Decision Support System for Managers
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Module - 10
Decision Support System for Customer Centric Value Driven Decisions – designing the service system
Lecture - 48
Roadmap to Six Sigma; Ishikawa Diagram and SIPOC

Hello and welcome to "Decision Support Systems for Managers"! We are into module 10, lecture 3: 'Roadmap to Six Sigma; Ishikawa Diagram and SIPOC'. And in this module, what are we studying? We are studying 'Decision Support Systems for Customer Centric Value Driven Decision Making'; ok. What did we learn? Customer centric; we gave you the example of a shoe sole; shoe sole should always have good cushioning because entire body weight is on this for at least 12 hours a day that is customer centric.

What is value driven? We gave you the example of: some people will walk straight; some people will bend forward; some people will bend backwards. So, accordingly the body weight is getting also tilted. Now, when the body weight is getting tilted the shoe having an even padding all through does not help. If the body is bending forward the padding should be more in front, if the body is bending backwards the padding should be more at the back; ok. So, that is value driven.

So, customer centric value driven decisions; now to have this you need quality; ok. What is the definition of quality? Quality basically means you should provide customers what they expect ok. Now, what do customers expect? Customers whatever they expect they expect, that is separate that is a marketing domain. But whatever customers expect, your product should not be too much of zigzag from whatever the customers expect.

Customers expect the product to remain within a band LSL and USL; whenever the product goes beyond that then basically you have to means a customer is not accepting the product clear. Many of you because you are working maybe you are staying at different places, many of you who are students maybe you are staying in hostels ok. So, suppose that particular restaurant or hostel they give lot of spice in the cooking, lot of red chilli powder, etc.

Now, you may not like it; I personally I just fear chilli ok. So, the red chilli powder; so, you do not like it because you do not you are not able to digest ok. So, what you do? You tell the delivery boy one day do not do not give so much of chilli, red chilli or green chilli; he does not listen, next day you do; third, fourth, 5 he does not listen. So, ultimately what do you do? You stop eating from that particular place; right; ok.

So, this is what is called quality has to be consistent ok; either consistently good, consistently bad both are acceptable. Consistently bad we know that ok, we cannot get work done from him or her, consistently good we know we can get done work done. But, be careful do not dump it everything on the so called good quality employee.

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So, we, but we have just ended here roadmap to the process for the process of Six Sigma. And, here roadmap is basically Six Sigma involves 5 steps: define, measure, analyze, improve and control. Six Sigma involves 5 steps: define, measure, analyze, improve and control ok; very very logical. You have a problem forget Six Sigma, you have a problem; ok.

School bus is not coming, your kid will go to school, school bus is not coming that is the definition of the problem. School bus is late; ok. When you define the problem very clearly half your work is done, next you know what we need to do. If school bus does not come maybe you will phone your children's friends whether school bus has reached their residence or not.

If they have reach then the bus will also come to your place, if they have not reached then you will have to think of how to take your children to school on your own ok. So, define the problem. Get a clarity on what exactly the problem is, is it a school bus problem, is it a general problem that there is a road accident or something and that roads are blocked whatever; ok; define.

Measure: measure the extent of the problem ok, measure the extent of the problem. Too much problematic you have to be very careful. Analyze: analyze where it has gone wrong ok. Improve: improve the process and control ok; DMAIC.

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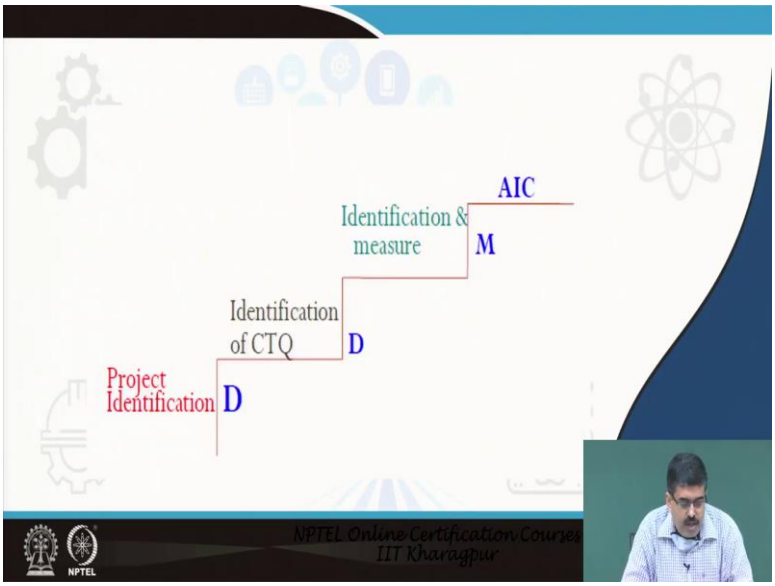

This is basically the ladder where which by which Six Sigma operates. Project identifications its a project identification, identification of the CTQ, identification and measure at the M stage and AIC ok. Define, measure, academy; sorry define, measure, analyze, improve and control. So, at the define phase basically you identify what the project is all about, what you are supposed to do, etc.

Once you are done, you find something called CTQ: Critical To Quality. Find out what is most critical to quality for that project clear. Suppose, Howrah station; many of you might have visited Howrah for some work or the other or take stations of any metro cities; Delhi, Mumbai, Delhi, Mumbai, Kolkata that is Howrah station.

One very perennial issue is that the train that incoming train that is coming inside Howrah, that will keep on stopping at different signals; that will keep on stopping because platform is not available. Only after some time it will enter the platform. Somebody has told means the railways have told you that please solve the problem.

So, what is the project identification? Problem solving traffic congestion, signal problem whatever etcetera for Indian railways at their Mumbai station, Mumbai Central. What is the critical to quality? CTQ is critical to quality. What is critical to quality? That the project will do very well, that you will have to solve the scheduling problem of Indian railways.

The critical to quality here may be one, maybe two nothing; critical to quality here is platform availability and signal, quality of the signaling system ok. Then you identify the issues, measure them and analyze, improve and control.

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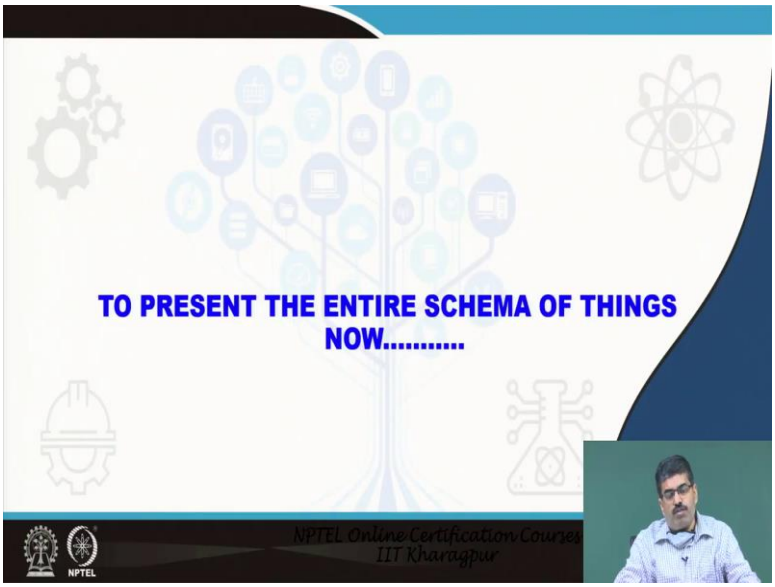

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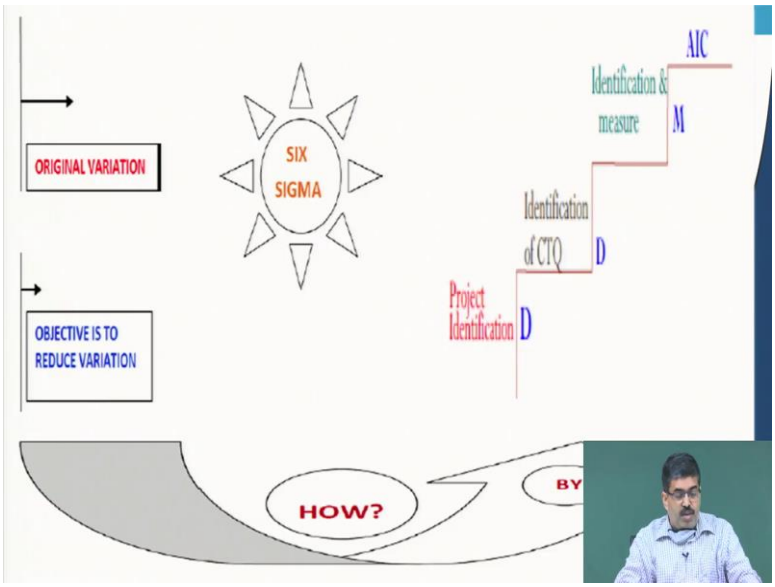

To present the entire schema of things now, this is the diagram. Original variation is in the top left hand corner ok, huge variation. Next just below this objective is to reduce variation to this much, how to that is the bottom, how to; by using DMAIC this right hand side, by using DMAIC that is Six Sigma; ok.

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Some tools Ishikawa diagrams, SIPOC diagram; let us explain these two.

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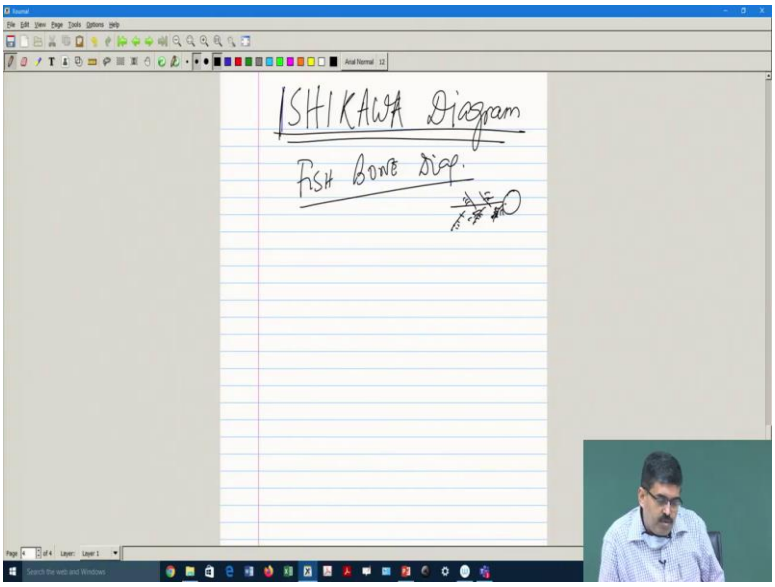

Ishikawa diagram is also called as fish bone diagram, because the diagram looks like this; we will explain ok. Just for your understanding fish bone diagram; ok. Now, what does it mention fish bone diagram? Let us say there is a problem listen very carefully, let us say there is a problem. There is a problem; ok.

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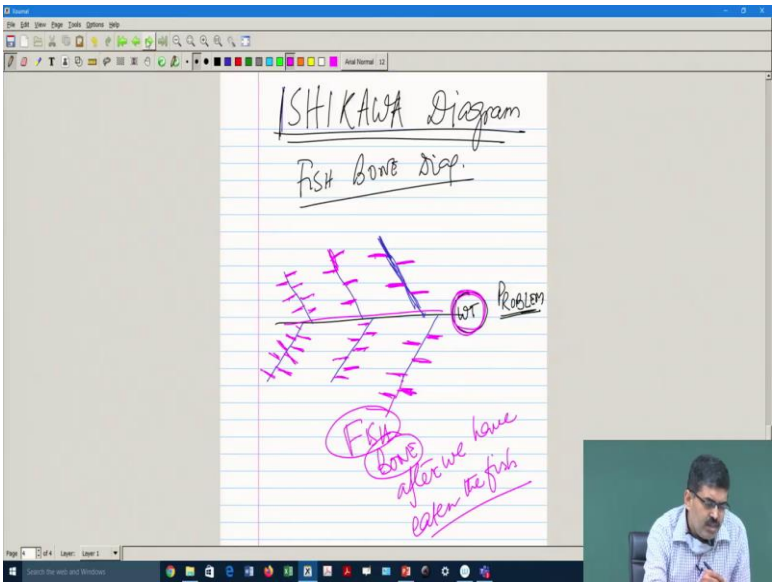

What is the problem? Too much of waiting time as the train is approaching Mumbai Chhatrapati Shivaji Terminus or Howrah station; ok, too much of waiting time; ok. This is the problem, waiting time. What is the reason? Let us write down the reasons; first reason: very lesser number of platforms, not very, lesser number of platforms.

Second signaling system is old, third track maintenance means the railway track maintenance not done properly, fourth no one cares. Fifth local trains have to stop giving way for express trains, sixth some other reasons ok. First lack of availability of platform; why is platform not available?

Look at look at look at the diagram, why is this was platform, this was platform. Why is platform not available? Platform is not available because there is not no not enough, no I mean whatever you say not enough space to build new platforms. Existing platforms are full, not enough space to build new platforms.

Platform not available, another reason is that even if a train has gone from platform; that is not reflected in the control screen at the railway cabin ok. Platform not available because some engine is standing; so, that engine has not got clearance to move out ok. Platform not available means one express train will start very soon; for that particular express train, this platform is getting blocked; right.

So, what is happening here is, this is one-dimension platform not available, second is signaling system itself is a problem; ok. Signaling system what is a problem? Automated signals not working; during rains rain water is entering the signal box and the signal is giving different signals, where it should be giving green, it is giving red.

Signal maintenance and repair not happening; spare parts for signals are not available; clear. So, HR issue, people do not care. Why they do not care? It is a government job, people do not care; why they do not care? Because, nobody cares about them, nobody listens to them, who cares, lack of employees, employees are on leave. So, lot of these issues.

So, at the end of the day if you look at this if you look at this; ok. So, now, if you look at this, this is looking like a fish bone after we have eaten the fish; ok; fish bone after we have eaten the fish, that is why it is called as a fish bone. But what is happening is, in one picture you are getting a total idea of what has gone wrong or what has led to such a problem of waiting time; ok; that is the beauty of Ishikawa diagram; ok. Next we had something called a SIPOC; ok.

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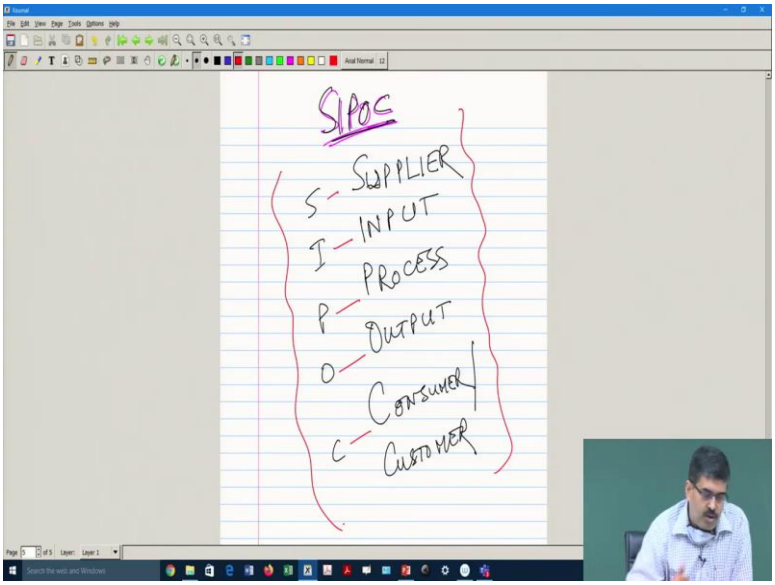

Next we had something called the SIPOC; What is SIPOC? Very easy S stands for Supplier, I stands for Input, P stands for Process, O stands for Output, C stands for Consumer. Supplier, input, process, output, consumer or it is better to write customer; ok; I will use it.

So, right what; so, this is SIPOC. Now, what is this? For every production system, if we can clearly outline the SIPOC diagram then any problem that has happened, any deviation that has happened you can really trace who is responsible; you can really trace who is responsible; ok. This is SIPOC. How to do this? Let us take an example.

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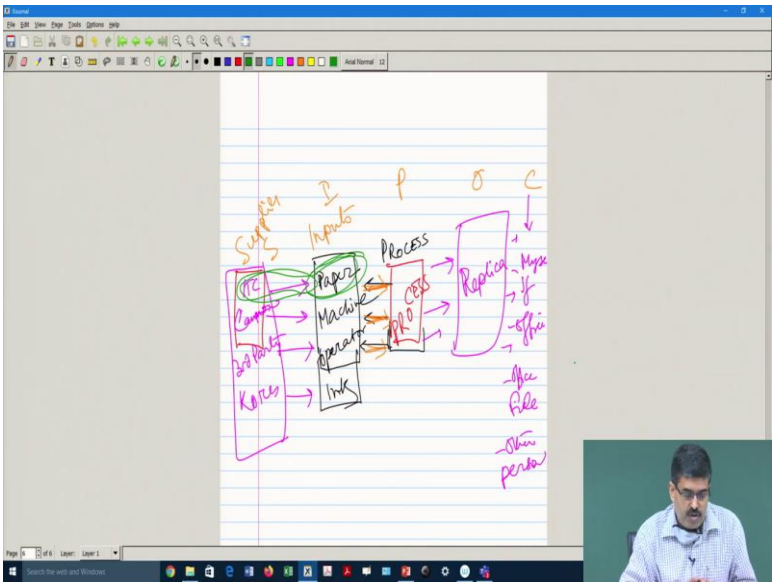

Let us take from the center that is better, now it is a input process, process. Let us take a photocopying machine, I do not know whether you are able to see, but we will write process here ok. Let us take a photocopying machine. What is the job of photocopying machine, Xerox machine which we normally call?

To create another image of the document on a piece of paper right, process. Now, to create an image what are the inputs do you require? We will change the direction of the arrow later; to create the image what are the inputs you require? Inputs you require are paper, you required the machine and you require the operator; is that all?

No, you require ink ok. So, these are the inputs. Now, we will change the direction of the arrow. So, these inputs are going to the process. Who are your suppliers? Suppliers right, S I P O C. Who are your suppliers? Who is supplying paper? Paper is getting supplied by ITC. Who is supplying the machine? Cannon.

Operator, a third party ok. Who is supplying the ink? May be sorry maybe Kores ok, maybe Kores; so, this is my supplier ok; supplier, input, process. What is the output? Replica. Who

are my customers of this output? Myself, myself, my office and my office file and the other person from who for whom I have done this photocopy ok. So, these are my customers. So, this is called as a SIPOC.

Now, if you see if any problem happens, if any problem happens, ok, what will happen? I can clearly, I can very clearly found find out what has gone wrong and we can trace as to what we have done clear. So, this is your SIPOC; right. So, some tools – Ishikawa diagram and SIPOC we have learned; ok.

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Ishikawa diagram I have explained.

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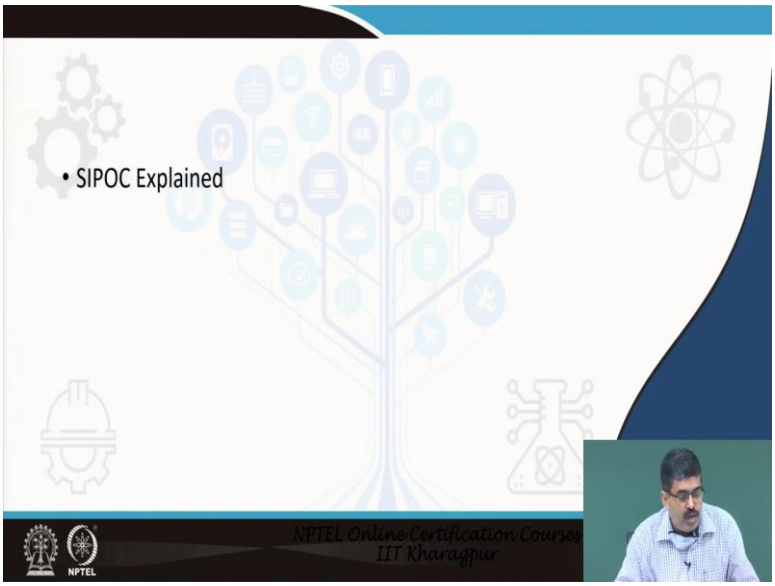

SIPOC; SIPOC also has been explained; ok.

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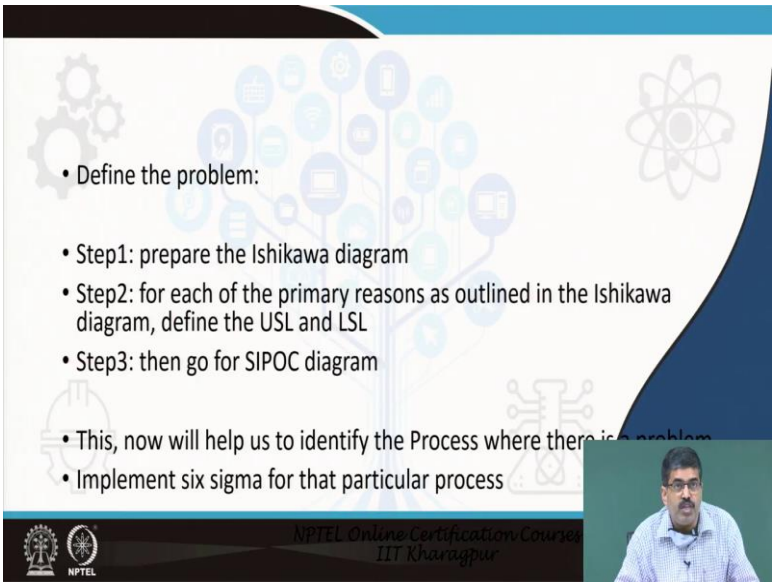

Now, I have just mentioned here the Ishikawa diagram, how to do it but anyway I have just shown you to how to do. Step 1: prepare the Ishikawa diagram. Step 2: for each of the primary reasons as outlined in the Ishikawa diagram, define the USL and LSL. How what is your; how what is your tolerance region? Step 3: then go for SIPOC. This now will help us to identify the process where there is a problem. Implement six sigma for that particular process; ok.

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These are the references that you can use; ok.

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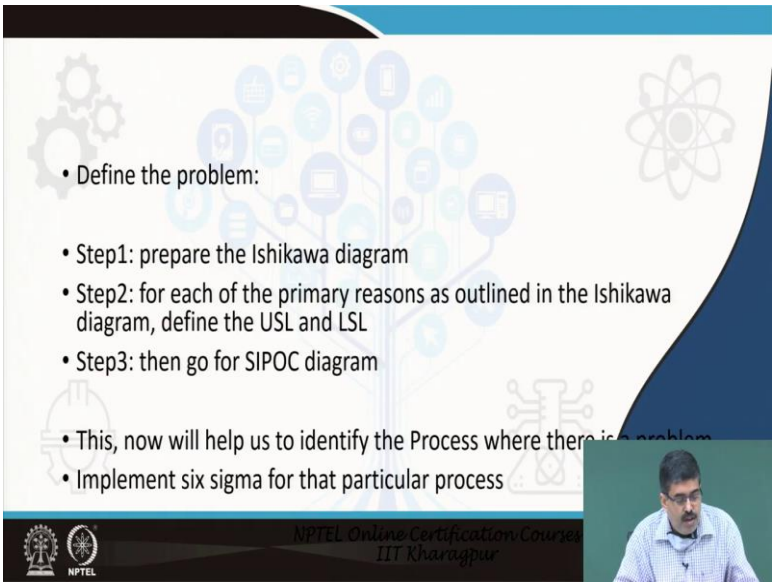

Now, I will just give you a brief about this for USL, LSL and SIPOC; you can take up any example. Now the references I am just giving you, Chopra and Meindl is a good one and Simchi-Levi is a good one. Now, what I want to say is this USL and LSL you can you do an exercise ok, you pick up any problem that you see around you and try to prepare a fish bone diagram; that will help you.

So, and then you can do some exercises also. SIPOC diagram is very much used in the industry for problem-solving. It helps us to find out exact and pinpoint exactly what has gone wrong, who is creating the or who is the person who has to be identified. And that person has to be, it is not a punishment, that person has to be retrained. Maybe the person is not understanding what is expected of him; so, that person has to be retrained and it can be done; ok.

So, these are the references and I think we will end this lecture here; ok.

Thank you!