Toyota Production System
Prof. Rajat Agrawal
Department of Management Studies
Indian Institute of Technology – Roorkee

Module No # 04
Lecture No # 16
Use of Reliable Technology

Welcome friends. So, now, we are entering into the fourth week of this course of Toyota production system and we have already covered 7 principles of Toyota production system. In all 14 principles are there and today in this session we are going to discuss another principle of Toyota production system and that principle of Toyota production system is very interesting, because, when you read about this principle, then only you can understand just by naming the principle it going to create a lot of confusion.

The title of the principle is use of reliable technology now, how you will check the reliable technology what are the criteria of reliability and nowadays, we all say that we need to continuously innovate, we want to remain ahead of our competitors. And when we want to remain ahead of competitors, we continuously want to innovate then how is it possible without following the latest technology.

And the principle of Toyota says that use only reliable well tested technology. Do not hurriedly adopt any technology. So, once a technology is properly tested, it has been proven, then only you start adopting the technology. So, that is one very interesting principle and it will say that, again because we have discussed this very aspect again and again that Toyota's focus is more on their people.

So, this concept also we will discuss that will help that I am giving more respect to people and technology is there to support the people. Now, what is happening in many organizations, we are adopting technology and then we expect that our employees, our people, they have to adjust themselves with new technology and in many sectors in India, it had happened that because of new technologies, people face a lot of problems and whether that new technology is useful for my organization or not, that also is a debatable issue.

I should not simply adopt any new thing, because it is new, we need to understand we need to evaluate properly the cost benefit that how much resources are to be exhausted for adopting for using this technology or this particular new phenomena and how much benefit we will be drawing because of its users when we have a proper cost benefit analysis, then only we should go for the use of those technologies.

So, that is the idea of this principle. And in this session, we are going to discuss the various aspects of using the reliable technology using the tested technology. So, this is as I said, that we have already covered 7 principles.

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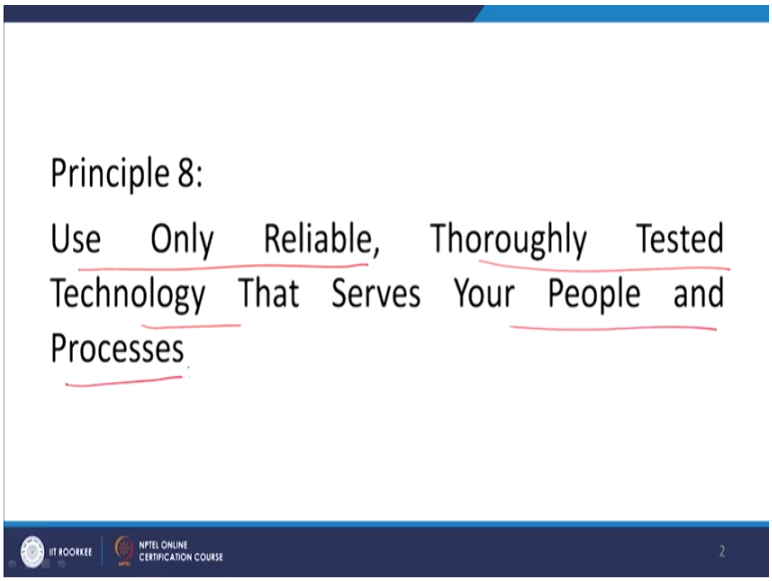

So, this is the principle number 8 that says that use only reliable thoroughly tested technology that serve your people and processes that in the adoption of technology, the importance is being given to people and your processes not to technology, that is a very interesting aspect. As I just said that many examples are there where new technologies are being adopted.

Like if we take the example of Indian banking sector, so, few years back in the Indian banking sector, most of the things were happening manually, we used to have manual ledger's in the banks and accountants used to make a lot of entries in the ledgers and everything was manual then slowly the period of digitization came, IT started knocking on the doors and because of IT, we started adopting a lot of software's a lot of tools techniques for automating our activities.

And that happened in the banking sector also. Now, presently, if you see the entire banking has gone to the digitization mode. But during that transition period, when digitization started happening in the banking sector, it was not people friendly and large number of people, those who are working in the banking sector for 10 years, 20 years, 30 years, and where in the age bracket of 50 plus they were forced to go on retirement, because they were not able to adapt to new technologies.

So, that is an example where the adoption of technology was not serving the people and processes, it was serving the larger interests of banking industry, but we lost a large number of those people who were very experienced, they were knowing the banking to the core, but because of the process of digitization, because of adoption of new technology, they were forced to took that kind of VRS at they got voluntary retirement.

So, this concept of reliable technology, the tested technology is there that you should continuously take into account what new technologies are being developed, but take only those technologies which are going to serve which are going to add value to your organization that is very important thing that how these things are adding value to your organization, only then you should adopt them you should put those technologies into practice in your organization. Now according to this principal, one of the senior persons from Toyota Motor Company Eiji Toyoda.

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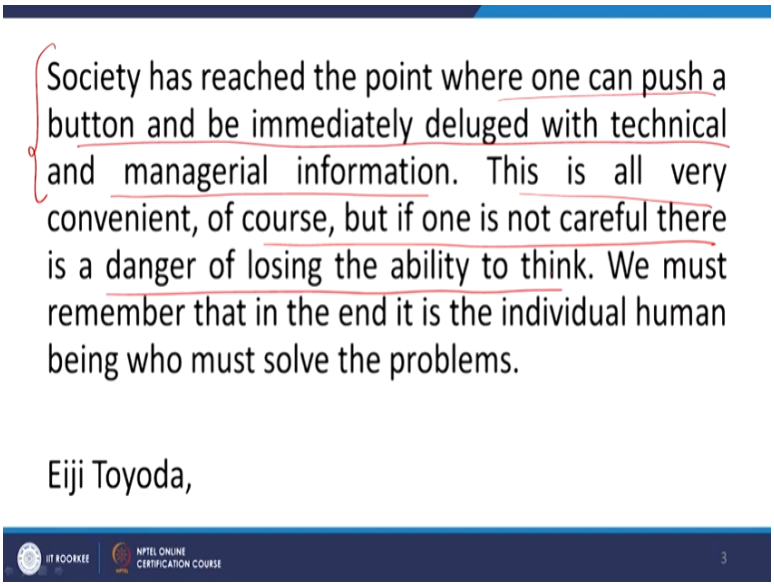

According to him, the society has reached the point where one can push a button and we immediately delude with technical and managerial information. So, as we say that everything is available on the click of your mouse. So, that is what the label of information availability, that is where the technological advancements have taken place, this is all very convenient, of course, but if one is not careful, there is a danger of losing the ability to think.

Now, because everything is available on internet, everything is available on www therefore, what is happening, that our ability to think is continuously reducing, that is the downside of what is happening of technological advancements now, we are losing this power of memory, we are losing this power of thinking and all these are losing the creativity of an individual. We must remember that in the end, it is the individual human being who must solve the problems, machines are not going to solve the problem, technology is not going to solve the problem.

Ultimately, when every system fails, it will be the human being which is going to solve the problem. But if you are too much dependent on technology, your ability to think will continuously reduce and because your ability will think will continuously reduce you will also lose this ability to solve the problems ultimately. So, therefore, it has to be a very careful decision that how to adopt the technology.

When we were going to school, we used to have this kind of essay debate competition, whether science is a good servant or a master and we used to have both type of arguments that nowadays it is happening that way only that we all are becoming servant of technology. Technology has started ruling the way we have to live everything is coming on our mobile. And that is one form of advancement in the technology that you can order your food, you can order your taxi, you can book your ticket, you can transfer money, you can see the news, you can listen music, you can take photographs, you can communicate.

So, you want to attend classes, you want to do whatever you want through your mobile phones. So, on a click of a button, everything is available to you. And therefore, your own ability to think is reducing we are becoming dependent on others, you have a problem and you immediately start searching on internet because you are dependent on others. And many a times this creates a lot of

problem also, if you have some kind of health issue and you are searching on internet about the solution for that problem.

So because it is an uncontrollable and there is no mechanism to check whether the solution which you are referring is authenticated or not authenticated, and you may apply some solution which is available on the internet, but because it is not reliable, it is not proven, and you start applying that solution. So your problem may even become more severe, more dangerous, and it may be a fatal incident also.

So, the point which we are trying to discuss that we need to be very careful, we are not against the point which Toyota Production System says that it is not against the innovation, it is not against the idea of moving ahead. Rather, Toyota is one of the company which is a flag bearer for new technologies, it is always at the forefront of using something new, but that something new should we reliable, that something new should be well tested.

And therefore, the concept of prototyping, the concept of testing the prototyping, and nowadays, we have this idea of rapid prototyping etc., which help us to do test at the early stages and we say in our language of innovation, that fail again and again, but fail with low cost fail cheap, if you are doing a long experiment and without taking into the consideration of failure and once you are at the final output and if at that time you fail, the cost of failure will be much higher and in terms of TPS, it will be a big wastage.

So, it is a very important that how do we use this information technology for the benefit of our organization not only information technology, but any kind of new technology. Now, where we were discussing that Toyota is a frontrunner for using new technologies.

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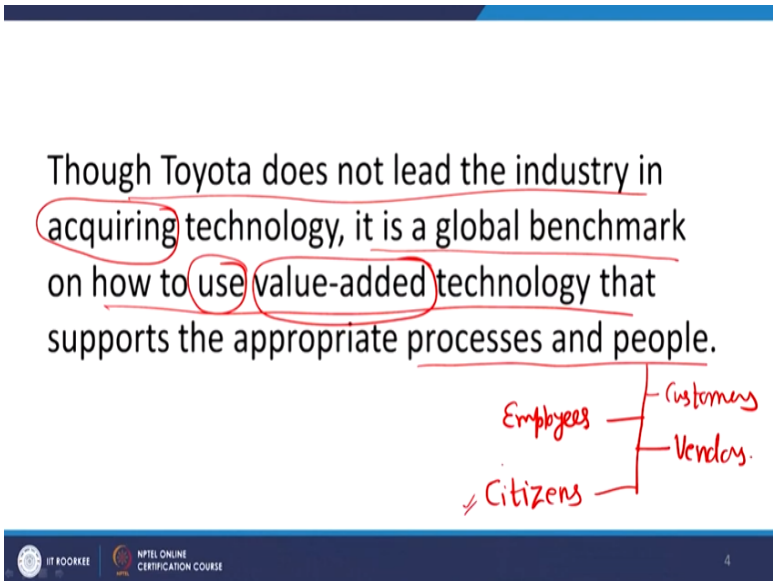

So, though Toyota does not lead the industry, in acquiring technology, but it is a global benchmark on how to use value added technology. So, you see two important terms here, one is acquiring and another is using. So, Toyota is not always at the front runner for acquiring new technology, but they will be always be ahead of their competitors for using those technologies rather they have created a benchmark for using the technology which are going to help them in creating the value added process.

And when they are able to do this value added process therefore, the concepts of lean manufacturing are becoming so popular that itself an example that how Toyota has created the benchmark of eliminating the waste from the production process. And by eliminating the waste itself, you are taking the advantage of superior competitiveness, what is the ultimate purpose of using technology in a manufacturing organization? What is the ultimate purpose of using the technology in a banking organization,?

What is the ultimate purpose of using technology in a railway reservation system? Because we all want all wanted better customer satisfaction, when we are able to provide 24 into 7 banking solution using technology. So, obviously, customer can banking customer can remotely access all banking facilities without even coming to your physical branch. And that is what we expect that how we are able to add value to our system.

Now, IT users in banking, IT users in reservation system, because of the use of IT in railway reservation system, we could eliminate large amount of corruption in the ticket booking and customers have better transparency about confirmation of their wait listed tickets. So, this increases the satisfaction level of the customer. And how the tickets will be given how the interest will be given how fixed deposits are maintained, how different types of accounts are maintained. So, you have strengthened those processes.

So, that is fun side of technology. So, here the adoption of technology is actually helping the processes and people. So, when I am saying the people, it includes almost all the stakeholders when you are counting people, so they may be your customers, they may be your employees, they may be your vendors etc. So, all these are or even the people living around you. So even those citizens who are neither your customer, nor your vendor, nor employees, but they are around your area.

So like if you are a power plant, if you are producing coal based electricity, so, those people who are living around that power plant, they are actually getting a lot of ash, they are inhaling a lot of waste which are being produced. So, if you are adopting a new technology, which is minimizing the ash content to the environment, so, even these people are also benefited, if I am living around a refinery and a lot of fumes are there in the air and lot of unburned gases are also way.

So, if I am developing a better system to control all those things, to normal citizens are also going to benefited if I am discharging the chemicals into the fields around my plant. So, I am actually creating a negative aspect for that area. Now, I am adopting a new technology which is efficient, which is going to create better treatment for discharges and now the discharge is having no hazardous element and the water which is coming out of that treatment process can be used for the integration purpose.

So, in fact, I am strengthening I am doing some kind of value addition for the people living around my plant. So, all these are the different forms in which adoption of technology can be useful, but if I adopt a technology, because it is new, but ultimately, it is creating more waste, if it is creating more hazardous elements in the environment in the discharge water. So, that means that is not as reliable properly tested technology.

And therefore, I should be careful in using such technologies I should be careful whether there is a negative aspect of that technology particularly you must have heard in the field of pharmaceuticals also, that the researchers are happening new types of drugs are being developed on the regular basis, but it takes large amount of time more than 10 years of time for that research to translate into a commercial medicine.

Because you cannot take a risk just by one research in a laboratory environment, you cannot bring that molecule in the form of a tablet to the market, because you need to develop 100% reliability, you need to check various side effects of that medicine. And once you are satisfied, you have completely tested all the aspects of that medicine, then only you will go to bringing that product to the market.

In India, ISRO is a very renowned name it is almost a world class organization and because of ISRO, India has done a lot of have achieved a lot of respect in a space science. But once they have developed so many spacecraft and they are now having a series of success, then finally they are now taking a decision that okay, we will set some human beings to space and that is again an example that once they have this kind of confidence that now we have a reliable tested technology, which can be used for sending human beings to space, then only they are taking this decision.

So, it is a very important that thing the use of technology should be done with a very careful thinking and it is not always necessary, we will discuss that you have to innovate all the time, because that is also a very important buzzword these days. Now, when you see what is happening at the Toyota with respect to new technology, so, you see that they are also using new technology, but when they are adopting and when they are using this new technology, these things will be explained with the help of this particular description.

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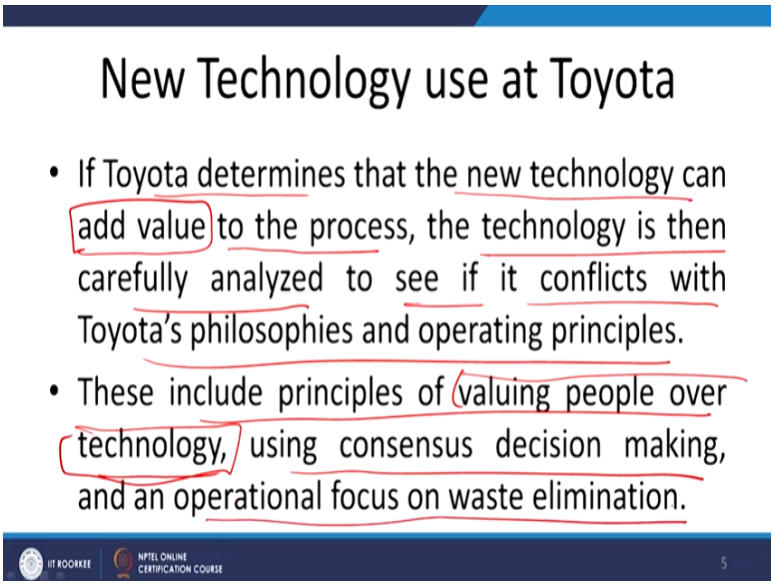

That if Toyota determines that the new technology can add value, so, for Toyota, anything they do, they always see whether this new thing is adding any value or not. So, for the sake of doing something new, they will not do new things. So, whether this new technology is adding value to the process, the technology is then carefully analyzed to see if it conflicts with the Toyota's philosophies and operating principles.

So, one thing is that it should add some value to the processes, it should add value to the people and at the same time, it should not conflict, it should not create any kind of conflict with the core values of Toyota, we have discussed 4 P model, which is defining the core values of Toyota and philosophy people process. So, all those core aspects of Toyota should not be compromised because of use of this new technology.

So, that is the way of testing that is the way of deciding whether to adopt a new technology or not to adopt a new technology. Now, these include principles of value people over technology. Now, the most important item of in this analysis is that considering people over technology, so your like particularly if I say with respect to India. In India's case, we have plenty of human resource and we can be a very, very competitive nation.

If we compete in those products, where we can use our labor power, where we can use the skills of hands effectively and we are not that kind of technologically savvy nation. So, therefore, for India's case, we have to be very careful that where to use technology and where to use more

labor intensive activities. And if we do more labor intensive activities, it will create more employment obviously, and therefore, one big problem that is lack of employment, which is one very important aspect in various governments agenda so, that may also be addressed.

But two things happening simultaneously will be a difficult task. Adoption of technology and particularly the technology which is being developed these days is more towards automation. So, developing technology which is focusing on automation, which is talking of minimum users of human being in the plant. So, if we talk of industry 4.0 where cyber physical systems, we will be there where robots will be there.

So, you are replacing human being with automation and probably that type of technology may not be that most suitable in India's context. So, therefore, you need to see that whether we are valuing people or we are valuing the technology and that balance, we need to clear. And then we need to take a consensus decision and an operational focus on waste elimination. If you adopted technology, and you are not able to use that technology, because you already have a lot of manpower in your company.

So, either you will be wasting the resources of manpower or you will be under utilizing the technology and therefore, you will be wasting the hard earned money or investors money or the money which you have borrowed for adopting that technology. So, it will certainly generate some amount of waste. So, you need to see that the balance which you are trying to achieve in the organization by respecting the people. by valuing the people, by using technology to actually support your people. So, that is the important idea, which Toyota actually uses for using any new technology.

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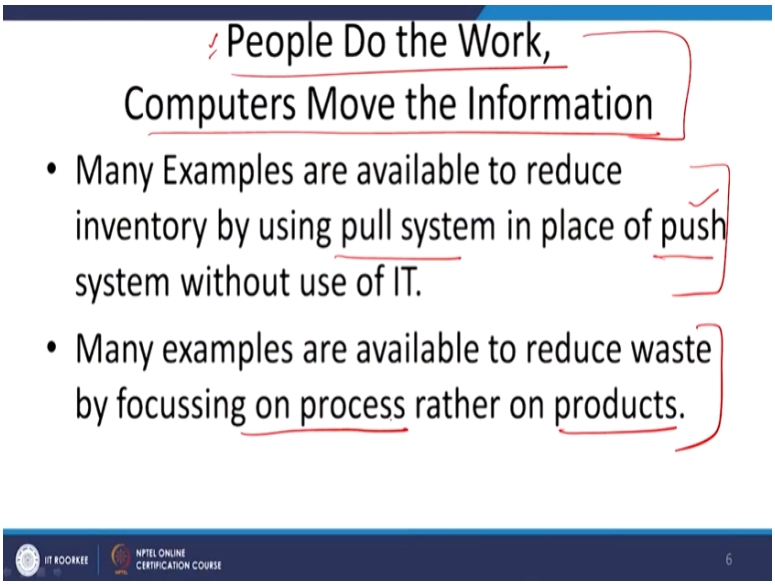

And we also need to understand another important thing that people do the work and computer move the information because many a time we all are living in IT era and this IT era, we are somehow believing that computer is doing everything computer is solving every problem computer is the ultimate (()) (27:00) for all our problems, but that is not true computer is simply moving the information.

And many places you will see that like I have two examples to share with you, one is the example from supply chains. Now in supply chains, there are huge amount of inventories and various supply chains organizations have implemented the complete computerization complete digitization of supply chain is taking place. So, with that, you can continuously monitor that how much inventory is there at a particular location.

So, that is simply the information for you that is not going to eliminate the waste of inventory. Now to eliminate the waste of inventory, you can do it even without computers. And there are plenty of case studies available where you can see that how organizations eliminated the waste of inventory by just changing the philosophy from pull system to push system. So, if you are having the push, you are pushing inventory to the supply chain it creates inventory.

And when you follow the system of pull, when you are taking you are forcing your manufacturing system, you are forcing your supply chain that give item in response of order that is the kind of system we talk in Toyota production system and that is what JIT all about. And that

will help you in reducing the inventory level in your organization. So, if you have the push system, you will create inventory if you have the pull system, you will reduce the inventory.

So, this philosophical change is done by the human beings that is not done by the computer. So, you need to understand that computer can provide you large amount of information with minimum effort, but ultimately, this is the human being who is doing the task. Similarly, you can have the example where people are focusing more on products and when you are focusing more on products, the chances of generating more defective products are there.

Because your focus is not on process, which is actually producing the product. So, you are continuously checking all the dimensions everything of the product. So, your entire focus is on the product, but and you are continuously developing the monitoring system, which are checking the output, but if you focus more on process, you can actually reduce lot of waste generation. So, this focus change from product to process will actually help you in reducing the waste and again, there is no role of technology, it is the mindset which is more important in this particular case.

So, pupil is more important and computer is just going to help you in giving the information the way you want. And nowadays, there are you can say a lot of issues with respect to some buzzwords. So, we need to see that whether it is appropriate to adapt them or so like flexibility, innovation, artificial intelligence, big data, machine learning, analytics, Fintech, these are some of the terms which you very often hear.

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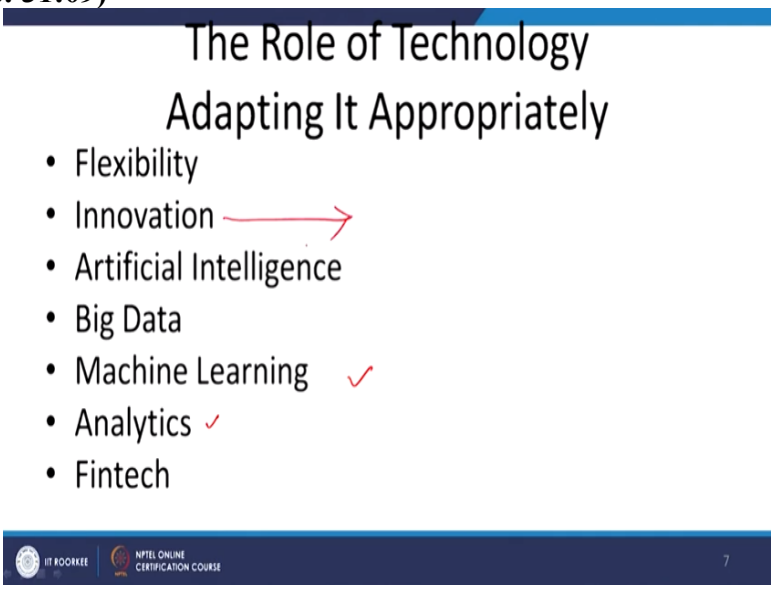

And normally we understand that if a company is adopting machine learning Company is adopting the artificial intelligence company is adopting analytics tools. So, it means the company is a leader in its field, but we need to see whether adoption of these things adding value to my processes or not even without adopting these things, you can be a market leader you need to see your strength and whether your strength is further solidifies, because of use of these technologies or not.

Like in India we have a problem of solid waste management. Now, many a times in different conferences, we talked that we need some kind of innovative approach for management of solid waste, but we all know that there are well developed solutions available for solid waste management in American European countries. So, how can we adapt those solutions for our conditions.

So, everything may not be required, there are some products, where it is said that these are to be artificial intelligence, these need feji controller. So many a times these type of words look okay for your promotional activities, but you will find that there is hardly any value being added by those technologies into the processes or people. So, you have to be very careful with respect to use of technology, you should not immediately jump to any new technology which comes to market.

Let it is stabilize the principle of says let it first standardize then stabilized and then you start using it and then probably you will have less amount of defect, you will produce less waste because of use of that new technology. So, that is the eighth principle of Toyota production system. And with this, we also complete the principles related seven principles related to the second P of Toyota production system that is process and now we will discuss about principles which are related to people. So that will be starting from our next session onwards. Thank you very much.