# MGT388 Finance and Law for Engineers

# Finance Lecture 4 Notes

# Why are management accounts important?

Management and cost accounting are needed to provide managers with information that allow them to make plans, control activities, monitor outcomes and revise plans. Management and cost accounting are an essential part of an organisation’s information system.

需要管理和成本核算，以便为管理人员提供信息，使他们能够制定计划、控制活动、监测结果和修订计划。管理和成本核算是组织信息系统的重要组成部分。

***The management accounting process within an organisation***

***Determine the organisation objective*** Collect information on market, suppliers, finance, and competition.

***Identify different strategies to achieve the organisation objective*** *C*ollect information on availability of resources (land, labour, and capital), collect accurate cost information and obtain information on different markets and revenue streams. Although uncertainty will exist in making future decision, the information needs to be relevant and reliable if appropriate choices are to be made on the alternative courses of action.

***Prepare detailed plans for the selected courses of action to achieve the organisation goal*** Plans need to be prepared on an organisation level but also broken down for individual departments. They need to be properly communicated to those responsible for carrying out the relevant activities.

***The plans need to be monitored throughout*** ***the process to ensure they are being adhered to.***

***Review of organisation achievement***

At appropriate time periods there needs to be a comparison of the planned organisation activity with the actual activity. Any divergence偏离 from the planned outcome, good or bad, needs to be explained and understood. Individuals need to take responsibility for the meeting of planned performance.

***Organisations goals and strategies may need to be reviewed and revised.***

# Why accurate cost information is required in organisations?

***Decision Making*** - If there are alternative products, need to accurately determine cost and revenue. If tendering for project accurate costs is essential.

***Planning*** - Need to be aware of the cash outflows in terms of amount and timing to avoid cash flow problems.

***Effectiveness*** – Need to have a clear idea of expected costs and actual costs to ensure the organisation is operating effectively.

***Preparation of financial accounts*** – need to accurate value inventory for the annual reports.

What is cost?

Cost is often seen as expenditure, but there is often more than one answer, more than one type of cost.

e.g.: historical cost (past cost) versus replacement cost (future cost).

full cost versus marginal (additional) cost. 全部成本与边际（额外）成本。

actual costs versus budgeted costs. 实际成本与预算成本。

Cost can also be seen in economics as is a resource sacrificed or foregone to achieve a specific objective. The opportunity cost of obtaining a salary as an engineer of £30,000 is not receiving a salary of £20,000 for being an accountant.

成本也可以在经济学中看作是为实现特定目标而牺牲或放弃的资源。获得 30,000 英镑工程师薪水的机会成本不是获得 20,000 英镑的会计师薪水。

The costing method used depends upon the decision you are trying to make.

***Prime Cost*** of a product are all the direct costs added together. The direct costs are those costs which can be economically raced to a product.

Product Costs and Period Costs

***Product costs*** are those costs that are attached to the products and therefore included in the inventory (stock) valuation. The product cost will be:

就是生产一个产品所需要的成本，比如材料，人工，以及其它一些费用。

Direct Materials X Direct Labour X Other Direct Expenses X Prime cost X Indirect production costs (overheads) X Product cost X

Remember from financial accounting – the cost of sales figure in the income statement is made up of just those units sold. It is an example of the accrual principle.

请记住，从财务会计中可以看出，损益表中的销售成本数字仅由已售出的单位组成。这是权责发生制原则的一个例子。

Cost of sales = Opening inventory + Purchases (current year product costs) – Closing inventory

***Period costs*** are non-manufacturing costs such as training, advertising, and invoice (debt) collection. Period costs are *not* attached to the products and are *not* included in the inventory (stock) valuation. All period costs will be recorded as an expense in the current accounting period.

期间成本是非制造成本，例如培训、广告和发票（债务）收款。期间成本不附加到产品中，也不包含在库存（库存）评估中。所有期间成本将作为当前会计期间的费用记录。

Product cost + period cost = total cost

**Example of the treatment of product and period costs**

Product costs (cost of goods produced) = £200,000 Period costs (marketing & admin costs) = £70,000

Assume: 60% of the output for the period is sold for £250,000 and there is no opening inventory £ £

Sale revenue 250,000 Cost of sales Production cost (product costs) 200,000  *Less* closing inventory (40%) ( 80,000) 120,000 Gross profit 130,000 Period costs (100%) ( 70,000) Net profit 60,000

NOTE: Only 60% of the product costs have been expensed in the current year income statement but 100% of the period costs have been expensed.

# Absorption Costing

The valuation of inventory at the direct cost, plus indirect production overheads is known as ***Absorption Costing***.

***Absorption Costing = direct cost + indirect production overheads***

**How does a business cost its output?**

A business will be able to obtain the production cost for its output, that is the direct costs plus indirect production overheads (***Absorption costing).*** But it may not be particularly useful (or too expensive) to gather that information for every individual unit of output instead an organisation will gather it for : A group of finished products – ***Product Costing*** One piece of work for a customer- ***Job costing*** Per production run- ***Batch costing***

**Product Costing**

***Direct and Indirect Costs***

These terms have been used above in looking at product and period costs, but what are they?

***Direct costs*** of a cost object are those that are related to a given cost object (product, department, etc.) and *that can be traced to it in an economically feasible way.*

成本对象的直接成本是与给定成本对象（产品、部门等）相关的成本，并且可以通过经济上可行的方式追溯到该成本对象。这意味着，这些成本与生产某个商品或提供某项服务直接相关，例如原材料成本和直接劳工成本。

**Indirect costs** are related to the cost object but cannot be traced to it in an economically feasible way.

间接成本与成本对象相关，但不能以经济上可行的方式追溯到成本对象。它们与产品或服务的生产过程有关，但不会直接计入任一特定产品或服务中，例如工厂租金、设备折旧或管理人员的工资。

**Absorption Costing: procedure**

1. Trace all the direct and indirect costs to cost centres.

首先，确定所有与生产过程相关的成本，包括直接和间接成本。

1. Allocate and apportion overhead costs.

然后，将这些间接成本分配到不同的成本中心，比如特定的产品线或服务。

1. Absorption

最后，将这些成本分摊到每个产品上，确保产品价格反映了生产它所需的全部成本。

**Absorption of Overheads Where One Product Passes Through One Production Department**

Ivanhoe Ltd manufactures two products: Cricket bats and Baseball bats Ivanhoe Ltd has one service department: Maintenance

Direct Costs: Cricket bats £70,000 Baseball bats £50,000 Indirect costs: Maintenance Department £40,000

Assume that Maintenance Department costs are apportioned equally平均分摊. How much is apportioned to each product? £20,000 will be allocated to both the cricket bat and baseball bat division.

Apportionment is the arbitrary allocation of production overheads to cost centres. This can be very problematic in business especially if cost centres are to be held responsible for the costs incurred, or if the cost is used as a basis for pricing. In the above example a more appropriate way of apportioning the maintenance costs may have been number of call outs, with accurate time keeping- hours spent within each department, number of machines, value of machinery, floor space etc.

分摊是将生产间接费用任意分配给成本中心。这在商业中可能非常成问题，特别是如果成本中心要对产生的成本负责，或者如果成本被用作定价的基础。在上面的例子中，更合适的维护成本分摊方式可能是呼叫次数，以及准确的时间记录 - 每个部门花费的时间、机器数量、机器价值、占地面积等。

For each indirect cost the most appropriate way of apportioning costs must be used.

The first step is to divide overheads among departments (cost centres or cost pools). Where whole items of cost can be charged to a cost centre this is known as ***allocation:*** E.g., 3 departments each has its own supervisor. The costs of 1 supervisor can easily be allocated to each department. Where overheads must be shared between more than one cost centre this is known as ***apportionment:*** E.g., 1 supervisor is responsible for 3 departments. The cost of the 1 supervisor must be arbitrarily split between the 3 departments.

*But note that this distinction between allocation and apportionment is not consistently used in textbooks or in practice.*

***Example***

A factory has 3 departments with each treated as a separate cost centre. These are: Production Department 1 (Producing Regular Rolling Suitcases) Production Department 2 (Producing Deluxe Rolling Suitcases) And a service cost centre (Canteen).

Regular Deluxe

Units produced during current year 2,000 3,000

Direct product costs per unit: £ £ Direct Material 60 70 Direct Labour 30 60 Total direct cost 90 130

Overheads (for both products) are: £ Indirect materials 12,500 Rent 60,000 Repairs 30,000 TOTAL 102,500

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| --- | --- | --- | --- | --- |
|  | Production  Department 1  (Regular Suitcases) | Production Department 2  (Deluxe Suitcases) | Service Centre (Canteen) | TOTAL |
| Indirect materials (£) | 5,000 | 7,500 | 0 | 12,500 |
| Area (square metres) | 1,500 | 1,000 | 500 | 3,000 |
| Value of plant (£000) | 120 | 100 | 80 | 300 |
| No. of employees | 10 | 15 | 5 | 30 |

STEP 1

The indirect costs of £102,000 must be split between the three cost centres. Production department 1, production department 2 and the canteen.

Indirect materials This overhead can be allocated directly to the cost centres.

Rent The most appropriate basis for apportioning the rent is floor space. The total area is 3,000 square metres and the total overhead is £60,000.

The overhead per square metre = £60,000/3,000 =£20

Rent apportioned to Production Department 1 = 1,500 square metres x £20 = £30,000 Rent apportioned to Production Department 2 = 1,000 square metres x £20 = £20,000 Rent apportioned to Canteen = 500 square metres x £20 = £10,000 Total £60,000

Repairs

**The most appropriate basis for apportioning the repairs is floor the value of plant.** The total plant value is £300,000 and the total overhead is £30,000.

分摊维修费用的最合适依据是工厂价值的下限。工厂总价值为 300,000 英镑，总管理费用为 30,000 英镑。

The overhead per £ of plant value = £0.10

Repairs apportioned to Production Department 1 = £120,000 x £0.10 = £12,000 Repairs apportioned to Production Department 2 = £100,000 x £0.10= £10,000 Repairs apportioned to Canteen = £80,000 x £0.10 = £8,000 Total £20,000

The Results after the apportionment of costs to cost centres:

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| --- | --- | --- | --- |
| **Overheads** | **Production Department 1** | **Production Department 2** | **Canteen** |
| **Indirect Materials** | 5,000 | 7,500 | 0 |
| **Rent** | 30,000 | 20,000 | 10,000 |
| **Repairs** | 12,000 | 10,000 | 8,000 |
| **Total** | **47,000** | **37,500** | **18,000** |

STEP 2

The Canteen is a service centre, and the costs of this service centre should be apportioned to a production department for them to be incorporated into the product cost.

The most appropriate basis for apportioning the canteen costs is on the number of workers in the two production departments. There are 25 employees in the production department and the costs that have been apportioned to the service centre is £18,000.

食堂是一个服务中心，这个服务中心的费用应分摊给生产部门，以便将其纳入产品成本。 分摊食堂成本的最合适依据是两个生产部门的工人人数。生产部门有 25 名员工，分摊给服务中心的成本为 18,000 英镑。

The canteen cost per employee is £18,000/25 = £720

Canteen costs apportioned to Production Department 1 = 10 x £720 = £7,200 Canteen costs apportioned to Production Department 2 = 15 x £720= £10,800 Total £18,000

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| --- | --- | --- |
|  | **Production Department 1** | **Production Department 2** |
| **Apportioned overheads** | £47,000 | £37,500 |
| **Apportionment of canteen costs** | £7,200 | £10,800 |
| **Total overhead allocated to production departments** | **£54,200** | **£48,300** |

Step 3 Absorption of overheads to products

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| --- | --- | --- |
|  | **Production Department 1** | **Production Department 2** |
| **Total Overhead** | £54,200 | £48,300 |
| **Number of units produced** | 2,000 | 3,000 |
| **Overhead per unit of product** | **£27.10** | **£16.10** |

Step 4 Product Cost Regular Deluxe

Direct Material £60 £70 Direct Labour £30 £60 Total Direct costs £90 £130 Overhead £27.1 £16.1

Total costs £117.1 £146.1

**Absorption of Overheads Where One Product Passes Through More Than One Production Department**

When more than one product is manufactured in a production department all costs direct and indirect costs need to be allocated to individual production departments once that has been done, they then need to be charged to individual cost units passing through the department.

Where more than one product passes through the production department the bases of absorption should best reflect the demands made by the products on the production facilities. Examples of possible bases include direct labour hours, direct machine hours, direct materials, direct wages, prime cost as well as number of units produced.

The overhead absorption rate is calculated as: Total cost centre overhead /overhead base.

当一个生产部门生产多个产品时，所有成本直接和间接成本都需要分配给各个生产部门，一旦完成，它们就需要计入通过该部门的各个成本单位。 如果不止一种产品通过生产部门，则吸收基础应最能反映产品对生产设施的要求。可能的基准示例包括直接工时、直接机器工时、直接材料、直接工资、主要成本以及生产的单位数量。 间接费用吸收率的计算公式为：总成本中心间接费用/间接费用基数。

Example

A business manufactures glass that is used in car window screens. The glass must go through two production departments.

Department 1 is mostly mechanised with the accountant estimating that a total of 10,000 machine hours will be available.

The overheads in department 2 will be spread over the number of units produced which are estimated to be 8,000 window screens will be produced.

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| --- | --- | --- |
|  | **Production Department 1** | **Production Department 2** |
| **Total Overhead** | £60,000 | £44,000 |
| **Total machine hours** | 10,000 |  |
| **Number of units produced** |  | 8,000 |
| **Overhead per machine hour/ unit of product** | **£6.00** | **£5.50** |

If the total direct costs of window screens were £55, the total cost would be:

Direct cost/Prime cost £55 Overhead in production department 1 £6 per machine hour x (10,000 hours/8,000 units) £7.50 Overhead in production department 2 £5.50 Product cost £68.00

Costing of Professional Services

A professional consultant may be working on several jobs at the same time. The consultant will be expected to keep a time sheet identifying the hours spent on each job. The cost of a job can be built up by combining the number of hours worked by each consultant on that job multiplied by their hourly rate.

专业顾问可能同时从事多项工作。顾问将需要保留一份时间表，确定每项工作所花费的时间。工作成本可以通过将每个顾问在该工作上的工作小时数乘以他们的小时费率来计算。