

Production and Operation Management
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Lecture 01

Introduction to Production

Welcome friends, we are starting this course on production and operations management. This is the very first session of this course. And in this week we are going to understand what is the role of production and operation management in an organization. We know about marketing management, we know about financial management, we know about management accounting.

We also know about human resource management, and all these are functional areas of management. And the meaning of functional area of management is that we are going to use these functions for performing some of the activities of the organization, and these activities must be in line with the overall objective of the organization. So that, my company, my organization can be a top class organization.

Similarly, it is also very much required that all these functions must have a proper synergy. If that synergy is missing, if we all are working excellent in our own domain, but without synergy, then again there will be a problem that organization may not achieve that excellence which we are looking for.

So, it is important to have highest level of professionalism in each function and at the same time, we also need to have synergy with other functional areas. In any organization, all these functional areas are present, but organizations may draw their competitiveness from different functions. We know that companies like Walmart, these organization have achieved superior performance because of their supply chain activities. They know how to leverage the supply chain therefore, they are ahead of any other retail company in the world.

We know about Chinese organizations, they know how to take advantage of operation activities and as a result of that, they are producing low cost products and that is the reason of their success. We know about various organizations which are known as multinational corporations, they know how to market the product, Hindustan Unilever, Procter and Gamble, ITC.

So, these companies are superior marketing organizations and because of their abilities of superior marketing, they are highly successful organizations. So, organizations can be

successful because of any particular reason, Apple we know an organization which knows that how to use creativity of the employees. So, their human resource policies which are helping them to take advantage of creativity of their people that is the secret of their success.

So, different organizations, so one particular functional area may be responsible for your superior performance, but at the same time, other functional areas are equally important, because they create that type of enabling environment under which one particular area excels and that particular area gives you competitive advantage.

In this particular course, we are going to discuss the role of production and operations management, and what are the various things, what are the various types of decisions we are going to make under productions and operations management. And we will see that many organizations with the help of different types of case studies in this course, we will see that how organizations have leveraged not only from entire production operation management, but from very few elements of production and operation management.

Particularly, let us say some organization is known only because of superior quality. Some organizations are known only because of cost effectiveness, some organizations are known only because of their delivery commitments. So, different organizations have obtained their competitiveness because of some particular reason, which may not be the entire operation management, but just few elements of operations management. So, today in this particular session, the very first session of this course, we are going to discuss that what is production and operations management, what is production?

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What is Manufacturing

- A process of value addition

What is V.A?

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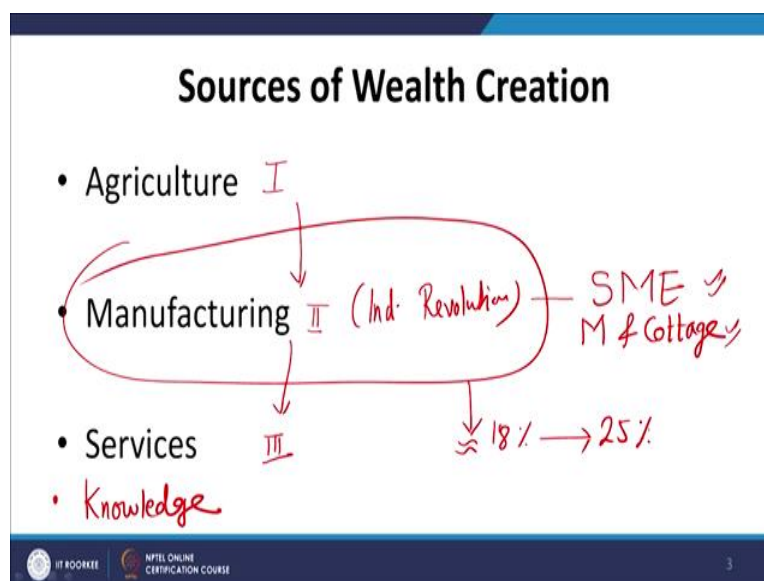
Now, to understand what is production? It is important to see that it is a process of value addition. Now, many a times the value addition is considered that you are converting some raw material into a finished product. But, we will see that value addition can be of variety of types and you need to understand the wider meaning of the value addition. And this is one particular reason that Japanese organizations understood the meaning of value addition in the right context.

And therefore, they gave a very different perspective of quality management, they gave a very different perspective of value engineering and that is one of the very important aspect of production and operation management that we need to understand that what is this value addition? What is value addition?

If we understand this meaning of value addition and particularly, what is value and what is non-value, then we are able to do miracles in our organizations, but many a times as manager, we are unable to identify that what is value and what is non-value and many a times we waste our resources in non-value adding activities.

And when you are wasting your resources in non-value adding activities, it incurs extra cost, it may take more time and therefore, you lose competitiveness. So, rightful identification of value is very very important for understanding or for taking the advantage of production and operations management. So, this is a process of value addition and we will see that what is the meaning of value addition in our coming slides.

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Now, going back a bit, if you see what are the primary sources of wealth creation. So, we know that, in the ancient time agriculture was the primary source. So, and particularly if I say from India that we are known as agrarian economy. So, in India the primary source of wealth creation was agriculture.

So, agriculture, and most of the industries were based around agriculture, making equipment for agricultural activities, keeping livestock that is also an allied kind of agricultural industry. So, most of the things were dependent on agriculture or for agriculture. So, it was the source of wealth creation for India as well as for large number of World's countries.

But slowly and slowly, when Industrial Revolution took place, and after Industrial Revolution, particularly from Europe and then to North America, the second important source of wealth creation became manufacturing. So, this is the period of Industrial Revolution. So, as a result of that, now many people shifted from agricultural activities to industrial activities, and industrial output became another important source of wealth creation.

People started working in the organizations, factories, mills, and large number of distribution activities, people started working for various activities, which are related to industrial activities around that, and that is a second important source of wealth creation.

It started, as I told from Europe and then it went to North America and then from there it went to other parts of the globe. Unfortunately, during this period, India was under British rule when this Industrial Revolution was taking place so we could not take much advantage of this manufacturing wealth creation.

We remained more or less agrarian economy and many of you may be knowing that till date our more than 50 percent of Indian population is dependent on agricultural activities. Though the contribution of agriculture in India's GDP is somewhere is around 16 to 17 percent, but 50 percent or more people are dependent on. So, there is a very skewed relationship between the large amount of population which is dependent on agriculture and the contribution of agriculture into the GDP.

So, if we want to make India a prosperous country, we need to see some kind of balance that the number of people, the percentage of population, which are dependent on a particular sector and the contribution of that sector into GDP should have some kind of a symmetry, but presently, this relation is highly asymmetric so therefore, we many times read in newspapers, in media debates, that farmers condition is not good in India, because of this very skewed

relationship that only 15 to 16 percent contribution is coming from agriculture and large number of persons more than 50 percent of population is dependent on agriculture.

Manufacturing, we have around 17 to 18 percent contribution coming to of GDP, but we see that there are countries which are much smaller than India and close to India, and these are countries like Thailand, Hong Kong, Taiwan, etc Vietnam, so these countries are touching up to 30 percent of their GDP from manufacturing activity.

So, Government of India is also looking to have higher contribution of manufacturing in GDP and particularly. Government is of the view that SME is Small and Medium Enterprises and micro and cottage, these two sectors need special attention, if we want to increase the contribution of manufacturing into the India's GDP.

And it is also believed that these SME sector, cottage industries, micro industries can be the engine of growth for India because these industries are capable of employing large number of people where we are talking of large plants, medium sized plants. So, more and more automation is happening. So, when more automation is happening, the need of people are reducing there. So, it is the small, medium or the micro and cottage industry, where we find more potential of employing the people. So, government is giving a lot of emphasis on these sectors.

And the third, which is coming that is the services sector. The third important sector of wealth creation is the services sector. And India took a good advantage of this service revolution, particularly in the field of IT and IT enabled services. India had the chance of having a large number of English speaking youth, we had very talented youth.

They were very much mathematical savvy, they were very much computer savvy. And as a result of that, we saw a very good, a very handsome growth of IT industry in India. So, it became a very popular source of GDP in India and more than 50 percent of GDP in India is coming from the services sector and particularly IT and IT enabled services are the most important source of India's GDP at the moment.

Now, the fourth source of wealth creation is also coming, that is knowledge. Now, we know that, it is the time where knowledge is going to rule the world. And as a result, those countries which are going to have superior knowledge, those who are having intellectual capital with them, these countries are going to rule the world. These countries will be at the top of the development indexes.

So, now countries like South Korea, countries like Israel, countries like where patent filing, IP activities are increasing. So, I can name the China which is immediate label to India. So, these are the countries where lot of IP related activities are taking place and as a result of that, these countries are going very fast on that economic development front.

So, knowledge is also be going to become a very very important source of wealth creation, though knowledge is required for agriculture, knowledge is required for manufacturing, knowledge is required for services also, but in that knowledge is considered to be the supporting activity.

But now, in this particular case, knowledge itself is going to be used as a commodity. If I am having a patent so that patent can be used as a product and I can transfer that patent to you. So, this way it is going to be a very very important source of wealth creation in coming time. The development of countries like Israel is totally based on this knowledge activities. They are one of the fastest country, which are having large number of patents.

South Korea is another example, what a marvellous system they have about protecting their intellectual capital. And as a result of that companies like Samsung, etc from South Korea are giving good fight to European and American organizations.

So, China obviously is a big country, but they also have a very fantastic enabling environment where not only academia but industries also as well as individuals are also are knowing that what is the potential of their intellectual capital, so they go for IPR and as a result of that, It has become a new source of wealth creation. So, now, we know that all these are the different sources of wealth creation.

Our focus in this particular course, is on this manufacturing, which is a very important source of wealth creation. The present contribution of manufacturing in India is somewhere around 18 percent and we want to, we means government of India feels that there is a potential, the report say that India can increase its manufacturing contribution up to 25 percent of the GDP.

If that can happen, if that can happen it will solve a large number of problems of the country. It will provide employment to large number of youth within our small and micro and cottage industries. So, therefore we will be focusing on these manufacturing activities that how manufacturing is going to help us. And when I am talking about manufacturing, I am though in all these agriculture, manufacturing services and knowledge, there is a role of value

addition, but our value addition discussion will be particularly focusing around manufacturing activities.

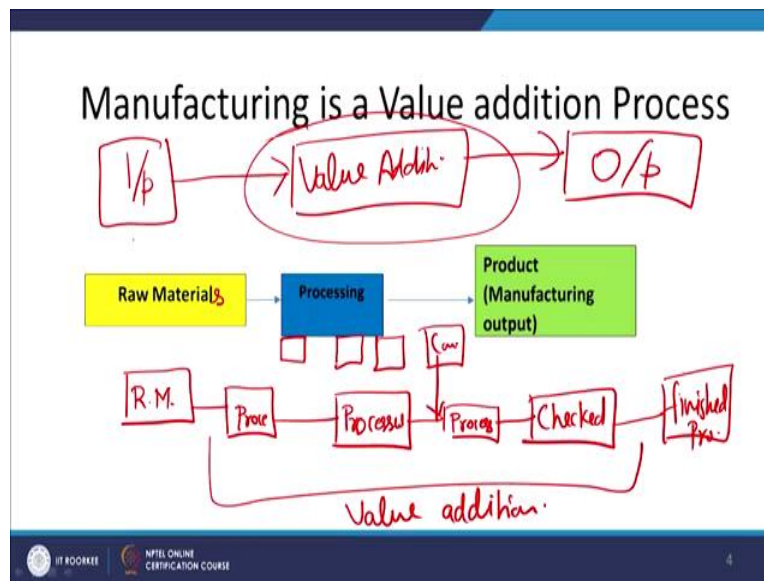
But everywhere, value addition is there you have seeds, you have fertilizer, you have pesticides, you have field and when you are mixing everything and that value addition gives you fruits, that value addition gives you crops. You have raw material, and when you process the raw material, you get a finished product in the form of car, in the form of a mobile phone, in the form of shirts, shoes, etc that is manufacturing activity.

You have ideas and you are now able to communicate using your emails, you are able to communicate through your WhatsApp, you are able to communicate through your other profiles that is a kind of service that is being happening. So, now how that idea is being transmitted, that is a value addition process.

Similarly, we all are having so much of knowledge, but protecting that knowledge so that it can be transferred, it can be licensed, it can be used for some kind of entrepreneurship activity that is also a kind of value addition processing. So, everywhere the value addition is there and only when value addition is there, you can use these different sources for wealth creation, without value addition, wealth creation will not be possible.

So, the point is that value addition, we discussed that value addition is the important thing for the manufacturing activities, but here I am generalizing, here I want to particularly emphasize that value addition will always be there, whether it is agriculture, whether it is manufacturing or services or knowledge creation, but our discussion will mainly be focusing only on this manufacturing and some time to the services also.

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Now, let us see how manufacturing is a value addition process. Now, when manufacturing is a value addition process, where you have the raw material and it is not only one raw material, there may be multiple raw materials. So, you have different types of raw materials, these raw materials are processed and it is also not necessary that only one level of processing is there, there may be multiple levels of processing.

Just to show in the form of a simple diagram, we have these 3 boxes only, but we may make it more and more complicated and you can see that there may be a raw material which is processed then it is again processed, some additional component is added and then it is again processed then it is checked that is also a type of processing and then it is converted into finished products.

So, in this 3 box diagram, it is not only that these are the only 3 boxes, these are representation only. And you see, there may be multiple type of raw materials which may be required in making a particular product. You take any simple example, you take the example of simple detergent powder, which you purchase in your house.

Now, in that simple detergent powder, you see there are lot of chemical processing through which that powder is made. So, the processing may take multiple steps and then once that powder is ready, then another important processing is required for the packaging of that powder.

Now, the packaging again may require different type of things, whether you are packaging in 500 grams or 1000 grams. Then on that packaging, you require different type of printing also,

badge number, prices, date of packing, etc etc so, all these things are the part of these intermediate stages, and all these intermediate stages are nothing but the value addition, all these intermediate stages are value addition. So, it is very important to understand that we need to have this kind of value addition activity and that value addition activity is to be properly monitored, it has to be properly designed, it has to be properly controlled, that is operations management.

So, all types of input you take it so simply that there are input, input is doing some kind of value addition and then value addition leads to output. Now, management of this value addition, management of this value addition is operations management, but many a times because, as I told you we are living in synergy with other functional areas, so we also need to extend this circle to our input side and to our operations output side.

We also need to decide that how to manage our input and what type of output is required. If I say that synergy is not required, so the responsibility of output will be of marketing people that whatever we will make, marketing people had to sell, but that is against the concept of synergy. We need to make those things which marketing requests, so there is a need of synergy here.

Then input, the purchase people, they need to purchase only those things which we require so we require a synergy with purchase people. So that is the concept of synergy, that from input to value addition to value addition or you can say the conversion and then conversion to output, everywhere this synergy is very much required and therefore, we say that manufacturing is a value addition process.

Now, as in the beginning of this session, I said it is important for us to understand, because here we will discuss some examples. In books also there will be some examples, but in real life you need to take a call but that what is value and what is not value.

So, when you have some industry experience, a lot of consultants come to your organization giving you this kind of knowledge that what are the activities which are you doing, having no value addition. Now, this is over a period of time their experience tells that these are value addition activities, these are non-value addition activities.

We do many things in our daily life from morning to evening and if you just reflect on those activities, if you just reflect on those activities, you will realize that many of those activities which you are doing daily in your life, at least 30 to 35 percent of those activities are non-

value adding activities. So, if we eliminate those non-value adding activities, from our daily routine, it is certainly going to give us more time, it is going to make us more happy, it is going to help us giving more relaxation. But it is important that you understand that this is a value adding activity or non-value adding.

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The slide is titled "What is value and what is not?". It contains two definitions with handwritten red annotations. The first definition is "Value : something which helps in improving customer satisfaction." where "Value" and "in improving" are circled, and a red arrow points from "in improving" to the handwritten text "Is Value.". The second definition is "Something which is not improving customer satisfaction is non value." where "not improving" is circled, and a red arrow points from "not improving" to a small diagram. The diagram consists of several overlapping circles labeled "Mkt", "Fin", "HR", and "IT" with arrows indicating interactions between them. At the bottom of the slide, there are logos for "IIT KOOBEE" and "NPTEL ONLINE CERTIFICATION COURSE", and a page number "5".

So here, to differentiate between these two things, that value is something which helps in improving customer satisfaction. Here we are taking this idea of value from the customers lenses, we need to change the optics for this purpose, when you use the customer's optics, then you understand what is value and what is not value.

And during the course we will discuss one or two examples of rural marketing. When you are developing a product for the rural customers, you will realize that we do not understand their requirements properly and therefore, we are not able to satisfy their requirements and as a result, we are unable to sell our products, because we do many things which are non-value adding to them, which are not improving their customer satisfaction that way you can understand.

So, something which is not improving customer satisfaction is non-value. So, you can have a very specific litmus test, in that litmus test things which are improving customer satisfaction, improving customer satisfaction is value is value, and which is not improving customer satisfaction not improving customer satisfaction is non-value. So, this gives you a very very direct answer of what is value and what is non-value.

And therefore, you will be able to understand that if you provide, if you provide some features to me in a product, which I am not going to use, which I am not going to use, then it may become a non-value feature, because for that feature, you have added the some resources and as a result of that, cost has increased.

Now, you are charging me that additional cost you must have seen In India, very recently the Government of India has introduced a system that in televisions, whatever channels you want to see, whatever channels you want to subscribe, you need to pay only for those channels. So, that is like this.

If you are in North India, you are into a Hindi speaking land and you are not wanting to have any kind of other language channel, you only want to see Hindi channels. But earlier, you were paying for all those channels, which were not required. Now, we all know that each one of us has some selected channels, I see only 10 channels I so I will serve within those 10 channels, some news channels, some sports channel, some movies channels, etc. So, why I am paying for additional 200 channels which I am not going to see.

So, all those additional 200 channels are non-value adding activities for me. So, now it is a very good thing that I will be paying only for those channels, which I am going to see. So, this is a very simple example to understand that what is value and what is non-value. And similarly, when we are developing a product, when we are doing something in the organization.

For an example, if in front of a machine, there are long number of products, which are waiting for their turn to be processed. Now, as a customer this queue has nothing to do with me that each product is waiting for 10 minutes for its turn to be processed. So, this is a non-value adding activity, waiting or holding is a non-value adding activity. So, now my duty in operation management is to eliminate or at least reduce that weightings time so that my non-value adding activity can be reduced.

And if I can do this, my operation management is a superior operation management. If I am not able to do this, then I am not able to take the benefit of this course, this operation management knowledge. So, in this particular course, we will be discussing large number of principles through which we will be able to eliminate non-value adding activities, and as a result of that our competitiveness, our productivity will improve. And if that can happen, and

at the same time we also need to have synergy with other functional areas. So, on one side we need to have a better operation management. So, that is the internal working for the system.

And at the same time, we also need to have a good system that is mean you have this internal looking for the operation management. So, this is your operation management function. And at the same time, you need to have good interface with other functional areas, which may be finance, which may be marketing, which may be human resource management.

So, you need to have a strong internal as well as external orientation at the functional level. And if you can do this, then your organization will have a superior performance. So with this, we come to end of this first session. And in our next session, we will discuss some important global trends, which are going to affect the operations management. Thank you very much.