Economics, Management and Entrepreneurship
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Lecture – 13
Job Costing

Good morning. Welcome to the 13th lecture on economics management and entrepreneurship. If you recall in the last lecture, we covered double entry bookkeeping system. Today we shall devote about 5 to 10 minutes on the remaining aspects of the voluntary bookkeeping system before taking up a new topic called job costing. In the last lecture while discussing the double entry bookkeeping system.

We had basically said that there is an accounting equation, balance equation, assets = liabilities + stockholder's equity and we had introduced terms like debit and credit. For every asset or liability or stockholder's equity, we have to keep accounts. The left-hand side of which is debit. The right-hand side of which is credit. Now we would like to say that bookkeeping or in general accounting is not a very exact science.

It is governed by certain principles that are known as generally accepted accounting principles or GAAP, G A A P, generally accepted accounting principles.

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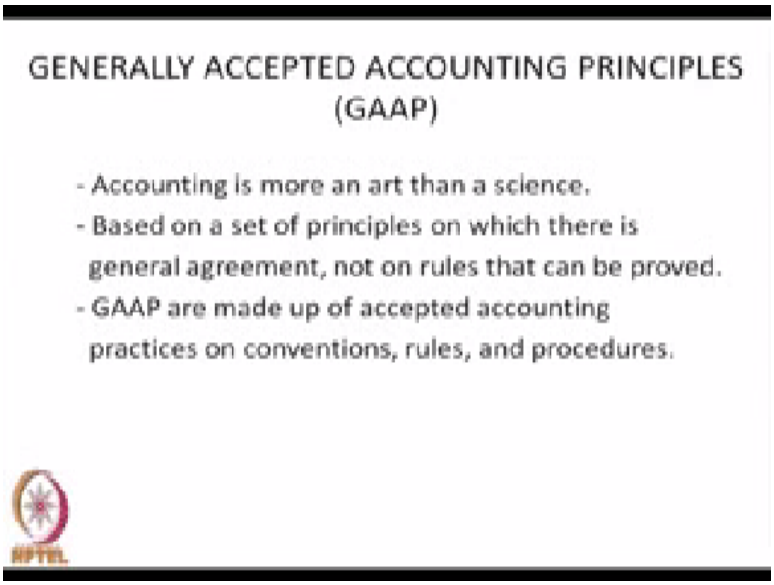

And we would end the lecture on double entry bookkeeping system by discussing some of these principles. These are basically practices on conventions, rules, and procedures that are accepted in practice but it is generally agreed upon by the whole accounting community and they have not been proved but they have said to be giving acceptable measurement of the financial condition of an organisation. Now what are these principles.

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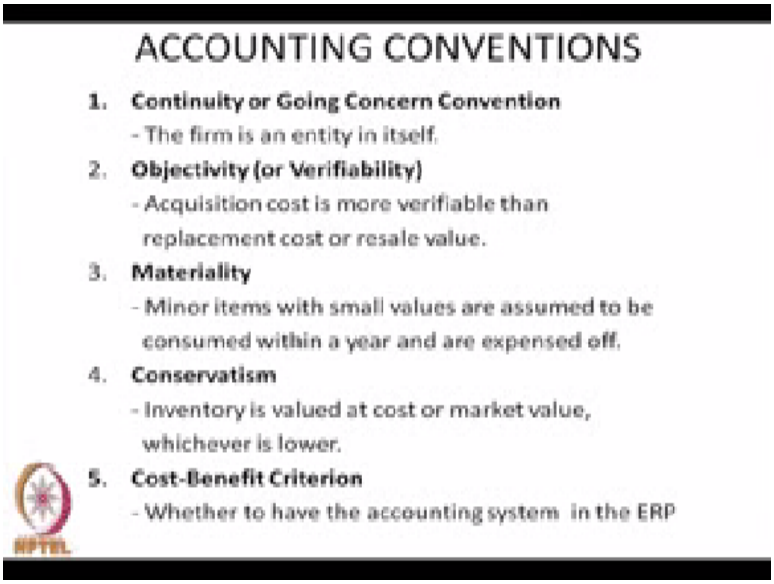

These conventions are the following. First is the Continuity or Going Concern Convention. Here we say that accounting or bookkeeping has to be done or transactions have to be recorded for an organisation which is an entity and this entity will continue to exist unless it is liquidated because of certain financial or otherwise difficulties. So this is an ongoing concern and therefore, it continues to live unlike a person who may die.

Well yes, organisations may also die and there are procedures if entities cease to exist, then how the financial position will change, that is another matter but normally when accounting for various transactions is made on records, then it is assumed that the concern, the entity, will continue to exist, that is the first convention. The second convention is that it is based on objectivity or facts rather than assumptions.

For example, when an asset is acquired, the cost is more objectively known by the amount paid for acquiring the asset. That is the acquisition cost. Therefore, that is taken as the cost of the asset

rather than the replacement cost or its resale value because that has to be estimated. Unless sold, we do not know its resale value. Unless replaced, we do not know its replacement value. Therefore, these are estimates whereas acquisition cost is more objective.

Materiality, we know that when materials are acquired, then there accounts are kept in such material but if the cost of the material is quite low and if it is consumed within a very small period, such as a year, then probably it is not necessary to keep an account of such materials. For example, suppose that an organisation buys a rim of paper or a glass board or few pens.

Now they are so less in price that the amount is so less that it is not economically feasible to keep a record of that as an account instead they are expensed off immediately as if they are consumed, although an inventory maybe available, yet the expense is shown as consumption expense. So they are expense stuff, minor items with small values are assumed to be consumed within a year and are expensed off.

Conservatism, inventory, now inventory is an item that will come in the balance sheet. It is an asset that comes in the balance sheet and sometimes inventory is to be valued, now there are different ways of valuation of inventory. We shall discuss inventory valuation later but one of a methods of valuation is to value it as the lower of its cost as appearing in the book of accounts or its market value whichever is lower.

So the conservatism principle is usually followed when inventory is valued. Cost-Benefit Criterion, these days instead of manual accounting systems, enterprise resource planning or similar such accounting information systems are available that helps in doing the accounting but whether a particular item or a transaction has to be accounted for separately in an account or expensed off like minor items is a function of the benefit that will be accrued by putting such accounts in the enterprise resource planning system.

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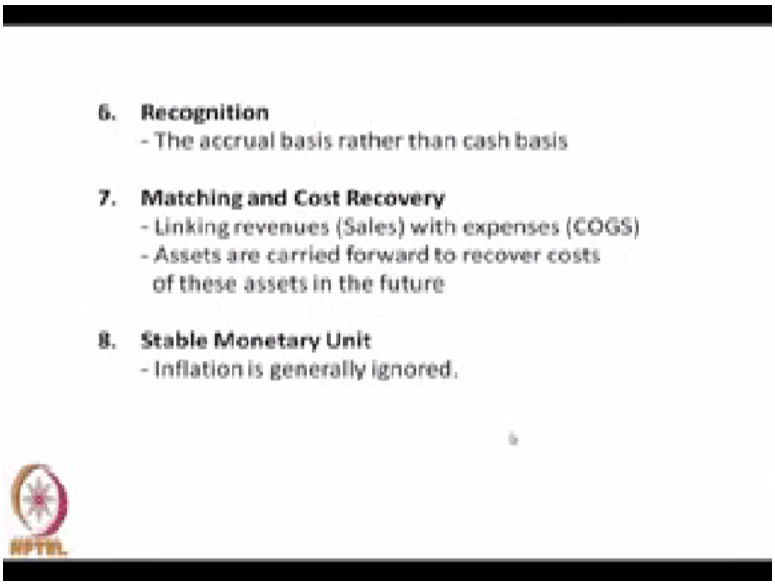

We have already discussed at length the accrual basis rather than cash bases. Many transactions today particularly sell and purchases are made on the basis of credit rather than actual exchange of cash at the time when a product or a service exchanges hands. In the accrual system, we assume that if the products are delivered to the customer, a sale is made whether or not the cash is received by the company.

We make an entry for sales as revenue and we show cost of goods sold as the expense. Whereas in a cash-based system, one has to wait till the actual cash is received by the company. The usual accounting system follows the accrual system. Then Matching and Cost Recovery. I have already told you that if let us say an item is sold for Rs. 100 but the cost of the item was Rs. 80, then the expense will be shown as Rs. 80 and the revenue will be Rs. 100.

So one has to link revenues with expanses and assets are carried forward to recover costs of these assets in the future. Finally it is assumed or rather finally inflation is ignored when we make our transactions. So these are a few conventions that accountants follow while keeping the accounts. With this we end our double entry bookkeeping system and we start a new topic called job costing. In job costing and also in process costing, we shall use the T accounts, the concepts of debit and credit as we had introduced them in the previous lecture.

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Now products of a company can be either actual products in the sense of goods or materials and it could also be services and when it is products, it can be manufactured on a tailor-made basis or a custom-made products can be manufactured or products can be manufactured en mass in a mass production bases or on a continuous manufacturing basis. So costing is done usually separately considering the aspects.

These particular specific aspects of a job production scenario or a mass production or a continuous production scenario. So accordingly, we have job costing systems and process costing systems. Today we shall discuss job costing systems.

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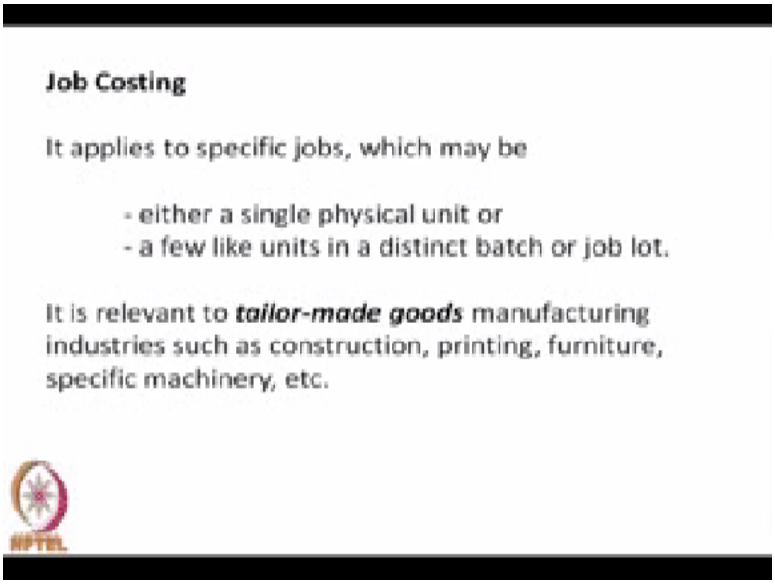

It applies to specific jobs which may be either a single physical unit or a few similar or like unit in a distinct batch or a job lot, either it is only one product which is manufactured or one service which is given, singular service or it could be batch of products or service given to a batch of customers similar in nature. So they are basically tailor-made goods or services such as construction, printing, furniture, specific message, etc.

They are not produced on a continuous basis. The actual job differs from one customer's requirements to another customer's requirements. Whereas in a continuous production system, these jobs are same or very similar to one another. So in a job costing system, we are giving stress on single item or a batch of similar items where the batch size is quite small.

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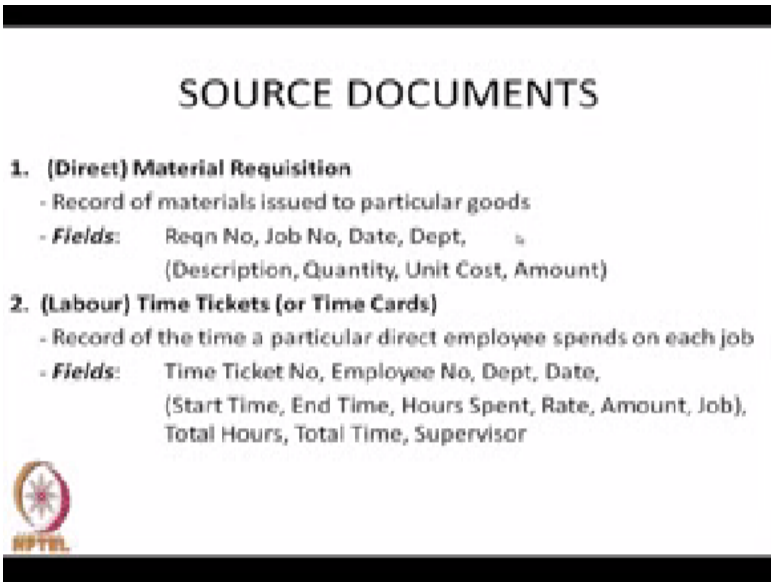

Now here to cost the jobs, we basically need 2 source documents. The source documents refer to direct material and to direct labour. The direct material for a particular job, it is requisitioned from the stores with the help of material requisition document. Now this is basically a record of materials that are requisitioned and issued to the subfloor to manufacture particular goods. Normally the different entries which we say fields of this record are requisition number, job number for which the material is requisitioned, date and department.

And then description of the requirement amount, unit cost, quantity in terms of kg or number, unit cost and amount in terms of rupees. These are usually, these are the fields in the direct

material requisition document. Then we have the direct labour, time ticket or time cards from where we can estimate the amount of time a particular employee has spent on a particular job. Record of the time a particular direct employee spends on each job is basically the time ticket or time card.

The different fields are time ticket number, employee number, department, date, start time that is time at which the employee starts working, end time and the difference is hours spent, the rate at which the worker is paid, total amount and the job done. Now within parenthesis means there repeating fields. So every item may be requisitioned more than once. So these items are written over and over again when particular item is issued for a particular job.

Similarly this also is repeated. These fields are repeated and then total hours, total time spent in the name of the supervisor. These are usually the fields that are available in the time ticket and these are source documents providing the primary data from where the direct material used for a particular job and direct labour hours used for a particular job are extracted.

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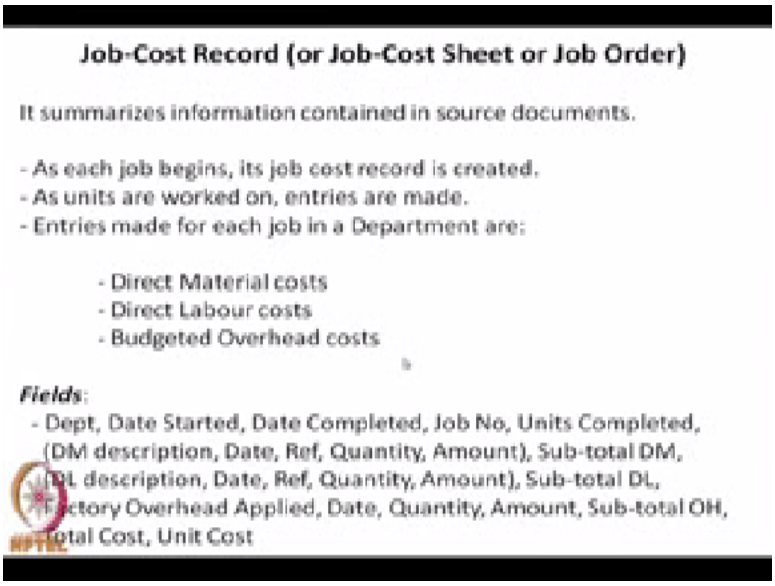

These extracted data are then put on a job cost record also known as job order or job cost sheet. This record summarises the extracted information contained in the source documents. As each job begins, its job cost record is created and as units are work done, entries are made. Entries made for each job in a department are the direct material cost extracted from the material

liquidation form, direct labour cost extracted from the time card and also the budgeted overhead costs, we shall talk separately on budgeted overhead costs later.

The fields are Department, date started, date completed, job number, number of units completed if it is a batch lot or a job lot and these fields are repeated. The direct material description, date, reference to the direct material liquidation form, quantity and amount and the subtotal of direct material. This is a repeating field, so adding them all will give the subtotal of the direct material. Similarly these are fields that are repeated for every labour.

This will give the subtotal direct labour. Direct labour description, date, reference, quantity and amount and their subtotal for direct labour. Lastly, the budgeted overhead cost for that we also have fields like factory overhead applied, date, quantity, amount, and the subtotal of overhead and then finally the total cost that is this+this+this, subtotal direct material, subtotal direct labour, subtotal factory overhead, all the 3 put together gives the total cost/the number of units completed, gives us the unit cost. So a job cost record gives the unit cost.

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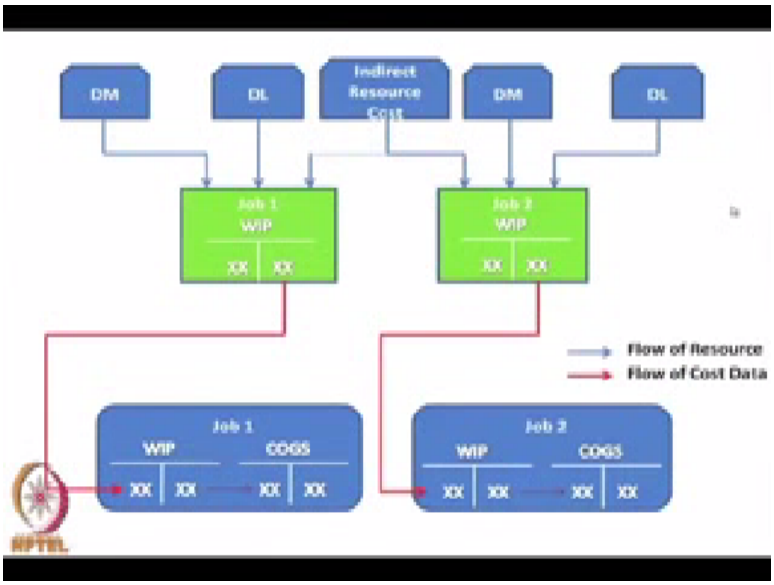

Now in this, this is a graphical form of representing how the costs are added out for each job. As I said each job in a job production scenario or in a job sub-scenario is different from another. So here we are first of all showing how the different resources are consumed. Now these are variable resources and this is a fixed resource. Now the variable resource DM and DL. Similarly

for job flow, it is DM and DL.

Indirect resources apportioned are allocated to the 2 jobs. Now when the job is in progress, this is called work in process and job 2 work in process. So as material is used up, labour is deployed, indirect resource is deployed, work in process rises which means the debit side of work in process rises. So debit side of work in process rises. These are assets.

Therefore, the debit side increases as this, this and this increases or this, this and this increases. Later when the job is complete, then it is passed on to job 1 and to job 2. And when it is sold, then it is cost of goods sold. This is transferred here, this is transferred here. So this is the graphical representation of how resources flow or how the cost data flow.

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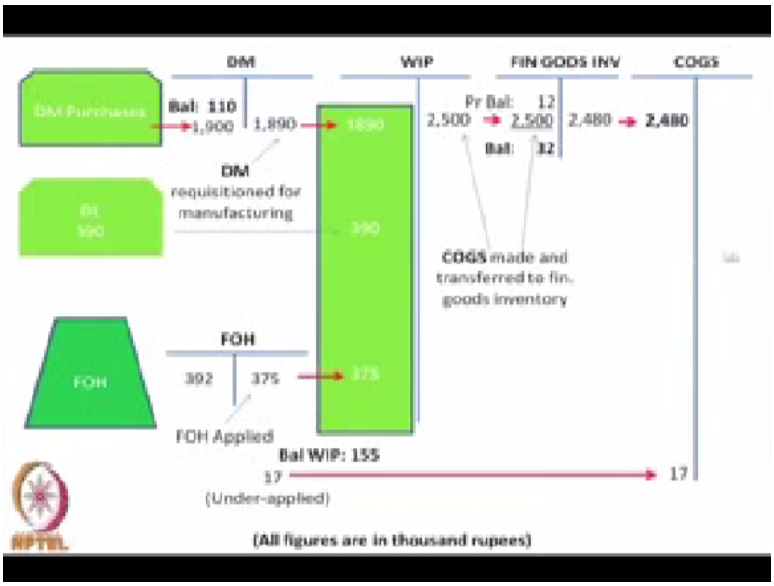

Now we show here how the cost calculations are made. This data are all in Rs. 1000. This is the 2 variable costs and this is the fixed factory overhead expenses. So here we are showing that direct material is purchased which is 1,900,000 because every number is in Rs. 1000. So basically 1900 means so many Rs. 1000 which is Rs. 1,900,000. this is the amount purchased. Therefore, the direct material increases, the debit side increases but for the job, we acquire requisitioned amount for making the job is 1890.

So this is the amount of material that is consumed or that is requisitioned for making the job.

Therefore the remaining balance in the direct material is 110, 1900-1890 is 110, that is the balance remaining after the material is issued for production of the job. Also the direct labour spent is Rs. 390,000. So that is obtained from the time ticket. This is obtained from the material requisition source document.

And lastly, the factory overhead, the total factory overhead adds up to Rs. 392,000 and only Rs. 375,000 could be applied to this job. Now how this 375 figure came into picture that we shall discuss a short while from now. Therefore when making the job, these are the cost that was obtained from different calculations. From material requisition form, it is 1890 for direct material, 390 for direct labour and 392 was the total factory overhead, of which only 375 was applied.

Therefore, the work in process debit side, we add up and that comes to 2655 but whereas only Rs. 2500,000 worth of goods was transferred to finished goods inventory. Therefore, the balance is 2650, the sum of all this -2500 is 155,000 was the balance work in process remaining in as work in process that means work is still going on on certain goods. So we have these many, this amount is in work in process that should shows the debit side, debit balance.

Now from finished goods inventory, some sale has taken place. So cost of goods sold, the sale, the cost of goods sold commensurate with the sale is 2480. So that is the credit by that amount finished goods inventory reduces. The previous balance of finished goods inventory was 12, 2500 was added, 2482 was sold away; therefore, the balance finished goods inventory position is 32.

This+this-2480, that is Rs. 32,000 and interestingly, we see that factory overhead actual cost was 392, whereas we apply to this job only 375; therefore, 17,000 of factory overhead remains unapplied or underapplied. So what is done here is that the complete thing is shown as cost of goods sold. So totalling, it will become 2497. Now how this 375 was decided upon, we shall study later but before that, we would like to see this cost transfers that are being made or various transactions that take place at different time points, how they are entered in the Journal.

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Journal Entries

1. DM purchased, Rs 1,900,000 on credit

Direct-Material Inventory	1,900,000	
Accounts Payable		1,900,000

2. Direct Material Requisitioned 1,890,000

WIP inventory	1,890,000	
Direct-Material Inventory		1,890,000

3. Direct-Labour cost incurred, Rs 390,000, remains unpaid

WIP inventory	390,000	
Accrued payroll		390,000

Say for example the first transaction is the direct material purchased was Rs. 1,900,000 on credit. So when it is credit, it is accounts payable. Entry will be in the credit side. Direct material position improves, increases; therefore, the debit side entry of 1,900,000. Direct material requisitioned for the job was Rs. 1,890,000. So by that amount the direct material position reduces, that is credited to direct material but work in process increases, DR, debited.

Direct labour cost incurred is 390,000 but at the time when the transaction takes place, it remains unpaid. It is not yet paid. So this remains as accrued payroll expenses meaning it is not paid. So it is a liability; therefore, the entries made in the credit side. If it was actually paid, then cash position will come down and this will be shown as an expense but since the labour cost incurred remains unpaid, this becomes a liability and it is called accrued payroll and that is credited, work in process inventory increases by Rs. 392,000.

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4a. Factory overhead incurred, Rs 392,000

Factory Dept O/H control	392,000	
Cash, A/Cs Payable, etc.		392,000

4b. Factory O/H applied, Rs 375,000

WIP inventory	375,000	
Factory Dept O/H control		375,000

5. Cost of goods completed, Rs2,500,000

Fin Goods inventory	2,500,000	
WIP inventory		2,500,000

Factory overhead incurred was 392; therefore, factory department overhead control, the debit side is this and the credit side we shall various forms like cash, accounts, payable, etc. will be 392,000. All we have put together. Factory overhead applied was 375,000. So by that amount factory department overhead control will reduce. So this becomes a credit whereas work in process inventory will rise that is 375,000. Cost of goods completed was 2,500,000. So finished goods inventory is debited, work in process is credited.

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6a. Sales on account (credit), Rs 4,000,000

Accounts Receivables:	4,000,000	
Sales		4,000,000

6b. Cost of goods sold, Rs 2,480,000

COGS	2,480,000	
Fin Goods inventory		2,480,000

Sales on account was Rs. 4,000,000. This of course was not shown in our diagram. In our diagram, we have not shown the sale. We have only considered the corresponding amount which is the cost of goods sold but now we are considering sales on account. On account means on

credit. So if it is a credit, then it is accounts receivables. We have not got the money with us but we are owner of that amount; therefore, this is an asset and that increases.

Therefore, it is debited, the amount is debited to Accounts Receivables and sales, I have already told you. This is credited. It is Rs. 4,000,000. Cost of goods sold however is Rs. 4,480,000. That is debited and finished goods inventory is credited because by that amount the finished goods inventory reduces. So these are the journal entries corresponding to the transactions which we have shown in our graphical representation of flow of resources and funds.

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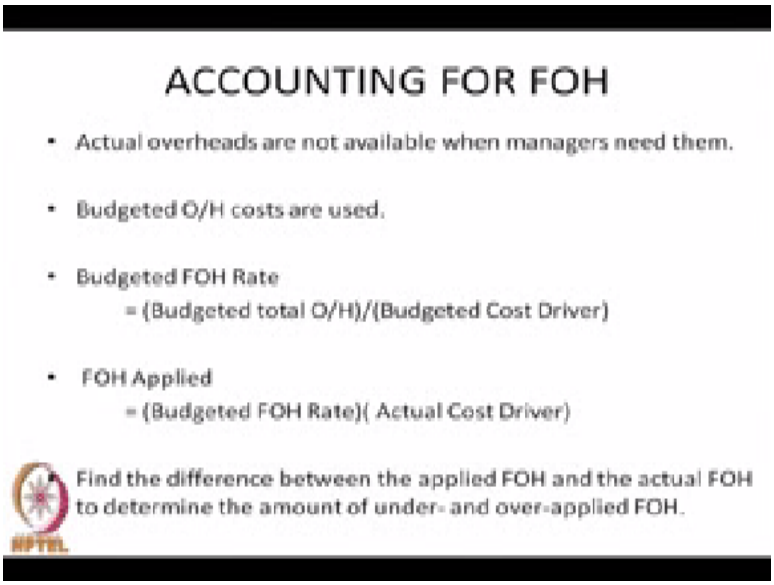

Now we come to accounting for factory overhead. Actual overheads are not available when managers made them. So what managers usually do or accountants usually do, they place their allocation on budgeted overhead costs rather than actual overhead costs and how do they do that. They plan in advance or they budget the total overhead that would be required or that will be incurred and they also decide on a Budgeted Cost Driver value and then the ratio they assume to be correct as.

And they take it as the rate at which the factory overhead would be allocated and when they know the actual cost driver value, the multiply with this budgeted factory overhead rate and that amount they apply to the product. And later they find the difference between the actual and the applied factory overhead to find out the amount which is either underapplied or overapplied.

Now these things will be clear if we give an example.

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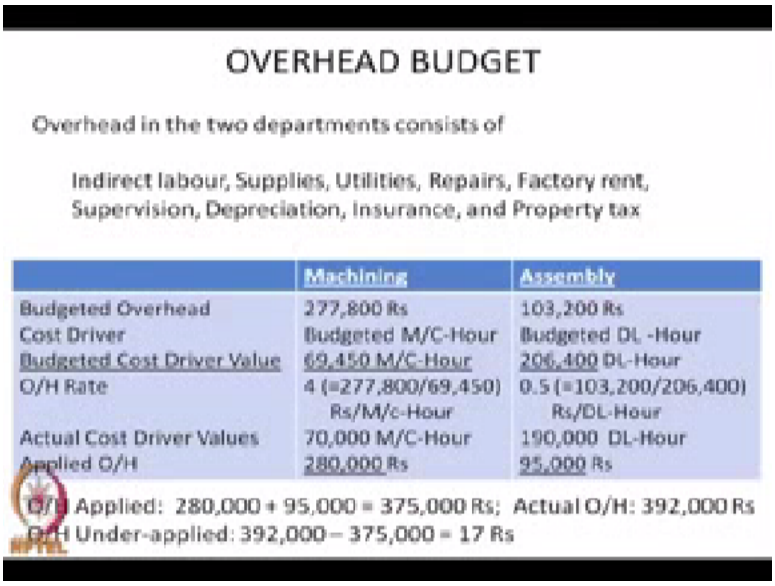

Now this is a example of how overhead budget is allocated. First of all, the overhead in the 2 departments consists of different components or different things such as indirect labour, suppliers, utilities like power, transport, etc. repairs, factory rent, supervision, depreciation of machinery, insurance, property tax, etc. So every department, in this case we have machining department and assembly department.

For the job that we discussed, there were 2 departments, machining and assembly and one can find out what was the total cost. Now the budgeted overhead at was Rs. 277,800 for machining and for assembly, it was Rs. 103,200 and assuming cost drivers for the overhead for machining as the budgeted machine hour and for assembly, as budgeted direct labour hour and the budgeted cost driver value was 69,450 machine hours, 206,400 direct labour hour.

This ratio, this by this, is what is the overhead rate for machining, so many rupees for machine hour, in this case, it is 4 and in this case, it is 103.2, 103,200/206,400, that is Rs. 0.5 per direct labour hour. These are the overhead rates. Now the actual cost driver values for doing this job was 70,000 machine hours and 190,000 direct labour hours. So we multiply 4*70 to give Rs. 280,000 and 0.5*190,000 as Rs. 95,000.

So this is when we add it up, this give a value of Rs. 375,000. Whereas the actual value, actual overhead expense came as Rs. 392,000. So in this case, it is a case of underapplication. The actual is more than what we allocated to the products or applied to the products. The difference they have put is Rs. 17. So here this gives you an example of how to budget for overhead.

So when a particular customer order is received by the company or by the organisation, it budgets for its machine hour requirement, direct labour requirement and overhead requirements and accordingly, it prepares the or estimates the or budgets the overhead rates and when the actual job is complete, they find out the overhead expenses to be allocated and later they come up with either over application or underapplication of the factory overhead. Now we shall study how these underapplication or overapplication is to be accounted for.

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DISPOSITION OF
UNDERAPPLIED OR OVERAPPLIED OVERHEAD

Two Methods:

1. Immediate write-off to COGS
2. Proration among inventories
   (*i.e.*, assigning in proportion to the sizes of the ending WIP, Fin. Goods Inv, COGS)

	Unadjusted Balance (Rs)	Proration of Under-applied O/H (Rs)	Adj Balance (Rs)
WIP	155,000	(155/2,667)x(17,000) = 988	155,988
Fin Goods	32,000	(155/2,667)x(17,000) = 204	32,204
COGS	2,480,000	(155/2,667)x(17,000) = 15,808	2,495,808
Total	2,667,000	17,000	2,684,000

This is what we are not taking it here. Disposition of underapplied or overapplied overhead. There are 2 methods, one is immediate write-off to COGS which is what was done in our diagram there if you see the diagram. Here, this was a case of underapplication. The actual was 392 and following our budgeted rate, we applied only 375. This 17 has to applied, it was added directly to COGS, the value become Rs. 2,497,000.

So this is directly writing-off as an expense or prorating it among the inventories. Prorating means, we had 3 types of inventories with us. One was work in process. The other was finished

goods inventory and the third was the actual sale that took place and the corresponding cost which was cost of goods sold. So in our case, the work in process, the remaining amount, was 155, 32 and 2480.

Look at the diagram again. This is 155,000 was work in process. Finished goods balance was 32 and cost of goods sold was 2480. So add all the 3 and proportionately, you allocate 17 to each one of this. That is what is proration. So 155,000 work in process, finished goods 32,000, cost of goods 2,480,000, totalling Rs. 2,667,000 of inventories. So what is to be applied, un adjusted was 17,000 or underapplied.

So what is done, proportionately we apply this much to work in process, this much to finished goods and this much to cost of goods sold. So that makes it, work in process becomes not just 155,000, it is Rs. 155,988. Finished goods became this+204, Rs. 32,204. Cost of goods sold became 2,495,808. If you add them up, you will see that this amount is equal to 17,000 which was earlier underapplied and the adjusted balance rose up 17 which is this+this, became this.

So before adjustment, this is what the raw data was. After the adjustment, the adjusted balance increased by, increased proportionately with respect to their balance remaining. So this is how the underapplied overhead is applied. Now if it is overapplied, this will be subtracted accordingly and this amount will be less than this amounts or COGS value, if you follow immediate write-off, COGS value will be reduced by that extend.

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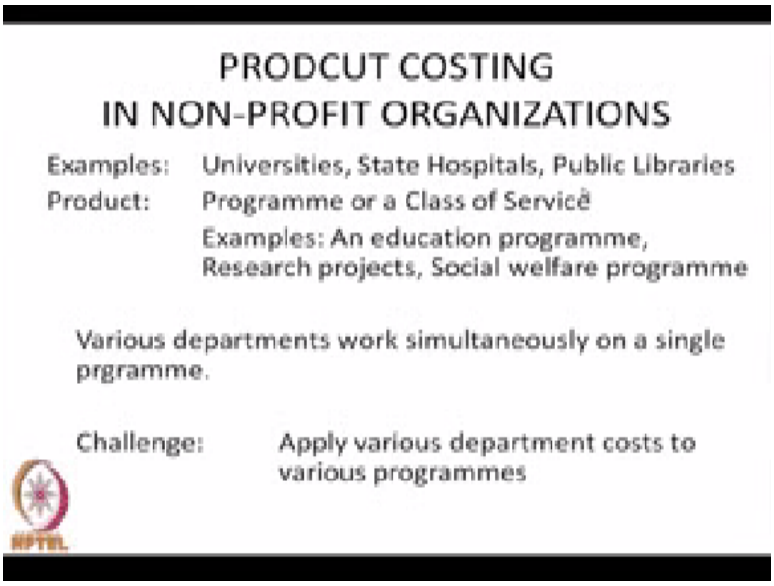

The previous discussion was regarding profit-making organisations. Now we consider cases of product costing in non-profit organisations. Basically service organisations which also are non-profit organisations. Examples are, I have given a few examples here. In universities, state hospitals, public libraries, in fact all public organisations which function in a non-profit manner. Now here normally what we say product in a manufacturing organisation is a program or a class of service.

An example, a few examples are in a university, it could be a particular program such as MBA or MTECH or it could be a research project. In a government organisation, it could be a social welfare program and so on and so forth. Now here various departments works simultaneously on a single program. So the challenge is how to apply these various department costs to these programs? So here the costing aspect comes. So this is a case of product costing in nonprofit organisations.

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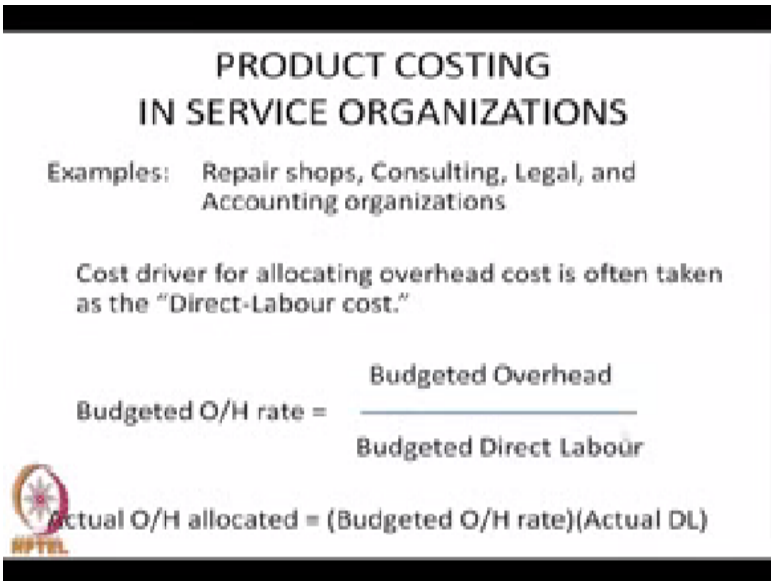

Now we consider the case of product costing, there is a spelling mistake here. Product costing in service organisations. We have given a few examples of service organisations. Examples like repair shops, consulting, legal, accounting organisations and so on and so forth. Now here once again the cost driver for allocating overhead cost is often taken as the direct labour cost. Usually in a service organisation, the explicit input is in the form of labour.

Therefore, it is quite often taken as the main cost allocation base or cost driver for allocating the overhead expenses. As before, we make a budget for the overhead and a budget for direct labour and the ratio is taken as a rate which is the budgeted overhead rate. Then the actual overhead allocated then becomes equal to the budgeted overhead rate. The product of budgeted overhead rate and actual direct labour cost, that is the actual overhead allocated.

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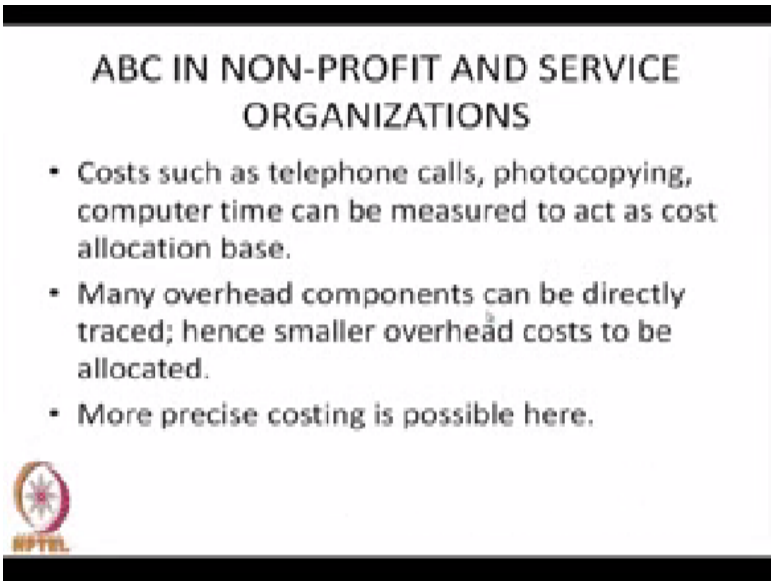

Now lastly let us recall that activity based costing, ABC, is a very very useful tool for cost allocation and the concepts of ABC can be applied to also non-profit and service organisations. In nonprofit or service organisations, there are costs like telephone calls, photocopying, computer time and although in the conventional costing these are taken as fixed overhead expenses.

But one can jolly well assume them to be variable overhead expenses varying with the number of telephone calls made, number of pages of photocopying, minutes of computer time or hours of computer time used and therefore they are the cost drivers. The number of telephone calls, pages of photocopying, hours of computer time, they are cost drivers and therefore, we can assume them to be variable and not fixed.

Hence they can act as cost allocation base and therefore many such overhead components can be directly traced and hence they are variable. Hence the actual overhead costs that remain fixed and that require to be allocated separately following the budgeted allocation rate is small because larger chunk of the total overhead expenses can be traced actually to such activities like telephone calling, photocopying, computing, etc.

And therefore, if one applies activity-based costing, it is more precise than the conventional costing. So basically what we are trying to say is that product costing is quite important. Product costing is important for many reasons, one company or a particular organisation can actually find

out the profit it is making if the revenue is this much and the cost of manufacturing the gods is this much, then the difference will give the profit.

Knowing the profit, helps the organisation to decide about its dividends policy, about whether to invest more in a particular line of business or not. It can also decide if it finds that its profit is quite low and cost is high, then it can make investigation as to where the cost is going high, how it can be reduced, controls can be exercised. Therefore, costing is quite important. Now depending on different types of organisations, costing methods can change.

2 extreme types of organisations are job shops or continuous production shops. In job shops, we assume that every order of the customer is different from the other which means that the requirements of skills, the requirements of material, the requirements of labour, power, supervision, etc. they all change from one product to another product. Now for this situation, what we do is that either there is a single product or there is a batch of products small in size.

Therefore, we try to estimate the amount of labour that will be spent, amount of material that will be spent, amount of other requirements, indirect material, supervision, etc. power requirement, etc., we make estimates and then we budget the cost but when the actual job is complete, then we know the amount of direct material spent, the amount of direct labour deployed and then the actual amount of overhead expenses incurred.

Now I discussed today the budgeted overhead rates. Budgeted overhead rates basically says that before the work is taken up, a budget is made as to its overhead expenses and that would be, that is likely to be incurred and the value of the cost driver with the help of which the cost allocation will be made. So these 2 items are budgeted prior to starting the manufacturing of the job.

This ratio of the budgeted factory overhead and the budgeted value of the cost driver gives the rate at which the cost allocation will be made and once the actual value is known, they are multiplied to find out the amount of factory overhead to be applied. Now invariably more often than not, there is a difference between the factory overhead that is allocated or applied and the factory overhead that should have been allocated.

So the difference can be positive or negative. That means either the amount may be underapplied or overapplied, then we say that there can be 2 methods. One is it is directly written-off as an expense or it can be prorated depending on the values of the inventory and finally, we said that job shop situations are also found in service organisations and in nonprofit making organisations.

We gave examples of each of this and we said that concepts similar to what we have discussed in job costing can be applicable there as well. Finally we said that activity-based costing is a very powerful tool and whenever possible, the factory overhead expenses, some of them or a large number of the components of factory overhead expenses can be traced to the product with the help of various activities.

Therefore, if we use activity-based costing method, then the amount of factory overhead remaining unallocated will be less and therefore product costing will be much more precise and accurate. In the next class, we shall talk about process costing and we shall show how process costing is similar and different, similar to and different from job costing. Thank you very much.