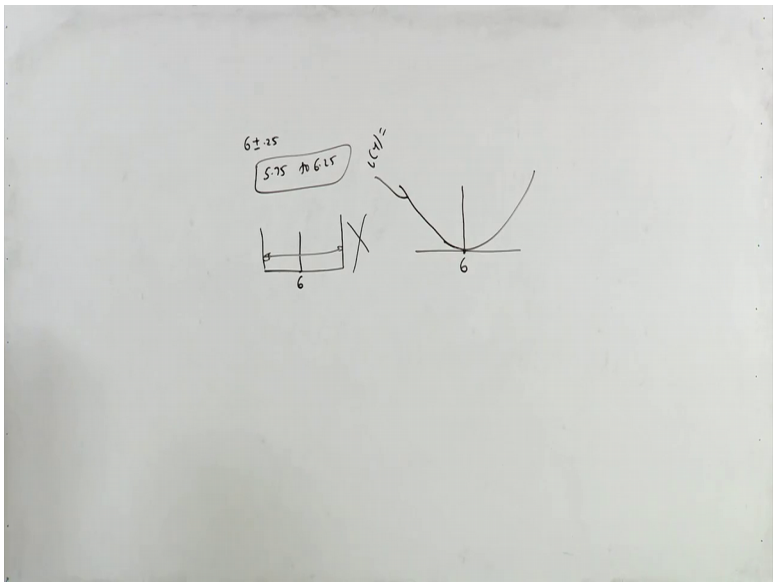

So, any pen which has got height of this much to 6.25 is a quality product right. This is the traditional approach of quality, that any product of any pen of having this much height this to this much height is a quality pen and this known as goal post view right a let me right. Like this so, this is your 6 inches initial size. And anything in this range is acceptable right. Taguchi said no, this not the correct way.

He said that, if this is the target values are the desired dimension of a product, and then it should be exactly this. If it is not this then it is a loss to society. So, and this is nothing but quality loss function he said it this quality loss function. So, any dimension less than this, is a loss to society at the end of the day. Because you are the manufacturer of the pen would be using resources of the society right. So, and if the height is this side then again it is a loss to society right. So, according to taguchi everything should be as per expect target right. No deviation at all right.

So, this is the opinion of taguchi as far as quality is concerned right. So, there are several other definitions of quality will not go into detail, but we will look at the modern definition of quality and the definition is quality is inversely proportional to variability. Variability means the dispersion right. If you if you want to have a quality pen then let us say if you are making 100 pens per day then the height should be same for all if it is not same then you will say that there is a variability in height.

So, you should try to reduce variability right. And when you reduce variability you say it is a quality product right. So, quality is inversely proportional to variability. So, reduce variability to improve quality right. Let us look at different dimensions of quality. Basically there are 8 dimensions; the product should have one of the dimensions as performance right. The product should perform for the purpose for which it has been made right. So, it should perform.

So, let us say the function of this pen is to write right. So, it should write clearly right. So, that is it is performance. If you look at a service then let us say if the service if you are going in a bank and you want some work to be done, then for service what is the, how would you define performance of the service? Let us say the bank employee taking time to process an account right. So, that is performance of the bank employee right.

So, you can have performance of product as well as performance of service right.

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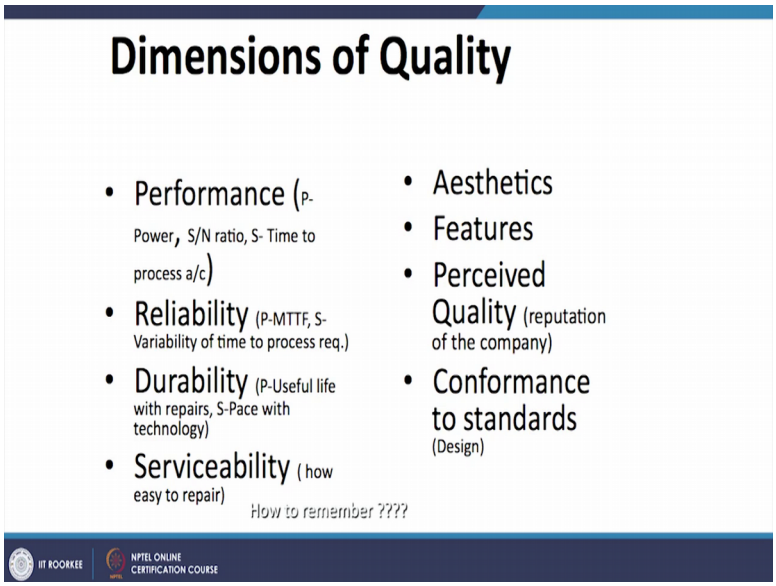

The second dimension is reliability; whenever you make a product it should be reliable. Similarly service should also be reliable. So, what is the meaning of reliability? When we say that the product is reliable? A product is we say reliable when it does not fail right. Or ah in other words it is meantime to failure or meantime between failures. It should be as low as possible right. Now it should be as high as possible right. Meantime to failure should be more and more right. If it is more and more over a it is useful life of all life then it is a reliable product right.

Similarly, in case of service the same example of bank employee, how would you define reliability? The reliability is variability of time to process a particular request of the customer right. So, that is reliability. The third dimension is durability. The product should be durable right. Apart from it should apart from performance, apart from reliability product should be durable also right. A durable durability means it just we are talking about it is useful life, isn't it? How long it is useful life is right.

We are also including the repair and maintenance points when we talk about it is useful life right. So, that is durability how would you define durability in case of let us say bank, if the bank is keeping pace with the technology right. So, we will say it is a it is a it is providing a durable service right. Then you have got serviceability the every product should have a serviceability right. How easy you are able to repair a product right.

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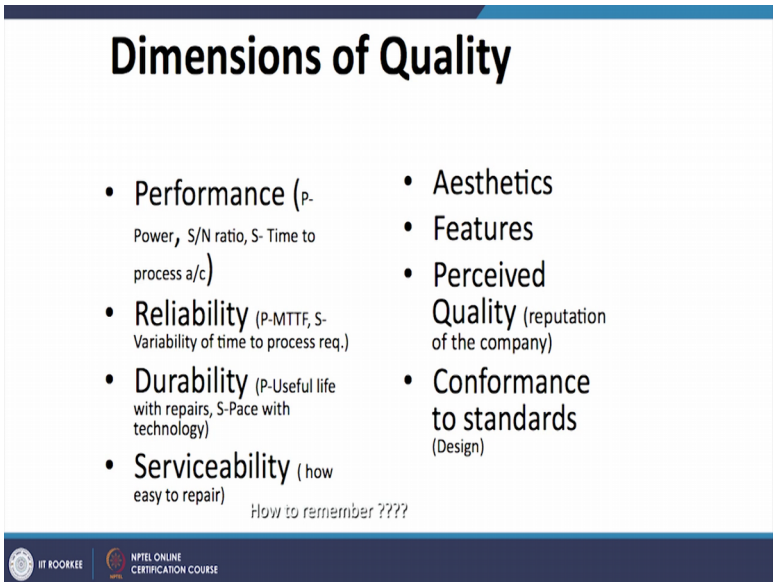

Similarly, you have got aesthetics, now nowadays this dimension is getting more and more popularity aesthetics. How product looks? It is shape, it is size, it is color, it is surface finish, it is packaging, isn't it? So, these things come under dimension called aesthetics right.

Then you have got features. Every product has got certain features right. You can have let us say primary features, secondary features, tertiary features right. So, look at features right. Then the next dimension is perceived quality. How customers are perceiving a brand? Or how customers are perceiving a company, right? So, perceived quality plays an important role. So, even if the quality of the product is good by an organization, but it is perception amongst customer about that company is not good, then it is not good for the company right; so perceived quality.

Then finally, conformance to standards, so you should design a product as per standards right; so this is the 8th dimension right. So, there are we have discussed a several definitions and we have discussed 8 dimensions. So, how to remember these 8 dimensions, right? Of course, if you are you can come up with a formula for this right. You just take t from here, r from here, d from here, s from here, a from here, f from here, p from here and c from here right.

So, you can come up with a world like this right: cards ppf right; C for conformance to design; A for aesthetic; R for reliability; D for durability. S for serviceability perceived

quality. And this p is for performance. And this f is for features right. It is very simple. So, if somebody asks you a what are different dimensions of quality then you just say cards ppf right simple.

So, let us move on to aspects of quality. In fact, there are a 8 dimensions, but if you look different aspects then it has got 3 aspects. So, you have got quality of design. So, whenever you design a product it should be according to standards right. So, this is that is known as quality of design right. The second point is quality of conformance this quality of conformance deals with how you manufacture the product. Because the designer is there he will just simply design the product, it is the responsibility of manufacturing engineer to make the product, or production engineer to make the product.

So, he has to look at whether he has got sufficient machines to make the product which has been designed by the designer. Many times what happens designer give very, very tight tolerances let us say in this case a height of this pen is 6 inches plus minus 0.001. Now do you have machines to manufacture such a pen having such a tight tolerances. No, it is not possible right? Of course, if you if you invest more and more in precise machine then it is possible, but what I am trying to say is that there should be coordination between these 2 right. There should be communication between these 2 functions right. Designer should look at whether the organization has got manufacturing capabilities or not right. So, that is known as quality of conformance more related to manufacturing right.

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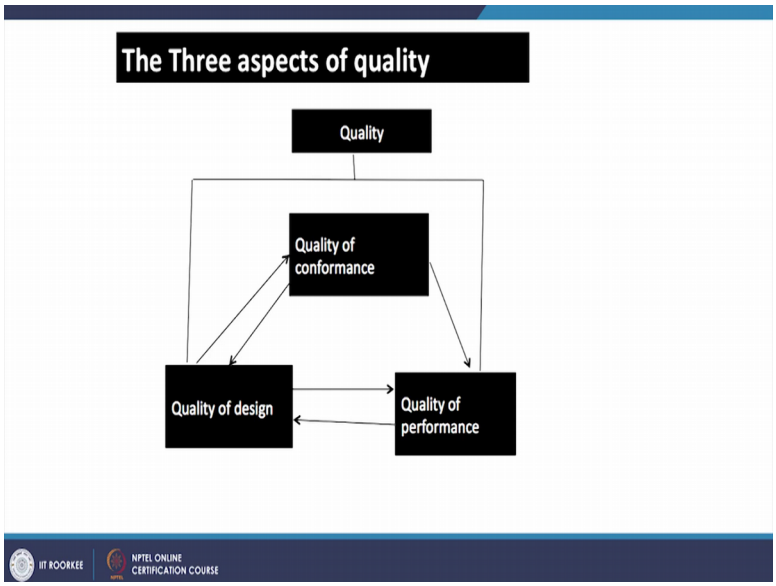

The third one is quality of performance right. So, designer has design the product manufacturing engineers has made the project. And now the project is and the product is in field right. Now is it is performing for which it has been designed and for which it has been made. If it does not perform then what will happen? If you look at this arrow is there is only one dimension arrow or one directional arrow right. There is only this direction; there is no direction from here to here, why? Just think for a while. Why there is no arrow from here to here? A reason is if the product is not performing then it should go to the design engineer first. He will look at what are the problems, and then he will redesign it and then again it will go to manufacture and then here right.

So, these are 3 aspects of quality, quality of design quality of conformance and design of performance right. Let us look at a something related to cost of the quality. If you look at products these days they are a very complex and it is very important for the organization to keep cost as low as possible. And in project management in other cost areas we have seen that cost control is an important function right. We have seen cost and budgeting area right.

So, these financial controls are very important, we should know; what is the budget of the activity and how much you actually spent on that activity right. So, cost control is an important issue in a project and equally important is quality of cost. So, you need to look, you need to control cost of quality also. Now why there is a need of studying this quality

of cost separately? There are other costs also right, but we should focus more on cost of quality, why? Because nowadays the costs of the products are increasing because of complexity of the product it has the first reason right.

Second is there is increasing awareness of life cycle cost including maintenance spare parts and cost of field failures.

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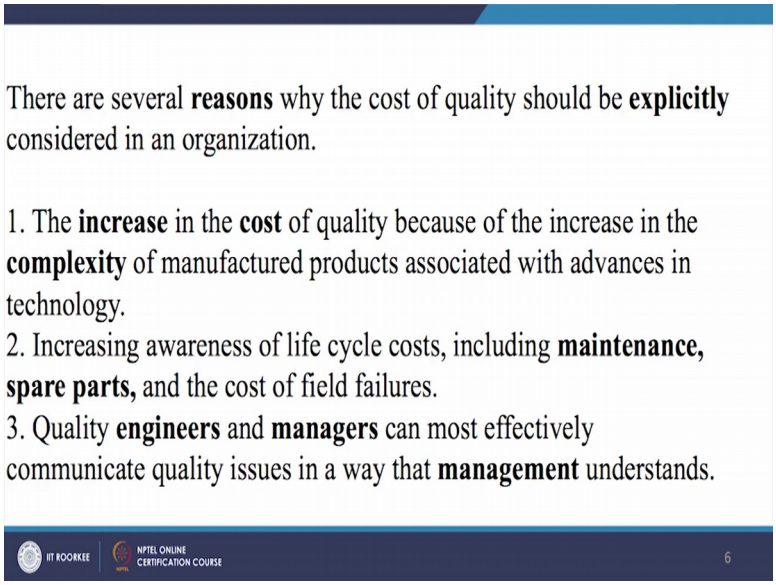

So, because of these things are happening more and more these days you need to look at cost of quality separately right. And it is when we do study this particular cost of quality separately it helps engineers and manager to communicate quality issues to the management in a way in which management understand in a better way right. So, these are couple of reasons why you should study cost of quality separately right.

Now, let us look at what are different cost related to quality. We have got something called defective product and a non defective product. Nowadays we do not call they them as defective or non defective, we call them you know say confirming product or nonconforming product. If it is if it is defective we will call it non defective nonconforming product if it is if it is a good product it is called confirming product. So, we can broadly classify these costs as costs for confirming products and cost for non conforming products.

The another way of classifying them is you can have it you know, internal and external failures and one more set right. It is called prevention and appraisal cost. So, we will look at these costs in detail.

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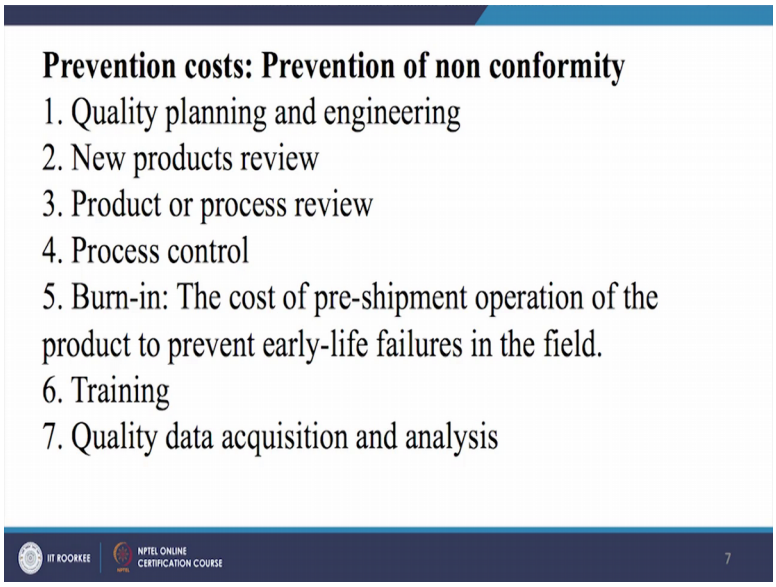

So, first of all we will look at prevention cost right. And prevention; cost just as the name suggest we are preventing non conforming right. We do not want defectives. So, all those costs which go to make a product confirming are called prevention cost right. And there are several sub cast cost in this prevention costs right.

So, let us look at this, quality planning and engineering. You want to make product right. So, for that you need to come up with different plans different policies, different guidelines and you need to put efforts in all those things right. So, those costs are called quality planning and engineering cost. Then you have got new products review cost. Let us say in your organization you are already making let us say 5 products. So, their designs are already there with you. But if you want to come up with a new product let us say sixth product. So, you need to review the design of new product.

So, the costs including reviewing new products are called new products review cost right. Then you have got product and process design. You need to since you are coming up with the new product. So, you will have to design a new product. And if new product requires let us say different process, then you need to design a new process also right. Let us say if new product requires a new machine in an assembly line, then you need to buy

that new machine. So, cost related to product and process design are called products and process design cost right.

Then there is something called process control cost. Whenever you make a product you need to ensure that you are making product properly right. It is as per specifications.

So, you need to check at different points, whether the product is within limit is within a designers limit or within you know customers limit or not. So, you need to prepare different types of charts right. So, let us say if you want to prepare a control chart. So, you need to require you know people to prepare control chart, they would be there would be people would be collecting data right. To prepare control chart and the cost related to those things are control process control costs right. And there is something called burn in cost; the cost of pre shipment operation of the product to prevent early life failures in the field right.

So, we do not want early failures in the field right. So, the cost of pre shipment operation of the product is to prevent early life failures in the field is called burn in cost right. And there is something called training cost, very important right. Because let us say if you are coming up with new product or new process, then you need to train your employees. Actually these prevention costs are not necessarily I am saying not necessarily for manufacturing organization. Prevention costs are there in service organizations as well. And this training and retraining is very much needed you on a service sector also right. So, you need to keep your employees updated and you need to train them right.

So, cost related to training is also a part of prevention cost right. Then you have got quality data acquisition and analysis. You can prevent product ah from failures if you are taking corrective actions during it is manufacturing. So, for that you need to collect data from different you know, machines or different assembly lines. So, you need to collect data and you need to analyze. Let us say if ah in an assembly line you have collected a data regarding dimension of shaft right. And if you we have observed that the shaft is not as per specification limits.

So, immediately you will take a corrective action right. So, the cost related to data collection right. Data preparation data analysis taking corrective actions all those things come under quality data and acquisition quality data acquisition and analysis cost right. So, these are couple of cost related to prevention right. We do not want non conforming

items. So, we want to prevent non conformities right. So, these are costs related to prevention costs right.

So, with this let me stop here in next session we will discuss some more cost related to quality.

Thank you very much.