Introduction to Lean Construction (Module 1)
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Module 1, Lecture 9
Key Lean Concepts#1 (Value, Value Stream, Flow, Pull, Perfection)

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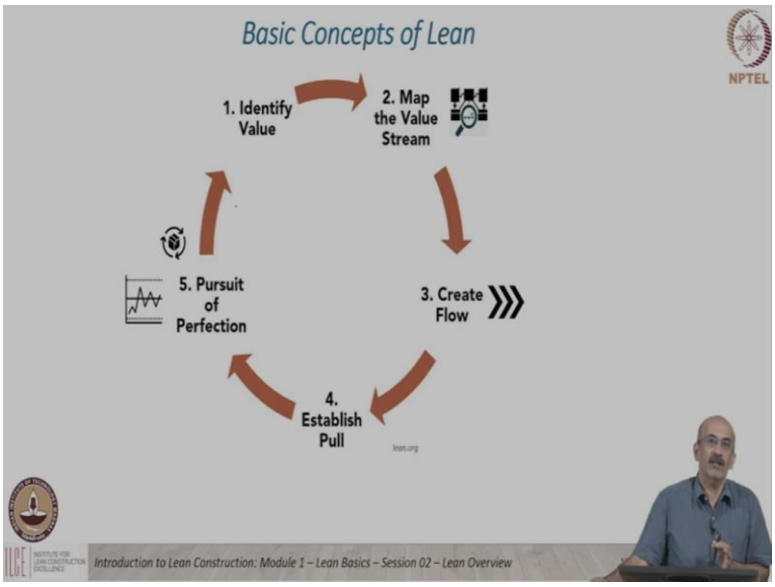

Now, coming back to the basic concepts of lean, which were discussed earlier, so we have the five concepts here, I will touch upon looking at lean from these concepts.

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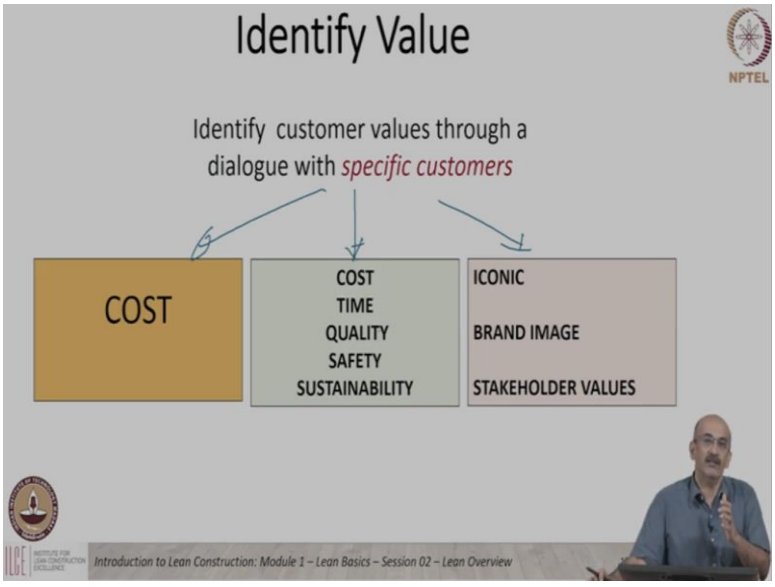

Now, when we talk about identifying value, this is the base. Ultimately, a lot of, what we do in Lean is, to deliver value to the customer. So, we need to be able to identify the value of the

customer. Now, our customers come with different types of values. For some customer, it could be a focus on cost, for other customers, your classic project objectives. It could be cost, time, and quality, you have to decide, what the balance is and where the customers' requirements are? For yet another customer, it might be all of these are taken for granted. It will be, might be the requirement for an iconic structure, a requirement for brand image, requirement for values of the stakeholders of the customer.

So, identifying value is very important and we know that in construction, our customers span all these requirements. We have several types of customers. We have also definitely customers within processes. But identifying value of your customer or your setup customers is core. Only then can you actually talk about value adding services.

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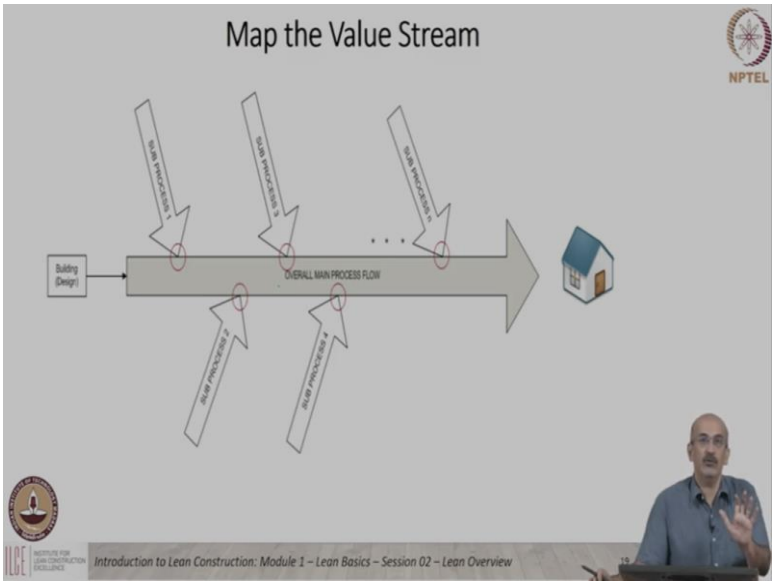

Now, when we go to mapping the value stream, we have to recognize that although we talk about construction as a project, there are processes involved. And looking at the processes, looking at, how do we model construction as a process, so each activity in a CPM is not just a start and finish, but within it, it has several processes, to be able to finish the activity successfully. So, how do we actually identify the processes? How do we map where value is added in the processes? So, here is a very broad level of processes and sub processes.

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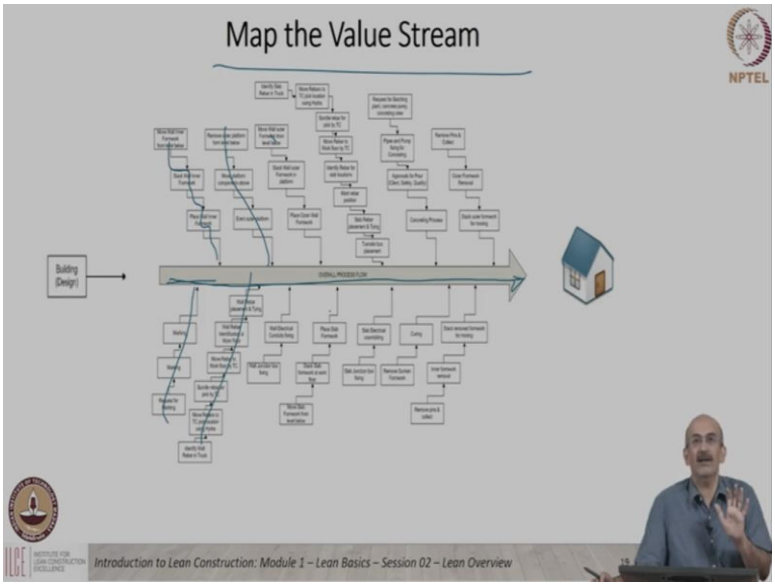

But as you get more detail, you can see there can be several sub processes that go into the same macro-process. So, to be able to identify, how, for example here, this is the form work, you know, before the form work, we have marking, you know, we have reinforcement, we have, platform. So, there are several processes that feed into this overall process of successfully delivering a concrete pour or a building.

So, we need to be able to find, what the sub-processes are and map where value is added in each and this is what we refer to as mapping the value stream. So, it can be a fairly detailed exercise and sometimes in construction, we are not used to going and documenting this level of detail. We keep it at a macro level. Mapping this level of detail adds value and allows us to see, what is happening and is a requirement to be able to implement Lean successfully.

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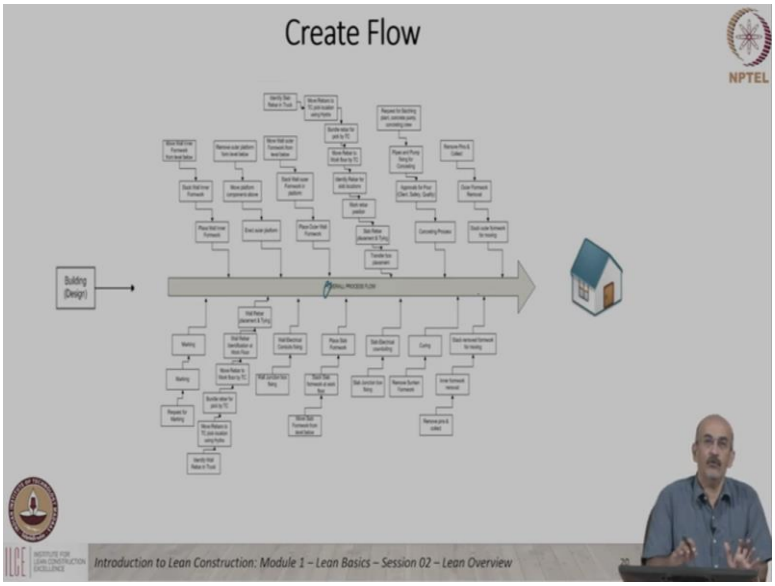

Now, if we take the same process flow, we need to create flow in this. We need to understand that if there is a bottleneck here that all this stops. We need to understand, how the process flows and be able to create this as a flow mechanism, not as independent activities that are done. So, this is another very very important concept of Lean, which talks about creating flow in all of these processes. And once you create, once you understand, how your processes are flowing, there is an important concept of 'pull' which I will try to illustrate with this example.

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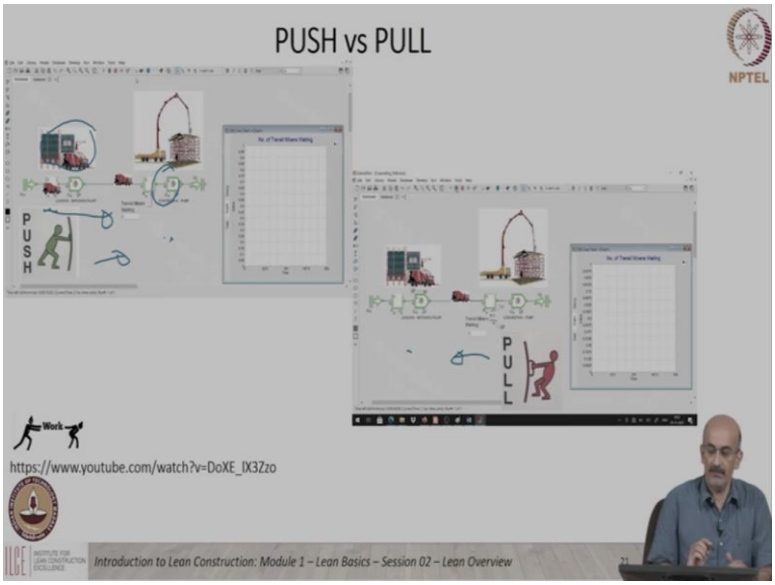

So, here we have a very simple two stage processes. We have a transit mixer being loaded and it being unloaded and concrete being pumped. So, this is one and this is again the same

process. We are going to look at this in a ‘push’ system as we call it here. In the push system, what is happening is the transit mixer keeps loading and going to the worksite as and when it is ready.

In a pull system, the transit mixer goes to the worksite only when there is a pull from the work site and it is called. We use this example because it is something which many of you will be able to relate to. So, if I go into the pull process system, so, here is the example.

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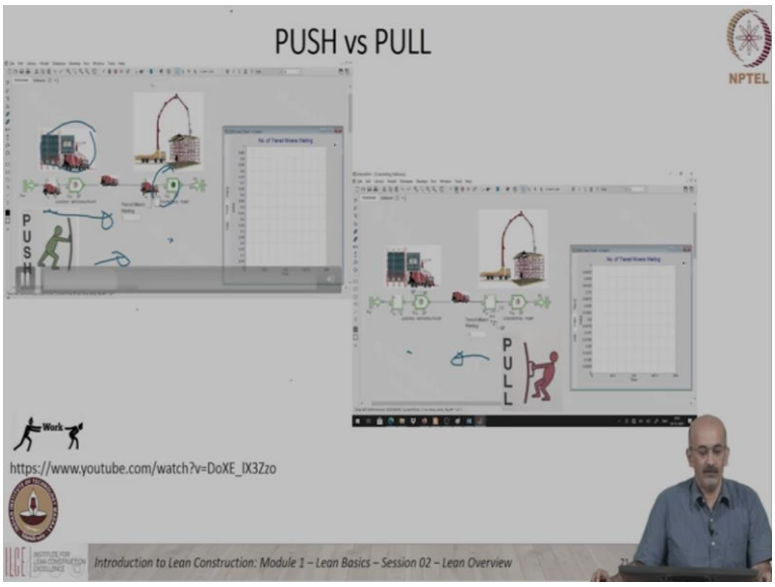

So, I am going to run this animation. It will show, what is happening here. Please, keep an eye on this. Here you can see the concrete trucks that are moving, and on the area here, you will see the number of mixers that are waiting in this queue here. So, as we wait, we can see now, there are two mixers waiting, three, going to three mixers now, and its gone to four, five.

As you can see in the push system, as the mixers are not waiting for the call from the site, the queue here keeps increasing. So, this is the push system. And as we go, you will see that the number of mixers waiting, will keep increasing, which we obviously know, is not good for the process.

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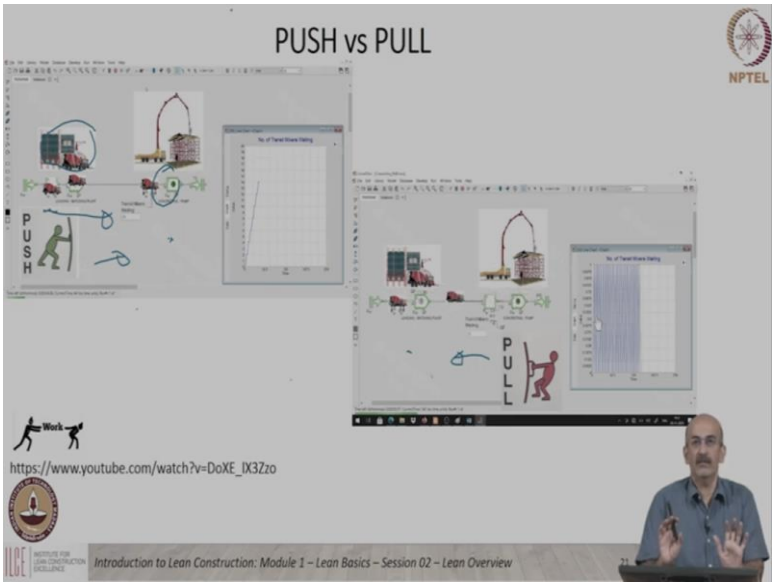

If we go to the pull system in contrast. Here what happens is the mixer waits for a call and only then comes. So, this is where you can see that here is the queue, the waiting queue. You can observe that at the maximum number of mixer waiting at any time is only one. Because there is a pull and only based on demand, the mixer is pulled into the system.

So, this is basically to illustrate a difference between push and pull. And we have to carefully evaluate. What is required in general a pull system is advocated because it shows or you can see the waste in the process much easier when the system is on a pull mode. In a push mode, the waste gets hidden. Now, we will learn more about this in the lectures dedicated to this, but this is sometimes a difficult concept to understand just wanted to illustrate it with this example.

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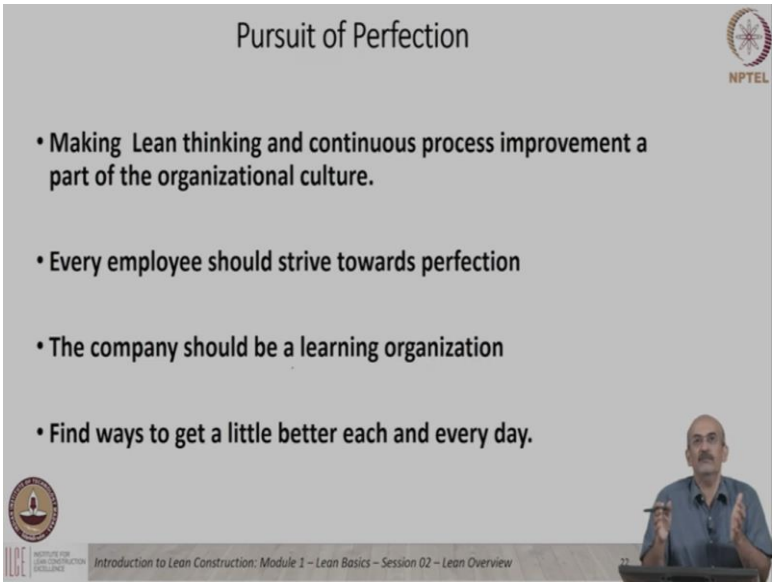

And the final concept is the pursuit of perfection. And here, this is really the concept of, whether it is continuous improvement or making it a part of organizational culture, basically, we are saying Lean, once you achieve the other four it should be strive towards perfection. Every employee should be on board. The company should be a learning organization. It should be constantly trying to get better, each day.

And only when that kind of culture is in your organization, will you really achieve, what you call, a full Lean culture, where you do not everything is thought only in lean terms. You do not have to think Lean separately. And say, oh, this we are doing Lean. Lean becomes a way of life. Without asking any question, Lean is what we do every day without thinking, and that is what is pursuit of perfection.

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