

Manufacturing Strategy
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Module No. #06
Lecture No. #26
Deming's approach to Quality

Welcome back. Now, we are moving into the sixth week, of this course on, Manufacturing Strategy. And, in last few sessions, we have discussed the role of Quality, in Manufacturing Excellence. And, you will find, lot of literature, lot of discussion, that Quality is centre, to Manufacturing Excellence. We will be discussing about, different types of Manufacturing Excellence Awards, Business Excellence Awards. And, we will find, that the root of all these Excellence Awards, is in Quality Management.

So, quality alone, is a very important contributor, in achieving the Manufacturing Excellence. Now, this idea of quality in its present form, has come, with the contribution of, large number of quality Gurus. Those philosophers, those thinkers, who contributed, in the development of this discipline, we need to understand their philosophy. Because, then only, we can use quality for the strategic purpose. In our last session, we discussed about quality trilogy, where we had, three important rules, for the quality.

One is, from the focus point of view. Another, from the strategic point of view. And, third from the, holisticness point of view. And therefore, if we understand the aspects, if we understand the idea behind those kind of dimensions, then only, we can do, proper justice with Quality Management. Now, in this particular session, we will be discussing, the contribution of Edward Deming, who is known as the Father of Modern Quality.

We, in our previous session, discuss the development of quality, from the inspection era, to Total Quality Management. Now, from inspection to Total Quality Management, there are large number of people, who contributed. Because, initially, it was simply grading and sorting. And, then people realised, that for effective Quality Management, we can use, the Principles of Probability. And, in the form of statistics, we started using, those principles. That, it is impossible, to check the product quality, for the large number of products, you are manufacturing.

And, when you cannot check the quality of all the products, the concept of probability started coming, into the picture for quality. And, the idea of Edward Deming, in the field of Quality Management, is emphasised, from this very idea of use of statistics, use of tools and techniques, for Quality Management. So now, when we start discussing about Deming's contribution, in the Quality Management.

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The slide is titled "Deming's View" and features a central statement: "Through a reduction in statistical variation, improves productivity and competitive position". This statement is circled in red. Below it are three numbered points: "1- Quality of design", "2- Quality of conformance", and "3- Quality of the sales and service". To the right of these points, there is handwritten text: "Reduce Variability" with a downward arrow pointing to "Improving Competitiveness". In the top right corner, there is a handwritten note "LT = 10 days". The slide footer includes the IIT Kharkee and NPTEL Online Certification Course logos, along with the number "2".

So, the basic idea, around which, Deming's view about quality are centred, that is, that if you can reduce, the statistical variation, so this reduction in statistical variation, will directly help, in improving the productivity. And hence, he said that, it will help you, in improving the competitive position of the organisation. So, Deming was one person, who linked, quality with competitiveness of the organisation. He said, that reduce the variation in your production processes, reduce the variation in your final output.

And, by reducing the variation, you will be able to improve, the productivity. And, this improved productivity, will help you, in achieving the competitiveness. And, this is what, we are discussing, since last five weeks, that how to achieve competitiveness, from your manufacturing. So, Deming gave, a simple formula, a simple proposition, for achieving the competitiveness. And, that simple proposition is based on, that reduce variation. And, this reduce variation, will help you, in improving your competitiveness.

So, this became, a kind of formula, you can say, from Deming's approach. And, later on, this idea became so popular, so popular, that across the globe, and across industries, people started following this idea of Deming, that how we can implement, statistical process control

techniques, in our organisation. Though, these things started primary for the manufacturing organisation, but later on, because of the success of these ideas, people started using these concepts, for services organisations also.

So, nowadays, the concepts of statistical variation reduction, are applicable equally, in manufacturing, as well as in services organisation. And, all types of organisations, whether it is automobile companies, whether it is consumer durables, or whether it is a banking company, whether it is a healthcare company, whether it is an airline, all are using the processes related to, statistical quality control, statistical process control, so that, variations can be minimised, variations can be eliminated.

And, we all know, that if we can eliminate the variations, it will help us, in getting the consistency, in my output. The basic idea is that, if variations will not be there, so I will have, consistent output. And, if I have consistent output, I can take the advantage of that, in wide variety of things. For an example, let me just give you, that how the consistency will help me, in improving the competitiveness. Now, consistency helps in competitiveness. That is what, I am saying.

Now, consistency means, I can exactly say, that I will be delivering you product, in 10 days. So, I am committing a lead time, of 10 days. Now, if I have consistency that, I will be delivering in 10 days, so my customer will maintain inventory, only for 10 days. Because, he knows, that I am very much consistent, in what I am saying. And, on exactly tenth day, I will be supplying the new consignment. And, he will not keep, any safety stock.

And, if we do not keep any safety stock, this will help him, in reducing the inventory cost. And, accordingly, competitiveness. Because, you are not keeping inventory, for the safety purpose, so your cost of inventory, will go down. And, your cost of inventory will go down, and therefore, your overall cost of manufacturing, will also go down. And, that will help you, in improving the competitiveness. So, the one simple example, of the consistency, that if I am having a consistency in my lead time, how it can help us, in improving the competitiveness.

Most of the customers, nowadays, they want that, you should be very particular, about your delivery dates. So even, if I discussed in earlier sessions, Order Winners and Qualifiers, so

my delivery dates, are very important, Order Winners and Qualifiers, in different markets. And, depending upon, my consistency of delivery, I can win, large number of orders.

So, this is statistical variation reduction, is not only related, to some specifications. Dimension of this pen, the diameter of this pen, is few millimetre. So, the consistency means, that all the pens which I am producing, are having the same amount of diameter. So, that is one way of understanding the consistency. But, Deming said, that we can have, consistency across processes, across functions. And therefore, I am taking you to an example of, lead time.

I can have you, the examples of, so many other functional activities, that how can you have consistency, with respect to various aspects, in your organisation. And, wherever you have consistency, because of statistical variation reduction, you will have, more competitiveness. So, that is, the precise in, you can say, one sentence, if I want to summarise, the idea of Deming. And, for that purpose, Deming emphasised, on different types of quality. Because, everywhere, he was talking of, consistency.

So, he mentioned about, quality of design, he mentioned about, quality of conformance, he also mentioned about, quality of the sales and services. But, it is not only, you have a quality, during the production process, quality during the design. So, these two things are, when things are within your organisation. But, once, product goes to the customer's hand, even at that time, how are you providing, the after sale support, how are you providing, the maintenance support, once a product fails. So, the quality related to, those things.

Each time, my product fails, and I know that, I will get a service in, 30 minutes, or I will get a service in, 40 minutes. Like in some of the cases, we know that, in some developed nations, if there is an emergency, ambulance will come, within 10 minutes, within 9 minutes. So, that is again, a consistency. That, as a customer, as a citizen in that case, I am very much sure, that wherever I will be, ambulance will come to me, in less than 10 minutes.

In our case, the situation is very much reversed. Even, if I am at best of the place, I may be in the national capital region, but I am not sure, how much time, it may take to reach ambulance to me. Variety of reasons, may be there. May be, traffic jam is there. May be, some road maintenance is going on. May be, ambulance is not free. May be, driver is not immediately

available. So, plenty of reasons are there. But, if I want to have consistency, I need to remove all these reasons, I need to find solutions, for all these reasons. That is precisely, the idea of Deming.

Now, for implementing these things, for how to have consistency, and how to improve the productivity, and finally to get competitive advantage, how to have some kind of winning performance, with this, Deming proposed, some 14-Point Agenda. So, now let us discuss, what is that 14-Point Agenda, which was proposed by Deming, for achieving the manufacturing excellence, through quality.

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The slide displays the first four points of Deming's 14-Point Agenda. The points are numbered 1 through 4 in red circles. Point 1 is 'Create constancy of purpose for improving products and services.' Point 2 is 'Adopt the new philosophy.' Point 3 is 'Cease dependence on inspection to achieve quality.' Point 4 is 'End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier.' Handwritten red annotations include 'traditional' next to point 2, a bracket around 'inspection' in point 3, and a bracket around 'total cost' in point 4. The slide footer includes the IIT Kharkee logo, 'NPTEL ONLINE CERTIFICATION COURSE', and the number '3'.

- ① Create constancy of purpose for improving products and services.
- ② Adopt the new philosophy. *traditional*
- ③ Cease dependence on inspection to achieve quality.
- ④ End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier.

So now, the first point, which Deming said is, create constancy of purpose, for improving products and service. The first important thing is, that you should have a constant purpose, the continuous improvement. If you do not have, this constant purpose, of improving products and services. If, you today understand, that I should do, this improvement. Tomorrow, you forget. Then, after 6 months, again you recall, oh, I need to work on improving this process.

So, if this type of approach is there, you cannot use quality, for your strategic advantage. So, there has to be, a constancy, or continuity. What I was saying, the word, continuity of purpose. And, the continuity of purpose for, improving products and services. So, it cannot be intermittent kind of activity, rather it has to be a, continuous kind of activity. The second important thing is, about the change management. You need to adopt, new philosophy. That,

traditional approach of quality was related to, some exclusive products, some high end products.

And now, we say that, the meaning of quality is, about reducing the variations. Meaning of quality is, to make products, which are useful to the customers. And therefore, we need to change our mind set. Adoption of new philosophy. Many of our Marketeers, as well as manufacturers, are not able to understand, that what type of products, people below poverty line wants. And therefore, they want to offer products, of inferior quality to them. Products, which are of inferior quality, are not liked by people below poverty line.

They want that, product should be fit for use. So, you need to provide, only those limited performance and features, which are required by them. By reducing the quality levels, by providing large number of features, but a product cannot work, there is no purpose. So therefore, many of the products, which we try to offer for rural markets, which we try to offer for bottom of pyramid, are not successful because, we are not able to adopt the philosophy, that what customer wants.

So, this is second important point, about the Deming's approach. Then, third important point is, cease dependence on inspection to achieve quality. The traditional view of quality, is about inspection. That is the traditional approach. We thought that, let us produce, as much as, we can. And, there is an inspector sitting, at the end of this production line. And, it is the duty of that inspector, to finally check, whether the products are meeting the standards or not.

So, it is not my responsibility. It is the responsibility of that checker, that inspector, who is sitting at the last of this production line. And, he is doing the sorting, he is doing the grading. And accordingly, the products will be passed, or rejected. So, this point of Deming says, that if I am doing something, I should take responsibility on my own, rather taking the benefit of that inspection activity.

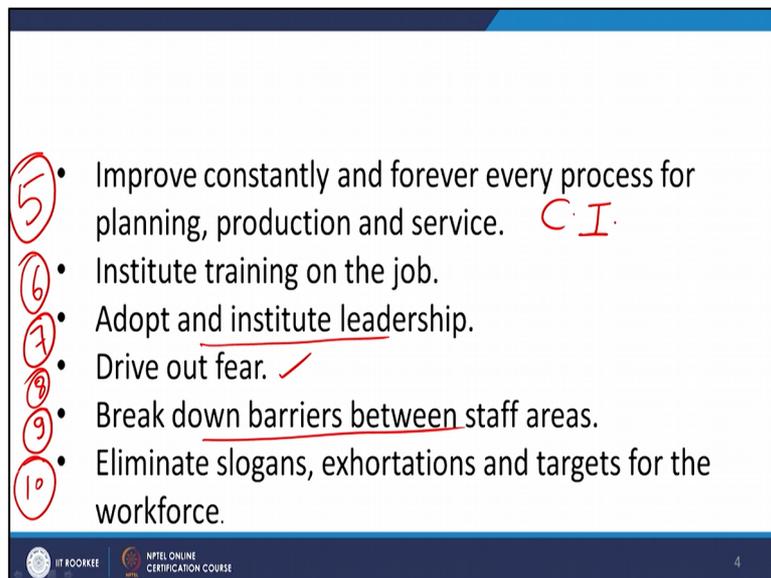
Or, he says that, we need to remove our dependence. We need to remove our dependence, for quality, on the inspection activities. Then, another important thing, which Deming said, that end the practice of awarding business on price alone; instead, minimise total cost, by working with a single supplier. We normally go, with the quotation kind of system. And, where, we give order to the supplier, who is giving us product, at the minimum possible cost.

So, in our language in India, we call it as, L1-Supplier. The lowest cost is being offered, by the supplier. And, we call that supplier as, L1-Supplier. So, we need to eliminate, we need to remove this practice of giving orders, only on the basis of price. Rather, we need to see, the total cost, of working with a single supplier. May be, this idea says that, we can think of, 2, 3, 4 suppliers, for the same product.

And then, we see, that what is the total cost coming, with those 2, 3 suppliers. And, what is the total cost coming, if I am working only with a, single supplier, based on cost alone. And, maybe it is possible, that when I work with, 2, 3 different suppliers, the cost may reduce. Then, the cost which I am incurring, when I am using only a single supplier. So, this also requires, a change of mind set, it also require, change of processes.

That, instead of going for, one single supplier, which is selected only on the basis of cost, we need to consider, other parameters also. And, for having a comparative analysis, you can consider the concept of total cost. And, where, the cost of quality, etcetera, can also be included. So, this is another important point, raised by Deming.

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5 • Improve constantly and forever every process for planning, production and service. C.I.

6 • Institute training on the job.

7 • Adopt and institute leadership.

8 • Drive out fear. ✓

9 • Break down barriers between staff areas.

10 • Eliminate slogans, exhortations and targets for the workforce.

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Then, the fifth principle of Deming is related to, how to improve constantly, and forever, every process for planning, production and service. So, again he emphasised, that we need to have, a continuous improvement system. And, this continuous improvement system, should be applicable for all the processes, which are related to planning, production and services, of

the organisation. So, that is important thing. Then, Deming also emphasised, on training on the job, that we need to do, some kind of arrangement for, On-the-Job Training.

And, if we remember, the contribution of F W Taylor, the Father of Scientific Management, he also advocated a lot, about training. And, Deming also said, that On-the-Job Training, is very important. Without On-the-Job Training, it is not possible to achieve, high quality standards. So, training is emphasised, by Deming also. Then, another important thing is, adopt and institute leadership. There are positions, which by virtue of position, becomes leader.

So, the top management in the organisation, because he is CMD, he is leader of the organisation. But, we need to create, many other smaller leaders also, those who can guide, their respective functional activity. So, we need to develop, an institute, leadership, at various levels, at various functional roles, in the organisation. So, that is another important thing, about Principles of Quality, by Deming.

Then, another thing is, drive out fear. A very important thing, from the Indian point of view. In India, we are more or less, like to work, as our predecessors were doing. So, we follow that approach, that if my seniors were doing this task, in this way, I will also do, same way. So, we do not want to do, anything differently. And, that is one of the major challenge, identified everywhere, about the poor performance of many Indian organisations.

And, this poor performance, or this following the legacy kind of approach, is because of some fear factor. Because, I do not want to be failed. I do not want to be known, as that, I did something fancy, and it failed. So, that type of fear is always there, in my mind. And, I want to say that, if that fear is there, we cannot use creativity of our employees. It is one of the important challenge, for the process of innovation also.

And, in this process of continuous improvement, we will continuously be moving for, new systems. We will be adopting, new methodologies. We will be adopting, a new kind of mind set. And, that all is possible, all those new things are only possible, when we remove fear, from our minds. So, unless until, fear is there, we cannot adopt new philosophy. So, for effective change management, it is very important, that we drive out fear.

So, that is another important thing, that how do we drive out fear. And, now organisations have started, doing workshops, on change management. How to develop the organisation, where everyone is free? And, we respect the leadership. But, at the same time, we are participating, in the decision-making. We are able to say, our thoughts, we are able to contribute, with our potential, in the development of the organisation.

So, that is also, a very important idea about, Deming. Then, another important thing, which Deming suggested, that break down barriers, between staff areas. Now, in organisations, normally we live in, watertight compartments. I am a production person, you are a maintenance person, you are a purchase person, you are a design person, etcetera, etcetera. But, if we want to go into Total Quality Management kind of area, we need to remove these barriers. These watertight compartments, cannot facilitate, the achievement of Total Quality Management.

So, the barriers need to be removed. Then, another important thing is, eliminate slogans, targets, for the workforce. Because, quality is, the Total Quality Management particularly, is an organisational wide activity. And, most of these slogans, etcetera, targets are given, for the workforce. So, that means, we are creating, divide in the organisation. Targets, slogans, are for the workforce. And, the other people, the top management people, are there, to monitor the performance of the workforce.

If this will happen, then you cannot have, the same constancy of purpose. And, whether you go to Henry Fayol's Principles of Management, in one of the principle, Henry Fayol mentioned about, Esprit De Corps. Same thing is here, that eliminate slogans, eliminate targets, for the workforce. We all need to be the part of, same boat. So, slogans, targets, etcetera, not for the workforce, but for the entire organisation.

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- Eliminate numerical quotas for the workforce and numerical goals for management.
- Remove barriers that rob people of pride of workmanship, and eliminate the annual rating or merit system.
- Institute a vigorous program of education and self-improvement for everyone.
- 14 ✓ • Put everybody in the company to work accomplishing the transformation.

Then, another principle was, eliminate numerical quotas, for the workforce, and numerical goals for the management. Almost, similar thing. That, specific quota, specific targets, goals, should not be there. It is a collective, overall responsibility. Because, why it is so?

It is so that, when some specific numerical targets are given to us, that particular functional area, that particular level of management, thinks that, our objective is just to achieve that numerical value, without considering the overall functioning of the organisation, without taking care into the aspects of customer requirements. So, that numerical value supersedes, every other thing in the organisation.

So, if I say, to my organisation that, the production department, I want to have a daily production of, 100 Tons of Steel from you. So, that production department considers that, if I achieve 100 Tons of Steel every day, that will fulfil my purpose, that will fulfil my existence, as the supervisor, of that production area.

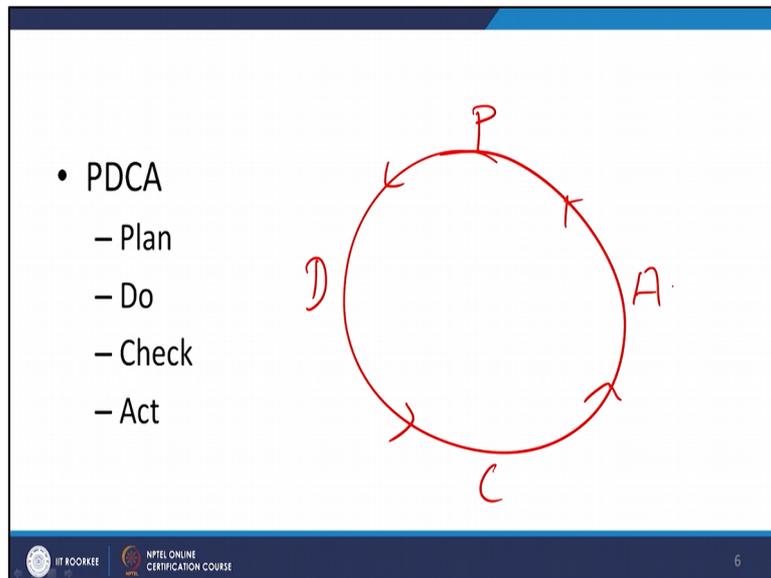
But, in that, I may not be able to, in proper sync, with other functional areas. So therefore, it is better, that we eliminate the numerical targets, for our management. That, another important thing is, remove barriers, that draw people of pride of workmanship, and eliminate the annual rating or merit system. Now, another important thing, another barrier, can be there, where we can have some system of ranking, some system of appraisal, which can take away our pride.

So, all those things, which are responsible in removing our pride, we should try to eliminate, we should try to remove those things, from my organisation. Then, institute a vigorous program, of education, and self-improvement, for everyone. So, we already discussed about that, there need to be a system of training education. But, that system of training and education, is not limited, only for the workmen. It has to be, for everyone. This is very important.

In many of the organisation, we only consider that, people at the lower level, people at the front end, they need to be trained. But, Deming said, that there is urgent requirement of training, at all levels, whether it is top, middle, or front level. So, for all the levels, training is very, very important. And, then finally, the last point, fourteenth one, Deming said that, put everybody in the company, to work accomplishing the transformation.

This idea of Total Quality Management, is the idea of transformation of the organisation, from the traditional view, to enlightened view. And, when we are talking of traditional view to enlightened view, it requires a complete change in mind set. And therefore, everybody, from the top to bottom, need to accomplish, this transformation, then only, you can achieve this benefit.

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Finally, we also know, one very important contribution, coming from the Deming, that is in the name of, PDCA Cycle. That, you have this cyclical approach, where you go for, Plan, Do, Check, and Act. And, through this approach of PDCA, we are able to do, continuous improvement in our organisation. So, PDCA became, a very popular way, of continuous improvement, or Kaizen, in our organisations.

We have already discussed, about Kaizen, earlier. And, may be, in our subsequent sessions also, we will discuss, in more detail about, PDCA and Kaizen, that how to use Kaizen, in the organisations. So, with this, we finally understand that, how Deming contributed, in giving those ideas, which can take your organisation, to the world class manufacturing status. With this, we come to end of the session. Thank you, very much.