

**Toyota Production System**  
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**Module No # 01**  
**Lecture No # 01**  
**Manufacturing Excellence**

Welcome friends, we are starting a course on Toyota Production System, Toyota car company we all know has created history by giving a unique manufacturing system which is being adopted worldwide. The success of Toyota car company because of this manufacturing system leads lot of academicians to do research on to their philosophy and then propagate that philosophy into the form of academic curricula.

Now the total idea of Toyota production system is based on 4 P's, which we will be discussing during the course of this course. And at the same time, one key element out of those 4 P's is processes, where Toyota Production System says that we need to eliminate waste from our processes. And by giving this particular concept of elimination of waste Toyota was able to do a miracle and what was that miracle?

Before that, it was a common belief that if you are going to improve the quality of a product, the cost will also increase, but, because of the concept of elimination of waste from the processes Toyota was able to do something different and something different was they were able to improve the quality of product without increasing the cost of the product. So, they said that quality can be improved without increasing the cost.

And that is how they were able to link two opposite ends otherwise, before Toyota, it was a common understanding that if quality is going to be increased you also need to increase the cost of the product, but as a customer, I want good quality products at the lower prices. But it was not possible because of the idea that if quality is going to be high, your cost is also going to be high. Toyota did that Toyota was able to reduce the cost and increase the quality of the product because of their focus on elimination of waste.

And they defined the waste in a very large perspective. During the course, we will be discussing that what is the meaning of waste? What is the meaning of non-value adding activities in a process? So, the Toyota's idea was a milestone idea in the history of manufacturing. Therefore, large number of academicians, they started working on the philosophy of Toyota and over a period of time, people came with the idea that it is the Toyota way of working.

And people started calling it as the production system on the basis of Toyota, which is now available in the form of TPS that is Toyota production system. The second important thing, which I would like to say in the beginning of the course, that all through the globe, now there is a greater emphasis on manufacturing activities. Few years back, we all were emphasizing on services sector.

And we saw tremendous increase in services particularly IT based services, then educational sector, banking sector, tourism, airlines, but we also saw that the real employment the problem of employment can only be solved by the manufacturing growth. So, now, whether we are in India or you go to USA, you go to any other part of the world, you will find that governments are focusing on the growth of their manufacturing sector.

Because manufacturing sector is considered to be an engine of growth, it can provide it has that power, which can help you in generating more employment. And because of those power of generating more employment, government wants that how to strengthen their manufacturing sector. No, it is not simply the strengthening of manufacturing sector is strengthening the manufacturing sector with excellence.

And when I say that, excellence is required in the manufacturing sector, so that your manufacturing sector is being accepted globally, in that particular context, it is important to understand the philosophies of Toyota Production System. Therefore, this course is conceived designed to help you better understand the philosophy of TPS to understand the tools which are to be used in TPS and then how to implement those tools in your organization.

Another important thing I would like to highlight in the beginning of this course, that Toyota Production System came from a automobile company which is primarily a production organization, a manufacturing organization. But the concepts the philosophy is a so well defined

and a lot of research has also taken place in this area that nowadays, you can apply the concepts of Toyota Production System, even in service organizations.

As I was mentioning, that elimination of waste is one important type of waste one important type of key of Toyota Production System. Now one waste can be since it is the period of innovation, creativity, one waste can be that you are not able to use creative potential of your employees now that unavailability of using the creative potential of your employee is equally applicable to a manufacturing organization and a service organization.

So, therefore, many things can be applied not only to manufacturing organization, but also to a service organization. So, in this context, if we understand the principles of Toyota Production System, have wide applicability not limiting only to manufacturing organizations, but they can also be used by services organization. Now, when I am saying that, these can be used by a services organization, we need to see that when we are going to discuss in detail that how it can be used for the manufacturing and how it can be used for the services.

So, that comparison that parallel we will continuously draw during the course in our coming sessions. Now, when we are talking of this first session, Toyota production system and what is the manufacturing excellence. In this Toyota Production System, first let us come to this topic itself. There are three words Toyota, production and system Toyota is there, because we are attributing this philosophy to the company from where this idea came.

So, that is the reason of Toyota now, what is production and what is system let us deliberate on that for next few minutes now when I am talking of production.

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## What is Manufacturing / Production

- A process of value addition



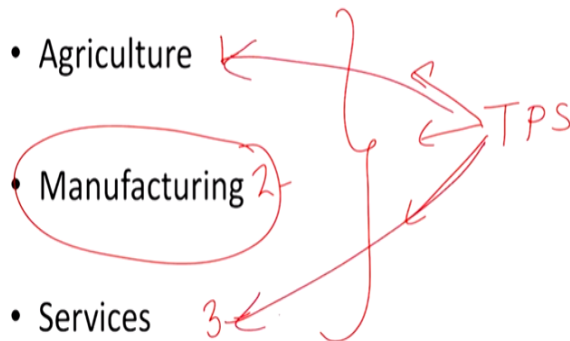
So, first meaning of production comes from the manufacturing that what is manufacturing, but it will be appropriate that I also add the word production with it. Now, when I am saying the production or manufacturing, this is a process of value addition, you have some input, you add some value through different processes and then you get the output. So, this is value addition.

So, when we are converting some input into output through a series of processes, that is production or manufacturing, the input is mostly in the form of some raw material and output is in the form of some kind of goods like car, mobile phone etc., or it can be in the form of service like knowledge etc., or health all these are the different kinds of output depending upon what type of system you have.

So, conversion of input materials, which is largely the raw material into the output, that is the production system. Now, the whole issue, where Toyota Production System come into picture is about this value addition process. If I see this value addition process, this will help us to understand what is waste and what is non-waste. But before that, since this is our first session, I will also like to draw your attention on some very important key elements.

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## Sources of Wealth Creation



Now, what is that, if I see from the economic points of view, there are these three sources of wealth creation. The primary source of wealth creation is agricultural activity, particularly in India, we say that we are an agrarian economy, our large number of farmers are in villages. And though you may have a debate on data, but still we say that 60%, 65% maybe somebody can say 70% of Indians live in villages and they are dependent on agricultural activities.

So, India is primarily known as an agrarian economy, not only India, but many other economies in the world are based on agricultural activities. The second important source of wealth creation is manufacturing. After industrialization, particularly, when steam engine was invented, after that, this became the second important source of wealth creation. Before that, agriculture was the only source of wealth creation.

But after this industrialization, manufacturing became the second important source of wealth creation and though it is started from Europe, but slowly and slowly North American countries and then other part of the globe, particularly Japan, and China, adopted the industrialization, the process of manufacturing in a big way. Later on, because of development of computers and information technology, IT became a big enabler for agricultural as well as manufacturing activities.

And slowly and slowly in the second half of twentieth century, services became the dominant form of your wealth creation and India particularly took advantage of this new revolution of

wealth creation in the form of services sector, and we all know that more than 50% of India's GDP is coming from services sector. So, these are the three primary sources of wealth creation.

But let me tell you that this Toyota production system is applicable to all three type of wealth creation system, how can you minimize your non-value adding activities in agriculture, how can you make your agricultural activities more efficient, so, that it becomes more profitable to the farmers. Unfortunately, in India, we hear that our farmers are not getting due on their crops, they are not able to sustain on the basis of agricultural activities.

And therefore, a lot of cases of farmer's suicide etc., are happening in India. But if we implement Toyota Production System, if we make our agriculture activities more efficient, I am very much sure that we will be able to do much more efficient agricultural activities which will help our farmers to get proper dues on their investments, manufacturing, no doubt, because TPS came from manufacturing.

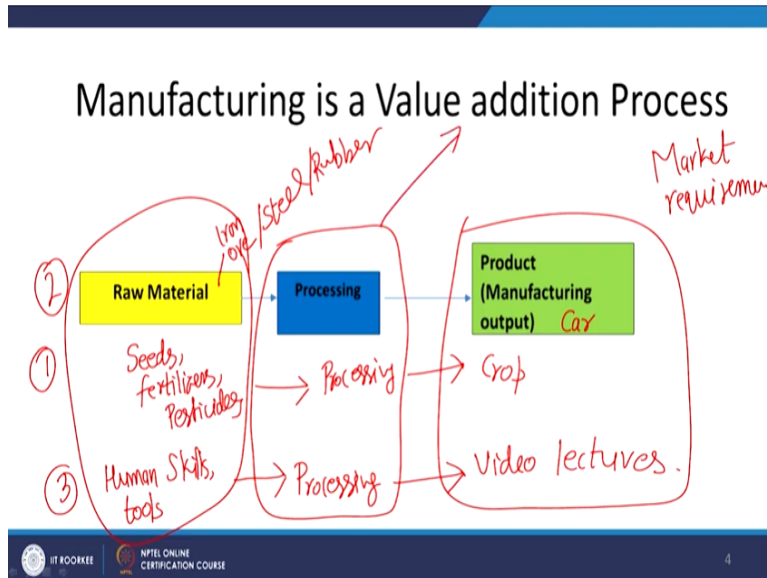
So, you can very well implement TPS into the manufacturing sector without any doubt, this services, how you can make your services also more efficient, how can you make your services also more responsive and TPS can also help in you improving the performance of your services sector, we know that some of the large Indian companies which are into the services sector are not actually doing that good.

So, there is a serious requirement of implementing the concepts of TPS into those large organizations, there are some other issues, there may be some financial issues, there may be some structural issues, but I am very much sure that there are large number of procedural issues also and when you can address those procedural issues you will be able to do much more efficiency in those organizations, and when efficiency will come, the performance of those organizations will increase.

So, these are the three sources of wealth creation. And I want to say I want to emphasize that TPS is not limited to this, but you can very well extend TPS to agriculture and services sector also. And during this course, we will continuously talk that how this TPS can be implemented into agriculture and services sector.

Because if you see the implementation of TPS into manufacturing is happening and lot of literature is already available, you can have a lot of research papers, you have a lot of books, you have a lot of internet resources on implementation of TPS into manufacturing. But through this course, I like to see that we should be able to appreciate that TPS can also be implemented into agriculture and services sector.

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Now, as I mentioned that production manufacturing is a actually value addition process and this diagram helps us in understanding that value addition process. You have raw material, then you are processing that raw material and then you are getting the product that is the manufacturing output. Now, this is happening in all types of activities. This diagram is particularly for the manufacturing, but if you talk the same diagram is applicable for agriculture. The same diagram is applicable for the services.

Now if raw material is in the form of let us say, iron and ore or raw material is in the form of steel raw material is in the form of rubber you do the processing and the product maybe a car. But, if raw material is in the form of seeds, fertilizers pesticides and then you are doing the processing sowing the seeds giving fertilizers at the appropriate time giving pesticides at the appropriate time you have proper water for irrigation purposes.

So, that is the processing and then the output is your crop. So, this is the agricultural system and the same diagram as it is applicable for the agricultural system also, then you come to services

system. So, this is for the second this is for the agriculture and now I am discussing the services sector. In the services center also the input is in the form of human skills and then there may be some supporting tools also now human skills and tools, you do the processing.

Now, processing is in the form of different types of systems you have you are having this system of recording the video lectures. So, I am delivering the lecture the camera is recording this tablet is helping me to write those slides and that all is the part of the processing activity and as a result of that, be video lectures are available. So, this is a service example. Now, if I see whether it is agriculture or manufacturing or services sector, this is a value addition process.

If I have knowledge, if these tools are available, I will be able to produce good quality video lectures if I have good quality seeds, if though I have the knowhow of using the appropriate pesticides and fertilizers depending upon the soil conditions, I will be able to generate good quality crop if I have good quality raw material, if I have the knowledge of how to make a car and appropriately I do the processing, I will come up with a excellent car.

So you see that the system is almost similar in all the wealth creation systems there is input there is processing and there is output. Now, in this case, these outputs are governed by the market requirements. So, market governs the choice of output, you will make that type of car you will make that type of mobile phone, you will make the type of shoes which are liked by the market.

If I make a shoe, if I make a car, if I make a scooter which is not liked by the market, then there is no point of making those kind of products. If more and more customers want to eat wheat and I am producing rice, so, nobody will purchase the rice because everybody wants wheat. So, I will like to do that type of agricultural activities, which has market potential. Similarly, I want to enter into that kind of services, where I have customers or I will like to customize my services as per the requirement of the market.

So, the output side is largely governed by the market requirement. So, based on this market requirement, I will select the appropriate inputs. So, input is being selected depending upon what quality of output or what type of output I want. Now this particular part that is the processing part, this is actually the core of my discussion under Toyota Production System. Because we want to govern this processing, we want to govern this conversion of inputs into output.



What is the output that market is deciding and accordingly our market research team gives the feedback so that we can customize, we can design, we can prepare that type of output, and for that type of output, our design engineers will suggest us that what is the raw material requirement. So, that is how things happen in the organization. But the Toyota Production System is applicable in between when we are converting this input into the output by governing my processing system.

So, our entire focus will be on this processing. And therefore I am saying that whether it is a manufacturing organization or agricultural activities or services activities, we can have a very good implementation of Toyota production system and let us not limit this Toyota production system only for manufacturing activities, it can be very well applied to any other kind of organization which is an any kind of wealth generation activity.

Now, another important thing, which is very, very important key, and I am bringing this particular issue in the very first lecture of our this course, and that is what is value and what is not value? Because without understanding this concept, that what is value and what is not value, we will not be able to justify with Toyota production system. And it is like that, if I read what is written here, that value is something which helps in improving customer satisfaction.

As I am saying that output is governed by the customer requirement and therefore, during the processing of our raw material, our input resources into the output those things, which are helping me in improving the customer satisfaction, that means, indirectly you understand that things which are helping me in improving my output, those are value from the point of view of the processing.

But those things, those activities, which are not helping in improving the customer satisfaction are the non-value.

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## What is value and what is not?

**Value** : something which helps in improving customer satisfaction. *Value Vs Non-Value*

Something which is not improving customer satisfaction is **non value.**

So, you understand now, that value versus non-value. So, if we go into this debate of value versus non-value. So, value means enhancing the customer satisfaction, non-value means it is not affecting the customer satisfaction, it is not enhancing the customer satisfaction. So, the litmus test for value versus non-value is those things, which are helping in improving the customer satisfaction is a value.

And those things which are not helping in improving the customer satisfaction are non-value. Now, in Toyota production system Toyota identified seven different types of waste activities. So, they have given a detailed list starting from overproduction, excess inventory, waiting time, unnecessary transportation kind of things, which are part of non-value adding things or the waste things. So, we will be discussing those non-value adding thing in our upcoming classes.

But it is important that we need to see from our own point of view, since we now understand that value is something which adds to your customer satisfaction, non-value is which does not add to your customer satisfaction. And based on that in a particular process, I on my own can see that which is a value thing, which is not a value thing and the whole idea is then to eliminate those non value adding things.

Remove those non-value adding things keep only value adding things so that the resources which you are wasting on those non-value adding things can be minimized and when resources are minimized, resources are not wasted on those non-value adding things. Obviously, you will have

a smaller contribution to the cost and your quality will also improve and your cost will also go down.

So, that is the simple formula like a very simple example, to emphasize on my point, when you are doing brush in the morning, there is a possibility that you keep the tap open. Now out of the entire water coming from the tap, you hardly use one mug of water for effective use, but you are wasting so much of water because the tap is continuously running. No, this is how you can understand that out of the entire water which you have wasted the useful resource was only one mug rest resource you have wasted because that was continuously running.

So, we need to see that when to open the tap only when you open the tap when the need is there of water and when there is no need of water, tap should remain closed. And that is how you will be able to save the resources and when you are able to save the resources, you will have more efficiency in your processing that is how you can understand the value and non-value adding activities in your processes.

So, the idea is that by these types of courses, that you should be able to understand in your way that what is value adding and what is not value adding and once you are able to do this kind of differentiation in your own organization in your own area of improvement, you will be continuously doing this kind of activities. And it is also very important to understand that this is not onetime activity that today you do this analysis of your processes and you find that these are non-value adding activities and I have to remove these activities.

It is a continuous process and you have to continuously get involved into these kinds of activities, that how I regularly see my processes, how I regularly see that I am improving continuously. So there is no ultimate level of excellence, it is the journey Toyota production system is a journey and you have to continuously get involved into this philosophy, then only you can actually reap the benefits of this kind of concepts in your organization.

Because it is also difficult to reach at the top, but it is more difficult to remain at the top. So, in this particular concept, we are talking that how to remain at the top by doing continuous analysis of your various processes and continuously remove those wasteful activities focus only on value adding activities which are enhancing your customer satisfaction.

And when this we come to end of this first session of this course on Toyota production system, where we understood that what is production, how this concept of Toyota production system is applicable to manufacturing, agricultural and services sector. What is value and what is non-value adding activities. Thank you very much.