Lecture - 10
Cost Allocation

Good morning all of you. Welcome to the 10th lecture on economics, management and entrepreneurship. In the last few lectures we classified cost into 2 basic categories, fixed cost and variable cost. We used the concept of fixed and variable in making break even analysis and also in the last class we talked about relevant costs and then used those concepts to decide to take different types of managerial decisions.

We had also introduced activity based costing and we have talked about traditional costing. In today's lecture we will elaborate on these aspects of how costs are accumulated and allocated to different organisational units or activities and then how they are finally applied to revenue generating products or and services. So today's topic is cost allocation.

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COST ACCOUNTING SYSTEMS

Cost accounting systems consist of techniques to determine the cost of a product, service, customer, or other cost objective.

It collects and classifies costs and assigns them to cost objects.

Before we start discussing on cost allocation let me recall that a cost accounting system is basically a set of techniques to determine the cost of a product, service, customer or similar such cost objectives. Basically it collects and classifies costs and assigns them to different cost objects.

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COST ALLOCATION BASE

A cost driver that is used for allocating cost to a cost object is called a **cost allocation base**.

Often cost objects are pooled (**Cost pools**) together because they are affected by a single cost allocation base.

Example:
Building rate and utilities cost may form a cost pool, because they are affected by a single cost driver, area of space occupied.

Now if you recall we had also said that a cost when we assign or allocate a cost to any particular cost object we need to define a cost driver. Such a cost driver when used for allocating cost to a cost object is called a cost allocation base. So basically in the discussion on cost allocation we shall interchangeably use the word cost driver, the term cost driver or cost allocation base.

Often one finds that the same cost driver causes different cost objects in such a situation we pool all those cost objects and call them cost pools because each of the cost objects in that cost pool is affected by a single cost driver or by a single cost allocation base. So we can say that buildings, utilities, machines can be put together as a cost tool because they are affected by a single cost driver such as area of space occupied.

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Synonyms used for the word "allocate"

apply, absorb, attribute, reallocate, trace, assign, distribute, redistribute, apportion, and reapportion

So this is a cost pool. Similarly different cost pools we can pool together. There are different synonyms used for the word allocate. We can also use the word apply, absorb, attribute, reallocate, trace, assign, distribute, redistribute, apportion, reapportion et cetera. So these are used interchangeably in our discussion.

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TYPES OF ALLOCATION

Allocation Type 1 Costs allocated to organizational units	Cost objective 1 Organizational Units
Allocation Type 2 Costs allocated from one organizational unit to Another	Cost objective 2 Organizational units receiving products or services
Allocation Type 3 Costs allocated to Activities, Products, Services, or Customers	Cost objective 3 Activities, Products, Services, or Customers

Now when we make allocation of cost there can be hierarchy of allocation. First costs are allocated to organizational units such as a department or a section that is allocation type 1, in such a case the cost objective or the cost object is the organizational unit which cost is to be estimated. Allocation type 2 is costs allocated from one organizational unit to another organizational unit.

Whenever we think of service department giving a service to another department then there is cost allocated from the service department to another department, so the organizational units receiving the products or the services becomes the cost objective or cost object and finally all the costs are allocated to revenue generating products, services or even to customers and of course activities.

So these cost objects for such allocation are activities, products, services and customers. So we will see that there are different types of allocation.

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EXAMPLE OF ALLOCATION

A computer service department serves both Engineering and Business Schools, each of which offers various UG and PG programmes.

Type 1 Allocation
Energy, building, and machine costs are accumulated by the cost accounting system and allocated to the computer service department.

Type 2 Allocation
The fixed and variable costs of the Computer Service Department are allocated to the two Schools.

Type 3 Allocation
The school costs are allocated to the programmes.

Examples of allocation we are giving here for each type. The computer service department serves both engineering and business schools. Each of these schools offers various undergraduate and post graduate programmes. So the first type of allocation will be the various costs such as building, machines, energy et cetera.

They are all accumulated and are put to the organizational unit in this case the engineering, the computer services department, so that is the type 1 allocation. So by knowing the component costs we first of all estimate the cost of the service department which is the computer service department. Type 2 allocation then is how the various cost components of computer service departments can be allocated to the engineering school and to the business school, that is the type 2 allocation.

Engineering school and business school then become the cost objects and for the purpose of simplicity various costs of computer service departments are pooled as fixed cost pool and variable cost pool and each of them are then allocated to the 2 schools. Finally, the type 3 allocation is that once we know the cost allocated to the different schools then each school offer certain programmes.

We would like to know how much cost will be allocated to each of the programmes offered by each of the 2 schools. So in this case each programme becomes a cost object and then the cost of the school is allocated to each of the programmes. So this is a very simple example of each type of allocation starting from service department's cost estimate allocating service department cost to 2 operating departments such as engineering school and business school.

And then finally applying these costs of each school to the final product which is the programme offered by each department.

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ALLOCATION OF SERVICE DEPARTMENT COSTS

General Guidelines

- Establish the cost allocation scheme before the service is rendered rather than after.

- Allocate fixed and variable cost pools separately.

- Evaluate the performance of the department using budgets.

Now this allocation of service department cost naturally comes fast and there are 3 guidelines. One, establish the cost allocation scheme before the service is rendered rather than after. So before the service is rendered one has to basically budget the procedure or the way or the scheme by which each cost pool fixed and variable is to be allocated to the service department.

Then allocate fixed cost and variable cost pools separately and evaluate the performance of the department using budgets. So these are the 3 general guidelines for allocating service department costs. Now let us apply them and see how it is to be used in practice.

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Fixed Cost:
Percentage budgeted for each unit
(Percentage fixed on the basis of past usage)

Variable Cost:
Budgeted unit rate x Actual usage by the unit

Normally for fixed cost we decide in advance a percentage budgeted for each unit, percentage fixed on the basis of past usage rather than the current use, which means that suppose in the past 5 years this service department's fixed cost or service department has been used by the operating departments, but is the past average usage of the service department for these different schools.

So that percentage is fixed in advance and the variable cost is also on the basis of a budgeted unit rate multiplication actual usage by the unit. We will actually make use of these 2 rules or methods to actually find how fixed cost and variable cost are allocated.

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Example

The Computer Services Department offers services to the Engineering and the Business School.

It has budgeted the following for the forthcoming year:

Fixed cost: 100,000 Rs
Variable cost: 200 Rs/hour

The monthly average use and the actual use of computer time by the two Schools are as follows:

	Monthly Average	Actual
Engineering School:	490 hours	400 hours
Business School:	210 hours	200 hours

Find the costs allocated to the two Schools.

Now let us take this example which will clarify all that we have said just now. The computer services department of university offers services to engineering and business school and the

computer services department has the following cost components, as I was telling all the costs that are considered fixed are pooled together, fixed cost is 100,000 rupees and variable cost comes to 200 rupees per hour.

Now the monthly average use and the actual use by computer time by the 2 schools are as follows. Now this monthly average is based on the past data will be the percentage budgeted for each unit. So for fixed cost allocation we need these information, percent budgeted for each unit based on past usage. So past usage data gives us this that monthly average of engineering school using services of the computer department is 490 hours and the business school makes use of the computer 210 hours of the time.

Therefore, the ratio is 490 divided by the sum of the 2. That is the engineering school and the business school percentage is 210/490 + 210. But the actual use in a particular month is engineering school uses 400 hours and business school uses 200 hours. This will be used for calculating how the variable cost is to be allocated to the engineering school and to the business school. The question is given this information find the costs allocated to the 2 schools.

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Given:
Fixed cost =100,000 Rs,   Variable cost= 200 Rs/hour
Actual usage: Engineering: 400 hours, Business: 200 hours

Fixed-cost allocation
Percentage usage by the two Schools:

Engineering: 490/(490 + 210) = 70 %
Business: 210/(490 + 210) = 30 %

Variable-cost allocation
Budgeted unit rate x Actual usage

	Engineering	Business
Fixed-cost:	70,000	30,000
Variable-cost:	80,000	40,000
Total:	150,000 Rs	70,000 Rs

Now we are given the fixed cost as 100,000 rupees and the unit variable cost is 200 rupees per hour. The actual usage is engineering 400 hours and business 200 hours. Now for fixed cost allocation the percentage usage by the 2 schools is as I was telling 490 hours divided by total which comes to 70% and for business it comes to 210/(490+210) = 30% which means

70% of the total fixed cost of the computer services department should be allocated to engineering.

And 30% of the fixed cost of the computer services department should be allocated to the business school and since the fixed cost is 100,000, 70% of that is 70,000 so in this table in which we are calculating how the cost is to be allocated under engineering, fixed cost allocation is 70,000 and fixed cost allocation to business is 30% of 100,000 that comes to 30,000 rupees.

Now when we come to variable cost allocation which is the budgeted unit rate product and multiplication actual usage. Actual usage is given 400 hours and 200 hours. So 400 hours multiplication the rate, the rate is 200 rupees per hour. So 200 * 400 makes it 80,000 rupees, variable cost allocation. For engineering school and 200 * 200 that comes to 40,000 rupees for business school.

So totalling will find for engineering school which is 150,000 rupees and for business school it is 70,000 rupees. So this is an example of how the allocation of service department cost to the other operating departments is made.

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Allocation of Central Costs

Such costs can remain unallocated.

Usually, it should be allocated on the basis of budgeted usage rather than actual usage.

Thus, advertising done for all products of a company is a central cost. The advertising cost can be allocated to various revenue-generating departments on the basis of budgeted sales.

Advertising cost = 100,000 Rs
Ratio of Budgeted sales for Territory 1 to Territory 2 is 60:40.

Advertising cost allocated to

Territory 1: 60,000 Rs
Territory 2: 40,000 Rs

Now suppose that we have certain central costs, central costs say for example advertising. This is done not for one particular product, but for all products of a company and therefore it is considered as a central cost. Now such central costs are considered unallocated and as I

was telling you this usually is subtracted from the gross profit to find the net profit. Now sometimes; however, we do try to allocate the central costs.

And that should be not on the basis of actual usage, but on the basis of a budgeted use. For example suppose that the advertising cost in a year is 100,000 rupees, so one can make cost allocation to different territories. Let us say that there are 2 territories for product distribution, 2 territories, territory 1 and territory 2 and the company hopes that territory 1 would be the total sales of territory 1 compared to territory 2 will be in the ratio 60:40.

So 60% of this advertisement cost which is the central cost can be allocated to territory 1 and the 40% of this can be allocated to territory 2. Now this is a very simplistic manner of saying, ordinarily this remains unallocated and is subtracted when the profit and loss statement is prepared. However if somebody wants to actually allocate it to different beneficiary such as territory 1 and territory 2, this is the procedure.

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RECIPROCAL SERVICES

Service departments offer services to one another.

Example:
Computer services department, library, and accounting departments are all service departments, giving service to one another.

Two methods of cost allocation:

1. **Direct Method:**
   It ignores services offered to other service departments.
2. **Step-down Method:**
   It considers the service offered to other service departments

Now we come to a very interesting case of service departments, offering services to one another. Let us say in the case of university we have computer services department, we have a central library, we have accounting department, we have establishment section, all these are service departments and they give service to one another as also to the operating departments. Now in such cases we say that reciprocal services are offed by the service departments.

Now, how to therefore allocate cost of these service departments, this is the question. Now usually there are 2 methods to allocate cost of service departments to final operating

departments and then finally to the revenue generating products and services. The 2 methods are 1, direct method; 2, a step-down method. In the direct method the services offered to other service departments are completely ignored.

That means only the services that are offered to the operating department are only considered in the direct method. Whereas in step down method, the services offered to the sister service departments are also considered before finally allocating the costs to the operating departments. Now let us take an example to illustrate this case.

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Example

Consider a manufacturing company with two producing and two service departments:

Producing Depts: 1. Moulding and 2. Finishing
Service Depts: 1. Facilities (rent, heat, light, etc.) 2. Personnel

Cost driver for allocating Facilities Dept costs: Area occupied
Cost driver for allocating Personnel Dept costs: Number of employees

Let us say that we are considering a manufacturing company with 2 producing departments and 2 service departments. The producing department are moulding and finishing. The 2 service departments are facilities department which considers rental, cost of heat, cost of light et cetera and personnel department.

Now naturally the service departments, let us say personnel department not only gives service to moulding and finishing departments which are basically operating or producing departments, it also gives service to facilities department just as facilities department which is another service department it gives service to not only the producing departments like moulding and finishing, but also to personnel department.

This is the reciprocal service that we are talking about. Now here the company has decided that cost driver for allocating facilities department cost will be area occupied. That means the area that is occupied by the personnel department, by the finishing department, by the

moulding department, will be the cost driver to determine how the facilities departments cost will be allocated to each of these 3 departments.

Whereas the cost driver for allocating personal department cost is the number of employees. Personnel department offers services to all the 3 and each of these 3 departments has some people associated with them and the number of employees working in each one of these will determine how the personnel managements department cost will be allocated to each one of these 3. Now let us use the 2 methods. First let us use the direct method.

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	Service Departments		Producing Depts	
	Facilities	Personnel	Moulding	Finishing
Direct Dept Costs	126,000	24,000	100,000	160,000
Square meter	3,000	9,000	15,000	3,000
No. of employees	20	30	80	320
Direct-Labour Hrs			2,100	10,000
Machine-Hrs			30,000	5,400

Before we do that we have the data. This table gives that these are the 2 service departments facilities and personnel and these are the 2 producing departments moulding and finishing. Now each department has got certain direct department costs 126,000 rupees, they are all in rupees, 24,000 per personnel, moulding is 100,000 and finishing is 160,000 rupees direct.

And they occupy 3,000 meter square facilities department, 9,000 personnel department, 15,000 moulding department and 3,000 finishing department so many meter square of space each one of these 4 departments occupy. Number of employees in each one of these 4 is 20, 30, 80 and 320 respectively and later we shall also use these 2 rows of data for applying the cost to the final product that is to be manufactured.

And for the time being we probably will not be needing these 2 rows of data, but we will come back to it once we need them. Now let us talk about the direct method. In the direct method the idea is that the service department the mutual service offered or the reciprocal

service offered is totally ignored. So it means that suppose we start with personnel department then personnel department's cost is allocated directly to moulding.

And finishing depending on the number of people the moulding department and the finishing department is having. So moulding department's personnel requirement is 80 and this is 320 so this is 400 people so 9,000 will be a percent in that manner that is 80/400, I am sorry not 9,000 but 24,000, so 24,000 * 80/400 will be assigned to moulding and 24,000 * 320/400 will be assigned to finishing. So directly the personnel departments cost is being assigned to moulding and finishing on this basis.

In a similar way the facilities department cost, the cost driver to be used is square meter, so facilities department cost will look at these 2 values so this is 15,000 and this is 3,000 so 15,000 + 3,000 makes it 18000, the ratio of 15,000:18000 * 126,000 is the cost to be allocated to moulding. Similarly the cost of the facilities department allocated to finishing is 3,000/18,000 * 126,000. Now these calculations are given here.

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Direct Method

Facilities Dept cost allocated to

Moulding Dept: $126,000[(15,000)/(15,000+3,000)] = 105,000$ Rs
Finishing Dept: $126,000[(3,000)/(15,000+3,000)]\quad = \quad 21,000$ Rs

Personnel Dept cost allocated to

Moulding Dept: $24,000[(80)/(80+320)] = \quad 4,800$ Rs
Finishing Dept: $24,000[(320)/(80+320)] = 19,200$ Rs

Total cost of Moulding: $100,000 + 105,000 + 4,800 = \quad 209,800$ Rs
Total cost of Finishing: $160,000 + 21,000 + 19,200 = \quad 200,200$ Rs

Facilities department cost allocated to moulding department. Moulding department has got an area of 15,000; total area is 18,000, total cost of the facilities department to be allocated is 126,000; therefore this comes to, I think there is a mistake here let me make the correction, this has to be 15,000 division, and this has to go from here, yes, there was a mistake, now it is alright. It says 126,000 * 15,000/18,000 is the amount here.

And for the finishing department it is 126,000 * 3,000/18,000 and that comes to 21,000 together it is 126,000. Similarly there is a mistake here as well, let me make the correction here, yes it is alright. Now the personnel department cost is 24,000 and this has to be allocated to moulding and finishing department and the pertinent cost driver is the number of persons, number of employees working in moulding and finishing.

In moulding department there are 80 employees, in finishing there are 320. Therefore 400 number of employees personnel department is having, but only 80 are in moulding, therefore, this ratio is 80/400 that multiplied by the personnel department's direct cost which is 24,000 and that gives a value of 4,800 rupees for moulding department and for the finishing department likewise this is 24,000 * 320/400 that makes it 19,200 rupees totally 24,000.

Now we see therefore that the total cost of moulding is 105,000 that is the cost allocated from the facilities department, 4,800 cost allocated to the moulding department from the personnel department and it is own direct cost, look at this table, the direct department cost of moulding is 100,000. So 100,000 rupees that it already has plus the costs allocated from facilities and personnel.

When they are added it gives you 100,000 + 105,000 + 4,800 that makes it 209,800 rupees, the total cost of moulding. Similarly the total cost of finishing is 21,000 here; 19,200 here and the direct cost of finishing department which is given here. The direct cost of finishing department is 160,000. So 160,000 rupees here, so when you add these 3 it comes to 200,200 rupees.

Now this is the way in which the direct method works. So as you can see in the direct method, we do not consider the reciprocal services offered, that means we do not consider in this particular case that a facilities department gives service to personnel department or personnel department gives service to facilities department.

We only consider the services offered by each of these 2 service departments to the final operating or producing department, in this case they are moulding and finishing. Now let us apply, let us look at the step down method.

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Step-down Method

Step 1: Select the service department that gives the greatest service (measured by cost) and allocate its cost to other departments.

Facilities Dept is selected.
Cost driver: Area (Square meter)
Cost of this department (126,000 Rs) allocated to
  Personnel: (126,000)[9/(9+15+3)] = 42,000 Rs
  Moulding: (126,000)[15/(9+15+3)] = 70,000 Rs
  Finishing: (126,000)[3/(9+15+3)] = 14,000 Rs

After Step 1 the total cost of various departments are:
  Personnel : 24,000 + 42,000   = 66,000 Rs
  Moulding: 100,000 + 70,000 = 170,000 Rs
  Finishing: 160,000 + 14,000 = 174,000 Rs

Step down method as I have already told you considers the service offered by a service department to another service department. So there are 2 steps, first step is select the service department that gives the greatest service measured by cost and allocates it is cost to all other departments including other existing service departments. So select the service department that gives the greatest service measured by cost. For that we look at this table.

There are 2 service departments, measured by cost which gives the highest service and cost direct department cost for facilities is larger than this, so 126,000 rupees is larger than 24,000. So we are selecting the facilities department cost first and then allocating this cost to not just the producing departments but to all the 3 departments.

So facilities department is selected, the cost driver for facilities department is area and the cost of this department is already known as 126,000 rupees and that is allocated to all the 3, not necessarily only to moulding and finishing. On the basis of the area, now area for these 3 departments are 9, 15 and 3, so personnel department what is the proportion of these area, it is 9/9 + 15 + 3 * 126,000 is therefore the cost of facilities department allocated to personnel that is 42,000 rupees.

Similarly we go for moulding department, it is 126,000 * 15/9 + 15 + 3 and that is 70,000 rupees. For the finishing department it is 3/9 + 15 + 3 * 126,000 and that is 14,000 rupees. Now after the step 1 is applied, what now becomes the cost of various departments, it is own direct cost plus the allocated cost. For example, in the personnel department the allocated cost was 42,000.

And it is direct department cost is 24,000. So 24,000 + the cost allocated from the facilities department 24,000 + 42,000, so that becomes 66,000 therefore is the cost of personnel department, moulding department becomes the direct cost which was 100,000 + the allocated cost 70,000 that makes it 170,000 finishing department is 160,000 direct cost + 14,000 that makes it 174,000 rupees.

So we have by allocating the facilities department cost we now have 1 less number of service departments. We have only personnel department as the only service department and now step 2 says continue to use step 1 for the remaining service departments till costs of all service departments are allocated.

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Step 2: Continue to use Step 1 for the remaining service departments till costs of all service departments are allocated.

Personnel Dept is selected.
Cost driver: Number of employees

Cost of this department (66,000 Rs) allocated to
  Moulding: (66,000)[80/(80+320)]   = 13,200 Rs
  Finishing: (66,000)[320/(80+320)])] = 52,800 Rs

After Step 2 the total cost of various departments are:

  Moulding: 170,000 + 13,200 = 183,200 Rs
  Finishing: 174,000 + 52,800 = 226,800 Rs

  Total: 410,000 Rs.

So now we have only personnel department left and the cost driver per personnel department is as we already know is number of employees. Cost of this department is known as 66,000 and we allocate this 66,000 is actually the total cost. The direct cost personnel department plus the cost allocated from the facilities department together gives the cost and this cost has to be now allocated to moulding and finishing.

The moulding cost, the cost allocated from the personnel department, 2 moulding is therefore 80 employees in moulding/80 + 320 which is 400, this is therefore is the cost allocated from the personnel department to the moulding department. Cost allocated from the personnel to finishing is 320/80 + 320 this is the number of employees ratio * 66,000 that makes it 52,800.

Therefore after step 2, the total cost of various departments becomes this 13,200 + the previous amount was for moulding 170,000. The original direct cost was only 100, but after allocation of cost from the facilities department the amount was 170,000 rupees, this 170,000 rupees is now added to the 13,200 rupees making it 183,200 rupees.

So this is therefore the total cost associated with moulding department and the total cost associated with finishing department is previously it was 174, here and now we are adding 52,800 rupees after cost of the personnel department is allocated to finishing and when we add this it becomes 226,800 rupees, the total is same total is 410,000 rupees which is same as if you add these 4, then will come to 410,000 rupees.

So we have now been able to allocate the service departments cost to the operating department. So these 2 methods are applied and usually the step down method is preferred because here it recognizes that each service department offers some service to other service departments as well in addition to offering services to the revenue generating departments.

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Now there are some costs that are not related to cost drivers. How to take care of these, that means we are unable to find specific cost drivers for such costs. Now there are 3 approaches. One, divide the costs into 2 cost pools, one cost pool to use the cost driver and the second cost pool to use another cost driver or use activity based costing. This is one approach; the second approach is divide the costs in to 2 cost pools.

One cost pool to use the cost driver and the second cost pool is considered as a period cost remains unallocated and subtracted at the end from the gross profit and the third approach is even though we know that a single cost driver is not adequate we still continue to use a single cost driver.

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APPLICATION OF COSTS TO FINAL COST OBJECTS

Cost application (or attribution) is the allocation of total departmental costs to the revenue-generating products or services.

Two Approaches:

1. Traditional approach
2. ABC approach

Now we come to the final allocation type 3 which is applying the costs to final cost objects such as products or services. Now here there are once again 2 approaches, the traditional approach and the activity based costing approach, ABC. We already know each of these 2 approaches but we are illustrating these approaches once again so that you get a full understanding of these approaches.

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Traditional Approach

1. Allocate service department costs to operating departments.

1. Find the total cost of each operating department to be applied to the products/services.

1. Use one or more cost drivers to apply the total cost of each operating department to the products/services

The traditional approach is allocate service department cost to operating departments and to find the total cost of each operating department to be applied to products and services and finally apply the total cost of each operating department to products and services. Now let us take the same example to illustrate our point.

You remember I had given this table there were 2 other rows of data, this row is direct labour hour, moulding uses 2,100 person hours so direct labour hours, finishing department uses 10,000 direct labour hours. Moulding department uses 30,000 machine hours and finishing uses 5,400 machine hours. We need this data because we would like to allocate the moulding and finishing departments cost to a product.

A product might be using so many direct labour hour of moulding and so many direct labour hour of finishing and similarly so many machine hours of moulding and so many machine hours of finishing. With the knowledge of these data it will now be possible to find out the cost of manufacturing a particular unit of product.

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Previous Example Revisited

	Cost Driver	Actual Value	Total cost to be allocated
Moulding:	machine-hours	30,000	183,000 Rs
Finishing:	direct-Labour hours	5,400	226,000 Rs

Unit cost of allocation:

Moulding: 6.11 (=183,000/ 30,000) Rs/machine-hour
Finishing: 22.68 (=226,000/5,400) Rs/direct-labour hour

Cost of a product that takes 10 machine-hours in moulding dept and 5 direct-labour hours in Finishing department would cost

(6.11)(10) +(22.68)(5) = 61.10 + 113.40= 174.50 Rs.

These are the values, now from our earlier calculation we have seen the total cost to be allocated to products moulding has got 183,000 rupees and finishing has got 226,000 rupees, these 2 data we have got from our earlier step down approach, using the step down approach of cost allocation and the machine hour for moulding is 30,000.

The finishing direct labour hour is 5,400. So the unit cost of allocation for moulding is 183,000/30,000 that comes to 6.11 rupees per machine hour. Whereas for finishing the cost

driver is direct labour hour. For moulding it is mostly machine intensive, finishing is labour intensive, therefore the cost driver chosen are different. For moulding department it is machine hour and for finishing department it is direct labour hour.

Now if so many machine hours are used and the total cost to be allocated is this then the unit cost of machine hour is 6.11 which is 183,000/30,000 and for finishing department the unit cost of direct labour hour is 226,000/5,400 that comes to 22 rupees 68 paise and suppose that a product takes 10 machine hours in moulding department and 5 direct labour hours in finishing department.

Then what we need to do is to multiply 6.11 with 10 and multiply 22.68 with 5 and add them up, that is what we have done to find the cost of a product, 6.11 * 10 + 22.68 * 5 = 61.10 + 113.40 = 174.50 that means the manufacturing cost of a unit product in this particular case that takes 10 machine hours in moulding and 5 direct labour hour in finishing is 174.50 rupees.

So this is the traditional method of applying cost to the final product. By the by we use the word application or apply basically it is the word application or apply is same as allocation, but when allocation is done to the final product it is called application, that is the only difference, otherwise the meaning is still the same we still use the cost driver concept and find out the allocation to be made.

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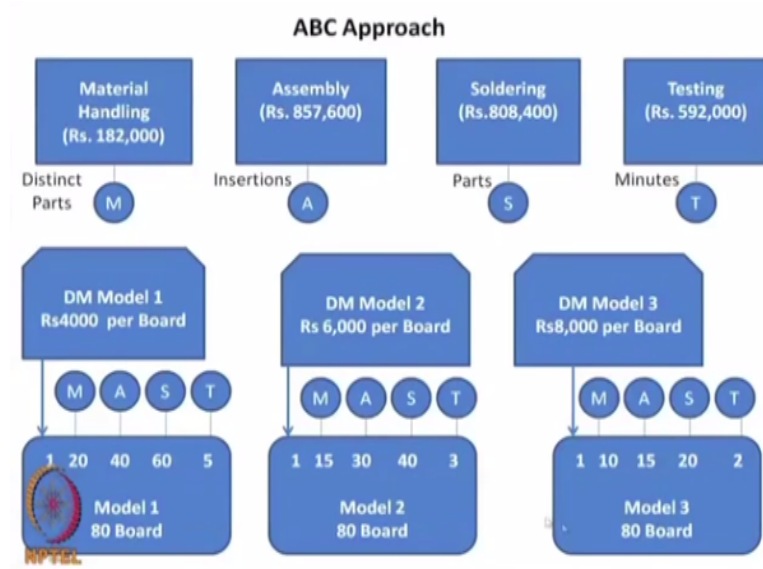
Now we illustrate the activity based costing approach. This is a different example and you are already acquainted with these symbols. In the activity based costing approach instead of allocating the costs to different organizational unit's allocation is made to activities. In this case the activities are material handling, assembly, shouldering and testing and the way the costs have been allocated to this activities we have not shown here.

We are just showing that this activity the total cost is 182,000 rupees, assembly it is 857,600, soldering 808,400 and testing 592,000 rupees. So these are activities. Now we are considering only the variable cost pool. Let us says that there is a small mistake here let me make the correction, this has to be model 2 and 3, yes, now these are the variable cost pools.

This is direct material for model 1, direct material for model 2, direct material for model 3, and these are the final cost objects that is the 3 products. Model 1 product, model 2 and model 3 and the number is same; 80 boards, 80 boards and 80 boards. And these are basically connectors instead of showing so many lines we have just said that this line is coming to here, to here and to here.

And this line is coming to the model 1 that is this activity is done for model 1, 2 and 3 similarly this activity is also done for model 1, 2 and 3 and this activity is also done for model 1, 2 and 3. And as you recall, as you can remember these are these 1, 20, 40, 60, 5 et cetera they are all resource consuming rate that is 1 board of model 1 requires 20 distinct parts to be handled by material handling.

40 insertions to be made in assembly, 60 parts to be soldered and 5 parts to be tested and 1 that is there is a 1:1 relationship that means 1 model requires rupees 4,000 per board, that is the meaning of 1. So similar interpretations are made here, here and here. So to find out these costs to be allocated to these products it is very simple, you have to find out let us say material M, material handling, material handling cost which is 182,000 is to be allocated to these.

So what we need to do is to basically find how many parts 80 * 20 so 60 parts are coming for model 1 and here for model 15 parts, 80 * 20 = 1,600; 80 * 15 = 1,200; 80 * 10 = 800. These many parts are used for material handling. So the ratio in the same proportion that is 80 * 20/80 * 20 + 80 * 15 + 80 * 10 is the ratio with which this will be allocated to model 1.

And similarly allocation will be made for assembly, for soldering and for testing and then the cost, the direct material cost of model 1 * 80 is to be added then the cost of making model 1 board is fully calculated. So friends in today's lecture we elaborately talked about the way in which costs are allocated.

Now I summarize, first of all different types of costs are pooled together as fixed or variable and they are allocated to different organizational units then service department's costs are allocated to operating departments cost following 2 methods, direct method or step down method and finally the operating departments cost are allocated or applied to the products or services, the final cost objects.

Activity based costing gives much more detail because it considers different activities that are performed and makes a thorough analysis of how the resources flow and therefore how the costs are allocated, so naturally the manufacturing cost for products estimated from an activity based costing point of view is much more precise.