Economics, Management and Entrepreneurship
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Lecture – 08
Cost Management Systems and Activity Costing Systems

Good morning, welcome to the 8th lecture on economics, management and entrepreneurship, today we are going to discuss on cost management systems and in particular, we shall discuss activity based costing in contrast with the traditional costing systems, various concepts of costs will also be discussed in detail. Cost management systems and activity costing system is the discussion for today.

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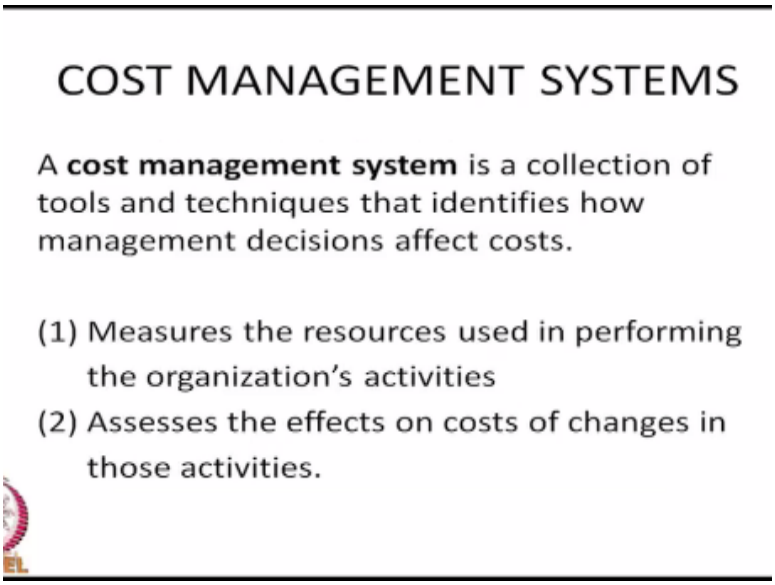

And here first of all let us define what we mean by a cost management system, it is basically a collection of tools and techniques that identify how management decisions affect costs. So, it is basically a set of tools and techniques that helps identifying how management decisions influence costs. In particular, it measures the resources used in performing the organizations activities and then assesses the effects of these decisions on the costs of these activities.

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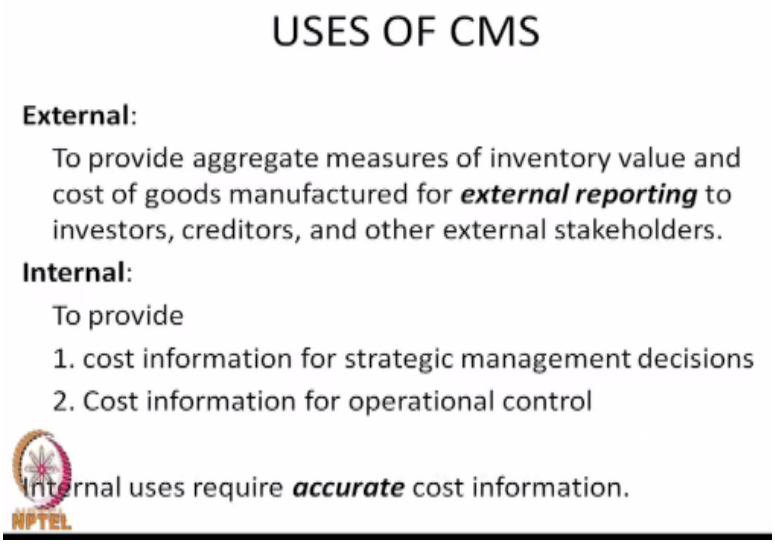

Now, let us study what we mean by the cost management system and in particular with regard to its external and internal use. When we bring to the discussion, the external uses of cost management system, this is to provide aggregate measures of inventory value and cost of goods manufactured for external reporting to investors, creditors and other external stakeholders. As you know every enterprise, there are some investors who invest money for creating.

And for sustaining the enterprise, they may be creditors also and there are various other stakeholders and for their information from time to time generally in a year; once a year, every company reports their financial health in terms of the inventory that they hold up, in terms of the cost of goods manufactured also, in terms of income that they make during that year. So, this cost management system helps in preparing certain aspects of these reports that are used by external people; external to the company.

More than that there are internal uses of cost management systems, it provides cost information; cost information for strategic management decisions and it provides cost information for operational control. Now, for these decisions whether they are operational or strategic, accuracy of cost information is extremely important although, for external reporting such accuracy is not so important.

But definitely for internal decision makings on how much to produce, how much inventor to hold, how many workers to hire, these are operational decisions and strategic management decisions are like whether to have a new plant, where a plants should be located in the first

place, which market to target, so these are strategic management decisions and for taking these decisions, the type of information; cost information that is needed has to be extremely accurate.

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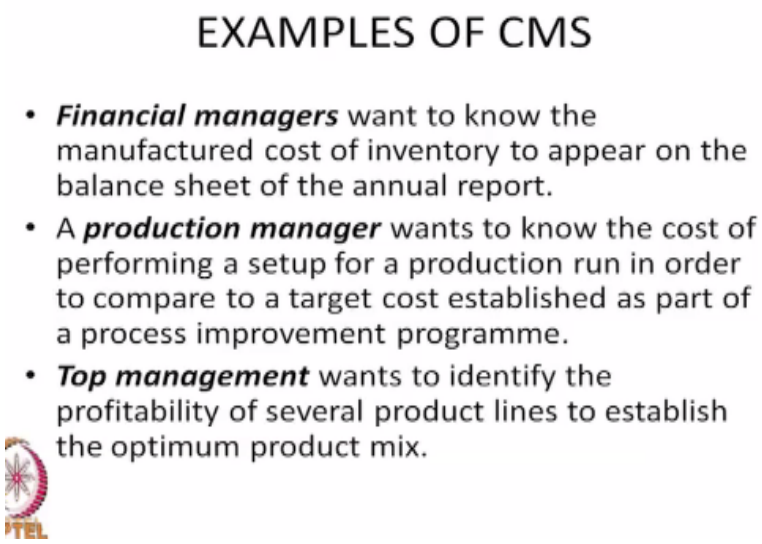

Now, if you look at the internal uses of cost management systems, we give examples of 3 types of managers; the financial managers; the financial managers, they want to know the manufactured cost of inventory, so that that item can appear on the balance sheet of their annual financial report for external reporting, this the financial managers need. Production manager wants to know the cost of performing a setup for a production run in order to compare a target cost established as part of a process improvement program.

And for various other buyer make decisions whether to how much to produce and so many other decisions, the production manager needs to know the information on different types of cost. Top management wants to identify the profitability of several product lines to establish the optimum product mix. Suppose, a company is producing 5 different types of products, cost information can help to know the profitability of each of these product lines.

The one that is least profitable may be deleted from the product line or how much of what product to produce will also depend on the profitability information. So, you can see that cost information is useful at various levels of management studying from production, financial to even top management.

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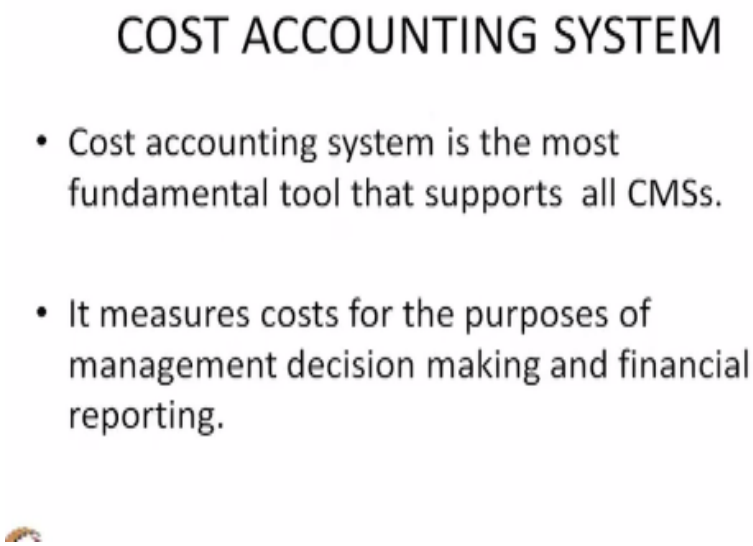

Now, cost accounting system is the most fundamental tool that supports all cost management system. Cost accounting system is basically one of the tools and cost management system as we have defined earlier is a collection of various tools and techniques and cost accounting system is one such tool. It measures the costs for the purposes of management decision making and financial reporting as we have already discussed.

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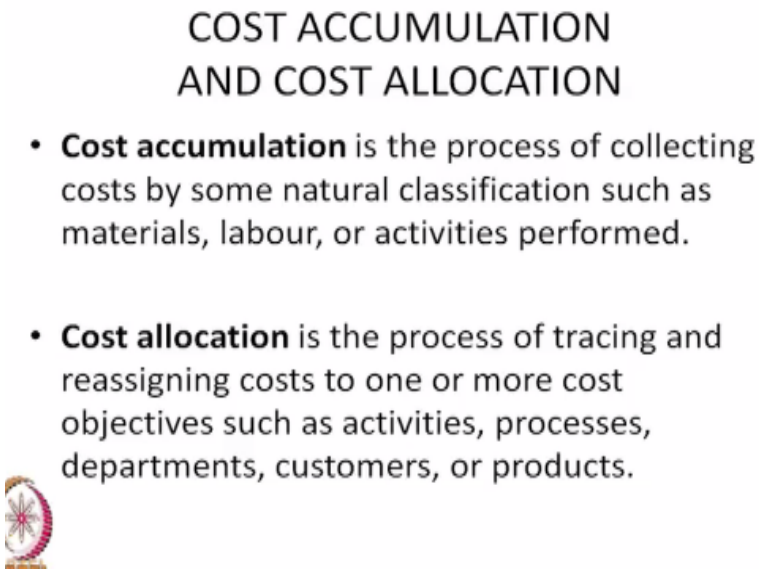

Cost accounting system basically does 2 things; one it accumulates cost by some natural classification such as material cost, labour cost, various activities that may have been performed in carrying out the task, so this natural classification if we accumulate all costs over time then it is called cost accumulation. So, at the end of a particular period such as a year, we can say the material cost in that year is this, for the labour cost in that year is this.

Cost allocation is the second aspect of cost accounting system is cost allocation; it is the process of tracing and reassigning costs to one or more cost objectives such as activities, processes, departments, customers or products. Now, you say for example, a particular machine is used for different products for some portion of the time, it is occupied by product 1, for some other portion of the time, it is occupied by product 2.

So, once we know the machine cost that is cost accumulation, we would now allocate this machine cost to these 2 different products; product 1 and product 2. On the basis of; let us say the machine hour utilized by each of these products, this is a cost allocation scheme.

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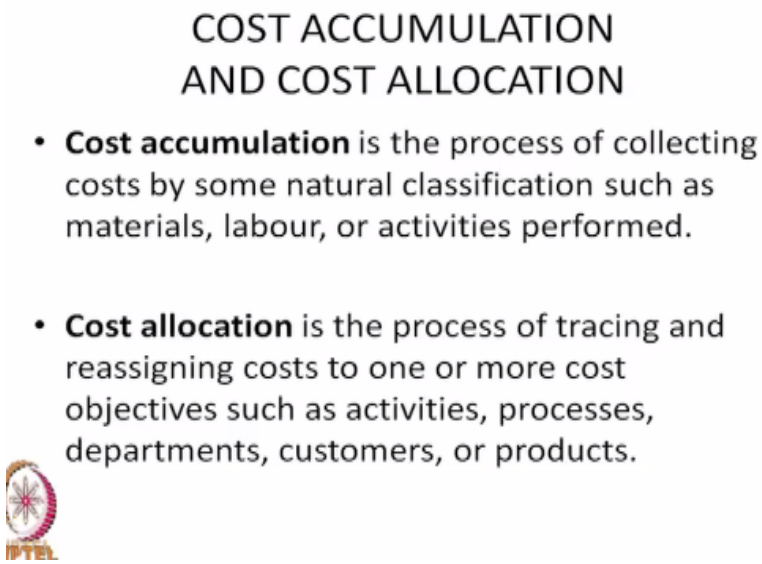

Now, here we have used term cost objectives, in the next slide we define what we mean by a cost objective also called a cost object. A cost objective or a cost object is defined as anything for which a decision maker desires a separate measurement of costs for example, one may like to have cost for a department in a year, cost of producing certain number of products, cost in a particular territory in the market, cost of bricks laid.

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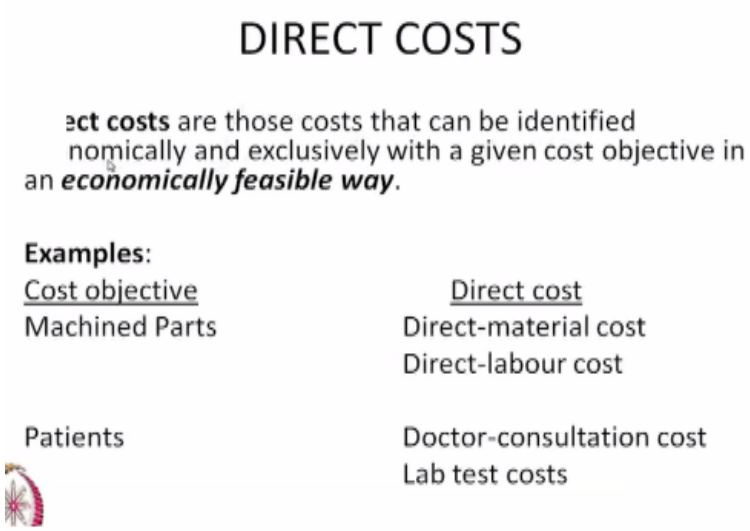

Cost of patients seen in hospital, tax bill sent, student hour taught, library books shelved, each one of them is a cost objective or a cost object. Now, we talk about direct costs and of course, indirect cost later, now when we allocate costs, we can see that certain direct; certain costs are easily identifiable to that particular cost objective. For example, material that goes into manufacturing a particular part is directly attributable to the part.

So, the material cost is a direct cost as far as manufacturing of the machine parts is concerned, similarly the labour cost can also be directly identifiable or assigned to or allocated to the machine parts manufacturing. So, it is very easy for us to say that these costs; material, labour, power and so on and so forth are directly and exclusively identified or identifiable with this particular cost of objective in an economically feasible way it is possible.

Similarly, in case of let us say a service system such as a healthcare system, patients; the doctor consolidation cost is directly attributable to the patient or the tests that are conducted; the pathological tests can be directly attributable to the patients, therefore as far as this particular cost objective is concerned; cost objective patient is concerned, these 2 are direct costs. So, we define direct costs are those costs that can be identified economically and exclusively with a given cost objective in an economically feasible way.

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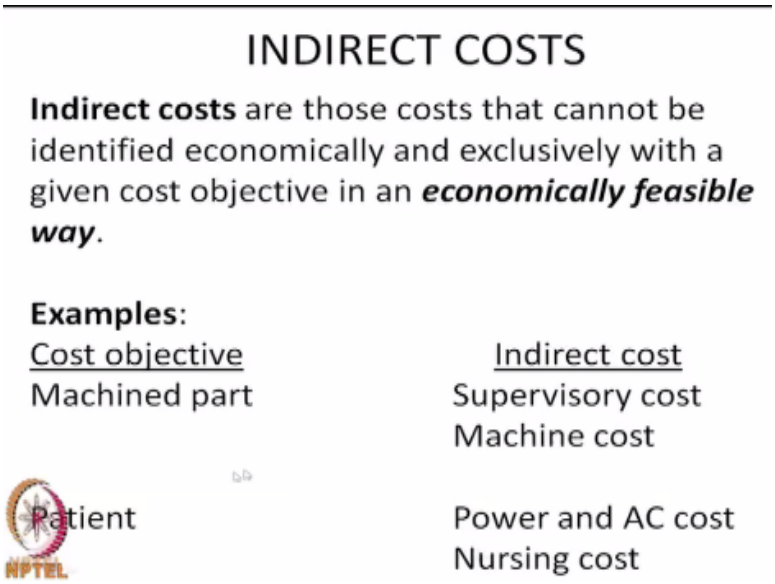

Now, let us talk about indirect costs; indirect costs are those costs that cannot be identified economically and exclusively with a given cost objective in an economically feasible way. We have given some examples to illustrate these, the same examples of cost objective, machine part and patient. Let us say a machine part is supervised by some people, some supervisors, now each supervisor may have been doing the task of supervision on not just this particular type of part.

But various other parts therefore, supervisor cost is not directly attributable to the cost of manufacturing to the task of manufacturing, the machine parts because the supervisor is also spending his time in supervising various other jobs. Similarly, the machine cost; a machine if not fully utilized for manufacturing these parts cannot be called to be a direct cost, the machine may be used at different time points for manufacturing different parts.

Therefore, machine cost is also indirect and we cannot identify economically and exclusively the cost of a machine to the machine part in an economically feasible way, take the example of a service system, a patient is the cost objective, let us say the power cost or AC cost that cannot be directly attributable to patient in an economically feasible way. Nurses, they spend their time not on one patient but maybe on a number of patients.

Therefore nursing cost, we cannot attribute this cost to only a particular patient, so these are examples of indirect costs well, we can no doubt say that if a nurse looks after 10 different patients giving 1 hour to one patient, 2 hours to another patient, 3 hours to another patient then

we can say the salary of the nurse has to be said on the basis of the amount of time the nurse spends on the patient.

So, there is a possibility of allocating the nursing cost to different cost objectives in some way but it is it may not be a very economically sound way of assigning it and therefore, we call it an indirect cost.

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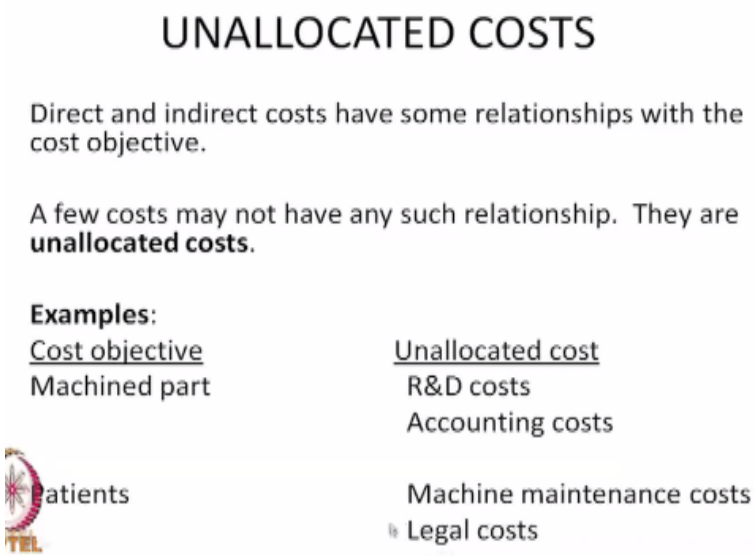

Now, that we have defined direct and indirect cost, we may still have certain costs that are too indirect to be able to be allocated on some basis. Sometimes these costs remain unallocated, now we give examples of let us say machine part, let us say R and D costs. R and D costs are basically costs that are incurred for investment for future benefits not necessarily for the present activity of manufacturing parts.

Therefore, R and D cost is extremely difficult to assign or allocate it to machine parts, so they may remain unallocated and from overall profit of the organization, these costs may be subtracted. Similarly, accounting costs can also; because accounting is done not for a particular part, it is done for various products services, products and services and various financial transactions such as buying equipment, selling goods.

It is also utilized for salary purposes and for meeting various external needs for financial reporting therefore, it is extremely difficult to suggest that accounting costs can be either directly or indirectly allocated to a particular cost objective. Therefore, these costs may remain

unallocated and later from the profitability of the company, these costs can be subtracted to give our net profit.

Similarly, this is the case for patients in healthcare system, let us say that a particular machine; X ray machine is utilized for X ray of different patients, it is maintenance; the operational expenses probably can be directly or indirectly attributable to the patients but the maintenance cost of these X ray machines is very difficult to attribute to any particular person and therefore this remains unallocated.

And similarly legal costs for example, a patient is not happy with the service given to him or her and therefore goes to court and there are legal cases that involve lot of expenses on the part of the hospital and there is a cost associated with it and then these costs remain unallocated. So, I have given you examples of direct cost, indirect cost and costs that remain unallocated, which are basically indirect but they are not called indirect.

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Because they remain unallocated and later when we find out the profit and loss accounts, we prepare the profit and loss accounts, we subtract these unallocated costs. Now, we come to a particular situation of manufacturing, now in manufacturing, there are basically 3 types of costs that are recognized. One is direct material costs, second the direct labour cost and third the indirect manufacturing costs.

Indirect manufacturing cost is also known as factory overhead or manufacturing overhead is also known as burden. Direct material cost and direct labour cost as I have told you they are easily recognizable or identifiable with the cost objective.

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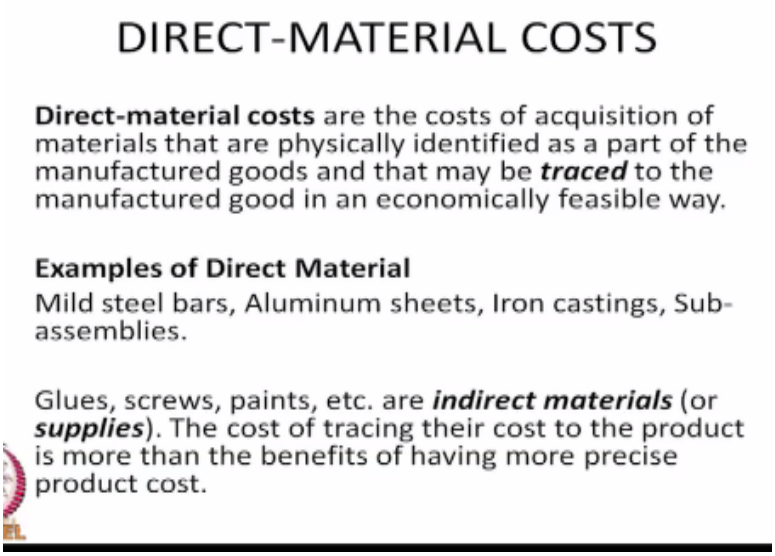

Direct material cost are the costs of acquisition of materials that are physically identified as a part of the manufactured goods and that may be traced to the manufacturer good in an economically feasible way. So, it is easily traced to the particular manufactured product, traced are attributed; traced material direct material cost. Examples are mild steel bars, aluminium sheets, iron castings, sub-assemblies etc.

But there are indirect materials, they cannot be directly traced to a particular product, screws; a particular product may be, needing only 10 screws but the company does not buy 10 screws, it may buy one packet of screws containing 1000 screws, so it is indirect; the cost is indirect to the particular product. It is possible to find out the cost, if 1000 items bought cost so much, 10 items cost this much and therefore, that is the cost associated with the particular product.

But this calculations, can be very tedious and may not be economically feasible, similar is the case of paints and glues. These are indirect materials and the cost of tracing these costs to the product is more than the benefits of having a precise estimate of the product cost, if we do these calculations. Therefore, they remain indirect and they are therefore, they go to manufacturing overhead rather than direct costs.

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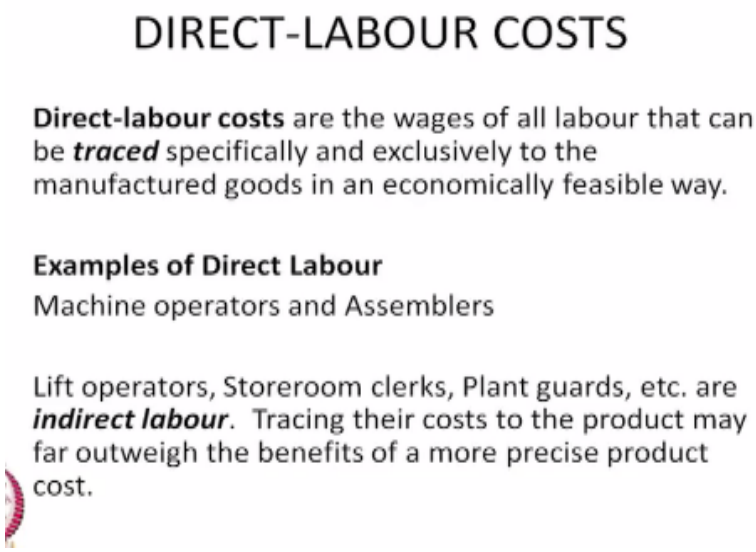

Now, the direct labour costs are the wages of all labour that can be traced specifically and exclusively to the manufactured goods in an economically feasible way. Examples are machine operators and assemblers but there is indirect labour such as the lift operators, storeroom clerks, plant guards, supervisors and so on and so forth, tracing their costs to the product may far outweigh the benefits of a more precise product cost, so they remain indirect.

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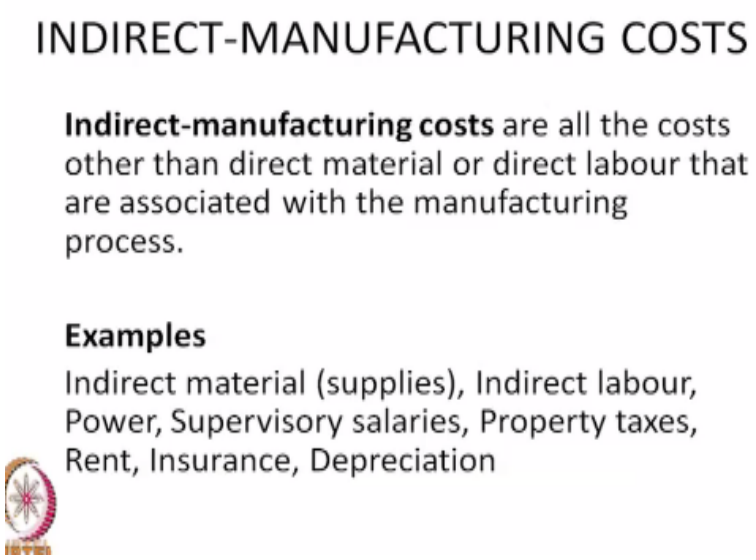

Now, indirect manufacturing costs are all the costs other than the direct material and direct labour that are associated with manufacturing process, they are as we have already told indirect material such as suppliers, indirect labour, power, supervisory salaries, property taxes, rent, insurance and machine depreciation and so on and so forth.

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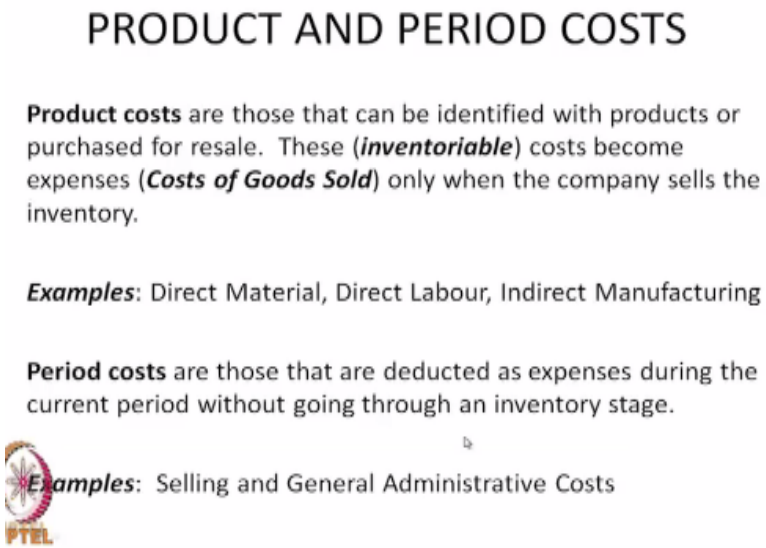

Now, we would like to give another classification of cost, we call it product costs and period costs. Now, product costs we say associated or identified with products or purchased for resale, now these costs are inventoriable, meaning that they can be stored before they can be used up. Now, these inventoriable costs become expenses in the form of cost of goods sold only when the company sells the inventory.

To give you an example, suppose that the company buys 100 kilogram of mild steel bar, it gives this 100 kilogram of mild steel bar in the stores but uses in a particular week only 100 kilogram for manufacturing a particular product, now this is sold out; 100 kilogram. So, 100 kilogram is the cost of goods sold as far as the material part is concerned and the remaining 900 rupees that we had that the company has invested in buying the mild steel bar remains in the inventory.

So, the cost is; cost of inventory is 900 rupees and the cost of goods sold is 100 rupees of course, we have ignored the labour cost, the power sizes and other things while calculating the cost of goods sold. Now, examples of product costs are direct material, direct labour, indirect manufacturing all these go with the product therefore, they are called product costs but various costs as we have already mentioned.

They are deducted as expenses during the current period without going through an inventory stages such as selling expenses and general administrative expenses or costs, these are examples of period costs, they are not associated with any particular product but they are cost nevertheless and for the entire period, let us say of for a year, the selling expenses and administrative expenses are estimated.

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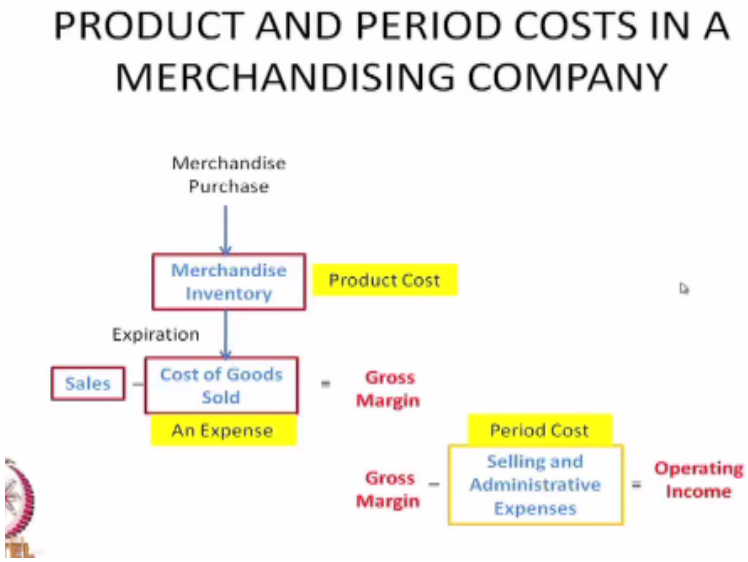

And then they are subtracted to find out the profitability, these aspects are shown in this diagram for a merchandising company, a company that buys products and sells it without using these products for manufacturing any new goods they just; it is like a; it is a trader who buys and sells. Now, here the product costs are these once, the trader buys the merchandise and this remains in the inventory, so that is merchandise inventory.

And that is part of the product cost and then it sells a few of these items or these products and there is the cost of goods sold, now suppose that I had given you an example, 1000 kilogram of bars, it had bought, so merchandise inventory was 1000 kilogram, cost of goods sold suppose 100 kilogram worth of 100 kilogram goods were sold, so the cost of goods sold would be 100 multiplied by the unit cost of the bar.

It probably sold it at a higher price, so thus the sale, so sales - the cost of goods sold that is considered as an expense is equal to gross margin. So, only when a cost expires, it becomes an expense, so I might have spent 10,000 rupees in buying a product but I might sell only 1000 rupees' worth of product, so that 1000 rupees is the cost of goods sold, which is an expense. I might sell it at a price of 5000 rupees.

So, sales is 5000 rupees but the cost of goods that I sold is only 1000, therefore the gross margin is 4000 rupees, these details we shall see when we talk about accounting for the time being, let us understand that the word expense is used only when it is subtracted; the cost is

subtracted from the revenue to calculate the gross profit or the gross margin or net profit etc only then cost becomes an expense, otherwise it remains as a cost.

Now, gross margin or gross profit minus the period cost that is selling and administrative expenses becomes our operating profit or operating income. So, we see here that a product cost when expires becomes expense subtracted from sales, it gives gross margin or gross profit, from the gross profit we subtract the period cost that is selling expenses or general administrative expenses such as accounting, legal, financial and other things for the whole year that is subtracted from the gross profit to give operating profit.

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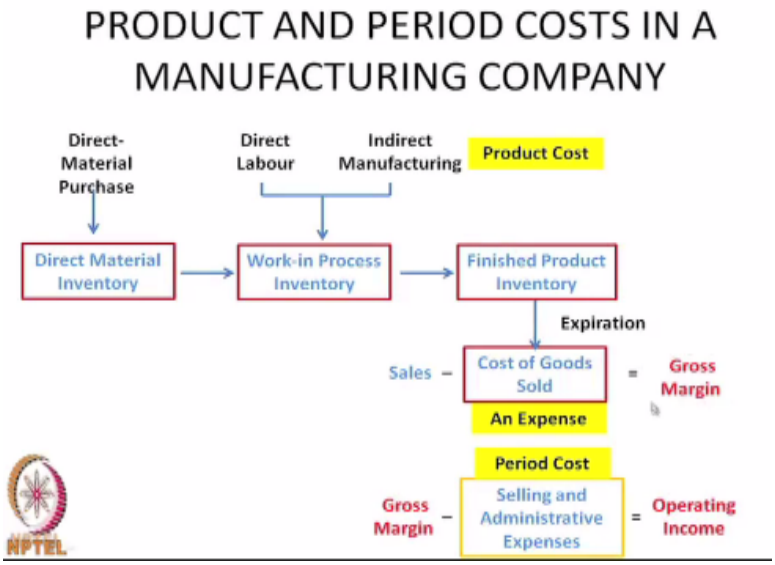

This diagram shows these costs in a manufacturing organization, here what happens the manufacturing company buys the material, which is a product cost and then manufactures it that means machines heat and add certain value to it. So, while adding it incurs the direct labour cost, it also incurs various indirect manufacturing cost such as indirect material, indirect labour, power, supervision and various costs that are indirect to manufacturing.

Now, these are all product cost and this while it is being processed or machine, we call it work in process inventory and later after the processing is over, it becomes finished product inventory. Now, all these are costs and from out of the finished product inventory, a few items are sold, the cost of those items that are sold is the cost of goods sold and then only it becomes an expense else not, else they are all costs.

And it might sell at a higher value therefore, the sales proceeds at the sales revenue is higher and the difference of the sales and the cost of goods sold is the gross profit or the gross margin, wherein the period cost, selling and administrative expenses are subtracted from the gross profit it gives the operating income, so you can see that in a manufacturing organization, the product costs are in addition to the direct material.

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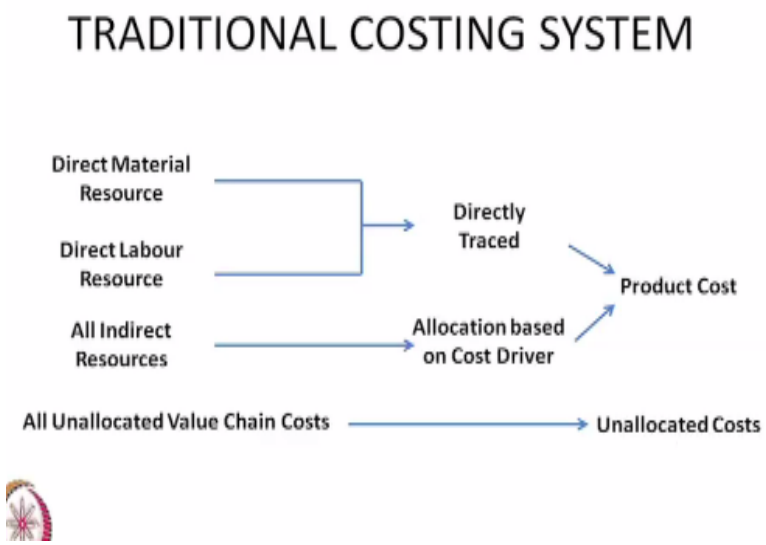

It also has direct labour and indirect manufacturing that gets reflected in the form of work in process inventory. Now, we come to 2 types of costing systems; the traditional costing system and activity based costing system and we give some example. One example of each type of costing system and compare them, these 2 costing systems. First, the traditional costing system; we already in fact discussed the traditional costing system.

This is a diagrammatic representation of the costing system that we have already discussed, direct material and direct labour, they can be directly traced to a product therefore, it is called; it is a part of the product cost. There are indirect resources with some effort; if we can identify the cost driver then we can allocate part of the indirect cost to the product, so the product cost can also be estimated.

For example, suppose a machine has a depreciation and that depreciation has to be allocated to a particular product, we can say that 2 products; let us say to give an example, suppose a machine is used for 2 different products, if the machine depreciation is 10, 000 rupees and if product 1 uses the machine hours' proportion of product 1 and product 2, if they are 3 is to 2,

then we can say that 10, 000 multiplication, 3 / 3 + 2, this is the depreciation allocated to product 1.

And the depreciation allocated to my product 2 is 10, 000 multiplication 2/ 3 + 2, so we find out the cost driver, the cost driver in this example is the machine hour, so the proportion of the machine hour used up by each product can be; this information can be used to decide how much is the indirect cost of the machine that is allocated to that particular product and other unallocated values and costs remain unallocated.

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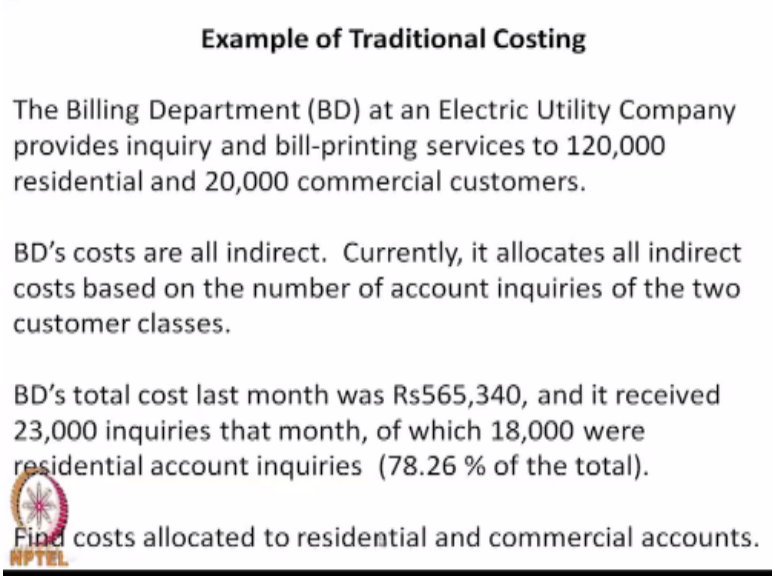

And they are subtracted later from the gross profit to give the operating profit; this is the traditional costing system. We give an example of a traditional costing system, let us say that the billing department at an electric utility company provides inquiry and bill printing services to 120,000 residential customers and 20,000 commercial customers. The billing department's costs are all indirect.

It allocates all indirect costs based on the number of account inquiries of the 2 customer classes, so there are 2 customer classes; residential customers and commercial customers and this company basically provides inquiry and bill printing services. The number of customers of each class given here as 120,000 and 20,000, the billing departments total cost last month was rupees 565,340 and it received 23,000 inquiries that month of which 18,000 were residential account inquiries.

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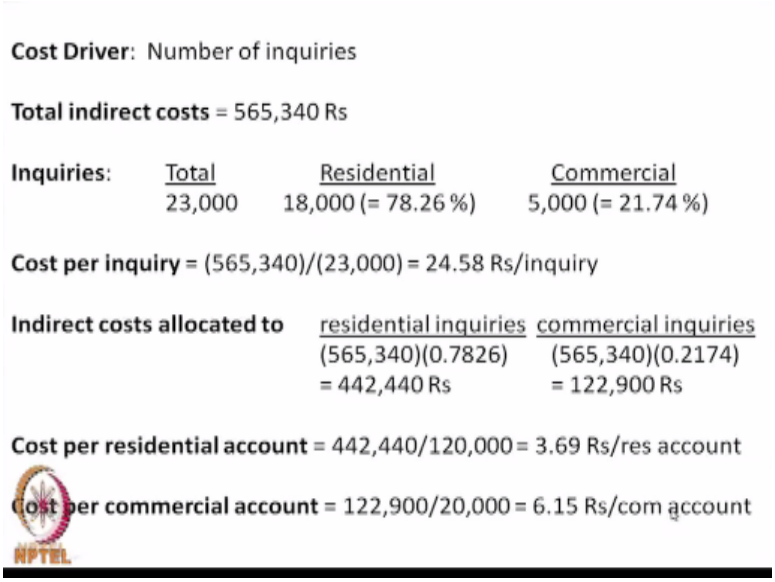

That is 78.26% of the total inquiries, where from the residential customers, the remaining where from the commercial customers, find the costs allocated to residential and commercial accounts. Now, this is how the traditional costing system operates, these costs are all indirect and to be able to allocate these costs to different inquiries or 2 different classes of customers, we have to find out the cost driver.

And in this case, the cost driver is taken as a number of inquiries, the total indirect cost that month was 565,340 rupees, total inquiries were 23,000 of its residential were 18,000 and commercial inquiries were; inquiries from commercial customers were 5000, 78.26% and 21.74% respectively. So, if this is the total indirect cost and these are the number of inquiries cost per enquiry becomes 565,340/23,000.

So, this is the cost per inquiry, so if the company we say to charge the customer on the basis of inquiry, it can use this; 24.58 * 18,000 is for the residential inquiry cost and for the commercial this is the cost. On the other hand, you see here that indirect costs allocated to residential inquiries then becomes 565,340 multiplication 0.7826, now that makes it 442,440 rupees and for commercial inquiries, the same thing becomes 565,340 * 0.2174 that is 122,900 rupees.

So, this is the indirect cost allocated to different classes of customers and we know that there are 120,000 residential customers and 20,000 commercial customers therefore, the cost for residential account is 442,440/ 120,000 that comes to 3 rupees 69; 3.69 rupees per for every residential account and cost for commercial account is 122, there is a mistake here, we can make a correction here, this has to be 122,9; 122; 120; 122, 900.

Yes, the cost per commercial account is the indirect cost allocated to the commercial inquiries which is 122.900/ there are 20,000 commercial customers, so divide by 20,000 that gives us 6.15 rupees per commercial account, now this is a simple method of traditional costing system which is used to find out how the indirect costs are allocated and you can see that the allocation is based on finding out first of all a cost driver.

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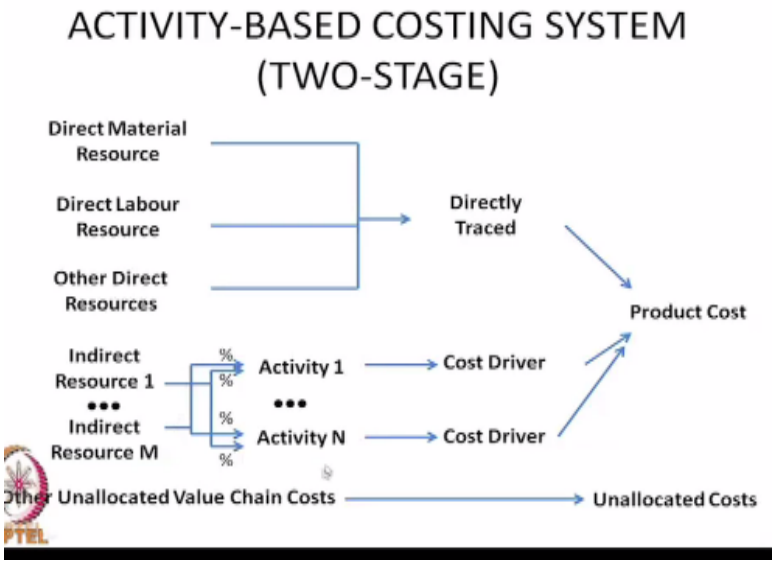

In this case, the cost driver is number of inquiries; now let us introduce the activity based costing system. It can be many stages, it can be 2 stages or more than 2 stage, we are giving here an example of a 2 stage activity based costing system also known as ABC system. Now, here first of all like the traditional costing system, all the resources first of all, you can see that here we try to find out which resources are used up directly.

And they are identified as product cost, as far as the indirect resources are concerned, we try to find out what activities are done and for each activity, a cost driver is found out and based on that the allocation of the indirect resource to the product cost is found out, the difference between the traditional costing system and activity based costing system is that instead of directly allocating the indirect resource with the help of cost driver to the product cost.

Here, a few intermediate levels of activities are first of all identified and the percentage of the indirect resource spend on each of these activities are found out and then the cost of activities are estimated and with the help of cost drivers, then these costs are allocated to product cost. As before various unallocated values and costs remain unallocated and are subtracted later. So,

basically here the inclusion of the concept of activities makes it very interesting, very robust and very popular.

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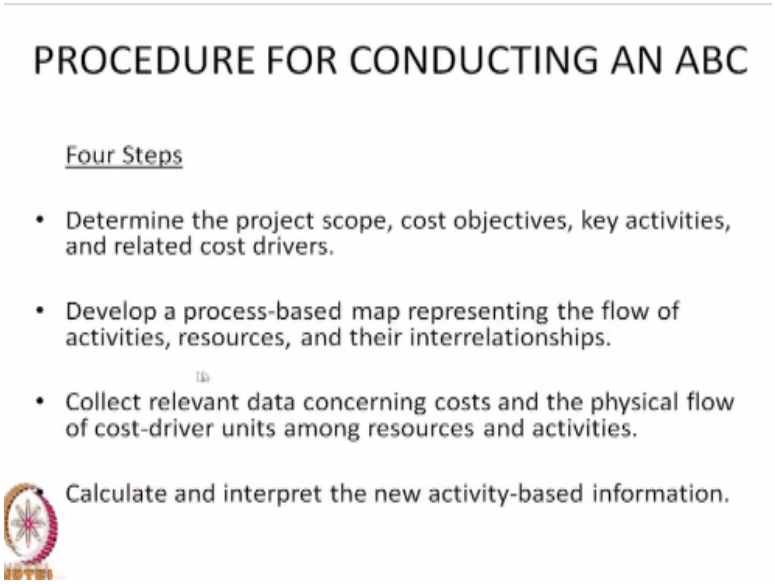

Now, the procedure for conducting an ABC requires 4 steps; one determine the scope, the cost objectives, activities and cost drivers, so not only cost objectives and drivers but also key activities, then developed a process based map representing the flow of activities, resources and their interrelationships. Collect the relevant data concerning costs and the physical flow of cost driver units among the resources and the activities.

And finally, calculate and interpret the new activity based information, so basically here, we try to find out the activities, cost drivers and resources and make a map representing the flow showing the flow of activities and the resources and their relationships and the relevant data concerning the cost driver units are to be collected before finally interpreting the information. Now, let us take an example to illustrate what we are saying here.

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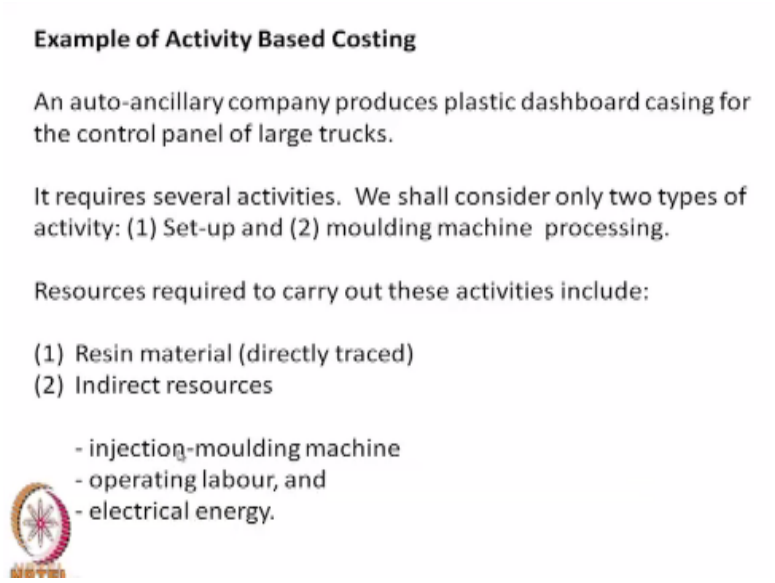

Let us consider an example of an auto ancillary company producing plastic dash board casing for the control panel of trucks. Now, this requires several activities but we will consider only 2 types of activity; the machine set up activity and the moulding machine processing, the actual setting of the machine and the actual operation of the machine, only these 2 aspects. Now, the resources required to carry out these activities include resin, which is directly traced.

And indirect resources such as injection moulding machine, operating labour and electrical energy meaning that these are used for other products also, whereas resin is used only for this product and therefore it is directly traced. The moulding machine, the workers and the energy they are used for different other products.

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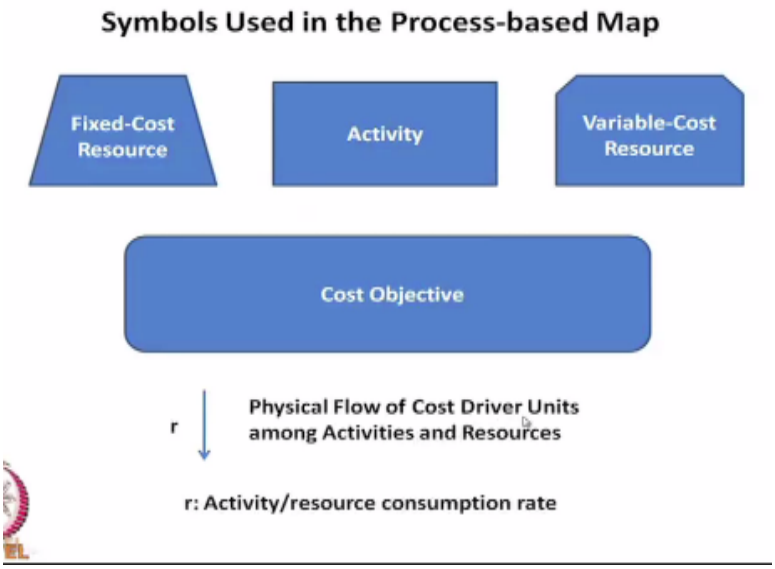

Now we to; in order to draw the process based map, we need to define certain symbols, we use 5 different types of symbols. First, we saw resources that are fixed in nature, fixed cost resource; we give a symbol like this. The variable cost resource is shown in the form of a symbol like this. The activities are shown in the form of a rectangle and the cost objective is shown in this form.

The physical flow of the cost driver units among the activities and the resources is shown in the form of an arrow with a value r in here; r we will indicate; we will mean activity or resource consumption rate.

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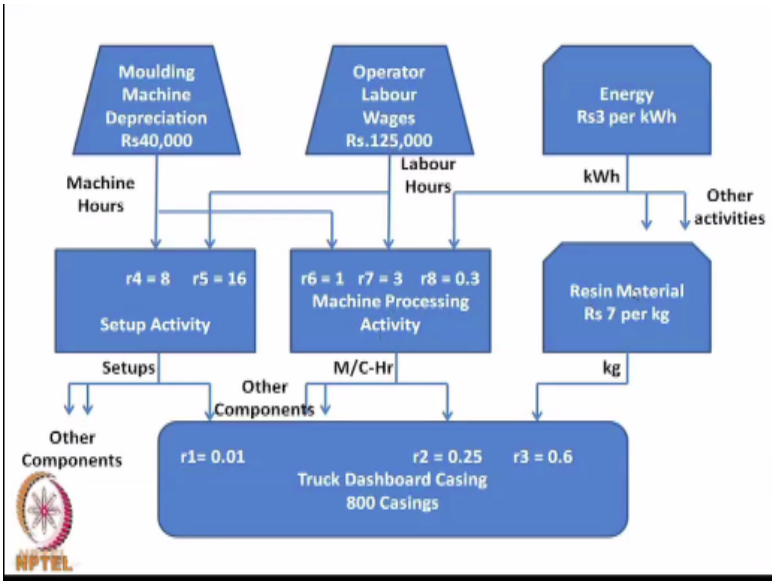

Now, for the previous example, let us use these symbols and so how they can be depicted in the form of a map, now these are our fixed resources, the moulding machine depreciation and the operator labour weights, these are fixed resources; fixed cost resources and energy and resin are variable cost resources. The activities are 2 types of activities; one is the set up activity and the other is the machine processing activity.

And this is our cost objective; truck dashboard casing, in a particular month, 800 casings have been prepared have been manufactured, the moulding machine is used not for this product but also for other components as well. Operator labour is used not for this particular product but also for other components as well. Energy is used not for machine processing activity but also for other activities as well.

Whereas, resin material he is a direct cost as far as truck dashboard casing is concerned, so this is a physical flow, these are cost drivers written down here, machine hours, labour hours, kilowatt hour, kilogram machine hour, number of setups, these values; rupees 40,000, rupees 125,000 are the total cost in a particular period. Let us say a month in which 800 casings have been made and this 40,000 is used not for manufacturing only 800 casings.

But other products as well; other components as well, similarly 125,000 rupees has been spent in that month not for producing only 800 casings but also other components as well. Now, what are these r1, r2, r3? Basically, it says that for one casing, 0.01 setup of the moulding machine is required, it means 100 casings would require one setup, it means in one setup of the moulding machine, 100 casings can be manufactured.

So, this is written as r = 0.01 which means, 800 casings would require how many setups? It will be 800 multiplied by 0.01 which is = 8, so 8 setups are required for moulding machine. Similarly, here r2 = 0.25, it means one casing would require 0.25 machine hour, something like 15 minutes of a particular labour working; of a machine working, so r2 = 0.25 hour that is the meaning.

So, 800 casings would require 800 multiplied by 0.25, similarly how many kilogram; 1 casing would require 0.6 kilogram and 800 casings would require 800 multiplied by 0.6, which is 480 kilogram of resin material. So, similarly we can say, 1 setup will require 8 machine hours, so if there are 800 * 0.1 that comes to 8 setups, it would require 8 * 8; 64 machine hours as far as this particular casing is concerned.

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One casing requires

- 0.01 setup (i.e., 100 casings require 1 setup)
- 0.25 machine hour (i.e., 15 minutes)
- 0.6 kg of resin material

Hence, 800 casings require

- 8 setups, 200 machine-hours, and 480 kg of resin material

	Moulding Machine Depreciation (Machine-Hour)	Operator Labour (Labour-hours)	Energy (kWh)	Resin Material (kg)
Setup Activity (8)	8 x 8 = 64	16 x 8 = 48	-	-
M/C Processing Activity (200)	1 x 200 =200	3 x 200 = 600	0.3 x 200 = 60	
Total	264	648	60	480

Similar interpretations can be made for this and for this, now we saw here that one casing requires 0.01 setup that is 100 casings require only 1 setup, 0.25 machine hour that is 15 minutes, 0.6 kilogram of resin material, hence 800 casings require 800 * 0.01, 8 setups; 800 * 0.25 that is 200 machine hours and 800 * 0.6, which is 480 kilogram of resin material. Now, here in this table, we saw set up activity, 8 setups and 200 machine hours.

So, moulding machine depreciation is 8 setups and each setup require 8 machine hours making it 64 machine hours and machine processing activity; machine processing activity requires as you can see here, so 1 * 200, so 200 machine hours, this is 800 * 0.25 is 200 machine processing activity, 200 machine hours and that is; that will require into 1, so 200 * 1 is 200, therefore the total moulding machine depreciation; total is 265, as far as these 2 activities are concerned.

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Direct cost of energy = 60 kWh x 3 Rs/kWh = 180 Rs

Direct cost of resin material = 60 kWh x 7 Rs/kg = 420 Rs

Indirect machine depreciation cost allocated to Casing
= (% of machine hours used by Casing)(Rs. 40,000)

Indirect operator labour cost allocated to Casing
= (% of labour hours used by Casing)(Rs. 125,000)

$$\text{\% machine hours used by Casing} = \frac{264}{\textit{Total machine hours used by all components}}$$

$$\text{\% labour hours used by Casing} = \frac{648}{\textit{Total machine hours used by all components}}$$

Total Cost of Casing = 180 + 420 + Indirect Costs allocated to Casing

Similarly, one calculates for operator labour, energy 0.3 * 200 resin materials already, we have calculated as 480. So, the direct cost of energy is 60 kilowatt hour * 3 rupees per kilowatt hour which is given in the process map that is 180 rupees, direct cost of resin material is 60 kilowatt hour * 7 that is 420 rupees, indirect machine depreciation cost is the percent machine hour used by casing into 40,000.

And indirect operator labour cost is percent labour hour * 125,000, percent machine hour used by casing is 264/ the total machine hours used by all components, percentage labour hour used by casing is 648/ very total machine hour therefore, the total cost of casing is 180 + 420 + all these indirect costs, so we take this as the ratio because we know that these activities are used for other components.

So, the fraction of the time it uses; it uses its time for this casing will be used to calculate this, now we gave here, a glimpse of activity based casing. I think in our next class, we shall elaborate a little because I went through this little hurriedly because of paucity of time, thank you very much.