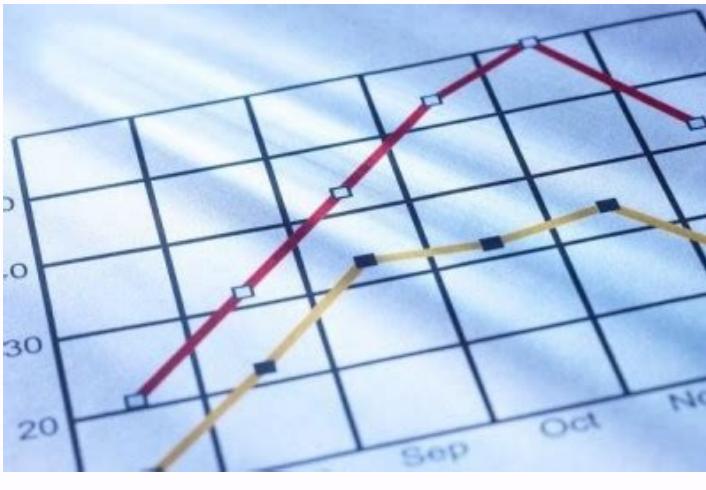


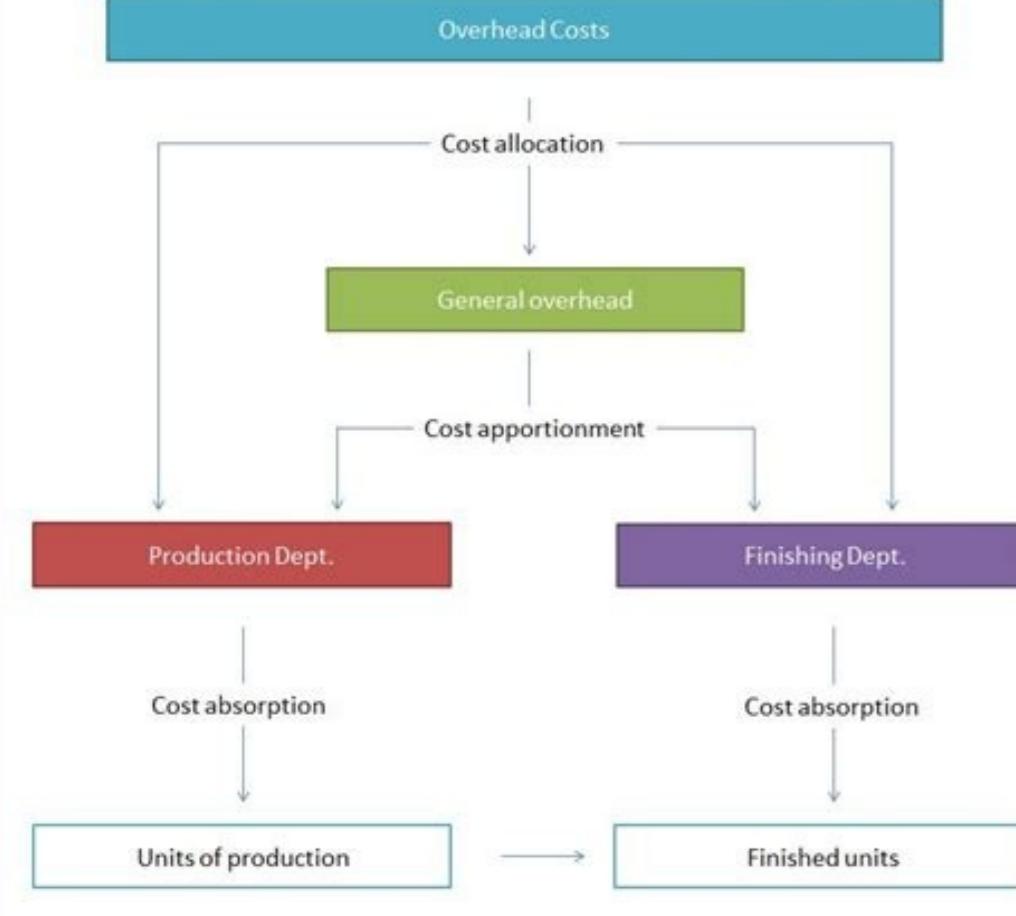
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## Difference between allocation apportionment and absorption in tabular form

Home Courses Infinity Allocation, apportionment, and absorption are three methods used in cost accounting to assign or allocate overhead costs to products, services, or departments. These methods help to ensure that overhead costs are accurately assigned to the specific cost objects that caused them, allowing businesses to make informed decisions about pricing, profitability, and cost control. Allocation: Allocation is the process of assigning direct costs to specific cost objects or products. In this method, overhead costs are assigned directly to a single cost object. For example, if a company has a single overhead cost related to the production of a specific product, this cost would be directly allocated to that product. Basis of allocation of Overhead: formula The basis of allocation of overhead refers to the method used to distribute indirect costs to cost centers or cost objects. The choice of basis of allocation will depend on the nature of the cost and the objective of the allocation. Here are Some Common bases of allocation of overhead and their formulas: Direct labor hours: Overhead costs can be allocated based on the number of direct labor hours required for each cost center or cost object. The formula for allocation based on direct labor hours is: Overhead allocation = Overhead cost x (Direct labor hours for the cost center or cost object / Total direct labor hours) Machine hours: Overhead costs can be allocated based on the number of machine hours required for each cost center or cost object.



The formula for allocation based on machine hours is: Overhead allocation = Overhead cost x (Machine hours for the cost center or cost object / Total machine hours) Floor area: Overhead costs can be allocated based on the amount of floor space occupied by each cost center or cost object. The formula for allocation based on floor area is: Overhead allocation = Overhead cost x (Floor area for the cost center or cost object / Total floor area) Number of employees: Overhead costs can be allocated based on the number of employees in each cost center or cost object. The formula for allocation based on number of employees is: Overhead allocation = Overhead cost x (Number of employees for the cost center or cost object / Total number of employees) Sales revenue: Overhead costs can be allocated based on the sales revenue generated by each cost center or cost object. The formula for allocation based on sales revenue is: Overhead allocation = Overhead cost x (Sales revenue for the cost center or cost object / Total sales revenue) Material cost: Overhead costs can be allocated based on the cost of materials used by each cost center or cost object. The formula for allocation based on material cost is: Overhead allocation = Overhead cost x (Material cost for the cost center or cost object / Total material cost) Number of units produced: Overhead costs can be allocated based on the number of units produced by each cost center or cost object. The formula for allocation based on number of units produced is: Overhead allocation = Overhead cost x (Number of units produced for the cost center or cost object / Total number of units produced) Apportionment: Apportionment is the process of dividing overhead costs among different cost objects or departments based on some basis of apportionment. This method is used when overhead costs cannot be directly traced to a single cost object. For example, if a company has overhead costs related to the maintenance of a factory building, these costs may be apportioned to different departments based on the amount of space each department occupies. Basis of Apportionment of Overhead with formula The basis of apportionment of overhead refers to the method used to allocate indirect costs to different cost objects or departments. The choice of basis of apportionment will depend on the nature of the cost and the objective of the allocation. Here are some common bases of apportionment of overhead and their formulas: Direct labor hours: Overhead costs can be allocated based on the number of direct labor hours required for each cost object or department. The formula for apportionment based on direct labor hours is: Overhead apportionment = Overhead cost x (Direct labor hours for the cost object or department / Total direct labor hours) Machine hours: Overhead costs can be allocated based on the number of machine hours required for each cost object or department. The formula for apportionment based on machine hours is: Overhead apportionment = Overhead cost x (Machine hours for the cost object or department / Total machine hours) Floor area: Overhead costs can be allocated based on the amount of floor space occupied by each cost object or department. The formula for apportionment based on floor area is: Overhead apportionment = Overhead cost x (Floor area for the cost object or department / Total floor area) Number of employees: Overhead costs can be allocated based on the number of employees in each cost object or department. The formula for apportionment based on number of employees is: Overhead apportionment = Overhead cost x (Number of employees for the cost object or department / Total number of employees) Sales revenue: Overhead costs can be allocated based on the sales revenue generated by each cost object or department. The formula for apportionment based on sales revenue is: Overhead apportionment = Overhead cost x (Sales revenue for the cost object or department / Total sales revenue) Material cost: Overhead costs can be allocated based on the cost of materials used by each cost object or department. The formula for apportionment based on material cost is: Overhead apportionment = Overhead cost x (Material cost for the cost object or department / Total material cost) Number of units produced: Overhead costs can be allocated based on the number of units produced by each cost object or department. The formula for apportionment based on number of units produced is: Overhead apportionment = Overhead cost x (Number of units produced for the cost object or cost object / Total number of units produced).

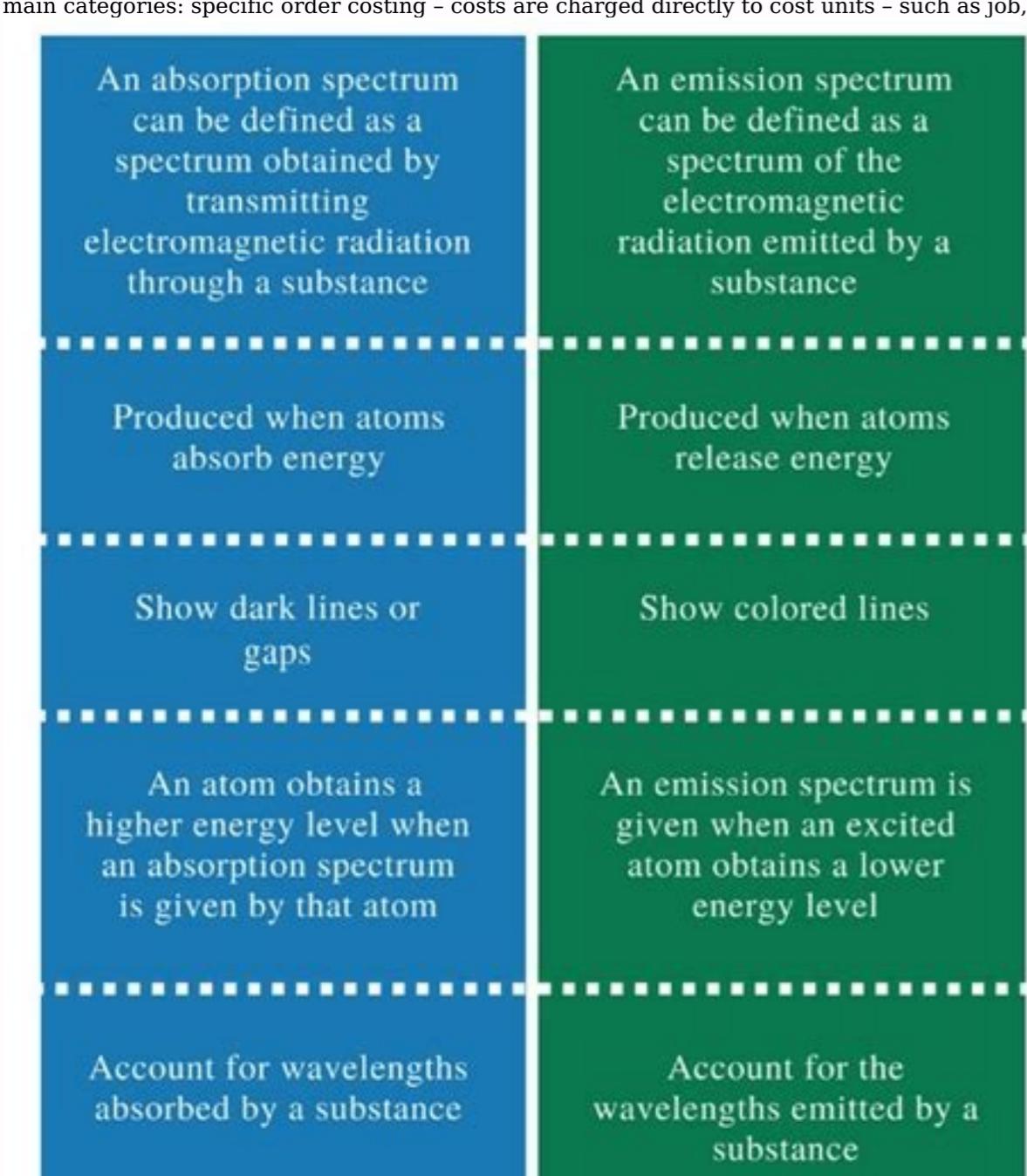


The formula for apportionment based on number of units produced is: Overhead apportionment = Overhead cost x (Number of units produced for the cost object or department / Total number of units produced) Absorption: Absorption is the process of including all overhead costs in the cost of a product or service. In this method, overhead costs are absorbed into the cost of each product or service based on a predetermined overhead absorption rate.

The absorption rate is calculated by dividing total overhead costs by the total number of units produced. This method is useful in determining the true cost of a product or service, including all direct and indirect costs. Basis of Absorption of Overhead with formula Basis of absorption of overhead refers to the method used to allocate indirect costs to different cost objects or departments. The choice of basis of absorption will depend on the nature of the cost and the objective of the allocation. Here are some common bases of absorption of overhead and their formulas: Direct labor cost: Overhead costs can be absorbed based on the direct labor cost of each product or service. The formula for absorption rate based on direct labor cost is: Overhead absorption rate = Total overhead costs / Total direct labor hours Direct labor hours: Overhead costs can be absorbed based on the number of direct labor hours required for each product or service. The formula for absorption rate based on machine hours is: Overhead absorption rate = Total overhead costs / Total machine hours Direct material cost: Overhead costs can be absorbed based on the direct material cost of each product or service. The formula for absorption rate based on direct material cost is: Overhead absorption rate = Total overhead costs / Total direct material costs Percentage of prime cost: Overhead costs can be absorbed as a percentage of prime cost, which is the sum of direct material cost and direct labor cost. The formula for absorption rate based on percentage of prime cost is: Overhead absorption rate = Total overhead costs / Total prime cost x 100% Importance of Overhead Allocation Overhead allocation is important for several reasons: Accurate product costing: Overhead costs are indirect costs that are not directly traceable to a particular product or service. By allocating overhead costs to individual products or services, businesses can get a more accurate picture of the true cost of each product or service. This information is essential for setting prices and making informed decisions about resource allocation. Performance evaluation: Overhead allocation allows businesses to evaluate the performance of each cost center or department. By allocating overhead costs to each department, managers can see the true cost of running that department and make informed decisions about resource allocation and process improvement. Resource allocation: Overhead allocation helps businesses to allocate resources effectively. By identifying the true cost of each department or product, businesses can make informed decisions about how to allocate resources such as labor, materials, and equipment. Budgeting and forecasting: Overhead allocation helps businesses to develop accurate budgets and forecasts. By understanding the true cost of each department or product, businesses can forecast future costs more accurately and plan their budgets accordingly. Procedure for Accounting & Control of Overhead The procedure for accounting and control of overhead involves the following steps: Identification of Overhead: The first step in accounting and control of overhead is to identify all the overhead costs. Overhead costs include all indirect costs that cannot be directly traced to a product or service. Examples of overhead costs include rent, utilities, depreciation, insurance, salaries of support staff, and other administrative expenses. Classification of Overhead: The next step is to classify the overhead costs into different categories such as production overhead, administrative overhead, and selling and distribution overhead. Allocation of Overhead: Once the overhead costs have been identified and classified, the next step is to allocate them to different cost centers or departments. This is done using different methods such as the direct method, step-down method, and reciprocal method. The choice of method depends on the nature and complexity of the business operations.

Apportionment of Overhead: After allocating the overhead costs to different departments, the next step is to apportion them to the products or services produced by each department. This is done using a suitable basis of apportionment such as direct labor hours, machine hours, or square footage. Absorption of Overhead: The final step is to absorb the overhead costs into the cost of the product or service. This is done by adding the allocated and apportioned overhead costs to the direct materials and direct labor costs of the product or service. The total cost of the product or service is then divided by the number of units produced to arrive at the unit cost. Control of Overhead: Once the overhead costs have been allocated, apportioned, and absorbed into the cost of the product or service, the next step is to control them. This is done by analyzing the overhead costs and identifying areas where costs can be reduced or eliminated. Re - Apportionment of Service Department Overheads concept and formula Re-apportionment of service department overheads is the process of re-distributing the overhead costs of the service departments to the production departments that use their services. The main aim of re-apportionment is to ensure that the overhead costs of the service departments are fairly allocated to the production departments. The formula for re-apportionment of service department overheads is as follows: Total overheads of service department / Total units of service provided = Overhead rate per unit of service Once the overhead rate per unit of service has been calculated, it is multiplied by the number of units of service used by each production department to calculate the overhead cost that should be allocated to each production department. For example, let's say a company has two service departments, A and B, and two production departments, X and Y. The overhead costs of service department A are \$20,000 and it provides 5,000 units of service. The overhead costs of service department B are \$30,000 and it provides 10,000 units of service. Production department X uses 2,000 units of service from department A and 5,000 units of service from department B, while production department Y uses 3,000 units of service from department A and 4,000 units of service from department B. To calculate the overhead cost that should be allocated to production department X from department A, the overhead rate per unit of service is calculated as follows: Overhead rate per unit of service for department A = \$20,000 / 5,000 units of service = \$4 per unit of service The overhead cost that should be allocated to production department X from department A is therefore: Overhead cost from department A to production department X = 2,000 units of service x \$4 per unit of service = \$8,000 Similarly, to calculate the overhead cost that should be allocated to production department X from department B, the overhead rate per unit of service is calculated as follows: Overhead rate per unit of service for department B = \$30,000 / 10,000 units of service = \$3 per unit of service The overhead cost that should be allocated to production department X from department B is therefore: Overhead cost from department B to production department X = 5,000 units of service x \$3 per unit of service = \$15,000 The same process is repeated for production department Y, and the total overhead cost that should be allocated to each production department is calculated by adding the overhead costs from each service department. Methods of Re-apportionment of Overheads There are several methods of re-apportionment of overheads costs from service departments to production departments. The choice of method will depend on the nature of the overheads, the structure of the business, and the objectives of the management. The following are the most commonly used methods: Direct method: The direct method allocates the overhead costs of each service department directly to the production departments based on their usage of the services.

This method is easy to understand and implement, but it does not take into account the reciprocal services provided by the service departments to each other. Step-down method: The step-down method, also known as the sequential method, first allocates the overhead costs of the service department that provides the most services to other departments. Then, the overhead costs of the next service department are allocated, taking into account the overhead costs already allocated from the previous department. This process continues until all service department overheads have been allocated. This method recognizes the mutual services provided by the service departments and is more accurate than the direct method. Reciprocal method: The reciprocal method is the most complex method of re-apportioning overhead costs. It takes into account the mutual services provided by the service departments to each other. Under this method, the overhead costs of each service department are first allocated to other service departments based on their usage of the services. Then, the overhead costs of the service departments are allocated to the production departments based on their usage of the services. This method provides the most accurate allocation of overhead costs but is also the most time-consuming and costly. Absorption of Factory Overheads concept Absorption of factory overheads refers to the process of including overhead costs in the total cost of production. This is done to determine the total cost of producing a product, which includes not only direct materials and labor costs but also indirect costs such as factory rent, utilities, and maintenance. The formula for absorption of factory overheads is: Total cost of production = Direct materials cost + Direct labor cost + Factory overhead cost. This rate is calculated by dividing the total factory overhead cost by a base, which is typically the direct labor cost or machine hours. For example, if the total factory overhead cost is \$50,000 and the total direct labor cost is \$100,000, the overhead absorption rate would be: Overhead absorption rate = Total factory overhead cost / Direct labor cost = \$50,000 / \$100,000 = 0.5 or 50% This means that for every dollar of direct labor cost, 50 cents of factory overhead cost will be absorbed into the total cost of production. To illustrate the absorption of factory overhead, let's assume a company produces 10,000 units of a product and the total cost of production is \$100,000. The direct materials cost is \$30,000 and the direct labor cost is \$20,000. The overhead absorption rate is 50%. Under this formula, the total factory overhead cost allocated in the total cost of production would be: Total overhead cost = 50% x \$20,000 = \$10,000. Then the total cost of production = \$30,000 + \$20,000 + \$10,000 = \$60,000. Overhead recovery rates refer to the rate at which a company recovers overhead costs by allocating them to its products or services. These rates are used to determine the cost of each unit of output and help in pricing decisions. There are several methods for calculating overhead recovery rates: Percentage of Direct Labor Cost: In this method, the overhead cost is allocated as a percentage of the direct labor cost. For example, if the overhead cost is \$100,000 and the direct material cost is \$300,000, the overhead recovery rate would be 33.33% (\$100,000/\$300,000). Machine Hour Rate: In this method, the overhead cost is allocated based on the number of machine hours used. For example, if the overhead cost is \$100,000 and the total machine hours used are 10,000, the overhead recovery rate would be \$10 per machine hour (\$100,000/10,000). Direct Labor Hour Rate: In this method, the overhead cost is allocated based on the number of direct labor hours used. For example, if the overhead cost is \$100,000 and the direct labor hours used are 5,000, the overhead recovery rate would be \$20 per direct labor hour (\$100,000/5,000). Activity-Based Costing Rate: In this method, the overhead cost is allocated based on the activities that contribute to the cost. For example, if the overhead cost is \$100,000 and there are three activities that contribute to the cost, the overhead recovery rate for each activity would be calculated based on the cost drivers of each activity. Once the overhead recovery rate is determined, it is used to allocate overhead costs to products or services based on the amount of the cost driver used. For example, if the overhead recovery rate is \$10 per machine hour and a product uses 5 machine hours, the overhead cost allocated to that product would be \$50 (\$10 x 5). Cost Analysis & Decision-making Quick revise After studying this section you should be able to: classify and analyse a range of costs evaluate absorption costing budgetary control and standard costing as control and planning methods Absorption costing Allocation and absorption Overheads are allocated when the cost is incurred wholly by a single department or cost centre. The overhead can then be charged exclusively to that cost centre. Overheads have to be apportioned when the cost is incurred by more than one cost centre. A good example is factory rent, with the total cost having to be shared between all relevant cost centres in the factory. The basis of apportionment will vary according to the nature of the overhead. For example: Overhead Possible basis of apportionment Rent and rates Floor area Lighting and heating Volume or floor area Equipment depreciation Cost or book value of equipment Maintenance staff Hours clocked for each department Stores staff Value of material requisitions Administrative support: e.g. personnel and canteen costs Number of employees In absorption costing, all overheads (indirect costs) must be absorbed, i.e. recovered, by the products, otherwise there will be no source of income to pay for these overheads. For example, if a product's share of total overheads comes to £300,000, this amount needs to be recovered throughout the period. Absorption methods include: direct labour hours - e.g. in a garage, if the budgeted number of direct labour hours is 100,000, each hour spent working on a car will be charged with an extra £3 (i.e. £300,000/100,000), so by the end of the period the £300,000 costs will be recovered machine hour rate - e.g. where machinery is heavily used, budgeted machine hours being 50,000 in the period, each hour a machine is used will be charged at £6 (£300,000/50,000). Costing methods There are two main categories: specific order costing - costs are charged directly to cost units - such as job, batch and contract costing, and continuous operation costing - costs have to be apportioned to cost units - such as service and process costing.



Job costing is used when work is undertaken to a customer's specific requirements: all costs are charged to the job. Contract costing is similar, though the contract (e.g. for construction of a ship) tends to be for a longer duration. Batch costing is used when a quantity of identical articles (such as similar houses on an estate) are manufactured. Service (or function) costing is concerned with establishing the costs of services rendered, and controlling these costs (e.g. within a hospital). The process costing method is used when products are made in a single process. KEY POINT - The costing method chosen must suit the manufacturing method.



Budgeting and forecasting Management by exception Budgeting helps control the finance available to a business. Budgetary control produces variances that allow managers to compare the expected (budgeted) performance of their department with its actual performance. These individual variances can be broken down into sub-variances. For example, a favourable sales variance might consist of a favourable volume variance - more are sold than had been planned - and an adverse price variance (the actual selling price is below the budgeted level, which may be the reason for the favourable volume variance).

## Differences Between Allocation and Apportionment

Allocation	Apportionment
Means the allotment of <b>whole item of cost</b> to cost centers or cost units	Means allotments of <b>proportion of items of cost</b> to cost centre or cost units
Deals with <b>whole item of cost</b>	Deals with <b>only proportions of items of cost</b>
Cost is <b>directly allocated</b> to cost centre or cost unit	Not directly allocated, but are <b>divided or apportioned</b> to different departments on suitable basis
Allocated when the cost centre uses <b>whole of the benefits</b> of the expense	Apportioned when cost centers use only a <b>proportion of the benefits</b> of the whole expenses
<b>No bases are required for allocation</b>	Need a <b>suitable base</b>

Variances may be controllable by managers. In the above example the sales manager may have made a conscious decision to lower prices and increase sales volume, the product's price elasticity of demand leading to the increase in total revenue (the overall favourable variance). Other variances may be noncontrollable, e.g. an adverse labour variance being due to a national wage agreement. Managers can only be held responsible for the variances they can control. Flexing the budget Budgets and variances must be adjusted for changes in volume. Comparing production budget figures based on an expected output of, say, 3000 units with the actual costs based on an actual output of 3500 units is not comparing like with like. The budget figures have to be flexed - scaled - accordingly, and these amended budget figures can then be compared accurately with the actual ones. Standard costing A 'standard cost' is a cost estimated by managers from information on expected prices and efficiency levels of production. Like budgets, standard costs provide targets for managers against which their individual performances can be appraised. It is linked with budgetary control: for example, it is easy to establish sales and production budgets once standard costs have been set. There are three main variance groups in standard costing: sales variances - the sales price variance measures the difference between the standard and actual selling prices, and the sales volume variance measures the effect on profit of the difference between the actual and expected numbers sold production cost variances - total cost variances are calculated for direct labour, direct materials and production overheads, each being subdivided to show 'price' and 'quantity' sub-variances. Direct labour: a rate variance based on the difference between actual and standard pay; an efficiency variance based on whether output is above or below standard.  $(\text{standard} - \text{actual rate}) \times \text{actual hours worked}$   $(\text{standard} - \text{actual hours}) \times \text{standard hourly rate}$  Direct materials: a price variance based on the difference between actual and standard unit prices; a usage variance based on the difference between actual and standard quantities.  $(\text{standard} - \text{actual price}) \times \text{actual quantity}$   $(\text{standard} - \text{actual quantity}) \times \text{standard price}$  Production overheads: variances based on differences between expected and actual volumes of use, efficiency and expenditure. Fixed overhead total variance, subdivided into expenditure (budgeted - actual expenditure) and volume ( $(\text{budgeted} - \text{actual volume}) \times \text{unit absorption rate}$ ) KEY POINT - Management accounting draws on financial accounting information, but also involves detailed internal analyses through setting budgets and standard costs. Forecasting cash flow Any forecast may be inaccurate: for example, any difference between budgeted and actual sales will affect cash inflows. Managers must therefore monitor the accuracy of the cash flow forecast. If it indicates that cash flow must be improved, the managers may: calculate and review the cash cycle factor debtors, use sale/leaseback or examine other ways of controlling working capital (for example, by reducing stock levels). It is just as important to identify large cash surpluses as well as large cash deficits, to ensure surplus cash is used efficiently.