Quality Design and Control
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Lecture – 07
Management of Quality- I (Contd.)

Now, I am going to discuss the second topic under Management of Quality – part 1.

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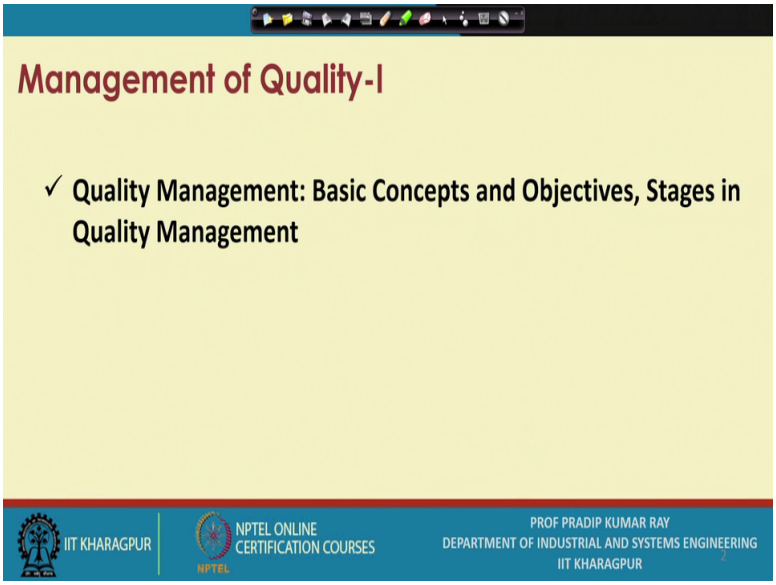

Now, this topic is named as quality management: basic concepts and objectives, stages in quality management. Now, prior to discussing these basic concepts and objectives of quality management I want to highlight, I want to just mention the domain of quality engineering, then possibly you will be able to link quality engineering with the quality management.

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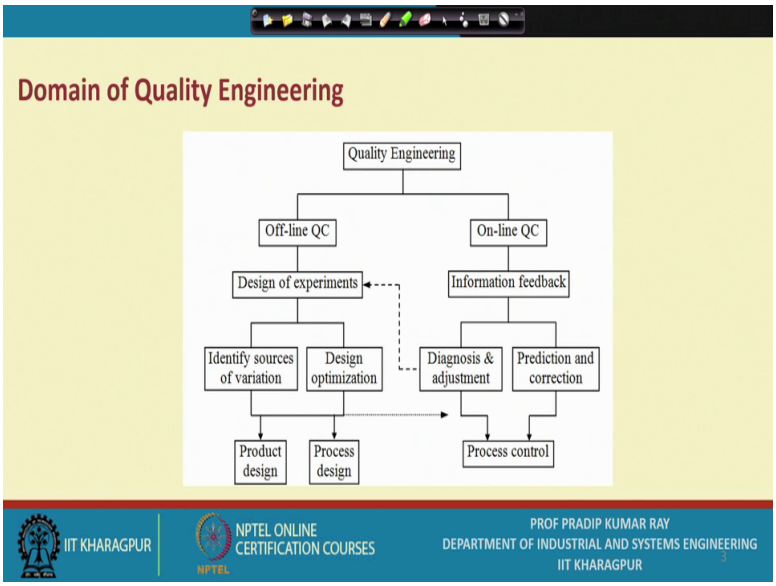

Now, under quality management you have off-line quality control, on-line quality control. This we have been emphasizing all the time. Under off-line quality control; we use design of experiment based tools and techniques, primarily and on-line quality control we actually we emphasize on information feedback. Under design of experiments you need to identify the sources of variation and you have to opt for design optimization, that means, parameter settings of the products as well as the processes and then we refer to product design, process design, these are the 2 aspects mainly dealt with by on-line off-line quality control as proposed by Taguchi.

Under on-line quality control, you have to deal with the information feedback and then diagnosis and the adjustment is one issue, we have already mentioned and the second important issue is the prediction and correction with respect to a particular process. And so obviously, the all these issues are related to the process control. So, this is nominance now.

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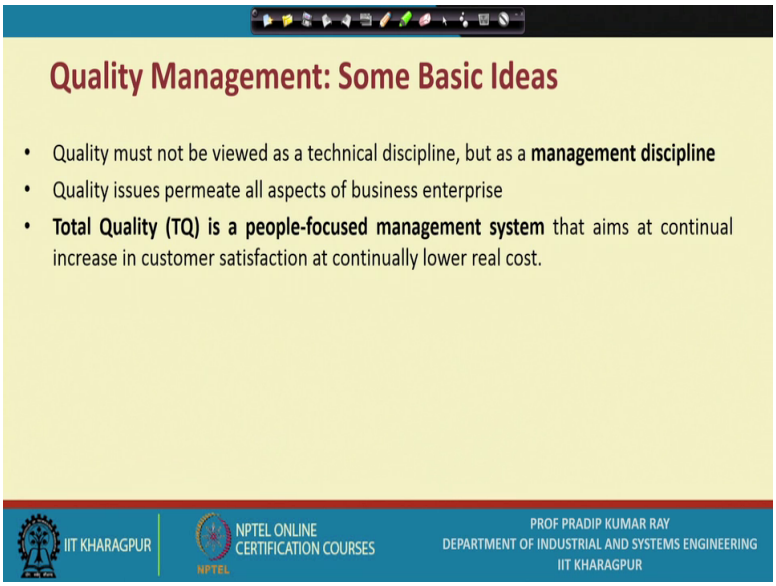

In order to say the implement this quality engineering based tools and techniques approaches and all, what you need? You need a management frame work and as it is related to the quality, we say that this frame work is nothing, but the quality management framework.

Now, as a student of quality or as a learner or as a beginner, now you must have some basic ideas related to quality management. Now, as I have already mentioned that the quality management terms there are different terms we use in respect of quality management, someone might say that this is total quality management, someone might say it is total quality and or say total quality control or simply you know say the quality issues. So, essentially you know all these terms are you can use interchangeably and their basically referring to the same concepts and approaches.

So, here I am using quality management and sometimes I also use the term called total quality, but the total quality or total quality management or quality management all are same. Quality must not be views as a technical discipline; now, this is the point to be emphasized. It is not simply a technical discipline, but as a management discipline. So, this is point number 1. The next important point is that the quality issues permit all aspects of business enterprise, that means, whether you are running a marketing sale or whether you are working in any other finance department, everywhere, you know the quality related or the quality of that departments activities, quality of the activities you carry out, the quality of the task, quality of the jobs it becomes they are very important and to be considered; that means, you say I am

working in a marketing department. Whether the marketing related activities while you carry out, whether you know that what are the qualities issues related to those activities or not, similarly, for all other departments all other sections.

So, that is why you say that the quality issues are relevant in all sorts functions, in all sorts of departments. Total quality is a people-focused management system. Though you use the quality term, but essentially it is a management concept and that is why it is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. So, this is one way you know you can define total quality.

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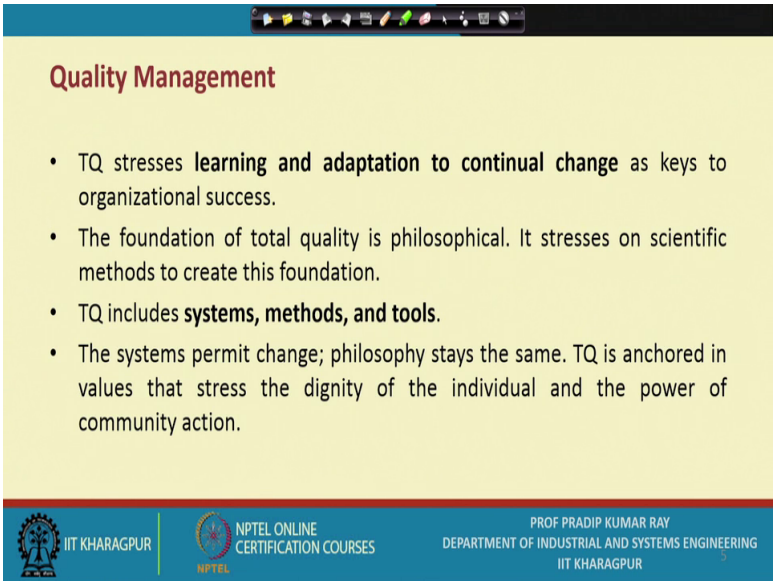

Now, total quality stresses learning and adaption to continual change as keys to the organizational success, that means, your performance or say performance of the department must constantly increase and you should know that what are the factors responsible for the increase in performance and similarly you must be able to relate your activities or your performance with quality related issues.

So, the foundation of total quality is philosophical, that means, you know ultimately it becomes quality must become a way of life. It stresses on scientific methods to create these foundation that is most important in fact. The scientific methods we must be able to you know we suggest and use to create this foundation. So, it includes systems, methods and tools; that means, there must be quality systems and in order to create this systems and you

want to run this systems you know what are the methods to be followed and what are the tools and techniques constantly you must be able to use to the sustain quality, to improve quality.

The systems permit change; that is first, philosophy stays the same. That is most important. In fact, like say continuous improvement could be your philosophy or you say that I will be creating an organization which must be a human in nature. So, that may be it treated as a quality organization. So, total qualities anchored in values that stress the dignity of the individual and that means, the person must be treated as an individual and the concept like say individual difference must we accept to believe in and the power of community action or the group activity you must emphasize.

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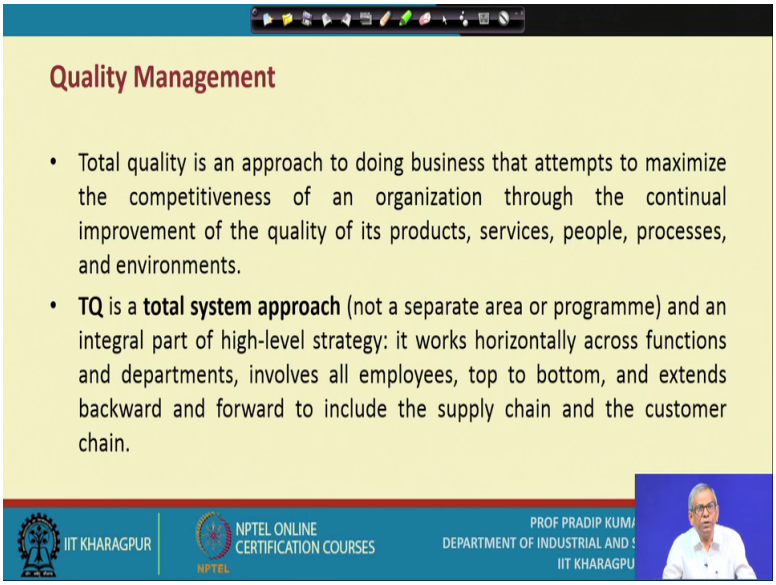

So, total quality is an approach to doing business that attempts to maximize the competitiveness of an organization through the continual improvement of the quality of it is products, services, people, processes and environments. Now, these days you will find that while you offer a product the service is also included. Many occasions now you cannot think of the product performance without looking into the kinds of services you must have for the products.

The total quality is a total systems approach, not a separate area or program, this is to be looked into; that means, whenever you talk about the total systems approach under total

quality; that means, entire organization must be it is domain of application and an integral part of the high level strategy; that means, the top management must be interested and implementing this total systems approach. It works horizontally across functions and departments, involves all employees top to bottom and extends backward and forward; that means, constant using the close loop manner it must work to include the supply chain and the customer chain. So, that means, its total systems approach.

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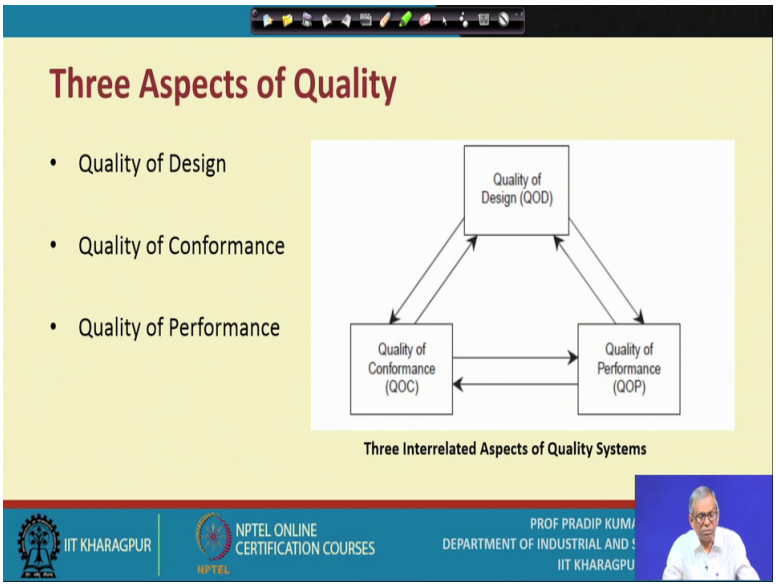

Now, in this context I want to highlight 3 aspects of quality; first one is the quality of design. Now, the quality of design, that means, you must be able to in plain and simple terms you are offering a design for a product. Now, whether this design is of a quality design or not that is very important. Like say, sometimes what happens know you go for over design, you go for under design? So, which design actually you will opt for? If it is under design, that means, you might say that the quality of the product may be very poor or if you go for over design may be the quality is assured, but the cost may be very high the cost of the design. So, these are the issues to be considered at the quality of design stage and then you go for the quality of conformance that means, you offer a design and then you try to the produce the product as per the design specifications.

So, if you can you know if you are able to do this, you say that my quality of conformance is very high. The conformance is conformance to specifications or the standards. So, that is the second stage and that means how competent your manufacturing system is to produce the

product as per the specifications. So, there are many other issues. In fact, related to quality of conformance we will discuss it later on and then ultimately whatever you design, whatever you produce ultimately the product will be used by the customer or the user.

So, and the products performance will be judged by the customer, that means, when the product is must be put to use and then the customer, the user, they will say whether the product is acceptable to or not as per the performance. So, these issues are also very important that is the ultimate test that how successful your product is in terms of quality. So, that is referred to as quality of performance.

Obviously, under quality of design there are many tools and techniques you use. Similarly, under quality of conformance many tools and techniques we are going to use and similarly, under quality of performance again you will be using several kinds of tools and techniques. In course of time we will be covering all these tools and techniques.

So, and these are all interrelated, that means, whenever you talk about quality of design and you must relate it to the quality of conformance as well as to quality of performance. So, this is the relationship between all these 3 aspects.

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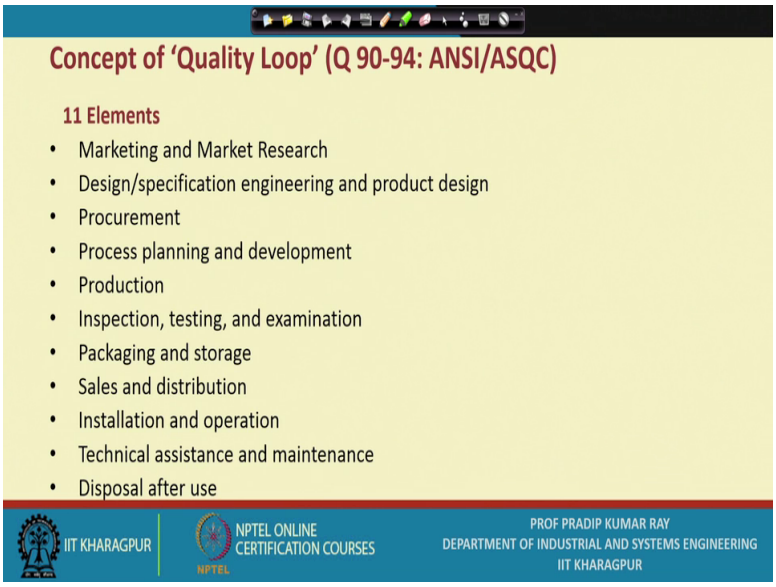

Now, when you know there is a concept called quality loop, at this point in time I want to high light these aspect. You know we always say that the quality is the concept is to be applied for all functions everywhere in the organizations, but then again you know it will be

very specific. Otherwise, you know it can be interpreted in 100 ways. So, in this case what we say that, what are the functions of an organization, where you know the quality issues you must be able to identify.

So, now there are 2 kinds of products you produce; one is the consumer product and second one is the industrial product. Now, obviously, you know with respect to the kinds of products you produce, you should identify that in general, in a generic fashion that what are the specific functions you have in an organizations and for each function you need to look into the quality issues. So, this is the first step in creating a total quality system in an organization. So, total means what? That means, you need to look into a number of functions. So, how many such functions, as per you know that the Q 90-94 standard is it ANSI, ASQC American National Standards Institutes and American Society for Quality Control, they say that these are the 11 functions you must consider while you create a total quality systems.

So, they are referred to as, they call it the quality loop. So, what are these elements in this quality loop? First one is the marketing and market research. Second one is the designer specifications engineering and the product design. So, third one is the procurement, say purchase department; process planning and development that is the next one, then you will have the production and where the production means 3 things actually the fabrication of any type, assembly and on-line or say the stage wise inspection this 3 activities production. Then you have the inspection, testing and examination of the final product; then packaging and storage; sales and distribution installation and operation, particularly for the industrial product, installation and operation, then technical assistance and the maintenance part and the last one is the disposal after use.

So, this is a very important function. So, these are the 11 elements.

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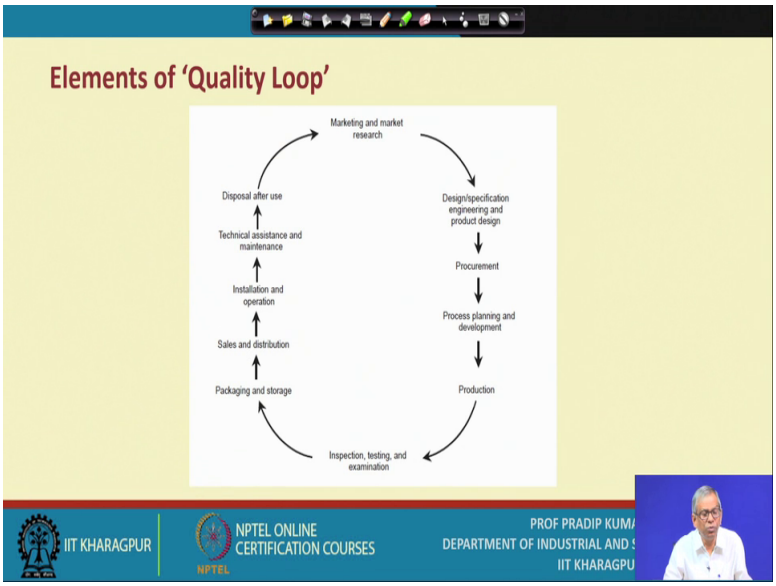

What you into look into, that means, all these are interrelated. You start with marketing and market research end with disposal after use and you go you know through this the loop and after disposal after use; that means, the product is born, the product dies and then you have to dispose it off and while you dispose the wastes while you dispose you know the absolute products or any to say decomposition or you have to dispose off your entire plant; that means, you must follow the rules and guidelines as said by the you know stated by or as offered or as proposed by the state.

So, you just cannot dispose it off as you like. So, these are the 11 elements under quality loop.

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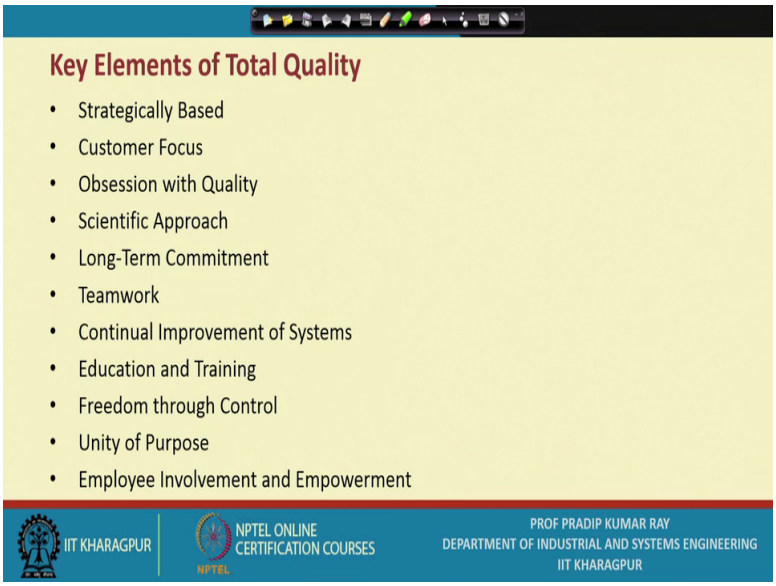

So, what are the key elements in the total quality? I will just you know I will be highlighting certain points like the strategically based; that means, it must come from the top management. It is the top management's responsibility. So, it is an issue bring del to it by the strategic management. Customer focus, obsession with quality; that means, everywhere all the 11 elements you have to consider one by one simultaneously and then all simultaneously and what you need to do; that means, given an element you must be able to identify the quality related issue, say marketing, say process planning, say you know the production. What the quality issues are like say installation of your product, at a particular location, at you know the customer companies a premises. So, what are the quality issues you must able to say consider.

Scientific approach we must believe in, that means, the data base and whatever you know the loss or say the hypothesis you make or you know or you assume. So, that must be considered; that means, we believe in scientific approach you want to commitment; that means, any exercise on building up the quality system in an element or in a function or company as a whole or the organization as a whole; that means, it must be you know the slow or the definite process and there must be a long term commitment. And, we believe in team work because the problem is so complex, unless the team is formed it may be very difficult to get the solution or the quality solution for related to the quality problem from and from an

individual or individually you may not be able to solve the problem. So, for majority of the problems related to quality that you teamwork is a must.

Continual improvement of the systems; that means, we say that even if you consider it to be the best, but best also can be bettered. Educational frame; this is very important in fact. So, particularly where the entire the systems will be managed when the systems will be controlled by the individuals. So, whether they have the right kind of potential whether they have the right kind of capability to address the problems to quantify the problems related to quality this must be ensured. Freedom through control there will be some individual ideas or say creative ideas we should look into because the quality related problems in many cases is very complex one.

So, the new ideas or we should always encourage and the freedom to be controlled, but again there must be within organization structure you have to work as per your authority and the power you must work and apply your resource to apply those tools and techniques particularly from the implementation point of view, the new tools and techniques where quality improvement suppose you want to implement, so for implementations you have to set the guidelines and also it is a total implementation manual you have to create.

So, unity of purpose; that means, the goal must be set and everyone for all the departments they must be aware of, all the departments must be aware of that, what is the main goal of the companies, related to the quality. So, unity of purpose and to achieve that common goal everyone should all the departments all the functions must work jointly as well as independently. An employ involvement and empowerment, this is very important in fact.

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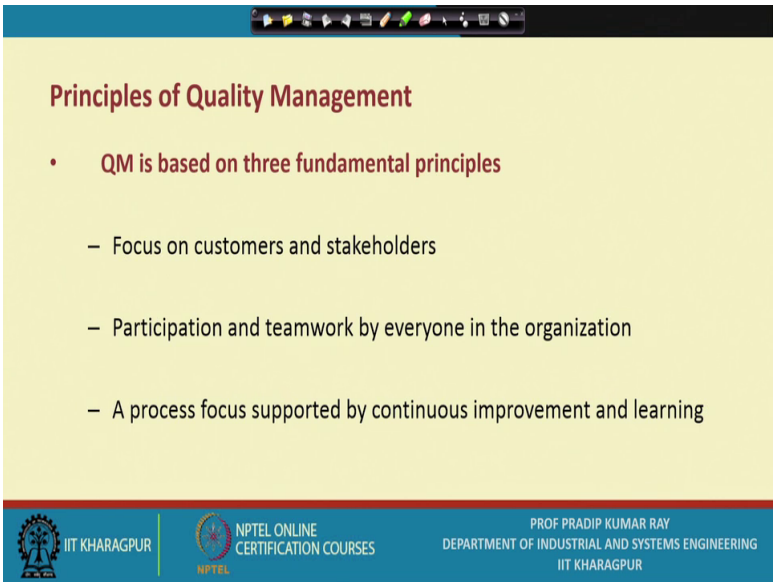

So, ultimate objective is to what extent you know we create a system we call it a quality systems where the individuals or the persons concerned they are become self motivated, intrinsically motivated to carry out their jobs. So, there are certain principles related to quality management I want to highlight this. First one is that quality management is based on 3 fundamental principles; focus on customers and the stake holders, that is the first one. Second one is the participation and team work of everyone in the organization and the third one is a process focus supported by continuous improvement and running; that means 3 things. So, the customer focused, process focused and participation and team work.

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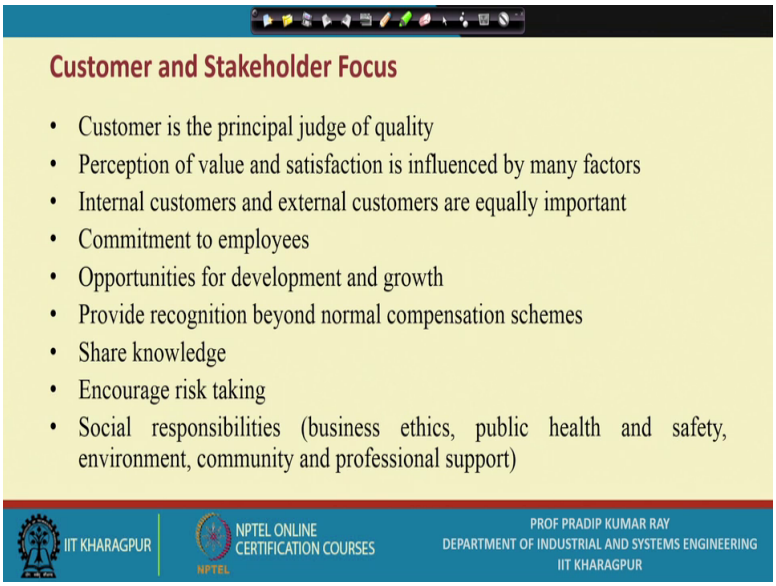

So, under customer and the stake holder focus there are many issues involved like say the customer is the principle judge of quality, then perception of value and satisfaction is influenced by many factors we must believe in. It is not that you just biased with one particular thought or one particular issue. Internal customers and external customers are equally important you know the internal customers; that means there are many stages in the production system. So, I work at a particular production stage the output I produce that must go to the next stage of the production systems or the manufacturing systems.

So, it goes to the next stage; that means, from say the upstream to downstream. So, the downstream you have the internal customers and in the upstream you have the internal suppliers plus when the product is produced and product is sold to the customers these are basically external customers, that means ownership gets changed. So, we need to consider that interests of both internal customers as well as the external customers while we create a total quality systems.

Commitment to employees, this is an important issue. Opportunities for development and growth, provide recognition beyond normal compensations schemes, share knowledge, encourage risk taking, social responsibilities like you maintain the business ethics public health and safety these are very critical issues these days in majority of the organizations, environmental issues you must consider, community and the professional support you also must have.

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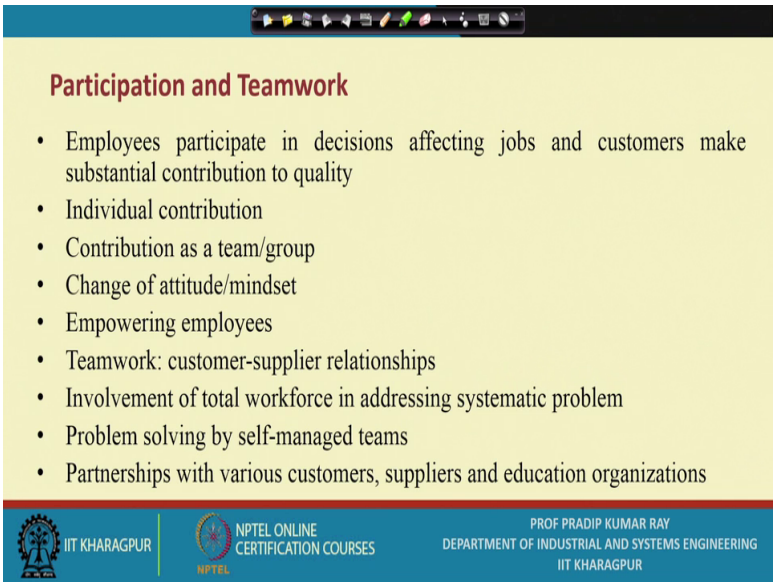

Participation and team work implies participation decision affecting jobs and customers makes substantial contribution to quality. Individual contribution we must be able to recognize. Contribution as a team or the group, change of attitude or the mindset; it is very difficult when we look into the geo defects program. You will find that the entire program is directed to change the attitudes or the mindset of the concerned persons, while you create a total quality system.

So, there are ways you can change the attitudes or the mind sets of the people concerned in order to improve the quality on a continuous basis. Empowering employees, this point already we have been mentioning that the ultimate objective is to what extent the employees whatever may be their work level to what extent you are able to make them intrinsically motivated to carry out the jobs assigned to them. So, team work we emphasize, involvement of total work force in addressing the problems systematically. Problem solving by self managed teams this we create and partnerships with various customers suppliers and educational organizations.

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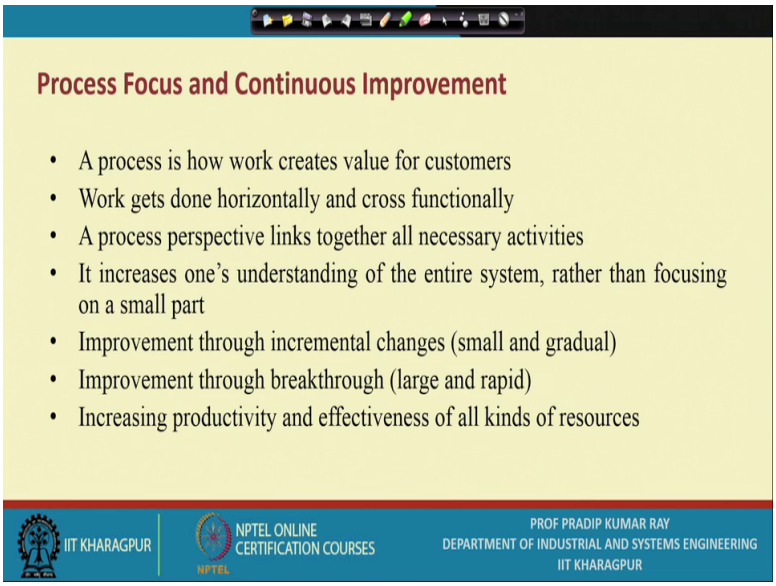

Now, the third point is the process focus and continuous improvement. So, this is a must, in fact. And, what you try to do, the last 3 points like improvement through incremental changes, small and gradual, this always you prefer and improvement through breakthrough, now, this breakthrough depends on how strong how effective your R and D is whereas, this incremental changes, sometimes they refer to as the stair case changes stair case improvement. Now, this will be easier for you. In fact, that means, whatever resources given to you suppose for quality improvement to what extent you are utilizing a resources to the fullest extent possible.

So, if you can do this, that means, incremental changes, with minimum investment you can go for incremental changes all the time and ultimately you can improve your quality level substantially whereas, if you dependent on breakthrough, that means, the probability that the breakthrough will occur at what point in time this breakthrough occur that is really not known.

So, this is an uncertain situation. So, you have to make the problems, you have to address the problems in such a way that the certainty is ensured and such certainty is ensured when we will opt for incremental changes in the quality level. So, that is very important. Or whereas, if you want to change your quality level through breakthroughs, then you maybe you will be dealing with the problem under uncertainty increasing productivity and effectiveness of all kinds of resources.

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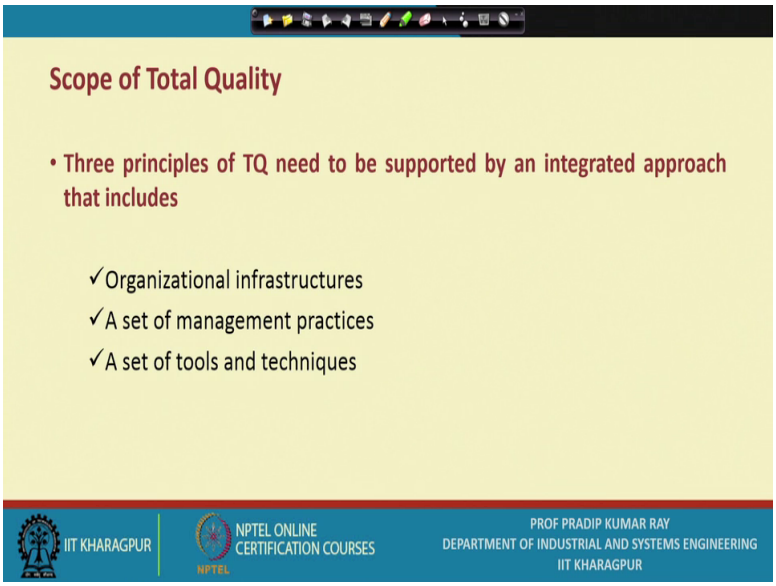

So, what is the scope of the total quality? Now, we must go for an integrated approach because all these 3 principles you have to apply and simultaneously. So, the first thing what you require that is the organizational infrastructure, a set of management practices and set of tools and techniques.

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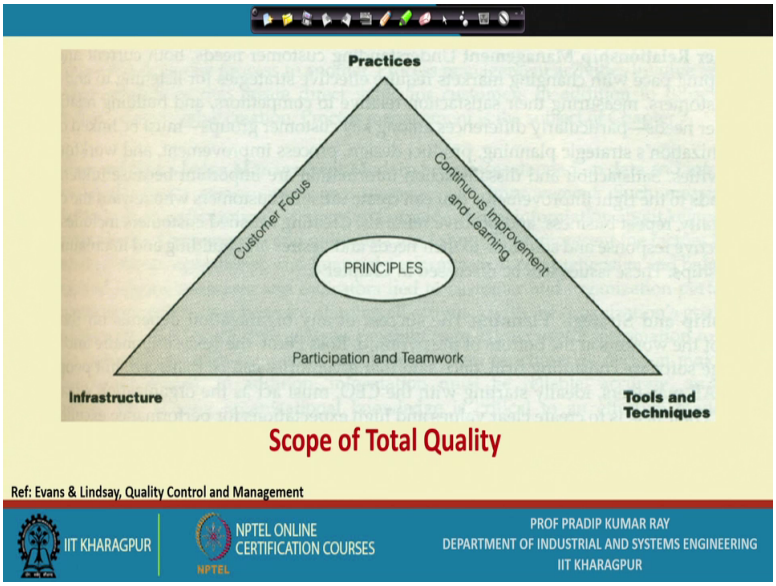

So, this is the scope for the say the total quality, what we have basically you know we have you need to highlight you have to create the infrastructure. Sometimes we say that you need to create the environment and while you try to create these environment; that means, what

sort of infrastructure you have that is to be looked into. What sort of practices you have related to quality management that also you must look into and what are the tools and techniques you are going to use. Now, what are the tools and techniques you are using and in future you know you feel like using some other tools and techniques whether you are creating the right kind environment to use this tools and techniques that is to be looked into and then within this you know structure you have there is the 3 points we have these are all interlinked.

Now, you need to apply which 3 principles; one is the principle related to participation in team work, principle related to the customer focus and principle related to continuous improvement and learning.

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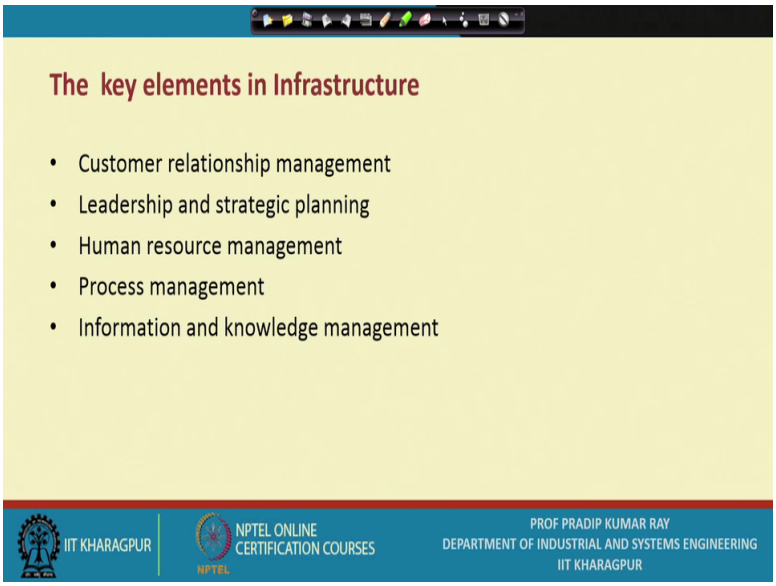

So, what is the key elements infrastructure customer relationship management? This aspect we have been emphasizing many organizations these days like CRM. They are focusing on this is known as the CRM. Leadership and strategic planning; without leadership right kind of leadership, total quality management is not possible. Human resource management we must be looking into, because ultimately it is related to the employment empowerment.

Process management we must know, as sometimes you know we refer to a particular process which is referred to as the business process; information and knowledge management.

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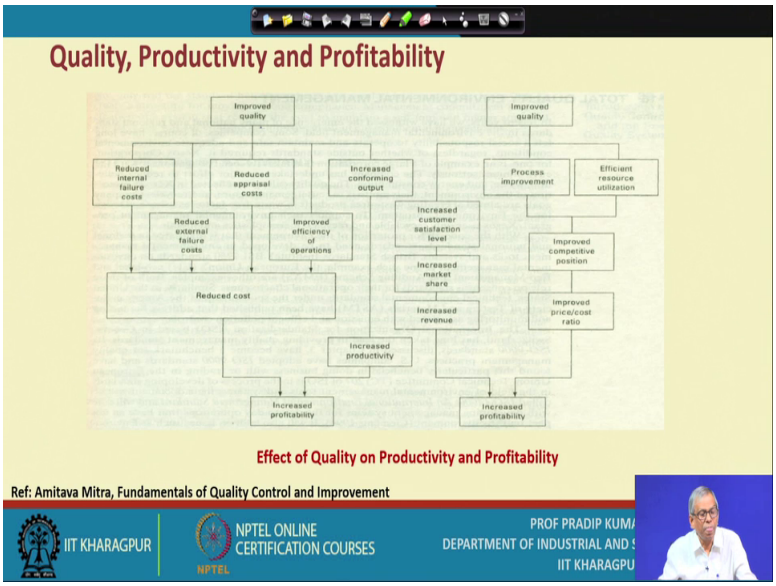

And, while you looking into this, that means, you must have an idea that to what extent quality is affecting the performance and productivity and profitability. So, improved quality you get through reduced internal failure cost, reduced appraisal costs, reduced external failure cost, improved deficiency operations, these are the ways you can improve quality and increased conforming output.

So, the cost aspect is considered, that means, reduce cost and then increased productivity conformance output. So, output is increasing acceptable the output is increasing and the cost is getting reduced so, obviously, you can increase the profitability. Similarly, input quality is possible through increased customer satisfaction, process improvement, efficient resource utilization, these are the key issues you need to consider for increasing the performance of an organizations and then increased customer satisfaction may lead to increased market share, increased market share may lead to the increased revenue. So, increased revenue will lead to increased profitability and similarly if you go for process improvement because you are the total quality is essentially process focused. Efficient resource utilizations if you can do, if you can have, then obviously, you can improve your competitive position because you have your competitors.

So, ultimately what happens that you will recheck condition where the prize cost ratio increases this value of price cost ratio increases and obviously, it will be reflected in increased profitability. So, how the quality is related to profitability as well as the

productivity this must be made very clear. So, this is a general outline you can say a general say a generic format what you need to do; given an organization, you need to look into all these aspects and you need to create data and then the exact increment in the profitability, exact increment into the quality, exact increment in productive over the time periods that you must know and for that the database is to be created.

So, in short ultimately, if you know your main objective is if you can create a total quality management systems in your organizations, ultimately you will be always will be aware of the relationship between quality productivity and profitability and so obviously, you know at this stage you create a mindset that whatever the quality related tools and techniques you are going to use, whether off-line and on-line, it must have a bearing on creation of a total quality systems with all these features. So, then only profitability is guaranteed, productivity is assured and the quality increased.

Thank you.