

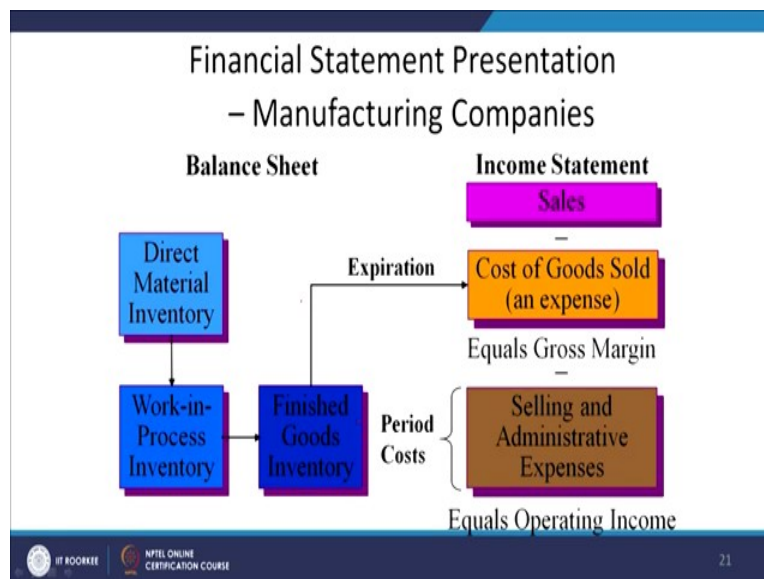
**Management Accounting**  
**Professor Anil K. Sharma**  
**Department of Management Studies**  
**Indian Institute of Technology, Roorkee**  
**Lecture-53**

**Cost Management System Activity Based Costing – II**

Welcome students, so we are learning about the activity based costing, and in previous two classes I just initiated this process this is discussion on the ABC with you, and say we learned about to some extent that how ABC is different from the absorption of the total costing system, what are the say limitations to the total costing system, and how they can be done away by the activity based costing systems.

So, as I told you that real replacement of any total costing system is not the budget not the standard cost not the marginal cost it is only activity based cost, and if we are able to implement ABC in any organization in any firm then certainly problem of the over costing and the under costing will be taken care of.

(Refer Slide Time: 1:23)



So, in the previous class I discussed with you that look that how the say financial statements of this year. We have the balanced sheet on the one side we have the income statement on the other side and how that means in the case of merchandising and the manufacturing organizations these 2 statements are different. In one manufacturing organization we manufacture the goods so we

talk about the material, we talk about the work in progress, we talk about the finished goods, we talk about the sales, and we talk about the Cost of Goods Sold.

So cost of goods sold works out as the sum total of the variable expenses, direct expenses and from that when you subtract means the selling administrative expenses, say this fixed expenses then we arrive at the net operating income before tax. So, but in the case of merchandising organization nothing sort of the manufacturing takes place and only you can say that is the say directly we purchase the material from the market as a for the merchandising purpose for reselling in the market and adding up our own margin into that bought material or purchased material we finally re-price it and then we sell it in the market.


So, cost and income statement revenue means prepare or you compare the 2 statements that is the your income statement of the merchandising organizations or the manufacturing organizations see only difference is there in the cost of goods sold in one case we are manufacturing the another case we are buying it from the market but as per the lower part is concerned fixed expenses largely the fixed expenses which are selling and administrative expenses are concerned they are fixed and means.

Same way they are being provided for they are been subtracted from the gross margin in both the organizations and bone of contention is are these fixed expenses because distribution of the fixed expenses is defective in the total costing system or in absorption costing system which we have to correct by moving from the total costing to the activity based costing system.

(Refer Slide Time: 3:19)

## Cost of Goods Sold for a Manufacturer

- The manufacturer's cost of goods produced and then sold is usually composed of the three major categories of cost:
  - 1 Direct materials
  - 2 Direct labor
  - 3 Indirect manufacturing




ST ROORKEE NPTEL ONLINE CERTIFICATION COURSE 23

We have already discussed that the cost of goods sold manufacturer is direct material, direct labor, and indirect cost.

(Refer Slide Time: 3:23)

## Cost of Goods Sold for a Retailer or Wholesaler

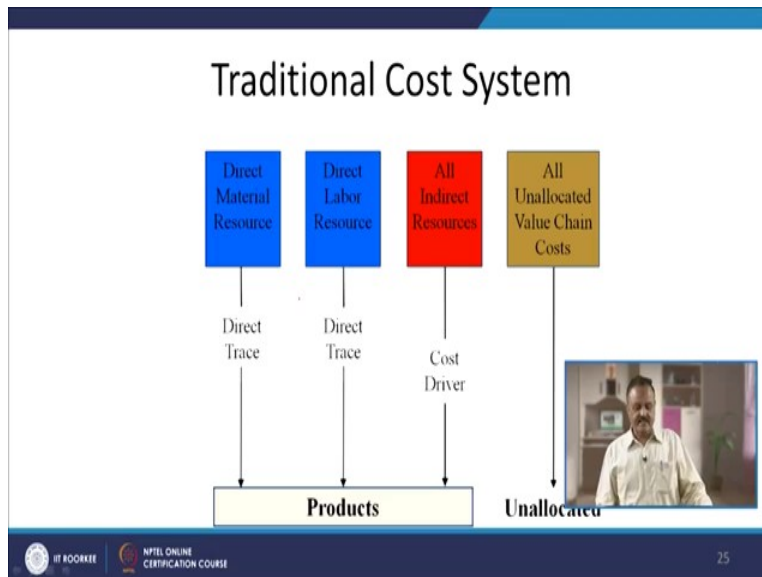
- The merchandiser's cost of goods sold is usually composed of the purchase cost of items, including freight-in, that are acquired and then resold.



ST ROORKEE NPTEL ONLINE CERTIFICATION COURSE 24

And the cost of goods sold for a retailer or a wholesaler is the cost of the goods merchandiser's cost of goods sold is usually composed of the purchase cost of items, including freight-in that are acquired and then resold.

(Refer Slide Time: 3:40)

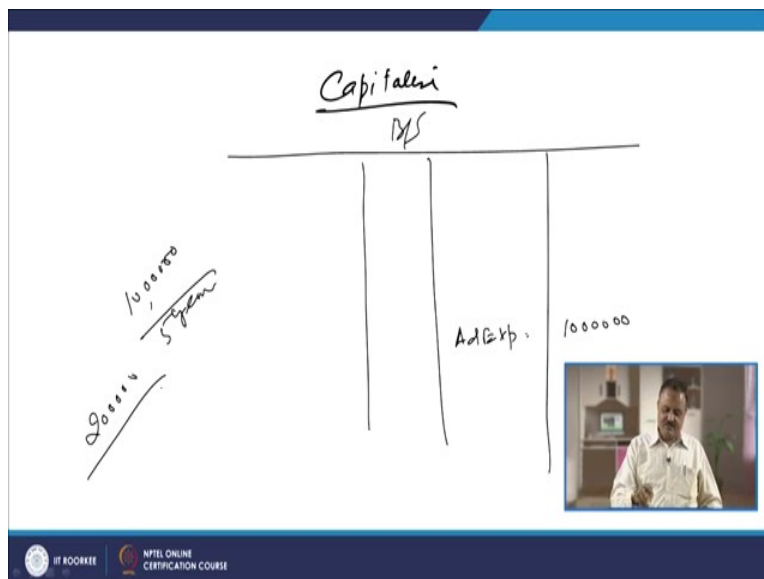


Traditional cost system, now we will talk about the traditional cost system, this cost system which I am going to show you here or we are going to say have this, this slide this a the traditional cost system or you can say it is based upon the absorption costing or the total costing and here you see what is the major defect here what we are doing here we have on the upper hand this blue, red and the this grey colors we have this brown color we have these different head of expenses and then we have the, the products here and then we have some unallocated cost.

This is the unallocated cost so in this case say what we do here is we calculating the cost of the product we take the direct material, direct labor and the all indirect resources we take here and then some unallocated costs are there so it means we are taking into account first part in the blue are the all variable cost that is the material, labor and the other overheads, the red one is the all indirect or you can call it is the fixed cost so it added up and then there are some unallocated cost, for example, advertising expense.

Now the advertising expense is there, is there in the organization so which not only for one product which may it may be for the organization as a whole company as a whole. So, it is not justified to say debit those expenses to the say cost sheet or may be to show as an expense in the cost sheet of any product so we debit them straight away to the total profit and loss account or income statement of the firm. So, in that case in this all unallocated expenses how we treat them, say for example the treating is we simply capitalize them.

(Refer Slide Time: 5:31)



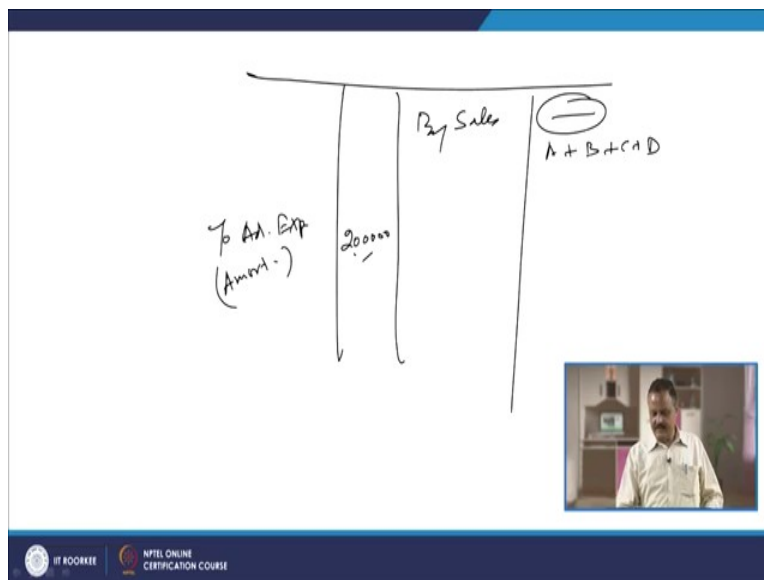
We, we capitalize them and in capitalizing these expenses what we do here that we take these expenses to the balance sheet you call it as they are basically called as a deferred revenue expenses, they are called as deferred revenue expenses and this is, for example, the balance sheet. So deferred revenue expenses is the one so, for example, we have spent say 10,00,000 rupees for the add in 1 particular year advertisement for the 1 particular year of the company and we are talking about all the products in that add or may be belongs to the company as the whole organization as a whole.

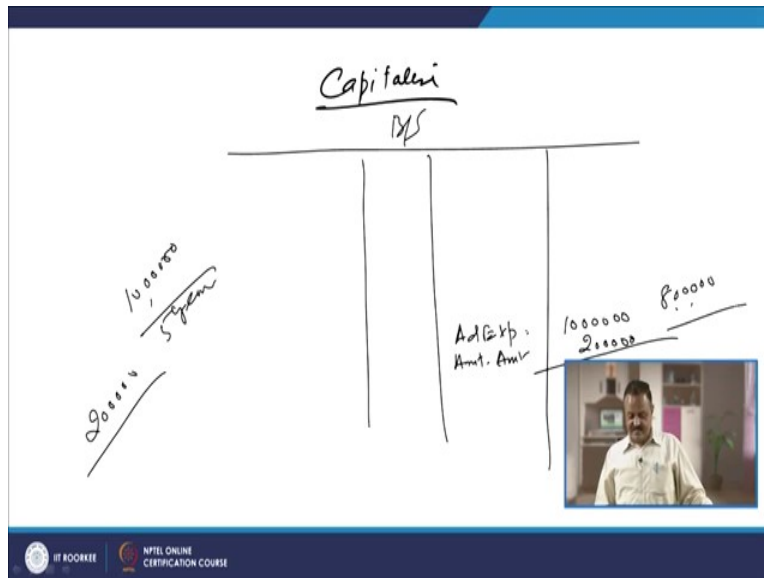
And effect of that say add is expected to be there for the next say 5 years, for the next 5 years so now because any expenditure which we have incurred which is not only for one product which is the firm as a whole. Second thing is the expenditure is so large that the benefit of that is going to be enjoyed by the firm for the next 5 years, so it is not advisable to means debit the total expense

in profit and loss account or debit the profit and loss account with that expense in the first year only in which that expense has been incurred.

So what we do is decapitalize that in the balance sheet it is called as the advertisement expense you call is as a fictitious asset also, we call it as a deferred revenue expense or the fictitious asset sometime so you may say 10,00,000 rupees, we show it in a balance sheet as 10,00,000 rupees and now we will divide it by 5 years so in one year what is the amount, amount here 2,00,000 rupees so with this 2,00,000 rupees means in first year only 2,00,000 rupees will be taken to the profit and loss account.

(Refer Slide Time: 7:12)

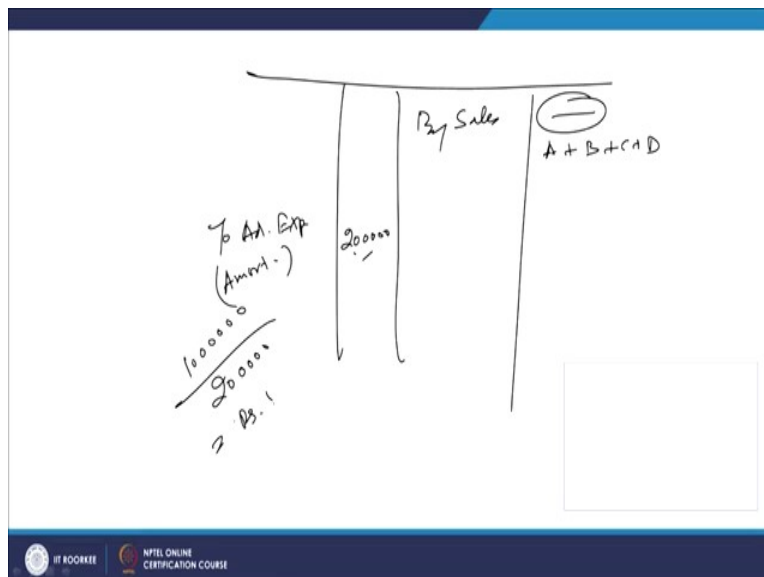
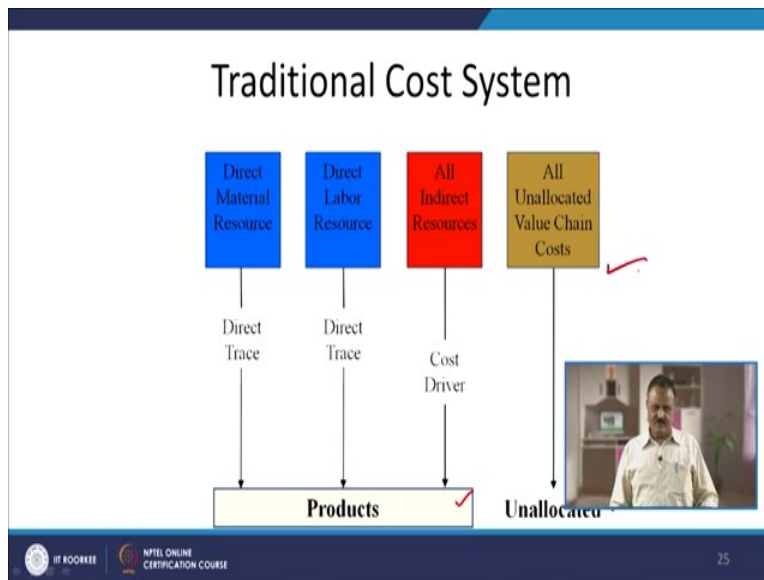




So when you prepare the profit and loss account here you will be writing here To Advertisement Expenses Amortized, advertisement expenses amortized so through amortization we go for this expenses Advertisement Expenses Amortization so it means only in this year profit and loss account 200,000 will be debited and in the balance sheet what we will do when this amount is debited so we will subtract it less the amount amortize, amount amortized.

So what you will do here you will be subtracting this 2,00,000 rupees and you are finally left with that balance of how much amount that is of the 800000 rupees in the balance sheet for the means for the beginning of the net year. So, it means we have with the process of amortization or under the process of amortization we can recover those expenses but we never show then as the part of any product because these are expenses which cannot be fairly unallocated to any product because here we are talking about the firm as a whole.

(Refer Slide Time: 8:18)



Similarly, there could expense like Research and Development when any firm does Research and Development activities so that is with regard to the different products, different may be either marketing or may be sometime the distribution policies also or may be the say Research and Development. Even with regard to the financial functions also, so those expenses are also sort of the organization expenses not for the one product or one service.

So, in this case it means some expenses are unallocateable which directly go to the income statement and other expenses which are allocatable or distributable may be the variable expenses or the fixed expenses they are added into the cost sheet of the product, we calculate the cost per



unit cost of the product each product adding our margin into that we determine the price and then the price for product 1, product 2, product 3, product 4 these prices are worked out and they are means the products are taken to the market and total amount of the sales of all the 4 products is then say becomes the sales which actually go to the say profit and loss account where you write it here as by sales.

So, by sales is the total amount for the products A plus B plus C plus D, Right. these are the 4 products so these this a consolidated statement so this will be deal with different kind of the expenses here so direct material, direct labor as I told you there is no problem adding those expenses into the products is not at all a problem, there is no problem at all we can add these expenses to the products.

Whereas the bone of contention is this red component which is indirect cost, fixed cost and that can be means added to the product can be apportion to the product may be on some basis but see under the total costing system what we are doing, we are simply taking the total of production and that production for example of all the products is of the 200,000 units and then for example here, the fixed cost is say something like this 10,00,000 rupees so it means rupees 2 or rupees 5 per unit is the fixed cost.

And we are adding that into the all the products means irrespective of the fact that 1 product manufacturing 50,000 units another you are manufacturing 40,000 units another you are manufacturing 5,000 units another you are manufacturing again 5,000 units so how the fixed expense can be same per unit 5 rupees for all the 4 products because the simple principle of the fixed cost is that as the volume of the production increases fixed cost per unit decreases.

But in this case fixed cost is remaining fixed it is not changing so it means this is the major defect in the total costing system or in the absorption costing system. Now, we will talk about the ABC, from this part I will talk to you, I will take you to the ABC activity based costing system because we have now, till now understood what are the major limitations of the total costing system or the absorption costing system and now we are going to answer this question that how these expenses or these say the defects in the costing can be done away in the or with the help of the activity based costing.

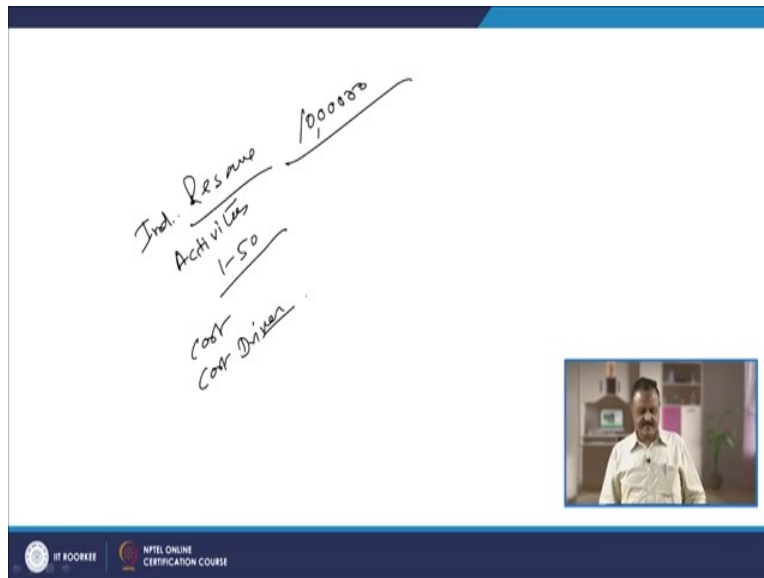
(Refer Slide Time: 11:29)

The slide features a title 'Activity-Based Costing' at the top. Below it is a large orange-bordered box containing the text: 'Understanding the relationships among activities, resources, costs, and cost drivers is the key to understanding ABC and how ABC facilitates managers' understanding of operations.' To the right of this box is a small video inset showing a man in a white shirt speaking. At the bottom left, there are logos for 'IIT ROORKEE' and 'NPTEL ONLINE CERTIFICATION COURSE'. At the bottom right, the number '26' is displayed.

Now, activity based costing means understanding the relationship among activities, resources, costs, and cost drivers is the key to understanding ABC understanding the relationship among activity resources cost and the cost drivers is the key to understand or to understanding ABC how and how ABC facilitate, facilitates manager's understanding of operations. So, again I will read it understanding the relationship among activities, resources, costs, and cost drivers is the key to understanding ABC and how ABC facilitates manager's understanding of operations.

Means the only thing is that you have to understand your operations that hoe many products we are manufacturing how many units of the different products we are manufacturing and how we have to allocate the fixed cost, so 4 important things are there number 1 is the resources, number 1 is the say resources, resources I am talking to you that is the indirect cost, resource is the indirect cost that is the fixed cost.

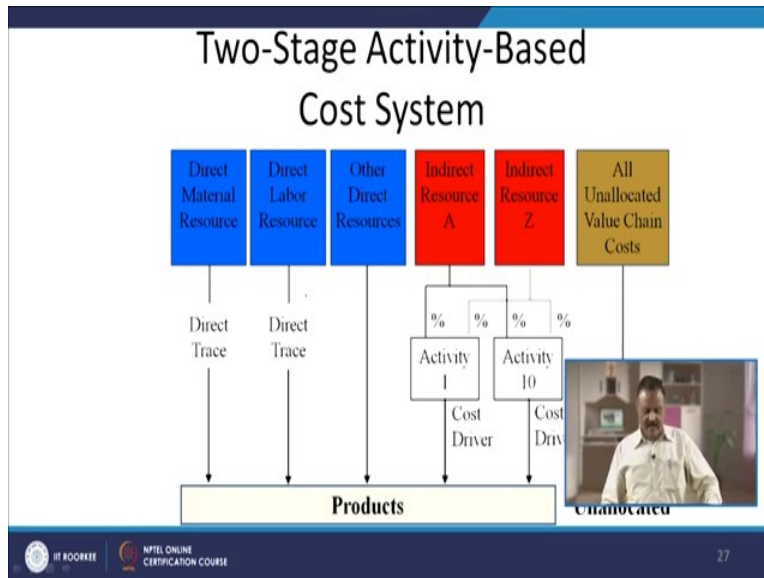
(Refer Slide Time: 12:34)



So, for example, it is 1000000 rupees and it is not directly traceable so we have to apportion it on some logical basis so you call it as a resource, because it is the indirect resource it is not the direct resource so direct trace is not possible, second thing is we are talking about the activities so it means now if we have to follow that activity based costing so we have to identify the total activities done by the organization which may be I told you yesterday in the previous class that is 1 to 50 activities total the firm is performing so we have to identify those activities.

So, when you talk about the cost means the resources activities cost and cost drivers so it mean now we have to talk about the cost so it means that how we have to allocate these resources as a, cost to the different products which is the fixed cost that is the another important thing and then we talk about the cost drivers, we talk about the cost drivers and cost drivers are the ones that which become the basis of distributing the fixed cost to or to adding up the fixed cost to the different products. So these are the 4 important things under the activity based costing system which we will have to identify in every organization in every firm and then we have to means go for say, say calculating the total cost of production.

(Refer Slide Time: 13:52)



So next thing is that now I am taking you to the sat ABC system this is the 2 stage ABC system, 2 stage ABC system is now you can understand that, what different things are say included in it what different things are included in it and these things included in it are say we have again blue portion those direct expenses so it has no problem under the ABC also under the total costing system also allocation of the blue cost or the blue components is very easy that is your direct material cost, direct labor cost and direct other overhead cost and direct trace is possible to the products.

Because we all know how much material is required for manufacturing 1 means n-number units of the product, we know that directly that apportionable to that how much we require labor require for manufacturing that product in the plant we can know that, how much direct overheads are required that we easily can know that. Only problem comes in the red component, red component is basically the indirect resource which is A to Z we have putted here these resources are A to Z.

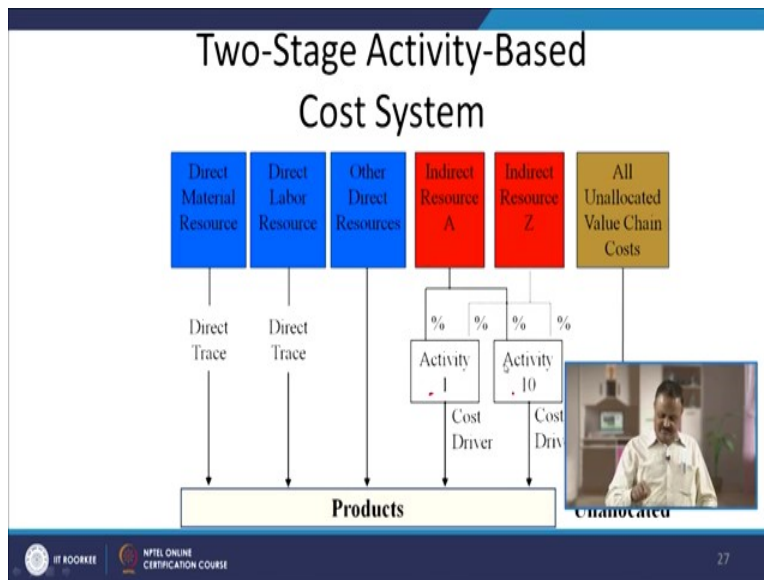
We put them A to Z it means any fixed expense we are going to do it weather it is regarding the administration expenses, salary's expenses or say distribution expenses or may be your you can

call it as a rent or may be power or anything this total fixed cost we have to take in account and then find out the activities.

Now see we have to find out the activities here then how many activities are being performed in the organization and then we are saying here that 1 to 10 activities are been performed in this organization and finally we have to identify the cost drivers, finally we have to identify the cost drivers. So, now what are the cost drivers, I will, I will discuss with you the concept of the cost drivers before we move forward. Cost drivers are basically means they depend upon the different type of activities.

(Refer Slide Time: 15:54)

The whiteboard contains handwritten notes in black ink. At the top left, there is a calculation:  $\frac{50000}{10000} = \text{Rs. } 5/-$ . Below this, it says "Ind. Res. no" and "Activities 1-50". To the right, there is a list of activities: "1. Unit level activities", "2. Batch level activities", and "3. Product sustaining Act". Further right, there is a list of cost drivers: "1. Transaction Driver", "2. Duration Driver", and "3. Intensity Driver". At the top right, there is a note "Black - white" with "Int" circled next to it. Below this, there is a table structure with a vertical line and the word "No." written vertically. In the bottom right corner of the whiteboard, there is a small video inset showing a man in a white shirt speaking. At the bottom of the slide, there are logos for "IIT ROORKEE" and "NPTEL ONLINE CERTIFICATION COURSE".



When you talk about the different type of activities identified under the activity based costing, first there are 3 kind of activities 1, 2, and 3, first activity is the Unit activities, unit level activities you would say unit level activities, second is the batch level activities, batch level activities and third one is the Product sustaining activities, Product sustaining activities, So these are the 3 activities.

Now, as per these 3 activities are in relation to these 3 activities there are the 3 cost drivers, first drivers are the transaction drivers, transaction drivers, second is the duration drivers, duration drivers and third one is the your intensity drivers, intensity drivers, so these are the 3 different type of activities any firm performs these are the 3 different type of drivers we perform and then finally we develop a system which is called as a ABC Activity Based Costing System.

So, it means when you are talking about the activities here 1 to 10 activities we are doing in these activities we are categorizing those all activities from 1, 2,3; first is a unit level activities, unit level activities are those activities which are to be performed for all kind of the products, you are manufacturing 4 products so those activities are unit level activities which are required to be performed for all the products may be they are the different products we are manufacturing.

So their further finishing level may be different, their further say quality of the product may be different further their color may be different further their other features may be different but some basic features are there which we have to means, for example, you talk about this pen we

are going to manufacture or may be any other thing other pen you are going to manufacture, every pen may be it is say the quality is different, the ink is different the fineness is different the tip of the fineness of the tip is different but the body of the pen is same.

So, every pen has to be given a body and that means creating the body of that pen may be it is black, blue, red or purple that for every pen we require a body creation of the body inside features may be different, quality may be different, say tip may be different but that body has to be there for all the pen, so you have to create you can create the specialty later on but first you have to create the structure of the pen so those activities which are to be performed for all the 4 products A, B, C, and D irrespective of their means the different types they are called as the unit level activities.

Then we talk about the batch level activities, batch level activities are those which are only performed for the say particular batch of the production, particular batch of the production so that is known as the batch level activities, for example, now we are normally manufacturing the black pen there is one pen which you are manufacturing in the firm that is the Black pen. Now, black pen which we are talking about black means black is a ink only but the outer color of the body may be normally the mass color is black outer side means the body's color is also black, ink is also black that is why we are talking is as a black pen.

But sometime there might be order from some buyer or may be number of buyers that okay we want this black ink pen but we want its body to be white, we want its body to be white so in that case largely the pen is remaining same, the qualities of the pen are same, fineness is same, tuning is same but the outer structure the body color we have to change and that is not all the times the standard black pen of the company is only having the black body.

But in this one special order somebody has given that we need 2000 pens from you, we need 2000 pens from you we need the black ink pens but the body should be white. So, only in the lot of 2000 pens we have to keep all other features as a same but only we have to change the color, and those activities will be known as the batch level activities, and these activities means those activities which are not performed to all the units which are only performed to a particular batch of the production they are called as the batch level activities.

And then third one is the product sustaining activities, product sustaining activities are only performed for those products which are specially ordered, which are specially designed, specially ordered and not a routine function is not a routine operation of the firm is not a routine product of the firm. So, product sustaining activities means for example some car manufacturing companies normally manufacturing the cars and they are the normal features but some person may place the order to the company that I want these special features in my car, you manufacture this car for me, means come what may be the price.

Whatever price you want to you charge that but I want these features in my car. Similarly, you talk about the say different qualities if the pens that we want the pens but okay we are ready to pay you any price but our pen should of this quality this structure and this type of the say the fineness so it means those products are specially designed, specially ordered, specially designed and sometimes specially conceived ordered designed and created and in that case all those expenses variable expenses also and the fixed expenses also have to be allocated differently.

So, 3 activities unit level activities second one is the batch level activities and the third one are the product sustaining activities so it means in this case when you talk about these activities we are performing here. You can understand that 3 different type of activities are to be performed in every organization in every firm unit level activities are performed for all the products, batch level activities should be performed only for a one batch of the special batch of the production they are not be repeated or may not be repeated.

Third is the product sustaining activities are only to be performed to the products which are specially ordered by the buyer and he is ready to pay a different price for that, so these 3 different activities are there. According to these 3 activities now we have the 3 drivers because you have somehow means for the unit level activities what is the cost and how many activities we are doing that and how we have to apportion that cost to or added up to the different products that is on the basis of these drivers Transaction drivers, Duration drivers, Intensity drivers.

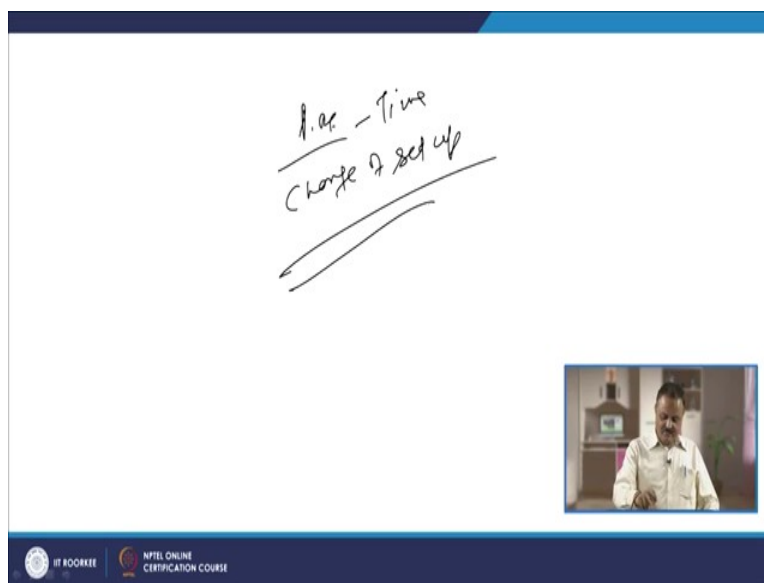
Transaction drivers are in terms of numbers, transaction drivers are in terms of numbers, now, for example, we talk about that you want to talk about the machining of the product, the machining of the product has to be done to all the products so machining is the cost for example engineering and the machining is the cost and there is say I would say it is 500000 rupees.



Now, how many units we are manufacturing we will be we are total units we are manufacturing is 100000, so rupees 5, rupees 5 is the per unit cost which has to be allocated to all the products so it means number means you can call it as transaction means numbers how many times we are performing of or how many units we are performing this activity we have to divide that unit level activities on the basis of the transaction drivers number means when you talk about that the total machining cost because machining is required for all the products so the common driver will be number of units of the products that is a transaction drivers.

So on the basis of numbers of units manufactured total machining cost is 500000 total units we have manufactured is 100000 so machining cost per unit is 5 rupees and that will be added to all and largely this you can call it as a very you can call it as a routine type of activity basic activity and it is the beginning of manufacturing of any product this is the first activity which we normally perform. Then we go for the duration drivers, duration drivers are actually talk about the time, duration drivers actually talk about the time.

(Refer Slide Time: 24:40)



So how much time is taken for say performing one activity, we have the different kind of the production runs, we do different kind of the production runs, so in the production runs the time taken is different, similarly change of setup, change of setup, change of the setup, so time taken is in the change of the setup is different because when you are manufacturing blue pen.

Now you have to manufacture the black pen you have to little clean the vessel where you are preparing the ink then you have to shift from the black to the red so more efforts are required more time is required to clean, cleans it properly that vessel that not even iota of the effect of that black ink should be left in that vessel otherwise that entire red ink will be spoiled.

Or maybe the while manufacturing the purple pens from the red pens again you have to spend lot of time in cleaning and changing the setup so it means changing of the setup number of the production runs how much time is taken is taken for completing those production runs they are known as the, the different types of drivers and these drivers we call it as the duration drivers. Transaction Drivers we define in numbers, Duration Drivers we define in say duration means hours, time and intensity drivers.

(Refer Slide Time: 26:05)

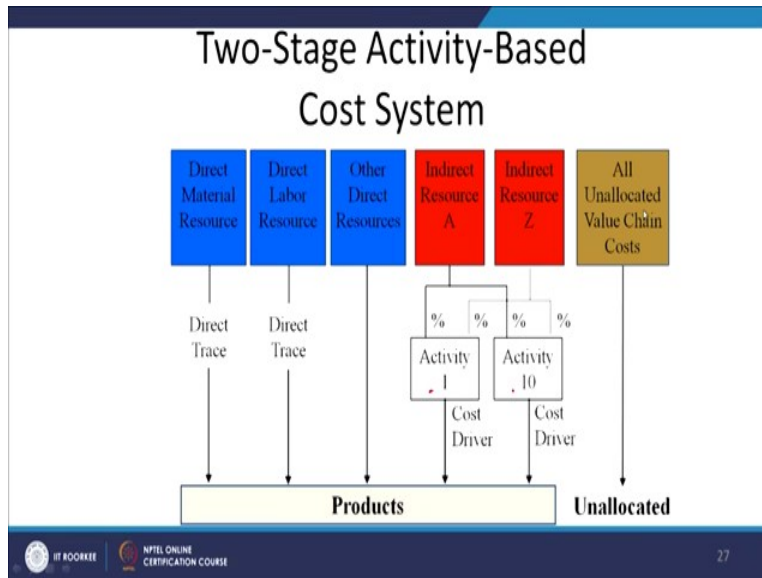
$\frac{500000}{100000} = \text{Rs. } 5/-$   
 Prod. Res. no. / Activities 1-50  
 Cost Drivers  
 Activities  
 1. Unit level activities  
 2. Batch level activities  
 3. Product sustaining activities ✓  
 Transaction Drivers  
 Duration Drivers  
 Intensity Drivers  
 No.

Black - Ink  
Black - White

When you talk about the intensity drivers, intensity drivers are only related to the third type of activities product sustaining activities, product sustaining activities, how complex the product is in manufacturing intensity drivers will be used there. We are not requiring it in the normal standard products that the company is manufacturing their only that transactional duration drivers will be helping us to find out the cost per unit, but intensity drivers are required that depending upon the intensity of the product.

Product sustaining level of the product we have to find out that how much extra efforts we have to make, how much extra performance we have to do and accordingly we will have to means calculate that cost and apportion that cost only to those products which are basically the unique products which are different products, specially ordered products and specially desired products. So we have 3 kind of the drivers, 3 kind of the activities unit level activities are related to transaction drivers, batch level activities are related to Duration drivers and then intensity drivers are useful for the product sustaining activities.

(Refer Slide Time: 27:04)



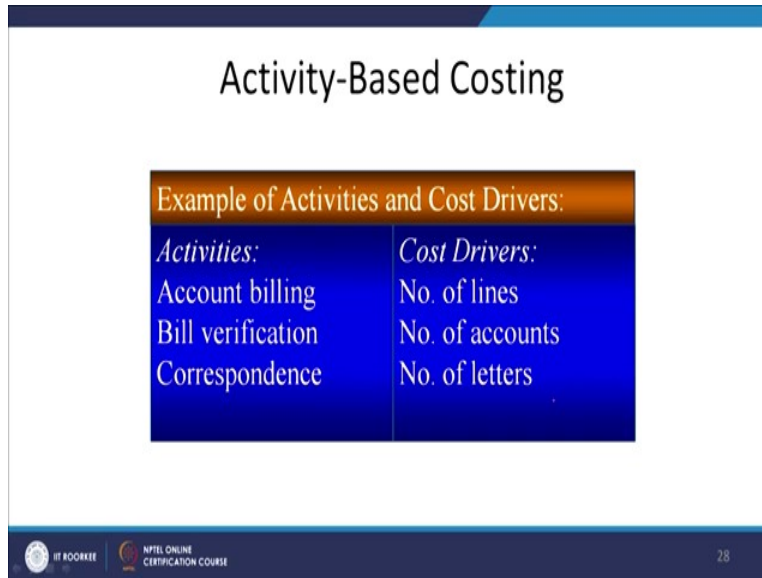
So, it means now when you talk about this structure of the activity based costing we have the 2 stage activity based costing. What is this activity based costing we are talking about is that first of all we are talking about the cost that what is the resource that is the red is a resource A to Z this is a one stage, so first of all you identify the head of expense, head of expense is variable fixed at unallocateable, variable allocation no problem.

Fixed is the problem and brown is also not a problem means unallocateable is also not a problem so first is the to identify different head of expenses second is to identify the different activities to be performed and third is means the on the basis of these different head of expenses, heads of expenses and activities and the cost drivers. So, this expense we have to distribute so one thing is we need to have this activity second you need to have this is the driver so it means this is 1 and this is 2 so this is called as a 2 stage activities.

Total means the finding of the ways to allocate this cost indirect cost to the products so not simply on the basis of that total costing system that total expense divided by the total number of units irrespective of the say volume of the production that has not to be done. So, now this structure will help you to understand how the ABC works first of all you identify what is the total indirect cost which has to be a portion then you find out.

Next thing how many different total activities we are performing in the organization and then the third one is the cost drivers, you perform the you find out the cost drivers whether it is the duration driver whether it is the transaction driver or whether it is the say intensity driver on the basis of these drivers you have to allocate the cost to the different products then the problem of over costing or the under costing will be taken care of.

(Refer Slide Time: 28:57)



The slide is titled "Activity-Based Costing". It features a table with two columns: "Activities" and "Cost Drivers". The table is set against a blue background with white text. The "Activities" column lists "Account billing", "Bill verification", and "Correspondence". The "Cost Drivers" column lists "No. of lines", "No. of accounts", and "No. of letters". At the bottom of the slide, there are logos for "IIT ROORKEE" and "NPTEL ONLINE CERTIFICATION COURSE", along with the number "28".

| Activities:       | Cost Drivers:   |
|-------------------|-----------------|
| Account billing   | No. of lines    |
| Bill verification | No. of accounts |
| Correspondence    | No. of letters  |

Now, here I am giving you some examples Activity Based Costing when you implement you talk about all these things here and in this case we have some examples of your activities and cost drivers. Here activities are account billing and number of lines means how many lines or you can say the products how many number of the products we are say manufacturing and how many means bills we have to issue that different type of the billings, so it means say how much because that person is a is on the permanent salary.

He is a permanent employee he is getting a salary he issues may be say 20 bills or 200 bills in a day he is going to be paid at a fixed rate. It may be possible the out of the 200 bills he is issuing 10 bills are for the product A, 20 are for the B, then 50 are for the C and the remaining number of the bills are for the product D. So, why not to distribute his expense on the basis of the number of accounts, on the basis of number of lines, on the basis of the number of the bills he is preparing that will be the better option.

So this is the account, account billing is activity and cost drivers are the number of accounts, number of customers or number of lines. Similarly, the bill verification, bill verification is our next thing is one person preparing the bill second person verifies the bill and number of account is the driver, how many accounts pertained one product, how many accounts pertained to the second product, how many accounts pertained to the third and the fourth product on the basis if that the bill verification done and the time spend is going to be the basis or that is going to be the means the way for distribution of the bill verification cost.

Then the cost correspondence, for example, we are doing the correspondence, we are writing the letters with regard to the different product we are manufacturing, for acquisition of the material or for the may be say placing the orders or may be receiving the orders or may be dealing with the customers or may be dealing with the distribution channels so it means this correspondence we are doing but that correspondence is different for the different products or may be a simple product, customized products so it means in that case there is no problem at all standard product we are manufacturing so it means in that one letter standard long term arrangements are there between the buyers and sellers so we do not means need to get the orders or to place the orders and then to have the materials or send the materials and do lot of communication no that is not required.

So you allocate that cost to that product less much less and similarly when you talk about the other products which are more complex or which is requiring more cost to be incurred in that case you can understand that the complex product requiring time and again talking to the customers, time and again talking to the suppliers of the material and time and again talking to the say other interest groups also.

So it means the correspondence will be very-very tedious in case of the complex products so number of letters will be changing number of letters will be different so on the one side these are the activities these are the drivers you must have understood what I meant to say by the activities what do I mean to say by the drivers and how we can identify the activities how we can identify the drivers and how we can allocate the cost to different products on the basis of activities and on the basis of drivers.

So, now today I will stop here and further more discussion with regard to some other concepts of ABC and activity based management I will be talking to you in the next class. Thank you very much!