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Learning Material for VM New Challenges for Management Accounting.

Chapter 4: Costing Systems. Cost Assignment.

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Chapter 4: Costing Systems. Cost Assignment.

Learning objectives

1. Introduce basis terminology for cost systems and cost assignment.
2. Explain why different cost information is required for different purposes.
3. Classify cost systems.
4. Understand the factors influencing the choice of optimal cost system.
5. Assign costs in non-manufacturing organizations.



Key words

allocation base, cost allocation, cost centre, cost driver, cost tracing, costing system, direct costs, indirect costs, overheads



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4.1 Terminology for Costing Systems



Let us briefly review some terms that we will use in discussing costing systems:

Cost object – anything for which a separate measurement of costs is desired.

Direct costs of a cost object – costs that are related to the particular cost object and can be traced to it in an economically feasible (cost-effective) way.

Indirect costs of a cost object – costs that are related to the particular cost object but cannot be traced to it in an economically feasible (cost-effective) way. Sometimes the term **overheads** is used instead of indirect costs. Indirect costs are allocated to the cost object using a **cost-allocation method**. The relationship among these three concepts is shown in Figure 4.1.

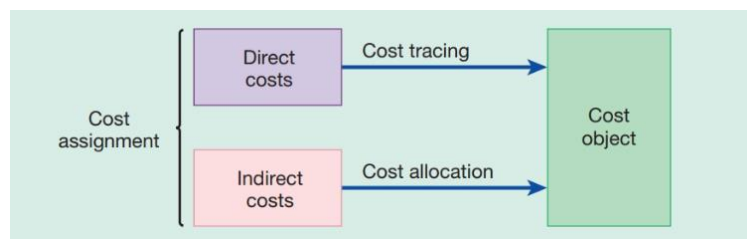


Figure 4.1 Relationship between a cost object and direct and indirect costs

Source: BHIMANI, A. et al. Management and Cost Accounting

Where a cost can be directly assigned to a cost object the term **cost tracing** is used. In contrast, indirect costs cannot be traced directly to a cost object because they are usually common to several cost objects. Indirect costs are therefore assigned to cost objects using **cost allocations**.

A cost allocation is the process of assigning costs when the quantity of resources consumed by a particular cost object cannot be directly measured.

Two concepts not previously defined are also important when discussing costing systems:

Cost pool – a grouping of individual cost items. Cost pools can range from the very broad (such as a company-wide total-cost pool for telephones and fax machines) to the very narrow (such as the costs of operating a car used by a travelling salesperson).

Cost-allocation base – a factor that is the common denominator for systematically linking an indirect cost or group of indirect costs to a cost object. A cost-allocation base can be financial (such as direct-labour costs) or non-financial (such as the number of car kilometres travelled). Companies often seek to use the cost driver of the indirect costs as the cost-allocation base.

For example, the number of kilometres travelled may be used as the base for allocating motor vehicle operating costs among different sales districts. Or, for example, if the indirect costs of operating metal-cutting machines is £500 000 based on running these machines for 10 000 hours, the cost-allocation rate is £500 000 divided by 10 000 hours

= £50 per machine@hour, where machine-hours is the cost-allocation base. If a product uses 800 machine-hours, it will be allocated £40 000, or £50 per machine per hour times 800 machine-hours.

Where allocation bases are significant determinants of the costs then the terms **cause-and-effect allocations** or **driver tracing** are used. Where a cost allocation base is used that is not a significant determinant of its cost, the term **arbitrary allocation** is used. An example of an arbitrary allocation would be if direct labour hours were used as the allocation base to allocate the costs of materials receiving.

4.2 Classification of Costing Systems according to Cost Assignment

Direct costs are assigned to cost objects using **cost tracing** whereas **indirect costs** are assigned using **cost allocations**. For accurate assignment of indirect costs to cost objects cause-and-effect allocations should be used.

Two types of systems can be used to assign indirect costs to cost objects. They are:

1. **direct costing systems**, also known as **variable costing systems** – assign only direct costs to cost objects,
2. **absorption costing systems**, also known as **full costing systems** – assign both direct and indirect costs to cost objects. They can be sub-divided:
 - a. **traditional costing systems** – were developed in the early 1900s and are still widely used today (by majority of organizations). Traditional costing systems were designed primarily for meeting external financial accounting requirements. They rely extensively on arbitrary cost allocations which may not be sufficiently accurate for meeting decision-making requirements.
 - b. **activity-based costing (ABC) systems** – began to be implemented only in the 1990's. One of the major aims of ABC systems is to use only cause-and-effect cost allocations and avoid arbitrary allocations. Surveys in many countries suggest that between 20 to 30 per cent of organizations currently use ABC systems.

Contemporary managerial accounting literature uses a different approach to costing systems and introduces two basic types of costing systems to assign costs to products or services:

1. Job-costing system

In a **job-costing system**, costs are assigned to a distinct unit, batch or lot of a product or service. A **job** is a task for which resources are expended in bringing a distinct product or service to market. The product or service is often custom-made, such as an audit by an accounting firm or a gearbox system for a particular car system. This costing system is most appropriate for production of units that are distinct from each other.

2. Process-costing system

In a **process-costing system**, the cost object is masses of identical or similar units of a product or service. In each period, process-costing systems divide the total costs of producing an identical or similar product or service by the total number of units produced to obtain a per-unit cost.

Most companies have costing systems that are neither pure job costing nor pure process costing. Rather, they combine elements of both job costing and process costing. For now, we introduce these two systems by focusing on their pure versions.

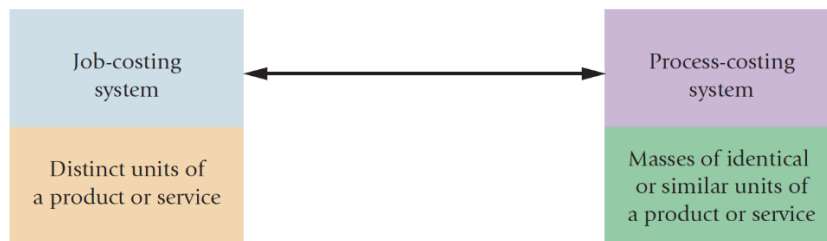


Figure 4.2 Job costing and process costing

Source: DATAR, S. M., RAJAN, M. V. Managerial Accounting, Making Decisions and Motivating Performance

The products or services accounted for with job costing can differ greatly. Companies that use process costing provide similar (in many cases identical) products or services to their customers. Figure 4.3 presents examples of job and process costing in the service, merchandising and manufacturing sectors.

	Service sector	Merchandising sector	Manufacturing sector
Job costing used	<ul style="list-style-type: none"> Accounting firm audits Advertising agency campaigns 	<ul style="list-style-type: none"> Sending a catalogue to a mailing list Special promotion of a new store product 	<ul style="list-style-type: none"> Aircraft assembly House construction
Process costing	<ul style="list-style-type: none"> Deposit processing Postal delivery (standard items) 	<ul style="list-style-type: none"> Grain dealing Processing new magazine subscriptions 	<ul style="list-style-type: none"> Oil refining Beverages production

Figure 4.3 Examples of job and process costing

Source: BHIMANI, A. et al. Management and Cost Accounting

4.3 Cost Assignment

4.3.1 Direct Cost Assignment

Direct cost assignment merely involves the implementation of suitable clerical procedures to identify and record the resources consumed by cost objects.

As for **direct labour**, the time spent on providing a service to a specific customer, or manufacturing a specific product, is recorded on source documents, such as **time sheets** or **job cards**. Details of the customer's account number, job number or the product's code are also entered on these documents. The employee's hourly rate of pay is then entered so that the direct labour cost for the employee can be assigned to the appropriate cost object.

For **direct materials**, the source document is a **materials requisition**. Details of the materials issued for manufacturing a product, or providing a specific service, are recorded on the materials requisition. The customer's account number, job number or product code is also entered and the items listed on the requisition are priced at their cost of acquisition. The details on the material requisition thus represent the source information for assigning the cost of the materials to the appropriate cost object.

In many organizations the recording procedure for direct costs is computerized using bar coding and other forms of on-line information recording. The source documents only exist in the form of computer records.

Because direct costs can be accurately assigned to cost objects whereas many indirect costs cannot, more attention in costing is focused on indirect cost (overhead) assignment.

4.3.2 Indirect (Overhead) Cost Assignment

The most simplistic traditional costing system assigns **indirect costs** to cost objects using a single overhead rate for the organization as a whole, known as **blanket overhead rate** or **plant-wide rate**. Recent surveys indicate that less than 5 per cent of organizations use a single plant-wide overhead rate.

To establish departmental overhead rates, an approach known as **the two-stage allocation process**, is used. There are different types of methods utilised for factory overhead costs to units of production.

- a. **The direct method** of cost allocation is the technique to charge the service department costs to other arms of the business.
- b. Then comes **the step-down method** of cost allocation, which is a technique that allocates service costs to the service departments and operating departments in a sequential process.
- c. Finally, there is **a reciprocal method** of overhead allocation, which recognises relationships between service departments, which means, the cost is allocated from and to other service departments.



Figure 4.4 Direct method of cost allocation

Source: <https://www.myassignmentservices.com/cost-accounting-assignment-help.html>

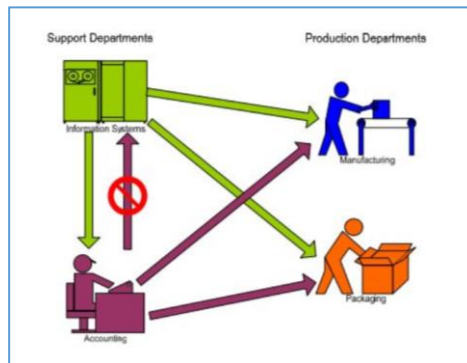


Figure 4.5 Step-down method of cost allocation

Source: <https://www.myassignmentservices.com/cost-accounting-assignment-help.html>

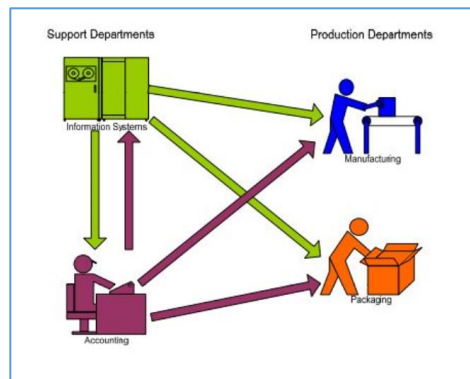


Figure 4.6 Reciprocal method of overhead allocation

Source: <https://www.myassignmentservices.com/cost-accounting-assignment-help.html>

4.4 Relevant Costs for Decision Making

For decision-making **non-manufacturing costs** should also be taken into account. In addition, some of the costs that have been assigned to the products may not be **relevant for certain decisions**.

For example, if property taxes, depreciation of machinery and insurance of buildings and machinery have been assigned to cost centres, it means that they are included in the costs assigned to products. If these costs are unaffected by a decision to discontinue a product they should not be assigned to products when undertaking product discontinuation reviews. However, if cost information is used to determine selling prices such costs may need to be assigned to products to ensure that the selling price of a customer's order covers a fair share of all organizational costs. It is therefore necessary to ensure that the costs incorporated in the overhead analysis are suitably coded so that different overhead rates can be extracted for different combinations of costs. This will enable relevant cost information to be extracted from the database for meeting different requirements.

Fluctuating overhead rates are not representative of typical, normal production conditions. Management has committed itself to a specific level of fixed costs in the light of foreseeable needs for beyond one month. Thus, where production fluctuates, monthly overhead rates may be volatile. Furthermore, some costs such as repairs, maintenance and heating are not incurred evenly throughout the year. Therefore, if monthly overhead rates are used, these costs will not be allocated fairly to units of output.

An average, annualized rate based on the relationship of total annual overhead to total annual activity is more representative of typical relationships between total costs and volume than a monthly rate. What is required is a normal product cost based on average long-term production rather than an actual product cost, which is affected by month-to-month fluctuations in production volume. Taking these factors into consideration, it is preferable to establish a **budgeted overhead rate** based on annual estimated overhead expenditure and activity.

The effect of calculating overhead rates based on budgeted annual overhead expenditure and activity is that it will be most unlikely that the overhead allocated to products manufactured during the period will be the same as the actual overhead, incurred. There will be an **under- or over-recovery of overheads** whenever actual activity or overhead expenditure is different from the budgeted overheads and activity used to estimate the budgeted overhead rate. This under- or over-recovery of fixed overheads is also called a **volume variance**.

Most organizations whose activities consist of a series of common or repetitive operations maintain their database at standard, rather than actual cost, for both traditional and ABC systems. **Standard costs** are pre-determined target costs that should be incurred under efficient operating conditions. When a **standard costing system** is used the database is maintained at standard cost and actual output is costed at the standard cost. Actual costs are recorded, but not at the individual product level, and an adjustment is made at the end of the accounting period by recording as a period cost the difference between standard cost and actual cost for the actual output. This adjustment ensures that the standard costs are converted to actual costs in the profit statement for meeting external financial accounting reporting requirements.

In respect of financial accounting, only manufacturing costs are allocated to products. **Non-manufacturing overheads** are regarded as period costs and are disposed of in exactly the same way as the under- or over-recovery of manufacturing overheads. For

external reporting it is therefore unnecessary to allocate non-manufacturing overheads to products. However, for decision-making non-manufacturing costs should be assigned to products.

In the allocation of non-manufacturing overheads we should select an allocation base/cost driver that corresponds most closely to non-manufacturing overheads. The problem is that allocation bases that are widely used by traditional costing systems, such as direct labour hours, machine hours and direct labour cost are not necessarily those that are closely related to non-manufacturing overheads. Therefore traditional systems tend to use **arbitrary**, rather than cause-and-effect allocation bases, to allocate non-manufacturing overheads to products. The most widely used approach is to *allocate non-manufacturing overheads on the ability of the products to bear such costs*. Recent developments in ABC have provided a mechanism for more accurately assigning non-manufacturing overheads to products.

Summary



The aim of this chapter has been to provide an understanding of how costs are assigned to cost objects. **Direct costs** can be accurately traced to cost objects whereas indirect costs cannot. Therefore **indirect costs** must be assigned using cost allocation bases. Allocation bases which are significant determinants of costs that are being allocated are described as cause-and-effect allocations whereas arbitrary allocations refer to allocation bases that are not the significant determinant of the costs. To accurately measure the cost of resources used by cost objects cause-and-effect allocations should be used.

Most organizations accumulate costs within a single database and different categories of costs are extracted for meeting different purposes. The sophistication and accuracy of costing systems vary and cost-benefit criteria should determine the optimal **costing system** for an organization. The range of the sophistication of costing systems varies from simplistic traditional to sophisticated ABC systems. Simplistic traditional systems make significant use of arbitrary cost allocations whereas ABC systems aim to use only cause-and-effect cost allocations.

Both systems use the **two-stage allocation process**. In the first stage overheads are assigned to cost centres, while the second stage allocates cost centre overheads to products. Some companies use only a single plant-wide overhead rate, but it has been shown that this approach can only be justified where products spend approximately equal proportions of time in each production cost centre.

The two-stage procedure involves the following steps:

1. the allocation of overheads to production and service centres or departments;
2. the apportionment of service department overhead to production departments;
3. the calculation of appropriate departmental overhead rates;
4. the allocation of overheads to products passing through each department.

The allocation bases that are most frequently used in the second stage by traditional costing systems are the direct labour hour method for non-machine departments and the machine hour rate for machine departments. As the use of actual overhead rates causes a delay in the calculation of product costs, and the use of monthly overhead rates causes fluctuations in monthly overhead rates, it has been suggested that budgeted **annual overhead rates** should be used. However, the use of annual budgeted overhead rates gives an **under or over-recovery of overhead** whenever actual overhead expenditure or activity is different from budget. Any under or over-recovery of overhead is generally regarded as a period cost adjustment and written off to the profit and loss account.

For meeting financial accounting requirements **non-manufacturing overheads** are not assigned to products. Instead, they are treated as period costs. For decision-making non-manufacturing costs must be considered but traditional costing systems allocate them using arbitrary allocations that result in the reporting of distorted product costs. Recent developments in ABC have provided a mechanism for more accurately assigning non-manufacturing overheads to products.

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