Management Accounting
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Lecture 34:
Activity Based Costing- An Introduction

Welcome students, so now we are going to move to the next technique of the Management Accounting which facilitates a better management decision making and in this technique, we will learn about the calculation of the total cost of production the right cost of production the correct cost of production and then to you make that use that information for the say day to day decision making.

So, you must be aware about that when you talk about the calculation of the cost of production we have started when we have started discussing the, this subject this Management Accounting first topic, I discussed with you was the cost sheet or the statement of the cost.

So, in the cost sheet we learned about that how to calculate the total cost of the production on the top we kept it as the three direct expenses material labor and overheads and then we calculated the prime cost and then we moved to the lower part and then we calculated the factory cost then the cost of production cost of sales and then selling price and minus the difference was, you can say that is your profit on margin.

So, that is one way of preparing the cost sheet or calculating the total cost of production and for every product a separate cost sheet has to be prepared but in that cost sheet what was the problem that, if you are manufacturing for example number of products if you are manufacturing only one product then there is no issue at all, that cost sheet is fine.

Statement of the cost is fine, for calculating the total cost of production but if we are manufacturing more than one product or maybe to 2 or 3 or something like that largely if more than two products, and the volume of that those product is different in number of units maybe you are manufacturing four different pens different color's pens and black and blue they have the largest production, black we are manufacturing 40,000, blue we are manufacturing say 50,000 units and the red and purple two more

colours which we are manufacturing they are only say you can call it as say a 5,000 and another one is also say 5,000.

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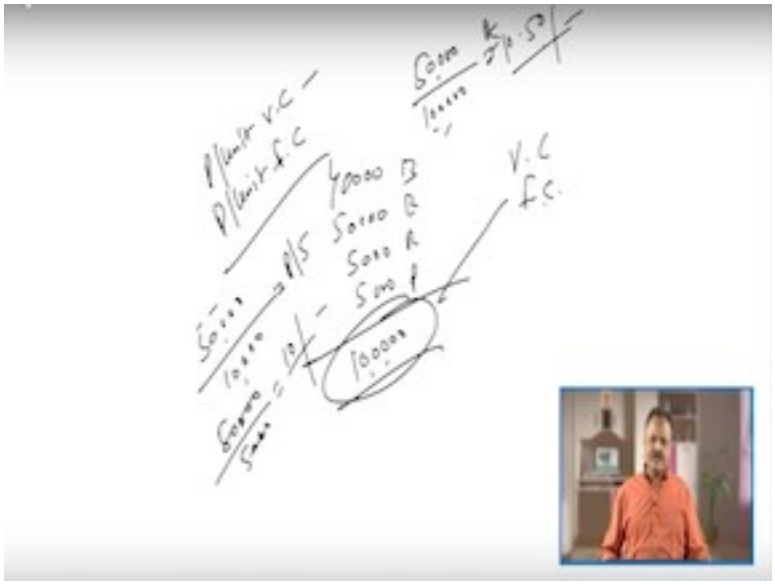

So, it means the total number of that pens we are manufacturing is that works out as 40,000, 40,000 is the black then 50,000 is the blue and then is the 5,000 is one and the 5,000 is other, this is red and this is purple and this is blue. Total number of pens we are manufacturing in our company in our factory is 1,00,000 right now for calculating the cost of production of these 1,00,000 pens or hundred thousand units of the pens we have to now calculate the total cost of production and when you talk about the total cost of production you must be knowing our you are clear about that we have the two kinds of cost one is the variable cost and another is the fixed cost.

And, if we look at the relationship between the variable cost and fixed cost that is a per unit, per unit variable cost per unit variable cost and per unit fixed cost so it means, if you are manufacturing 40,000 black pens your material will be required as per this number, if you are manufacturing the 50,000 pens your material will be required as that number, if you are manufacturing 5,000 red pens your material will be required as per that number and in case of the purple also you will requiring to have the material as per the requirement of manufacturing 5,000 pens.

Now it means that the Per unit cost that is the per unit variable cost moves directly with the volume of production, when the volume of production is more per unit cost goes up because it is proportionately that cost increases, material cost, labor cost and overhead cost, which are direct in nature that cost goes up, right.

Accordingly you are using material, accordingly you are using labor and accordingly you are using the overheads but the fixed cost remain fixed that does not change means whenever you want to establish a manufacturing unit you have to decide in the beginning while preparing the detailed project feasibility report that what will be the minimum plant or the plant capacity available in the market or the plant of the minimum capacity available in the market.

Then you will match it with the sales forecasting which we have done and we are forecasting that maximum I think in the market which we can sell in the unit means the in the market the number of units which we can sell are say 5,000.Total market is for the 50,000 units, but we maximum we can have the 10 percent market share so we can manufacture and sell say 5,000 unit only not more than that right.

So 5000 unit and this our manufacturing capacity because the selling capacity is that much of the firm in the market will be a new segment you are talking about new product introduction new product you are talking about and all other things.

Now, the plant which is available in the market there is a minimum capacity of that plant is manufacturing 10,000 units, you cannot have the plant less than that whereas we can anticipate that currently the demand in the market for our product is going to be 5000 units but in the time to come this demand will go up or we will enter into the new segment so we would be able to exhaust the full capacity of the 10,000 units manufacturing units in the time to come.

So initially what will happen when the total plant for example is available of say is 50,000 rupees cost of the plant is 50,000 rupees and currently we are we can manufacture how many unit that is that 10,000 unit so per unit cost will be how much? Per unit cost will be rupees 5.

But if you are not able to make proper use of it so what will happen you are manufacturing only 5,000 units so it means the cost per unit cost will be 10 it will go up so the behaviour of the fixed cost per unit is inverse as compare to the variable cost, variable cost moves means in correlation with the intended with the increase in the production or increase in the volume and if the volume of the production is more variable cost is high per unit.

Means total is also high and per unit is also high but fixed cost remaining fixed, if the volume production is something x so that particular cost we are calculating here for example that is the 5 rupees 50000 cost and 10,000 is the volume of production which can be done with this plant so per unit cost is 5.

But, if that number of units which we are going to sell in the market or we have potential to sell in the market is only 5,000 just 50 percent plant capacity you are using, so what will happen per unit cost will go up, so fixed cost has a inverse relationship per unit relationship that is the fixed cost has a per unit inverse relationship.

Larger the volume of production per unit the fixed cost come down comes down and lesser of production fixed cost per unit in case of the variable cost reverse happens in the variable cost variable cost increases in accordance with the changes of the sales in the market production, volume sales in the market and accordingly that progress goes up.

So, in this situation you talk about the cost calculation when you talk about the cost calculation, so it means what we are doing here we are manufacturing four products 40,000, 50,000, 5,000 and 5,000 units and the total is going to be the 1,00,000 units and what is your total fixed cost here for example the total fixed cost we have already calculated is 50,000 and how many units we are going to manufacture? That is 0.5 is the cost this is the rupees 0.5 is the cost is going to be the cost of the production.

So, in this case 50 paisa per unit fixed unit is 50 paisa per unit number of units we are manufacturing 1,00,000 total and number of the total amount of the fixed cost 50,000 rupees 50,000 you are dividing by the 1,00,000 so your fixed cost per unit comes up as 50 paisa per unit.

But now what we do, that we while preparing the for cost sheet it and calculating the total cost of production, there what we do we calculate the per unit cost and simply while preparing four different cost sheets while preparing four different cost sheets.

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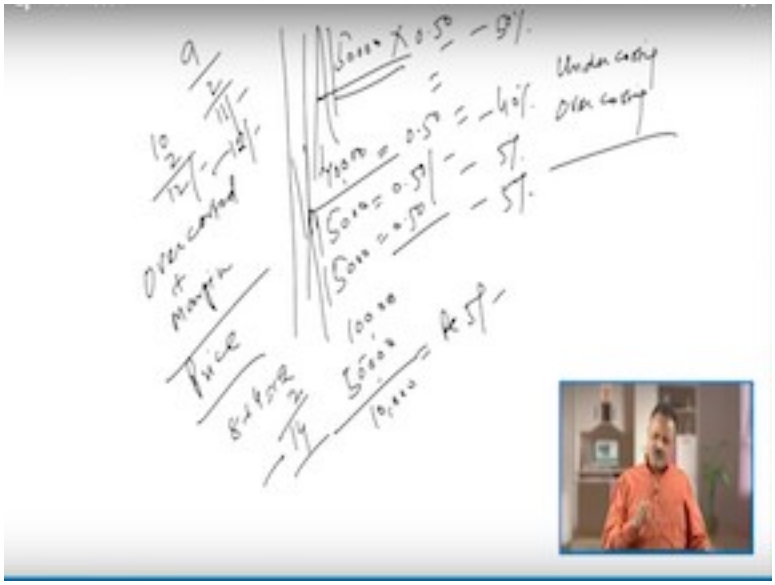

For example, you are preparing the cost sheet for the 50,000 pens so what will you do, you will multiply that 50,000 by the 0.50 as the fixed cost per unit so the total amount will come something some amount will come here right, when you are manufacturing 40,000 units then is the again you are multiplying by 50 paisa and then the total some amount will come here, again when you are manufacturing the 5,000 units again you will multiply bye 50 paisa and that amount will come here, and if you again second fourth product the 50 paisa means the cost is going to be the 50 paisa, you are multiply by 50 paisa a which is a very very defective system which is a very very defective system.

If you are doing like this it means you are saying that my total number of units production is 1,00,000, my total fixed cost is 50,000 and per unit cost is 50 paisa per unit so there is no problem for me I can simply means while preparing the four different cost sheet for the product A, B, C and D you will know the number of unit you are producing, you will know the per unit fixed cost, you will simply multiply the fixed cost you will calculate the fixed cost by multiplying the per unit cost by the number of units we are going to manufacture. So that way the total cost can be worked out, that way the total cost can be worked out.

But, this is the defective system. How it is defective, as I told you that the per unit relationship per unit cost relationship of the fixed cost is inverse with the volume when the volume increases per unit fixed cost goes down when the volume goes down per unit fixed cost goes up.

So in this case the difference in the volume is very high here the volume is how much 50 percent of the total production here, 40 percent of the total production here, and 5 percent of the total production here, and 5 percent of the total production here, so when this is the case this is the situation in this case, How can you say here, that the fixed cost it should be same? 50 paisa per unit for the 50 percent production also, for the 40 percent production also, and for the 5 percent production also.

On the one side, you are manufacturing 50 half of the means unit half of the one product and you are saying that the 50 paisa is the fixed cost, you are multiplying 50,000 by 50 paisa and that you are calculating the cost fixed cost is 25,000. 40000 yes so 50000 and 40000 unit is not a big problem but 5 is big problem.

So, and it may be possible that there is some fixed cost which you are incurring for manufacturing those units, which are lesson amount less in production for example we are manufacturing 4 pens, black pen, blue pen red and purple.

When you are manufacturing blue, and then you start manufacturing black so that means change in the set up does not require proper cleaning of the say the vessels and everywhere the ink is prepared because the difference between the blue and black is video is not very serious but when you have to shift from the black to red or the black to Purple you have to spend means some extra cost in changing the setup or cleansing those vessels, where ink you are preparing and it will take more time, more cost, more investment. So it may be possible that is some extra time, extra cost is being consumed and when the fixed cost is high and number of units is less per units cost should be high.

So, the major difference the major limitation of the cost sheet and the statement of the cost is, that it does not differentiate between the fixed cost in terms of the volume of the production and any product which you are manufacturing just 5 percent of the total production, you are also taking the per unit cost same and the one we are manufacturing 50 percent of the production per unit cost is the same that is the defect here.

So what we have to do is, we have to then find out that if you are manufacturing 50,000 units right, and 40,000 units just because of this 40000 and 50,000 units 90,000 units your just because of this 90,000 units your fixed cost has come down to 50 paisa per unit 50 paisa per unit for example, you remove these 90,000 units then how much units you are manufacturing this plus this is going to be my 10,000 units and how much is the fixed cost? Fixed cost is 50,000.

So you dividing it by 10,000 and then what is the fixed cost per unit here coming up as 5 rupees per unit from the 50 paisa to 5 rupees and then you add up that cost to the cost of black and sorry the red and the purple pens then you see where the cost goes.

So here it has come down because, of the 90,000 units you are manufacturing only of the two products and 90,000 units and 10 percent production only 10,000 units you are manufacturing of the other products.

So, in this case this defect we have to remove and for removing this defect so that larger the volume of production per unit fixed cost is lesser and lesser the volume of production per unit fixed cost goes up, so and that is the standard natural relationship also and for doing that, you have to not to use the cost sheet for calculating the cost of the production but something else and that something else is called as the Activity Based Costing.

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That something else is called as the activity based costing so now in this in the coming number of classes we will be learning about the cost management systems and activity based costing because cost sheet has a defect and the major defect of the cost sheet comes up as what when you are saying that my 50,000 units my fixed cost is 50 paisa my 5,000 units my fixed cost is 50 paisa so what are you doing here the per unit cost should be less in case of the 50,000 volume your per unit cost should be much less and for the 5,000 units fixed cost per unit should be much higher.

So, if you are not doing that if you are simply means the total number of the units are being used to divide the total fixed cost then the total calculate the per unit fixed cost so, what you are doing in this case this cost should have been different it because the volume of production is very high in this case also the volume of production is very high, in this case the volume of production it is not very high, so the cost should have been different.

So, if you are not doing it simply by multiplying by the per unit cost and volume of production you are creating two problems. One problem is of the under costing and second is of the over costing, under costing of the product and over costing of the product. Over costing of the product means 50,000 units and 50 paisa same fixed cost as there is for the 5,000 units which is defective.

So, when you are adding up the 50,000 units cost is as of 50 paisa, it means that product black pen blue pen is over costed the cost of that pen is not that much because fixed cost had you been only manufacturing the 50 and 40,000 pens maybe your fixed cost would have certainly come down the fixed cost has been added because we are manufacturing the specialty pens red and purple ink, so maybe some extra cost we have to incur.

So, what we have to day do here is, remove the problem of overpricing over costing of the product and under costing of the product because when it is a over costed it is the over costed product so what will happen when you fix up the price here you will add up cost and margin you will add here the margins, your profit you will add here and then it will become the price right.

So, if you are following this method of costing means it is simply multiplying the total volume of production means total volume of production of any one product with per unit cost, so what you are doing, it may be possible that your cost per pen is coming up 10 rupees, your adding to rupees as the margin so you are means your selling price is coming up as 12 rupees, but if you change the system and exactly calculate the fixed cost per unit, so it may be possible that fixed cost is furthermore less and it is possible to manufacture the pen for 9 rupees and then 2 rupees margin then you can reduce the price to 11 rupees.

Even, you do not reduce the price to 11 rupees then you can reduce it to, means you can keep the price at 12 rupees so what will happen? If you reduce it to 11 rupees your margin your price will go up because price has come down others may not be able to do that.

So, our price has come down, so means we are able to grab the larger share of the market and the second case is that if we are not going to reduce the price so the profitability of the firm is going to increase buy 1 rupee, this is the one problem we are removing. Second problem we are removing with the help of the activity based costing that is the problem of under costing, it may be possible that fixed cost of that pen red pen is not 50 paisa but it is 4 rupees, so if you take that into account so the total cost maybe 8 rupees plus 4 rupees is of 12 rupees.

Adding your margin into this this cost us 14 rupees but, we are selling this pen also for the 12 rupees. So what we are doing that, we are under costing this and we are over costing this and we are over costing this here. At the place of 9 rupees we are cutting it for the 10 rupees.

So, it means you are increasing the 2 rupees cost in one case you are reducing the 2 rupees cost in the other case and when your costing system is defective, when your cost sheet is defective, when the statement of the cost is defective how can your price be correct. Because cost is a basis of the price, so we have to calculate the actual cost of the production and there we can make use of the activity based costing system absorption costing is a failed there is a flop there so we have to replace the absorption costing system with the activity based costing system.

And in in the activity based costing system what happens? We identify the different activities are being done in any organization and the total activities means to carried over you can call it as the fixed activity which are, which cause of fixed cost they are somewhere maybe the total number if I am trying to find out is 1 to 50 activities, 1 to 50 activities.

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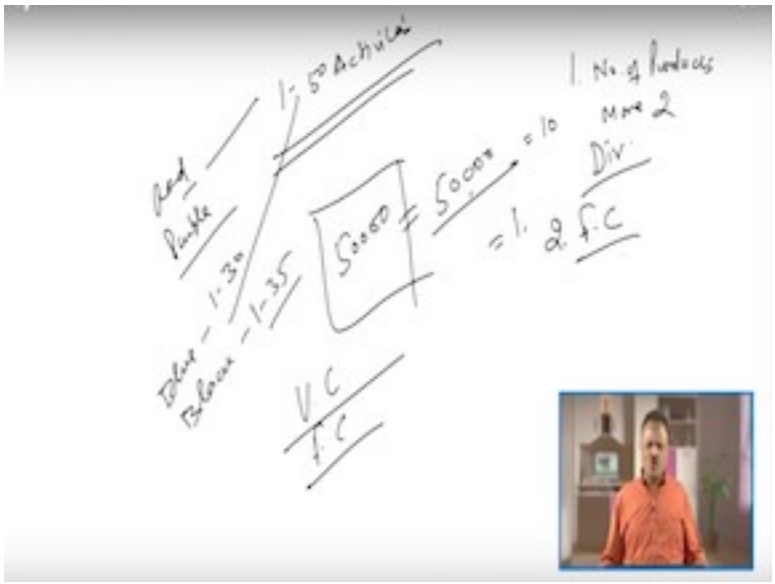

We are performing, means total activities, buying of material, then taking the material to the store, then issuing the material from the store to the first production process, second production process, third production process, fourth production process, then taking the material from the production process to the warehouse, from the warehouse

it has to go to the market so these different activities and in this entire process you have office people will be helping us is the fix income, where fixed cost, advertising you are doing is sometimes fixed cost, if it is fixed cost advertising is not generally fixed cost but it may be the electricity cost of the warehouse that is the fixed cost, so it means the consumption of the different number of products we are manufacturing, the consumption of the fixed cost buy those products is not same, is not same.

For example you create this big hall, big warehouse and this maintenance cost of this big warehouse is how much 50,000 rupees, in this warehouse if you keep only 5,000 units the unit per unit cost is going to be 10 rupees, maintaining a warehouse but in this warehouse if you keep 50,000 units this cost is going to be 1 rupee per unit so you are keeping 50,000 units for one product and you are keeping 5,000 units of the another product so how can you say that your fixed cost per unit is same.

It is not same, it has to be proportionate to the total volume of the production because the behavior of the per unit fixed cost is the just inverse, now I will talking to the we are performing activities is 1 to 50 activities, 1 to 50 activities and in these 1 to 50 activities now these are the maximum and these maximum maybe that you manufacture the red pen yes you have to perform all the 50 activities.

If I am manufacturing the purple pen then you have to certainly perform all the 50 activities, but when you are manufacturing the blue pen and you are manufacturing the black pen in case of the blue pen you are you only using the 1 to 30 activities, we are not making use of the remaining 20, in the black pen we are the making the use of 1 to 35 activities, we are not making the use of remaining 15 activities, in the cost of blue pen why the additional 20 activities, which we are not making use of for this pen why should be added and in case of the black pen why it should be added that is 15 activities should be added.

These activities extra we are doing only for manufacturing the specialty products the specialty pens. So that cost it should be added to those products only and not to the products of mass production right so in this case we have to correct this anomaly we have to correct this defect in the costing system and then we have to use the other costing system which is called as Activity based costing.

Total number of activities will be identified in any firm, any organization and then we will see out of the four products we are manufacturing which product is consuming all 50 activities which product is consuming what is 40, 30, 20 it and accordingly you have to distribute the cost that is the fixed cost to the different products while preparing their cost sheets and then calculating the per unit cost.

In this entire process now we have the two kind of the cost, variable cost and the fixed cost, as per the variable cost is concerned there is no problem at all if you manufacture more production you will use more material, you will use more labor, you will use more overheads, but if you are going for the fixed cost then if you increased the volume of production per unit fixed cost will come down so variable cost has no issues that is same way we have to apportion when we are apportioning in the cost sheet are while preparing the cost sheet system cost sheet or the statement it off the cost under the absorption costing system or the total costing system, in that case variable cost allocation of the variable cost process is same, no defect at all.

But, defect comes up here between the two systems that is the absorption costing system and the second one is the ABC is with regards to the fixed cost. So you have to solve this problem of the overpricing for over costing and under costing by shifting to the activity based costing system rather than the cost sheet system or the statement of the cost and then exactly calculate the real cost of the real cost of the production of different products right.

Now, there are certain prerequisites where ABC can be implemented, is it possible to implement ABC in all the companies, in all the manufacturing organizations? No that is not true, it is not possible to manufacture in all the organization, it is only means it is possible in certain companies, certain manufacturing organization, even in the services organization also, where two conditions are fulfilled, two conditions are fulfilled.

What is the first condition? First condition is that number of products, number of products I am talking about should be the manufacturing should be say you are can call it as more I am not saying more means what is the number at least it should be more than 2, of then you are manufacturing diversify products in the condition diversify products so you are to means you can go for ABC and second is that when the magnitude of fixed cost is very high when the magnitude of the fixed cost is very high and you are manufacturing more than means you are manufacturing diversified products more than two products 3, 4, 5 products.

There, in those kind of organizations ABC can be implemented if the fixed cost is not very high then creating this kind of system does not make any sense and if number of products we are manufacturing one or two only with an idea you can allocate the fixed cost, so means shifting or resorting into such complex system is not required.

Because implementing implementation of the ABC, Activity Based Costing system in any organization is very very expensive, creating that system in the firm within the firm identifying all 1 to 50 activities, then identifying the number of transactions we are doing with regard to those activities, so the identification of activity, identification of the drivers, identification of the per driver cost, identification of the total cost is not a very easy job. We have to hire consultants who know the concept of the this activity based costing, their fees is very very high, we have to constantly keep on changing this calculation in this system so there system requires more demands.

Once that the system is put in place sometime the person who is handling controlling system means transports on leaves organization, new person coming at his place will be find it difficult to understand the whole system how it has been done. So if the company's volume of production it is quite large means it is a large scale organization, large scale company or minimum medium scale organization and two conditions are fulfilled that they manufacture diversified products like I was talking to you blue pen, black pen, red pen purple pen then fine, you can means the first condition is ok second condition the fixed cost is high so the problem of the over costing and under costing will come if you do not follow the Activity Based Costing system when you are manufacturing the diversified products.

So, two conditions have to be first seen, that where you can implement this system or you can create this system it is not possible to implement this technique or system everywhere or in every firm of the organization in every manufacturing concern not possible it is just impossible next to impossible.

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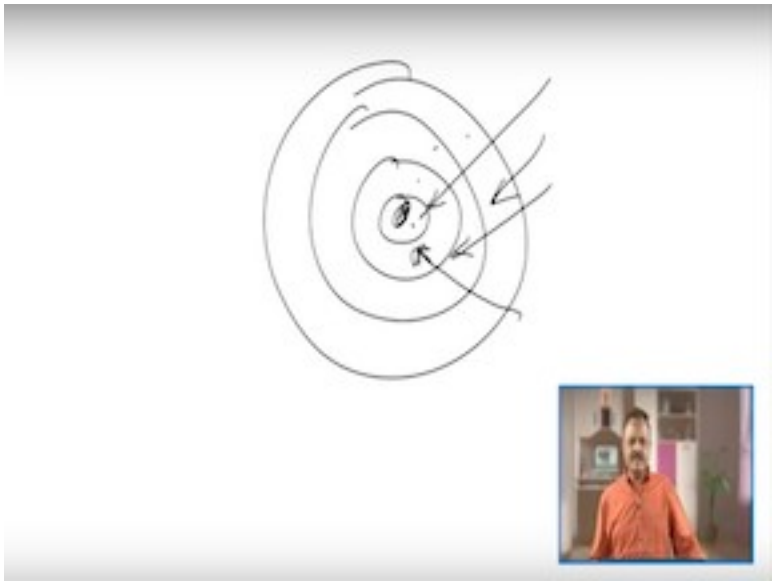

So, in this whole process we will be learning about that, what is activity based costing system, how we can implement this system what are the important means prerequisite required to implement this system and how to go ahead as in any kind of the companies in the organization. When you create this ABC system basically we have the we create different kind of layers.

These different layers you can say these layers are divided by like this, these are the players and then we have the layers, and then we have the players right, it is not all the times required that you means ultimate target is reaching up to this this is the correct cost, exact cost which we can have which we can attain by say following the activity based costing system but reaching up to this point and attaining this much of the accuracy in calculating the cost of the different products it may not be possible for all the organization so if you are able to reach up to this it means you are able to hit the bull's eye.

But, sometimes if it is not possible and that much of the input cannot be done that much of the expenses cannot be incurred in any company in any organization in that case you can initiate creation of the ABC, Activity Based Costing system not identifying all 1 to 50 activities but one to 30 activities initially.

So, even if you do that at least you have reached up to this first outer cycle, then and next time make some more improvement reach up to this by identifying 40 activities, and then next time you move about to this time and 45 activities, and then and lastly when we have become so efficient that we have learn about how to implement the system then you can go up to this point and finally hit the bull's eye.

That yes we want to do correct our system implemented the system and we are now in a position to remove the problem of the over costing and under costing and the product as per the consumption of the variable cost, as per the consumption of the proportionate consumption of the fixed cost we will calculate the total cost of production, We will calculate the total cost of production

So, the means real ABC will be implemented when you will be reaching at this point but in the first go it is not required to reach up to this point. You can reach up to this cycle then you can reach up to this cycle then you can reach up to this cycle and at the fourth level to the inner circle and hit the bull’s eye.

Because the system is complex, it takes time am all the activities so in that case we will have to be careful while implementing the system, so in the ABC activity based costing system we identify different activity and then we identify the number of drivers means the transactions maybe if it is a the production you are doing, so one can be the driver in number of units.

So, if you are talking about the say distribution of the material number can be the driver can be number of units we are manufacturing and the total cost of the material right, or maybe the total cost of the money you can call it as other say where in numbers you can say means there are the different types of drivers they are the numbers drivers, transaction drivers and then they are the you can call it as a product sustaining drivers, which are only useful for the special specialty products.

So, largely the drivers can be numbers or in say hours transaction drivers as well as the say you can call it as the drivers related to the time so transaction is with regard to the unit and the time is with regard to the say total the number of workers are the people working in the in the organisation.

Now, for example in the sale purchase department five people are working and they are performing a different kind of the purchase activities, so in that case maybe they are spending more time to deal with the product A, that is the blue pen little less on the purchasing the material for the black pen and then for the may be purple and the red pen.

So we have to find out that of these 5 people how much time is taken or consumed for purchasing the material for the material for the black pen for the blue pen for the red pen and the purple pen and how we have to calculate that total cost and how we have to them and locate that fixed cost to this four different products.

So we have to identify different product activities, we have to identify different drivers and then finally we have to implement this system so what are the other important aspect of implementing this system, what are the important prerequisites of implementing system, how this system works? And finally how is it look like when we create the system in any organization.

This all we will discuss in the next class currently it is just an initial discussion on the activity based costing further more I will take you to the next level in the next class and once we are conceptually clear about the concept of the ABC then we will do some problems also and then we will understand that how this ABC concept can be implemented in the manufacturing or the service organization. Thank you very much.