

Production and Operation Management
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Lecture 05

Types and Characteristics of Services Systems

Welcome friends. This is the fifth session of this course on Production and Operations Management. In our last session, we discussed about types and characteristics of various manufacturing systems. Because production and operation is basically dealing with the manufacturing aspects, so we discussed in detail about different types of manufacturing systems. We discussed various product strategies, whether we want to have a custom product or a standard product. And in between, from custom products to standard products, we can have some different types of mixed strategies.

Then we also have what type of finished inventory policy we follow. Whether products are readily available in the stock or we are making products when order is available, so you have either to stock or to order, two types of inventory policies. So, in all, we discussed that there are four different types of combinations for manufacturing systems. You have process focused manufacturing system which can be either to order or to stock. You can have product focused manufacturing system which can again be either to order or to stock.

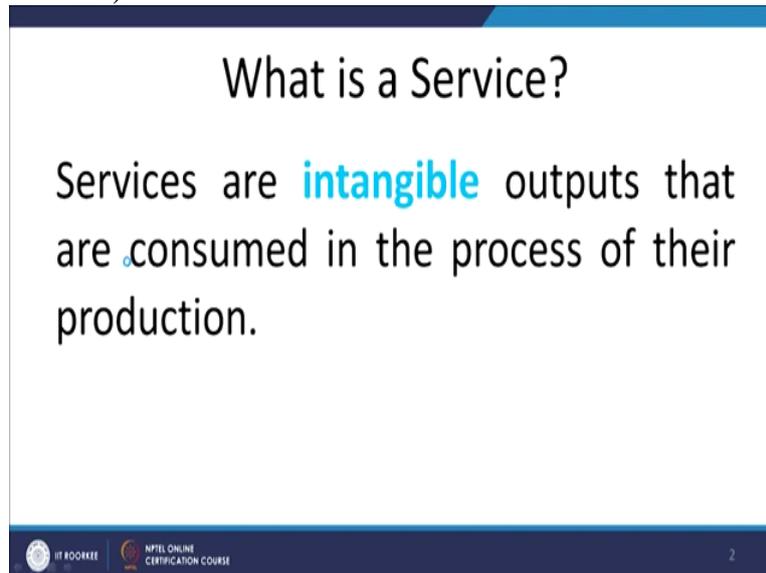
So we discussed in detail with the help of some examples, with the help of some special characteristics of these four types of manufacturing systems. Now, in present circumstances we all know that services are very important component of our GDP. If I talk of India, more than 55 percent of GDP is coming from services sector. And therefore, we need to see that principles of productions and operation management can also help us in developing the productivity of our service sector also.

In our third session, we discussed about productivity concept and we discussed also that improving productivity is one of the most important aspect of operations management. Earlier the concept of productivity was more or less related with the manufacturing sector. But nowadays, productivity concepts are equally applicable in services sector.

And therefore, in this particular session we are going to discuss what are the different types of services systems. We will like to discuss various types and their characteristics and that will help us understanding of different types of service systems, will help us in applying the principles of production operation management to improve the productivity of services

sector. Now, before we go for detailed discussions about various types of services system, it is important for us to know what is a service.

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Now, what is a service, to answer this question we have very simple one line definition. Services are intangible output, services are intangible output and this intangible output is consumed in the process of their production. What is the meaning of this that is very very important. That services cannot be stored, you cannot store services. When you are producing a service, simultaneously it is consumed. For an example, if an artist is performing on a stage, if some singer is singing a song live on a stage, so you have to enjoy that song immediately.

If you record that song and then you later enjoy that song, you will not have the same kind of pleasure which you are having when you are seeing that performance live. When you are seeing a cricket match live in a stadium, you have to enjoy that match at that very moment. So, services are something which need to be consumed at the point of production itself. There can be some other extreme cases also. That in some cases, service can only be produced, service can only be produced when a customer is there.

Without customer, without that person who is going to avail the service, service cannot be generated. For an example, you are going to a barber for a haircut. Now, barber is giving you a service of haircut. Now, that service of haircut can only be generated, is only possible when a customer is there.

Without customer that service cannot be possible. You are going to a doctor for some prescription, now doctor can only give you a prescription when a patient is there. Without

patient doctor cannot keep some prescriptions readily available and doctor knows that some patient will come and I will give this prescription to that patient from my stock. So, that is not possible.

So, in case of cricket match, in case of live singing, the performer, players can start playing their respective activities even if there are no audience, there are no persons to watch that performance. But in many cases, services are not possible without the customer. And another very important thing that services are to be consumed at the point of production itself. So, these are the two very important thing that you have this aspect of intangibility.

The intangibility means services are not like this pen. This pen has a physical shape, you understand this physical shape, you can touch it. You can touch it, you can store it. But in case of service this is not possible. You can only sense, you can only feel but you cannot touch it. You cannot touch it. You can only experience it that yes, my knowledge level is increasing, I am having more enjoyment, I am getting relaxed, I am getting better because of the medicine, because of the prescription I am now feeling better.

So, all these things are related to your experience but you cannot physically touch all these kinds of products. So, the services are very much different from our manufacturing output. Manufacturing output has some kind of physical shape but one very important thing I will like to share that even though these physical shapes are there in case of manufacturing output but important point is that, that physical shape like this is a pen, this is a pen, I have watch, I have spectacles, I have mobile phones, all these physical products are used to give me some type of service.

I use this pen for the service of writing. I use these spectacles for the service of getting a better vision. I use watch for the service of knowing the time. So, even there are physical products but all these physical products are meant for providing some kind of services. If the physical product not providing you that service, you have a two-wheeler, a motorcycle, now the service this motorcycle provides you is of transportation. You are at location A, now from location A, you want to reach to location B and for that purpose, this service is being provided by your two-wheeler.

But somehow this two-wheeler is not working. There is some problem in the engine and you are not able to start the vehicle. So, what will you do? Since it is not giving you the service,

this vehicle is of no use to you, you will not like to keep that product. You only are interested, that means we are only interested in the service provided by that product.

So, this is very important that though I am slightly digressing to the discussions of products which are having the physical shape, but coming back to the services that services are those products which are intangible, which we need to consume at the time of production, which cannot be stored, you cannot have inventory, they do not have any physical shape.

So, all these are the important characteristics. But one very important characteristic which will help us in operation management, when you are developing a product, when you are developing a product, in that case the responsibility of operation management is first to understand the requirement of the customer and then you do lot of conversion process, you do lot of value addition process and as a result of that value addition process the final product is ready. And then using a particular supply chain, that product reaches to the retail outlet. From the point of distribution this product is distributed to the customers.

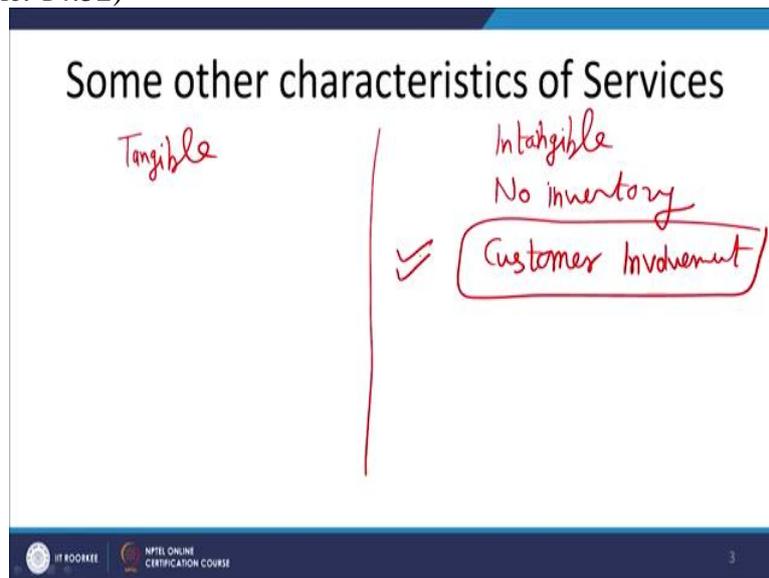
So, now customers are not involved in that value addition or conversion process. Customer is involved either in the beginning to take feedback about the product, to know about the requirement of the customer or customer is involved at the last stage, at the stage of distribution. But in case of services customer is continuously involved in the service production. So, that is a big difference between the physical products and services.

In physical product, the involvement of customer is only at the point of distribution, when the product is finally in the distribution stage. But here in case of services customer is involved right from the planning of the product. You go to a barber and you start giving suggestion to the barber that I want this type of haircut and you are giving instructions for designing of the cutting and then when that process of haircutting is going on, even at that point also you keep instructing the barber that this side is okay, this side is not okay, front is okay, back is okay or whatever different type of design you want.

So accordingly, you are also very much involved in the development of that output. So, the customer contact is deeply there in case of service generation which probably is not there in case of other product development. Though there are some concepts which are coming in the field of marketing, like co-creation, co-production where we are trying to involve customer in development, in planning, in production of the physical products also. But that is very low, very minimal at the moment.

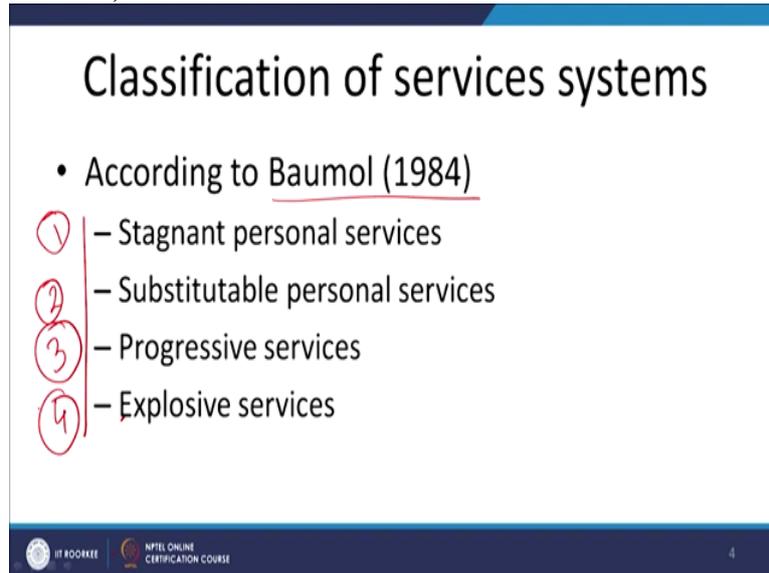
But in services because of the characteristic of these products customer's involvement is very much necessary or you can say in other words, without customer involvement services will not be possible. So, that is the fundamental difference between customer... between the physical products which we say output of the manufacturing system and these services which are output of services system. So, we discussed that the output of the manufacturing system has distinct characteristics and the output of the service system has some distinct characteristic.

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And when we try to identify that one important thing is tangibility and these are intangible. Second is you cannot keep inventory, so no inventory. The third thing is customer involvement. And as we are discussing, this customer involvement is a very very important aspect for the classification of these services system.

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Classification of services systems

- According to Baumol (1984)
 - ① – Stagnant personal services
 - ② – Substitutable personal services
 - ③ – Progressive services
 - ④ – Explosive services

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And on the basis of this customer involvement, we classify the manufacturing this services system into four different types of systems and these are based on one research paper which was published in 1984 by Baumol.

And then we do some little modification in that but the basis is that Baumol's paper. Now, these are the four different types of services system, one is and the basis is primarily the customer involvement in producing the service. The stagnant personal services, the second is substitutable personal services, the third is progressive services and fourth is explosive services. Now, we will see the role of operations management in improving productivity of different types of service systems because the services are too heterogeneous, services are large amount of heterogeneity.

And therefore, it is very difficult to see services from the same optics. You require different type of vision for seeing different types of service systems. So, now let us first see what is the characteristics of stagnant personal services.

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Stagnant Personal Services

- Direct contact between the customer and the service provider.
- These services offer low innovation potential and are difficult to standardize.

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Now, stagnant personal services are those services where there is a direct contact between the customer and the service provider. Service provider and the customer, they are having the direct contact and where the direct contact is there, it is very difficult to improve productivity because you can understand that it requires lot of labor intensive service.

And when it is labor intensive service, you cannot increase productivity beyond a particular point. And if you are improving productivity beyond a particular point, certainly you have to compromise on the quality of service. So, for an example, haircut I say again. Now, haircut is a service where there is a direct contact between customer and the service provider. Doctor sitting in the OPD, there is a direct contact between patient and the service provider.

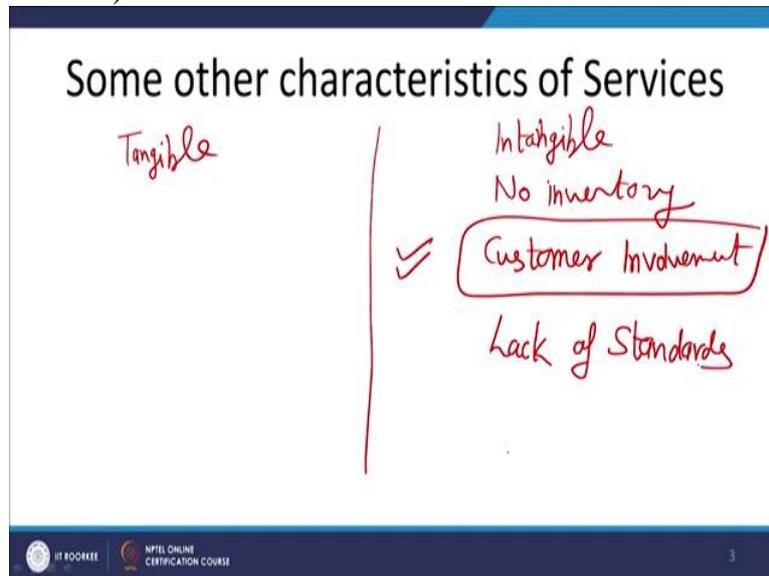
Now, if a doctor is able to see only 30 patients or 50 patients in a particular day, because doctor is giving at least 15 minutes of time to one patient or let us say 10 minutes of time to a patient, so in a day if doctor is sitting for 10 hours, so doctor can maximum give 600 minutes and in that some bio-break and some other kind of rest and relaxation periods are also required.

So, you cannot increase the number of patients to be seen by a doctor in a day. And if you are increasing the number of patients to be visited to a doctor, certainly the quality of prescription, quality of healthcare will take a backseat.

Then you are only thinking of giving more and more patients some kind of prescription, whether that prescription is effective or not that is not the concern. So, operation management is not able to improve the productivity in this. And because human involvement is too much

in stagnant personal services, so these services offer low innovation potential. Because human involvement is there, so since instruments and tools and other things are not that much involved, so there is a limited potential of innovation. And you cannot standardize these services because each customer requires a very unique kind of service.

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This is also a very important characteristic of services that services are highly customized. So, lack of standardization. Each customer going to a doctor requires a different kind of prescription. Even if both of us are suffering from the same problem, you also have fever, I also have fever, but it is quite possible that we may have some other complications.

Therefore, my prescription may be different than your prescription. So, the stagnant personal services have very low potential of innovation and it is also difficult to standardize. And as a result of that, you can have only some support activities which can help you. For an example, in case of doctor, in case of barber, these examples we are using again and again. So, you can have better tools which can help doctor to diagnose more effectively.

So, the diagnosis can become more effective if you have good equipments available with the doctor. If barber is using better air conditioning system in the saloon, then what is going to happen? This is going to improve the comfort of that customer.

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Stagnant Personal Services

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So, that type of things are possible but since the crux of the service is that contact between customer and the service provider, you have very, so you can do lot of, if this is the basic service, so here you do not have much scope of improvement.

But you have various other peripheral activities. So, you can do some kind of innovation, you can provide more comfort. Like today we have lot of singers doing stage performances, lot of entertainers doing stage performances, so you cannot do much innovation in this stage performance. But what is happening? We have digital lights, we have digital sounds. So, these things add more you can say entertainment to the performance.

Then you have lot of air connectivity, so our artist can go from one city to another city in just few hours. So, he can do more shows in a day. One show he can do in Ahmedabad and after some time he can do the show in Mumbai. So, within same evening he can perform two shows.

So, that is possible because of these secondary things, not the primary thing. Primary thing is that performance itself. So, stagnant personal services are highly customer and service provider interaction and therefore as to the core service, we do not have much scope of productivity improvement.

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Substitutable Personal Services

Some actions can be substituted with technological or other alternatives.

CCTV ← S.G.
Apps ← P.T.

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Then the second is when you can substitute some of the things with technology. So, therefore this is known as substitutable personal service. Now, in this case of substitutable personal services, you are substituting some of the actions, some of the activities with technology or some other alternative.

For an example, everywhere now see, we see in buildings, in our colleges, in shopping malls, CCTV cameras are there. Now with the help of CCTV camera you are replacing your security guards. Your security guards are being replaced by CCTV camera. So, the manual security, manual vigilance is not needed and you are having CCTV cameras and these close circuit cameras are able to monitor your entire premises.

So, that is the substitutable personal services. Now, another type of some example, you have personal tutor. Now, the personal tutor is being replaced by mobile apps. So, different companies are coming with mobile apps where they give your personal mentorship, personal tuitions.

And that personal tuition is an example of stagnant personal service. But now to some extent, now how effective it is going to be, that is a matter of debate. Whether we say that it is effective or not effective, but to some extent we have replaced this system of personal tuition with mobile apps.

You have barriers, entry barriers. Now, that entry barriers are being replaced by automated gates where the sensors are there and those sensors sense that some object is coming and as soon as some object is coming, the gate opens. You have biometric systems. So, gate opens

only for authorized persons. So, all these are the examples of, or otherwise what used to happen that security guard used to be there. Security guard used to check your I-Card and based on your proper authentication you are allowed to enter into that building.

Now, it is not required, no security guard, no I-Card. You have your biometric impression and there is a biometric reader installed at the gate of the, at the entry gate of the building. And if you are an authorized person, your biometrics will match with the database and the gate will open automatically.

So, you have replaced all that process with this kind of technological solution. So, these are another kind of service systems, where with the technology productivity is able to improve. So, here operation management can play a very important role to improve the productivity of the system.

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3 Progressive Services

It has two components, one is less labour intensive and other is highly labour intensive.

Software + Hardware
(labour) (tools, equipments)

Movie Camera, Softwares, Computers ↓ Artists

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The third type of services are progressive services. In the progressive services, we can divide the service system in two components. One component is less labor intensive, and other component is highly labor intensive. So, you can say that one component is more software and another component is more hardware. Now, software component is like labor oriented and hardware component is more like tools, equipments etcetera.

Now, in this particular case, what is happening over a period of time? The cost and the technology, particularly in the hardware component is improving like anything. The cost of equipments are getting low day by day and the quality of these equipments are improving. While whatever advantage you are going to have by lower cost of hardware part, that is taken

away by increasing cost of software component because for an example, you take making of a movie now.

Now, in movie we have lot of equipments where camera, softwares, computers, all these things are used. And on the other side, you have artists also. So, all the crew members, then other people who are involved, technicians, choreographer, lyricists, all these types of human involved people are also there. Now, what is happening that the cost of all these things are reducing. Better and better quality of camera is coming with lower and lower prices.

Better and better computers are coming with lower prices. Very good type of graphics cards are coming with lower prices. So, those things are giving productivity advantage. Your cost of input is reducing but what is happening? The cost of artist, cost of hero, cost of heroine, cost of choreographer, cost of lyricist, all these things are increasing day by day. And as a result, whatever advantage you are getting from this lower cost of tools and equipments that is compensated by increasing cost of the software component, the labor intensive component.

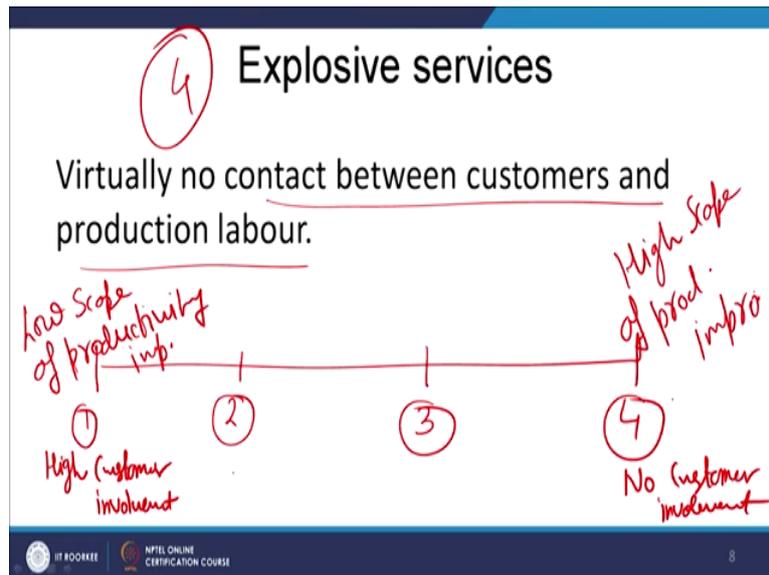
So, you need to see that if I want to increase the productivity of a progressive service system, we need to see that there has to be a proper balance between hardware and software cost. If software cost increases too much then again this is anti-productive. You will not be able to enjoy the productivity in that particular case.

But sometime in case of these progressive services your ability to charge extra premium depends upon this software component, this artist component. If in your movie, you have some superstars, so you are having a kind of guarantee that this movie is going to be a hit movie.

And therefore, even if the productivity is low, you are paying very high prices, you are paying a very heavy fee to that superstar for a 2 hours of movie. You can do the same movie, same story with a very new star, with a new player, with a new artist, with less just 10 percent of the cost. But there is no guarantee of success with that new hero. Therefore, you will not be in a condition to charge premium on that output.

So, for that purpose many a times the progressive service issue is not linked with the productivity, it is more linked that how much revenue you will be able to charge with the help of this software component attached to your service system.

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Then the fourth type of service systems are explosive services. The explosive services are those services where practically there is no contact between customer and production system. You do not know, it is more or less like a manufacturing system, it is more or less like a manufacturing system where I do not know who are working for giving me this pen, this watch, and I do not know any labor.

But I know who is my barber, I know who is my doctor, I know who is my architect because they all are my service providers and I have to be in contact with them to take the services. But in case of these explosive services I do not have any contact with the service providers. For an example, the mobile services, the Internet services. We all use mobile services, we have some kind of subscription of either Reliance or Airtel or Vodafone or Idea, etcetera, BSNL.

So, we are a mobile service user, which is service but who are there, who are at the exchange, who are managing that entire network, we have no contact with those people. So, there are large amount of services. We use Google and Google provides large amount of services related to Internet. But we hardly know, we do not know anybody in Google that they are providing service to me. So, in these explosive services there is a huge potential of productivity improvement because of low contact of customer and the service provider.

So, you see that we have this spectrum, where we have stagnant personal services, we have substitutable services. Then you have progressive services and then you have explosive

services. Now, here you have high customer involvement and here you have no customer involvement.

So, that is the spectrum on the basis of which we have classified the services, that on one extent, you have very high customer involvement, so low scope of productivity improvement. And here since customer involvement is almost 0, you have high scope of productivity improvement.

So, in this way we can understand the classification of services system and manufacturing systems classification is totally done on some different lines and the services system classification is done on totally different scope that is based on customer involvement. So, with this, we come to the end of this session. Thank you very much.