

Chapter 17

Classification of costs

REAL WORLD CASE

This case study shows a typical situation in which management accounting can be helpful. Read the case study now, but only attempt the discussion points after you have finished studying the chapter.

This extract is taken from an article describing the expansion of the farmed area devoted to the growing of borage, whose oil is used in the health food market to alleviate a number of human disorders.

All borage grown by contracted farmers in the Driffield area is now dried at Inn Carr Farm. There are two other drying plants, based at Bishop Burton, near Beverley, and at Aughton, near Bubwith, Selby. Oil extracted at the New Holland plant is sold to encapsulators to produce products for the health food market.

Mr Voase said: 'Last year's harvest was difficult because of the wet weather in August. But we still managed to achieve three hundredweight of cleaned seed per acre.'

'The crop fetched £288 per acre and after variable costs of £87 per acre, including fertiliser and chemical inputs also swathing, drying, cleaning and storage we were left with a margin of £201 per acre.'

'This season the contract price is £1,800 per tonne. It is a very low-input crop and Glafield [seed company] provide the seed free of charge. A four tonne per acre crop of feed wheat selling at £60 per tonne gives on average gross output of £240 leaving a margin of £125 per acre compared with £201 for borage.'

Source: *Yorkshire Post*, 29 January 2005, 'Healing herb that's at top of the crops.'



Discussion points

- 1 What are the variable costs of growing this crop?
- 2 Why does the farmer prefer growing borage to growing wheat?

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Learning outcomes

After reading this chapter you should be able to:

- Define 'cost'.
- Explain the need for cost classification.
- Define 'activity' and 'output'.
- Explain and distinguish fixed costs and variable costs.
- Explain and distinguish direct costs and indirect costs.
- Explain and distinguish product costs and period costs.
- Explain how cost classification can be developed to be relevant to the circumstances of planning, decision making and control.
- Explain and devise a cost coding system.
- Explain how costs may be selected and reported for the type of activity required (cost unit, cost centre, profit centre or investment centre).

17.1 Definition of a cost

The **cost** of an item of input or output may be analysed in terms of two measurements:

- 1 a physical quantity measurement multiplied by
- 2 a price measurement.

Where a production process uses 100 kg of material which has a price of £5 per kg, the cost is £500. Where a production process uses 200 hours of labour time at a rate of £4 per hour, the cost is £800. That may appear to be a statement of the obvious, but the breaking down of cost into physical quantity and price is frequently essential for the application of management accounting methods where the physical flow of inputs and outputs may sometimes be recorded separately from the unit price. The analysis of the separate elements of quantity and price will be dealt with in more detail in Chapter 22.

17.2 The need for cost classification

Cost classification systems in practice are as varied as the businesses they serve. In Chapter 16 the functions of management are described as: planning, decision making and control. For purposes of classification it is convenient to take planning and control as a combined function because the classifications required by each are similar. For decision making, particular care has to be taken to use classifications of cost which are relevant to the decision under consideration.

This chapter will first explain three *traditional* types of cost classification:

- 1 **variable costs** and **fixed costs** (section 17.4);
- 2 **direct costs** and **indirect costs** (section 17.5); and
- 3 **product costs** and **period costs** (section 17.6).

Each of these cost classifications will then be related to the **management** functions of **planning**, **decision making** and **control** (section 17.7). It is important to emphasise here that the three types of cost classification are *different* ways of looking at costs. Any particular item of cost could have more than one of these classifications attached to it, depending on the purpose of the classifications being used.

Finally, the chapter will explain the importance of correct coding of costs in a computer-based system (section 17.8), and will show how costs are selected and reported according to the unit of the business for which information is required (section 17.9).

17.3 The meaning of ‘activity’ and ‘output’

The word **activity** will be used in this book as a general description to cover any physical operation that takes place in an enterprise. In a business providing bus transport for schoolchildren the activities will include driving the bus, cleaning the bus, making telephone calls to check routes and times, and ensuring that the administrative requirements, such as insurance and licences, are in place. In a local government department providing assistance to elderly persons, the activities will include sending out home helps, paying the home helps, telephoning the clients to arrange visits, and checking that spending is within the budget allowed. In a manufacturing business providing floor cleaning machines the activities will include ordering parts, assembling parts, delivering the finished products to shops for sale, taking in returns for repair under warranty, paying employees, and checking on the quality of the goods produced. These are all activities and they all cause costs to be incurred. The idea of activities causing costs (‘driving costs’) is central to much of the classification of costs and the collection of costs relating to a specific activity. You will find later that the phrase **activity-based costing** (ABC) has been created to recognise that management accounting is most effective when it links costs to the activities of the business.

Activities have to be measured. For the soap manufacturer the measure of activity is the number of cartons of washing powder sold. For the retail store it could be the

number of items of clothing sold, or it could be the value of clothing sold. Selling a large number of small-value items causes higher staffing costs than does selling a small number of high-value items. For the road haulage business the measure of activity could be the hours worked by drivers or the number of miles driven. Hours worked takes no account of whether the drivers are on the road or waiting at the depot. Miles driven are a better measure of productive activity but do not distinguish full loads from empty trucks. Fuel costs are higher for a full load than for an empty truck. Activity might be measured using a combined unit of kilogram-miles.

Throughout the following chapters the word **activity** will be used and measures of activity will be described. You will be expected to show your analytical skills in thinking about the meaning of the word and the relevance of the measure of activity to cost classification and cost behaviour.

Output is a particular kind of activity. It is the product or service provided by the enterprise or by one of its internal sections. The output of a soap manufacturer is washing powder; the output of a retail store is the clothing that it sells; the output of a service engineer might be the repair of washing machines; the output of a garden centre is pot plants grown from seed; the output of a road haulage business is the loads delivered by its drivers; the output of a refuse disposal company is the service of emptying household dustbins; the output of an airline is the passenger loads carried; the output of a school is the successful education of its pupils.

Activity 17.1

(This is another use of the word 'activity' where you are asked to pause and think actively about what you have read.) Think about any activity that you carry out during a week (e.g. travel to college, eating meals, washing clothes). How would you measure the volume of that activity in a week? How might the cost of the activity be affected by the volume of activity? For example, could you share some travel costs; would one large meal cost more or less than two small meals; would one large wash cost more or less than two small washes?

17.4 Variable costs and fixed costs

Costs behave in different ways as the level of activity changes. Some costs increase in direct proportion to the increased level of activity. These are called variable costs. Some costs do not vary, whatever the level of activity. These are called **fixed costs**. Some show elements of both features. These are called **semi-variable costs**. Fixed costs that increase in steps are called **step costs**.

17.4.1 Variable costs

Definition

A **variable cost** is one which varies directly with changes in the level of activity, over a defined period of time.

Examples of **variable costs** are:

- materials used to manufacture a unit of output or to provide a type of service
- labour costs of manufacturing a unit of output or providing a type of service
- commission paid to a salesperson
- fuel used by a haulage company.

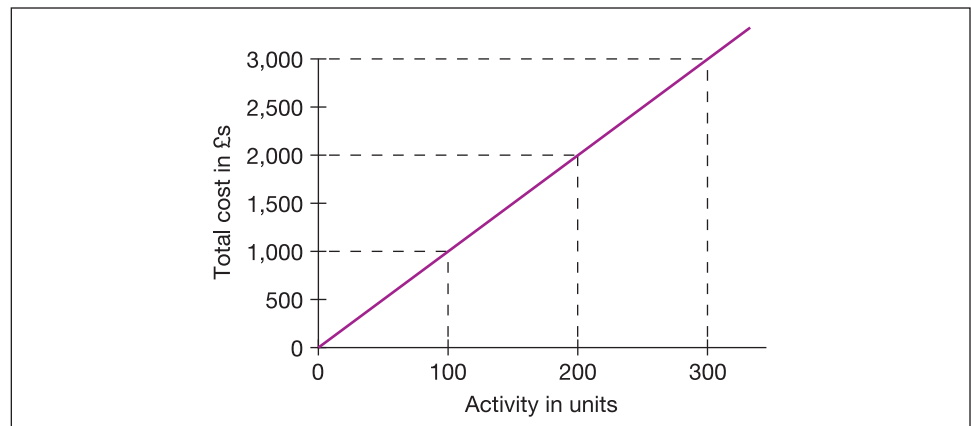
Exhibit 17.1 shows the costs of clay used by a pottery company for various levels of output of clay vases for garden ornaments. The clay required for each vase costs £10.

Exhibit 17.1**Costs of clay related to activity levels**

Output (number of vases)	100	200	300
Total cost (£s)	£1,000	£2,000	£3,000

The **total cost** increases by £10 for every vase produced, and is described as *variable*. The **unit cost** is £10 per vase and is *constant*. Sometimes students find it a little confusing at this point to decide whether they should be thinking about the total cost or the unit cost. It may help you to think of yourself as the owner of the business manufacturing the vases. If you were the owner, you would be most interested in the total cost because that shows how much finance you will need in order to carry on production. You will only recover the cost of buying the clay when you sell the finished goods to the customers. Until then you need finance to buy the clay. The more you produce, the more finance you will need. If you approach the bank manager to help you finance the business you will be asked 'How much do you need?', a question which is answered by reference to total cost.

Exhibit 17.2 shows, in the form of a graph, the information contained in Exhibit 17.1. It plots activity level (number of vases produced) on the horizontal axis and total cost on the vertical axis. The graph reinforces the idea that the total cost is a variable cost. It shows a straight line moving upwards to the right. The fact that the line is straight, rather than curving, means that the total cost increases in direct proportion to the increase in activity (that is, total cost increases by £10 for every unit of output).

Exhibit 17.2**Graph of variable cost measured as activity increases****17.4.2 Fixed costs****Definition**

A **fixed cost** is one which is not affected by changes in the level of activity, over a defined period of time.

A **fixed cost** is by definition unchanged over a period of time, but it may vary in the longer term. Rent, for example, might be fixed for a period of one year, but reviewed at the end of every year with the possibility of an increase being imposed by the landlord. Other examples of fixed costs are:

- rent of buildings
- salary paid to a supervisor
- advertising in the trade journals
- business rates paid to the local authority
- depreciation of machinery calculated on the straight-line basis.

Continuing our illustration based on a pottery company, Exhibit 17.3 sets out the cost to the pottery company of renting a building in which to house its kiln and other production facilities. The total cost remains *fixed* at £3,000 irrespective of how many vases are produced. The unit cost is *decreasing* as output increases, as shown in Exhibit 17.4, because the fixed cost is spread over more vases. Here again, it is more important usually to think about total cost because unless the pottery can pay its rent it cannot continue in business. This type of cost is therefore described as a fixed cost. The cost of rent is shown in graphical form in Exhibit 17.5.

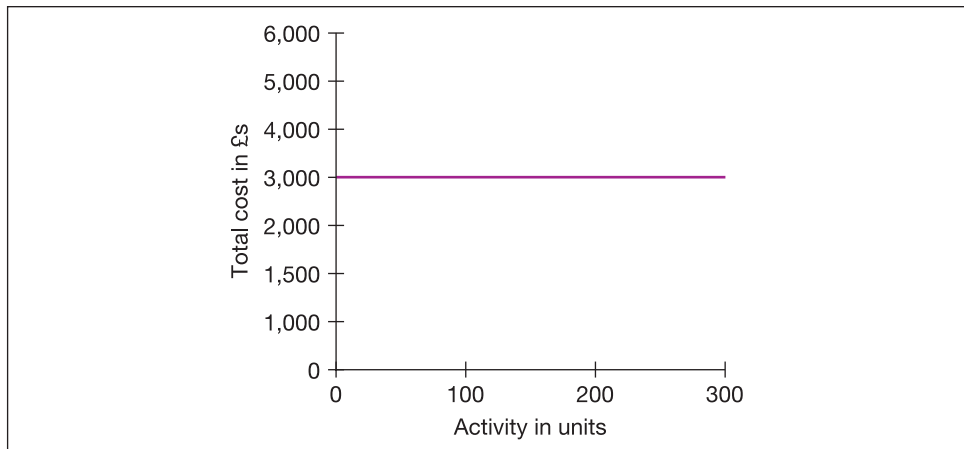
Exhibit 17.3
Costs of rental related to activity levels

Output (number of vases)	100	200	300
Total cost (£s)	£3,000	£3,000	£3,000

Exhibit 17.4
Unit cost of the pottery rental

Output (number of vases)	Unit cost (£)
100	30
200	15
300	10

Exhibit 17.5
Illustration of fixed cost



17.4.3 Semi-variable costs

Definition

A **semi-variable cost** is one which is partly fixed and partly varies with changes in the level of activity, over a defined period of time.

Examples of **semi-variable cost** are:

- office salaries where there is a core of long-term secretarial staff plus employment of temporary staff when activity levels rise;
- maintenance charges where there is a fixed basic charge per year plus a variable element depending on the number of call-outs per year.

Exhibit 17.6 sets out the costs incurred by a telephone sales company which pays a fixed rental of £2,000 per month and a call charge of £1 per telephone sale call. This total cost has a mixed behaviour, which may be described as semi-variable. It has a fixed component of £2,000 and a variable component of £1 per telephone sale.

Exhibit 17.6

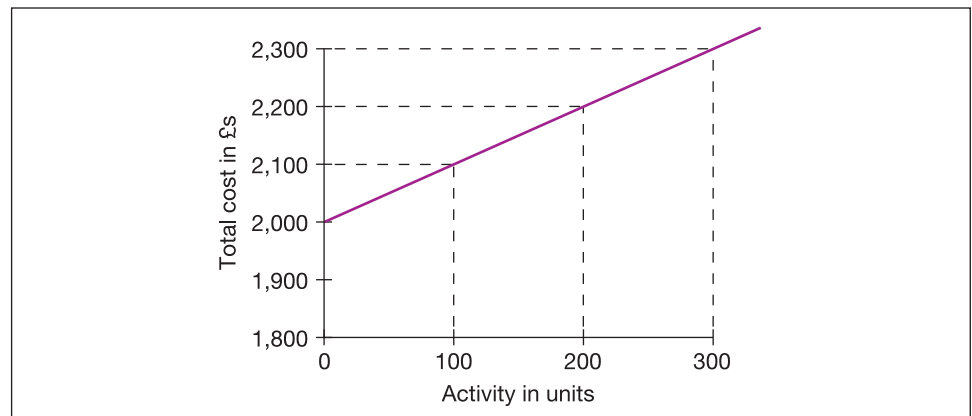
Telephone rental costs

Activity (number of calls)	100	200	300
Cost (£s)	2,100	2,200	2,300

The graph of this semi-variable cost is shown in Exhibit 17.7. The fixed cost is shown by the point where the line of the graph meets the vertical axis. The variable component is shown by the slope of the graph. The slope of the graph shows the total cost increasing by £1 for every extra unit of activity. The fixed component of £2,000 is shown as the point where the line of the graph meets the vertical axis.

Exhibit 17.7

Illustration of semi-variable cost



Examples of semi-variable cost are:

- office salaries where there is a core of long-term secretarial staff plus employment of temporary staff when activity levels rise;
- maintenance charges where there is a fixed basic charge per year plus a variable element depending on the number of call-outs per year.

17.4.4 Step costs

A fixed cost that increases in steps is called a **step cost**. The cost is fixed over a specified level of activity but then increases as a further amount of fixed cost is incurred. One example is the cost of renting storage space. The rent is unchanged while the output can be fitted into one store but as soon as a second store has to be rented the total rental cost increases. Another example is the cost of paying a supervisor of a team of

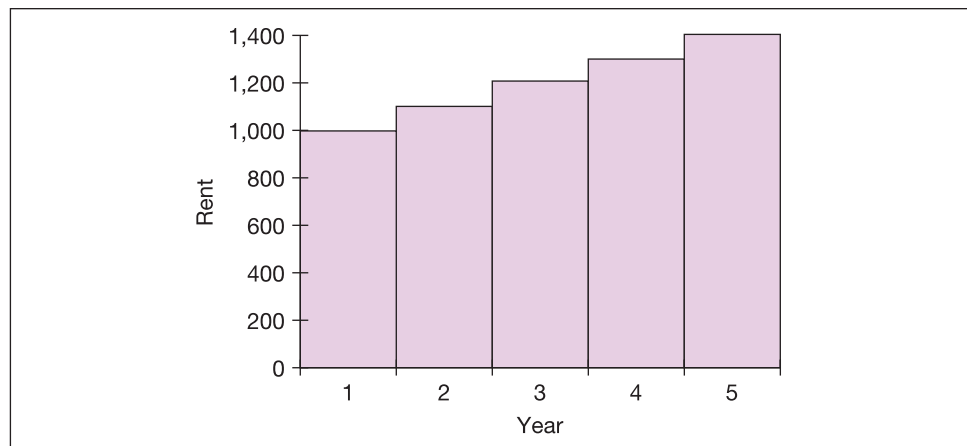
employees. Suppose one supervisor can manage up to 20 employees. Cost of supervision will be fixed for the level of activity from 1 to 20 employees. Beyond that level a second supervisor will be needed, causing a sudden increase in fixed cost.

Exhibit 17.8 shows a step cost of rent increasing annually over five years. The rental starts at £1,000 and increases by £100 each year.

The graph in Exhibit 17.8 is different from those shown earlier in the chapter because the horizontal axis measures time rather than activity. However, it is also possible to estimate the activity levels expected over the five-year period. Whatever the expected activity level, the relationship between total cost and activity level will be more complex than the simple fixed, variable and semi-variable relationships already shown. For the purposes of the rest of this book all the costs you meet will be simplified as fixed, variable or semi-variable, within a defined period of time.

Exhibit 17.8

Step cost for five-year period, with annual increase



17.4.5 Importance of the time period chosen

The extent to which a cost varies with activity depends on the period of time chosen. In manufacturing picnic tables, the cost of the plastic frame and the table top are variable costs, as is the labour cost of assembly. The annual rent of the warehouse where the tables are assembled is a **fixed cost** for the year, but will increase in steps (a **step cost**) over a period of several years if there is a rent review each year.

Activity 17.2

At this point, be sure that you are comfortable with the idea of variable costs, fixed costs and semi-variable costs. These will appear frequently in later chapters and it is important to understand them. If you are not familiar with graphs, go back through the section and try to draw the graph from the data presented. If you are familiar with graphs, make up some cost patterns and plot these on graph paper to confirm that you can link the graphic presentation to the pattern of numbers.

17.5 Direct costs and indirect costs

The costs of a business activity can also be classified as direct and indirect costs. **Direct costs** are those which are directly related to a particular object (such as a product which has been manufactured) or a particular service (such as a repair job

completed) or a particular location (such as a department within the organisation). **Indirect costs** are those which cannot be directly related to a particular object or service or location and therefore have to be apportioned on a basis which is as fair as can be devised.

The first question you should ask, whenever you see the words 'direct' or 'indirect' is 'Direct or indirect in which respect?' This will remind you that the words have no meaning in isolation. An item which is a direct cost for a department could be an indirect cost for the units of output produced by the department. Take the example of electricity consumed in a department. If the department has a meter, then the amount of electricity used may be identified directly with the department. However, if all items produced within the department share the benefit of the electricity supply, then the cost will need to be shared among them as an indirect cost so far as products are concerned.

Definitions

The definition of **direct** and **indirect** costs depends on the purpose for which the cost will be used.

Direct costs are directly traceable to an identifiable unit, such as a product or service or department of the business, for which costs are to be determined.

Indirect costs are spread over a number of identifiable units of the business, such as products or services or departments, for which costs are to be determined. Indirect costs are also called **overhead costs**.

Overhead costs are the costs which cannot be identified directly with products or services.

Fiona McTaggart gives an example of how she would distinguish direct costs and indirect costs in a particular situation.



FIONA: I was working recently with a publishing firm about to bring out a new children's magazine series based on a popular cartoon programme. The publisher had already incurred market research costs in respect of the new magazine series and it looked like a good idea.

The magazine is to be produced in a department where there are already ten other magazines in production. Writers work freelance and are paid fees on a piecework basis for each item they write. Graphic artists are employed full-time in the department, producing designs and drawings for all the magazines. Once the magazine production is completed, it is sent for external printing at another company which charges on the basis of volume of output. I was asked to help design a monthly cost analysis statement for the new magazine.

I pointed out that some costs were easy to identify because they were directly traceable to the product. Working back from the end of the story, the external printer's charge would be a direct cost of the new magazine because it is directly related to that specific output. The work of the freelance writers is also a direct cost of the new magazine because it is easy to make a list of fees paid to them in respect of particular work on the new magazine.

The work of the graphic artists is an indirect cost so far as the product is concerned, because their time is spread over all magazines produced. They do not keep detailed records of every design they produce. Many designs can be used in more than one magazine title. I suggested that a fair basis of allocation would be to share their cost across all magazines in proportion to the number of illustrated pages in each. That turned out to be a bad idea because some illustrated pages may contain full-size pictures while others may contain a quarter-page design, so it was eventually decided to apply a factor to each page depending on whether it was fully illustrated or partly illustrated.

Although the graphic artists are an indirect cost so far as the product is concerned, they are a direct cost for the department, because they don't work in any other department. I suggested that the full cost of the new magazine would only be known when it was also carrying its share of the direct costs and indirect costs of the department as a whole. Direct costs for the department could include heat and light, maintenance of the operating equipment, machine depreciation and supervisor's salary, while indirect costs could include a share of administration costs and a share of rent and business rates. It is not easy to ensure that all costs are included for purposes of planning and control.

In her explanation, Fiona has repeatedly used the words 'direct' and 'indirect', but at the start of the explanation she is referring to the direct and indirect costs of the new magazine while at the end she is referring to the direct and indirect costs of the whole department. The departmental costs, taken together, are all indirect costs so far as the *products* of the department are concerned.

Activity 17.3

Think of some activity observed in your everyday life where costs are involved. (It could, for example, be travelling on a bus, watching the sales assistant in a shop, or asking the television repair service to call.) Write down five costs which might be incurred in that activity. How would you decide which costs are direct and which are indirect?

17.6 Product costs and period costs

Another way of looking at the cost of a unit of output of a business is to distinguish product costs and period costs. **Product costs** are those which are identified with goods or services intended for sale to customers. These costs belong to the products and stay with them until they are sold. If goods remain unsold, or work-in-progress remains incomplete, then the product costs stay with the unsold goods or work-in-progress under the heading of inventory (stock). **Period costs** are those costs which are treated as expenses of the period and are not carried as part of the inventory (stock) value.

Definitions

Product costs are those costs associated with goods or services purchased, or produced, for sale to customers.

Period costs are those costs which are treated as expenses in the period in which they are incurred.

Product costs include direct *and* indirect costs of production. Exhibit 17.9 sets out a statement of product cost that includes direct and indirect costs. The total of direct costs is described as the **prime cost**.

Exhibit 17.9 uses the words **production overhead** to describe the total of the indirect costs of production. Examples are:

- depreciation of machinery
- insurance of the factory premises
- rental of warehouse storage space for raw material.

There are many other types of overhead costs which you will encounter in your progress through later chapters. They all consist of indirect costs, with the type of cost determining the particular name given to the overhead cost.

Exhibit 17.9
Statement of product cost

	£	£
Direct materials		xxx
Direct labour		xxx
Other direct costs		xxx
Prime cost		<u>xxx</u>
Indirect materials	xxx	
Indirect labour	xxx	
Other indirect costs	<u>xxx</u>	
Production overhead cost		<u>xxx</u>
Total product cost		<u>xxx</u>

Definitions

Prime cost is the total of direct materials, direct labour and other direct costs.

Production overhead cost comprises indirect material, indirect labour and other indirect costs of production.

Example of product costs and period costs in a service business

A financial adviser provides each client with three hours' consultation prior to arranging a pension plan. The cost of the adviser's time is estimated at £500 per hour. Advertising costs £2,000 per month. The client is charged £2,100 commission on completion of the three-hour sequence of consultation. During one week the financial adviser provides 20 hours of consultation. The statement of costs would be:

Product cost	Labour: 20 hours at £500 per hour	£ 10,000
Period cost	Advertising	2,000

Suppose that the consultations are complete for six clients (18 hours) but unfinished for one client, who has been provided with only two hours' consultation by the end of the week. The incomplete consultation is described as work-in-progress. There was no work-in-progress at the start of the week. The calculation of profit would be:

Product cost	Sales (commission) 6 clients at £2,100 each	£ 12,600
	Labour: 20 hours at £500 per hour	10,000
	Less work-in-progress 2 hours at £500 per hour	<u>(1,000)</u>
	Product cost of goods sold	(9,000)
Period cost	Advertising	2,000
	Operating profit	<u>1,600</u>

Example of product costs and period costs in a manufacturing business

A toy manufacturer produces hand-crafted rocking horses. During one week six rocking horses are completed. The direct materials costs of wood and leather materials amount to £180 per completed horse. The indirect materials cost of glue and paint amount to £20 per completed horse. The direct labour cost for craft working is £150 per completed horse. The indirect labour cost of handling within the production department is £50 per completed horse. Advertising amounted to £1,200 per week.

Five completed rocking horses are sold for £1,000 each. There were none in inventory (stock) at the start of the week. The statements of costs would be:

		£
Product cost	Direct materials, wood & leather, 6 @ £180	1,080
	Indirect materials, glue & paint, 6 @ £20	120
	Direct labour: craft work, 6 @ £150	900
	Indirect labour: handling 6 @ £50	300
Period cost	Advertising	1,200

The calculation of profit would be:

		£	£
Product cost	Sales: 5 completed rocking horses		5,000
	Direct materials, wood & leather, 6 @ £180	1,080	
	Indirect materials, glue & paint, 6 @ £20	120	
	Direct labour: craft work, 6 @ £150	900	
	Indirect labour: handling 6 @ £50	300	
		<u>2,400</u>	
	Less unsold inventory (stock), 1 × (180 + 20 + 150 + 50)	<u>(400)</u>	
	Product cost of 5 horses sold		(2,000)
Period cost	Advertising		(1,200)
	Operating profit		<u>1,800</u>

In each of these examples the **product cost** of completed services and of goods sold is matched against sales **revenue** of the week. The **product cost** of **work-in-progress** and of unsold goods is carried in the inventory (stock) valuation to be matched against sales **revenue** of a future week. The **period costs** are all matched against sales **revenue** of the week.

In a service organisation, all costs incurred up to the point of completion of the service are regarded as **product costs**. Any costs incurred beyond the act of service, such as advertising the service or collecting cash from customers, would be a **period cost**.

In a manufacturing organisation, all manufacturing costs are regarded as **product costs**. This will include the direct and indirect costs of manufacturing. Chapter 19 will explain the methods of calculating the indirect manufacturing costs for each product item. Costs incurred beyond the completion of manufacture, such as the costs of administration and selling, are **period costs**. The valuation of unsold inventory (stock) is based on the **product cost**.

17.7 Cost classification for planning, decision making and control

Sections 17.4, 17.5 and 17.6 have described fixed and variable costs, direct and indirect costs and product and period costs. Each of these may have a role to play in planning, decision making and control. The idea of contingency, explained in Chapter 16, is important here; the classification is chosen to suit the intended use.

17.7.1 Planning

Planning involves looking forward and asking questions of the ‘what if...?’ type. Exhibit 17.10 gives examples of planning questions and sets out the cost classifications that may be appropriate to each.

Exhibit 17.10**Cost classification for planning purposes**

<i>Planning question</i>	<i>Cost classification</i>
1 What is the cost impact of a change in levels of production over a period of time?	Fixed and variable costs. Fixed costs will not be affected by production levels; variable costs will alter proportionately.
2 What is the cost effect of planning to expand operations by opening a new outlet in a separate location?	Direct and indirect costs, in relation to the location. The direct costs will include the rental and running costs of the chosen location; indirect costs will be that location's share of the general running costs of the business.
3 What is the cost impact of remaining open for longer hours to improve on existing client services?	Fixed and variable costs. The new service will incur variable costs. Will it cause any step increase in fixed costs?

17.7.2 Decision making

Decision making involves asking questions of the type 'Should we do ...?' Exhibit 17.11 gives examples of decision-making questions and sets out the cost classifications that may be appropriate to each.

For decision-making purposes, the key word is 'relevance'. The costs used in the decision-making process must only be those which are relevant to the decision. In this respect, the classification into variable and fixed costs is particularly important. That is because, in the short term, little can be done by a business in relation to **fixed costs**, so that the need for a decision may focus attention on the **variable costs**. Fiona McTaggart explains how she would use such a classification to present information for decision making.

Exhibit 17.11**Cost classification for decision-making purposes**

<i>Decision-making question</i>	<i>Cost classification</i>
1 Should the company produce components in this country or produce them overseas?	Fixed and variable costs. The variable costs of production should be compared for each country. Fixed costs are not relevant to the decision if they are incurred regardless of the location. Fixed costs are relevant if they can be avoided by changing location.
2 Should the company continue to provide a service when demand is falling?	Fixed and variable costs. The price paid by customers must at least cover the variable costs. In the longer term there must be sufficient revenue to cover variable and fixed costs.



FIONA: *The Garden Decor Company is thinking of making two garden ornaments, gnomes and herons. The variable cost of making a gnome would be £24 and the variable cost of making a heron would be £14. Market research indicates that garden ornaments of similar types are selling in the shops for around £20 each. Output up to the level of 20,000 garden ornaments, in any combination of output of each, would lead to fixed rental and insurance costs of £6,000.*

My recommendation would be that the company should not even contemplate the garden gnomes because the expected selling price of £20 will not cover the variable cost of £24 per unit. The company will make a loss as it produces each item. The selling price of the herons would cover their variable cost and make a contribution of £6 each (£20 minus £14) to the fixed cost. If they can sell 1,000 herons or more, the £6 contribution from each will cover the £6,000 additional fixed costs and any further herons sold will give a profit clear of fixed costs.

Fiona has used the word ‘contribution’ in this discussion. You can probably guess its meaning from the context in which it is used, but you will meet the word again as a technical term in Chapter 20.

17.7.3 Control

Control involves looking back and asking questions of the ‘how and why . . . ?’ type. Exhibit 17.12 gives examples of **control** questions and sets out the cost classifications that may be appropriate to each.

Exhibit 17.12

Cost classification for control purposes

Control question	Cost classification
1 How closely do the costs of each product match the targets set?	Direct and indirect costs in relation to the product. If the direct costs do not match the targets set then questions must be asked about the product itself. If the indirect costs do not match the targets then questions must be asked about the control of those costs and the method of apportioning (sharing) them across the products.
2 How closely do the costs of a service department match the budget set for the department?	Direct and indirect costs related to the department. The direct costs are closely under the control of the departmental manager, who should explain any deviations. The indirect costs are shared across several departments and so questions may be asked about the basis of apportioning (sharing) those costs.
3 Is the value of the inventory (stock) of unsold goods stated correctly?	Product costs and period costs. The unsold inventory (stock) should be carrying its share of the product costs.

Activity 17.4

Imagine you are the manager of a department store in the centre of town. Write down one planning question, one decision-making question and one control question that you might ask and suggest a cost classification that would provide management accounting information relevant to the question.

17.7.4 Cost classification to meet changing circumstances

Chapter 16 noted the contingency approach to management accounting which emphasises that management accounting should be flexible to meet changing circumstances

of planning, decision making and control. Some of the changes of recent years, to which management accounting practices have been adapted, are:

- The need to identify more closely the costs incurred in a business with the activities which drive those costs.
- The introduction of new technologies in which labour costs have diminished in relation to the cost of operating flexible computer-based operating systems.
- The reduction in inventory (stock) of raw materials and finished goods as the business has linked up with suppliers and customers to ensure that items are delivered just at the time when they are needed.
- The emphasis on managing the quality of output and the cost of achieving that quality.
- Comparing the cost structures of the business with those of others in the industry.

These have led particular businesses to develop management accounting practices which suit their particular needs. Observers of those new practices, particularly academic writers, have identified new patterns of management accounting to which they have given titles such as:

- activity-based costing
- just-in-time purchasing
- cost of quality
- benchmarking costs.

These approaches reflect dissatisfaction with the traditional approach in particular instances, but they do not indicate that the traditional approach has entirely failed. Consequently it remains necessary to study the traditional approach while having regard to continuing developments.

17.8 Cost coding

We will now look in more detail at an approach to cost recording that allows classification systems to be applied accurately and speedily.

Most costing systems are computerised. In a computerised system every cost item is given a **cost code** number which allows the cost to be traced through the computerised system. The coding is critical to effective use of the cost information. Computers allow selective retrieval of information quickly, but only if the coding is correctly designed to suit the needs of the organisation.

A cost code must be unique to the cost which it identifies. The code should be as short as possible and it is preferable to have a code structure which creates consistent images in the mind of the user. The code may be entirely numerical or may have a mixture of letters and numbers (an *alphanumeric* code).

Definition

A **cost code** is a system of letters and numbers designed to give a series of unique labels which help in classification and analysis of cost information.

The design of the coding system and the assignment of code numbers should be carried out centrally so that the system is consistent throughout the organisation. The code system may have built into it the structure of the organisation, so that the code starts by specifying a major unit of the organisation and gradually narrows down to a particular cost in a particular location. Here is Fiona McTaggart to explain a cost coding system she has recently designed.



FIONA: *This company, producing and selling books, has 15 different departments. Within each department there are up to six cost centres. There are three different types of book – reference, academic and leisure. The list of costs to be coded contains 350 items, down to detail such as bindings purchased for special strength in reference works.*

The coding is based on a six-digit alphanumeric code. The department is represented by the first digit of the code, taking one of the letters A to Z (except that the company decided not to use letters I and O because of the confusion with numerical digits). Each cost centre has a letter code, which appears in the second position. (Again the letters I and O are not used.) The next digit is the letter R, A or L depending on whether the book is reference, academic or leisure. The last three digits are numbers taken from a cost code list which covers all 350 items but which could in principle expand up to 999 items in total. Within those three digits, there is further grouping of costs by code – for example, 100 to 199 are reserved for fixed asset items; 200 to 399 are various types of material cost; 400 to 599 are various types of labour cost; 600 to 899 are a whole range of production overhead costs; and 900 to 999 are administration and selling costs.

So, under code number HCA246, it would be possible to find the cost of paper used in printing an academic textbook on the new printing machine. Working backwards through the code, item 246 is paper, letter A is an academic book, letter C denotes the new printing machine (which is itself a cost centre) and letter H indicates the printing department.

Activity 17.5

Create a six-digit coding system which would allow you to classify all the items of expenditure you make in a year. (You will need to write down the items of expenditure first of all and then look for patterns which could be represented in a code.) To test your code, ask a friend to write down three transactions, converting them to code. Then use your knowledge of the code to tell your friend what the three transactions were.

17.9 Cost selection and reporting

Once the costs have been coded, a computerised accounting system can be programmed to retrieve the costs in a systematic manner for reporting purposes. The code structure must include alphanumeric characters that cover each of the purposes for which cost is required.

The code structure outlined by Fiona McTaggart above would allow classification of cost by reference to items of output and would allow classification of cost by reference to a cost centre. A **cost centre** is only one of the units into which an organisation is subdivided for cost collection purposes. Two others are a **profit centre** and an **investment centre**. The chapter ends with definitions of the following terms that will be encountered in subsequent chapters in relation to cost selection and reporting: cost centre, profit centre and investment centre.

17.9.1 Cost centre

A **cost centre** is a unit of the organisation in respect of which a manager is responsible for costs under his or her control. A cost centre could be a location (e.g. a department) or a function (e.g. the manufacture of a product), or it could even be a production machine or group of similar machines. One essential feature of a cost centre is that it must be a homogeneous unit carrying out a single form of activity. A second essential feature is that it must correspond to an identifiable managerial responsibility.

Identification of a cost centre with managerial responsibility leads to a further type of cost classification, namely **controllable** and **non-controllable** costs. Costs allocated

to a cost centre should be classified according to whether they are controllable or non-controllable by the manager of that cost centre.

Definitions

A **cost centre** is a unit of the organisation in respect of which a manager is responsible for costs under his or her control.

A **controllable cost** is one which is capable of being managed by the person responsible for the cost centre, profit centre or investment centre to which the cost is reported.

17.9.2 Profit centre

A **profit centre** is a unit of the organisation in respect of which a manager is responsible for revenue as well as costs. In practice an operating division would be a profit centre if it produced output whose selling price could be determined in some manner. The selling price could be based on an internal transfer between departments at an agreed price. It would not necessarily require a sale to a third party outside the business entity.

A profit centre is similar to a cost centre in that it must relate to an area of managerial responsibility, although the activity may be less homogeneous than that of a cost centre. The profit centre, though, is likely to contain more than one cost centre.

Definition

A **profit centre** is a unit of the organisation in respect of which a manager is responsible for revenue as well as costs.

17.9.3 Investment centre

An **investment centre** is a unit of the organisation in respect of which a manager is responsible for **capital investment** decisions as well as **revenue** and **costs**. These decisions could be related to such matters as purchase and disposal of equipment or acquisition of premises. The investment centre will be undertaking business activity in such a way that it will probably carry out an operation which is significant to the overall profit-earning capacity of the organisation. As is the case with a profit centre, the investment centre must relate to an area of managerial responsibility, but the activities of the investment centre need not be homogeneous. There will probably be a number of cost centres and profit centres within the investment centre.

Definition

An **investment centre** is a unit of the organisation in respect of which a manager is responsible for capital investment decisions as well as revenue and costs.

17.10 Summary

Key themes in this chapter are:

- Costs may be classified using one or more of the following pairs of definitions
 - **fixed/variable cost**
 - **direct/indirect cost**
 - **product/period cost.**

The choice of cost classification should be matched to the management function of planning, decision making or **control**.

- **Cost coding** is essential to make the cost classification system operational in a computer-based recording system.
- Cost classification must be relevant to the responsibility level for which the costs are reported, which may be a **cost centre**, or a **profit centre**, or an **investment centre**.

The chapter has set out the basic terminology of cost classification to be used throughout the book. In later chapters you will meet more detailed classifications such as controllable/non-controllable and avoidable/unavoidable.

Further reading

The following references go well beyond a first level course but they are noted so that you may delve more deeply into any of the cost aspects outlined in this chapter. You should, however, be aware that there is no standard terminology in the field of management accounting, so every author will have a slightly different form of wording to define a given concept.

CIMA (2000) *Management Accounting Official Terminology*, Chartered Institute of Management Accountants.

Innes, J. (editor) (2004) *The Handbook of Management Accounting*, third edition, Chartered Institute of Management Accountants CIMA Publishing/Elsevier.

QUESTIONS

The Questions section of each chapter has three types of question. 'Test your understanding' questions to help you review your reading are in the 'A' series of questions. You will find the answers to these by reading and thinking about the material in the book. 'Application' questions to test your ability to apply technical skills are in the 'B' series of questions. Questions requiring you to show skills in problem solving and evaluation are in the 'C' series of questions. A letter **[S]** indicates that there is a solution at the end of the book.

A Test your understanding

- A17.1** Explain what is meant by 'cost'. (Section 17.1)
- A17.2** Explain the meaning of 'activity' and 'output'. (Section 17.3)
- A17.3** For each of the following cost classification terms, give a definition and give one example of how the definition applies in practice to a person providing car repairs from a rented garage:
- variable cost; (Section 17.4.1)
 - fixed cost; (Section 17.4.2)
 - semi-variable cost; (Section 17.4.3)
 - step cost; (Section 17.4.4)
 - direct cost; (Section 17.5)
 - indirect cost; (Section 17.5)
 - product cost; and (Section 17.6)
 - period cost. (Section 17.6)
- A17.4** Explain how each of the following cost items could be classified under more than one of the headings given in question **A17.3**:
- raw materials to be used in production;
 - subcontracted labour in a special contract; and
 - rent of a warehouse for one year to allow temporary expansion of output.

- A17.5** Classify each of the following as being primarily a fixed cost or a variable cost, and, if necessary, explain why you think such a classification would be difficult without more information being provided (Section 17.4):
- direct materials;
 - factory insurance;
 - production manager's salary;
 - advertising of the product;
 - direct labour;
 - indirect labour;
 - depreciation of machinery;
 - lubricants for machines;
 - payment of a licence fee for the right to exclusive manufacture; and
 - canteen manager's salary.
- A17.6** What are the component costs of the total cost of production? (Section 17.5)
- A17.7** State the cost headings which are combined to give each of the following: (Section 17.6)
- prime cost;
 - production overhead cost;
 - total product cost.
- A17.8** Explain how cost classification must be matched to the purpose of planning, decision making or control. (Section 17.7)
- A17.9** How does cost classification vary to meet particular circumstances? (Section 17.7.4)
- A17.10** Explain the importance of an unambiguous system of cost coding. (Section 17.8)
- A17.11** What are:
- a cost centre; (Section 17.9.1)
 - a profit centre; (Section 17.9.2) and
 - an investment centre? (Section 17.9.3)

B Application

B17.1

Give an example of a management planning question for which it would be useful to classify costs as fixed and variable.

B17.2

Give an example of a management planning question for which it would be useful to classify costs as direct and indirect.

B17.3

Give an example of a management control question for which it would be useful to classify costs as direct and indirect.

B17.4

Give an example of a management control question for which it would be useful to classify costs as period and product costs.

B17.5 [S]

- Identify the cost behaviour in each of the following tables as:
 - fixed cost; or
 - variable cost; or
 - semi-variable cost.
- Draw a graph for each table to illustrate the cost behaviour.

Cost X

Output (units)	100	200	300	400	500
Total cost (£)	600	600	600	600	600
Unit cost (£)	6.00	3.00	2.00	1.50	1.20

Cost Y

Output (units)	100	200	300	400	500
Total cost (£)	300	600	900	1,200	1,500
Unit cost (£)	3.00	3.00	3.00	3.00	3.00

Cost Z

Output (units)	100	200	300	400	500
Total cost (£)	660	720	780	840	900
Unit cost (£)	6.60	3.60	2.60	2.10	1.80

B17.6 [S]

Oven Pies Ltd plans to buy a delivery van to distribute pies from the bakery to various neighbourhood shops. It will use the van for three years. The expected costs are as follows:

	£
New van	15,000
Trade-in price after 3 years	600
Service costs (every 6 months)	450
Spare parts, per 10,000 miles	360
Four new tyres, every 15,000 miles	1,200
Vehicle licence and insurance, per year	800
Fuel, per litre*	0.70

*Fuel consumption is 1 litre every five miles.

- Prepare a table of costs for mileages of 5,000, 10,000, 15,000, 20,000 and 30,000 miles per annum, distinguishing variable costs from fixed costs.
- Draw a graph showing variable cost, fixed cost and total cost.
- Calculate the average cost per mile at each of the mileages set out in (a).
- Write a short commentary on the behaviour of costs as annual mileage increases.

B17.7 [S]

During the month of May, 4,000 metal towel rails were produced and 3,500 were sold. There had been none in store at the start of the month. There was no inventory (stock) of raw materials at either the start or end of the period. Costs incurred during May in respect of towel rails were as follows:

	£
Metal piping	12,000
Wages to welders and painters	9,000
Supplies for welding	1,400
Advertising campaign	2,000
Production manager's salary	1,800
Accounts department computer costs for dealing with production records	1,200

- (a) Classify the list of costs set out above, into product costs and period costs.
- (b) Explain how you would value inventory (stock) held at the end of the month.

C Problem solving and evaluation

C17.1

Supermarket checkout operators are paid a weekly wage plus overtime at an hourly rate. One operator has recently resigned from work. The supermarket manager has been asked whether the direct costs of the supermarket operation could be maintained within the annual target by not filling the vacancy created. What should be the reply?

C17.2

Tots Ltd manufactures babies' play suits for sale to retail stores. All play suits are of the same design. There are two departments: the cutting department and the machining department. You are asked to classify the costs listed below under the headings:

- (a) Direct costs for the cutting department.
- (b) Direct costs for the machining department.
- (c) Indirect costs for the cutting department.
- (d) Indirect costs for the machining department.
- (e) Direct costs for the play suits.
- (f) Indirect costs for the play suits.

List of costs

- (i) towelling materials purchased for making the play suits;
- (ii) reels of cotton purchased for machining;
- (iii) pop-fasteners for insertion in the play suits;
- (iv) wages paid to employees in the cutting department;
- (v) wages paid to employees in the machining department;
- (vi) salaries paid to the production supervisors;
- (vii) oil for machines in the machining department;
- (viii) rent paid for factory building;
- (ix) depreciation of cutting equipment;
- (x) depreciation of machines for sewing suits;
- (xi) cost of providing canteen facilities for all staff.

Cases for study groups

Case 17.1

You are the management team in a business which makes self-assembly kitchen units and sells them to large do-it-yourself stores. One person should take on the role of the financial controller but the rest of the team may take any managerial roles they choose. Each manager will have responsibility for a cost centre. The group should decide, at the outset, on the name and purpose of each cost centre.

In stage 1 of the team exercise, each manager should write down the name of the cost centre and a list of the costs for which the manager expects to have responsibility. A copy of the cost centre name and the list of costs should be supplied to each member of the team.

In stage 2, each manager should separately write down his or her requirements from a company-wide cost coding system, yet to be designed, which has been specified in outline as having six alphanumeric characters. Each manager should also make a note of any costs which are shared with another manager or managers.

While the managers are carrying out the second stage, the financial controller should prepare a cost coding system which would meet the needs as specified on the lists of costs provided by each manager from stage 1.

In stage 3, the group should come together for a management meeting at which the financial controller will provide his or her cost coding system and each manager will respond with his or her ideas. If possible, a mutually agreed solution should be found but, at the very least, the group should identify the areas where further negotiation will be required. Finally, the group should make a five-minute presentation to the class describing the negotiations on the coding system and commenting on the practical problems of such negotiation.

Case 17.2

The group is the management team of a supermarket chain operating ten shops in out-of-town locations. Each member of the group should choose a management role, one of which must be the financial controller. Work together to prepare a proposal for establishing one profit centre, together with three cost centres within the profit centre for which each manager will be responsible, writing a definition of the responsibilities of each profit centre and cost centre.

Then work together further to produce a list of costs for each cost centre, in a table as follows:

<i>Type of cost</i>	<i>Fixed/variable cost</i>	<i>Direct/indirect for the cost centre</i>	<i>Product/period cost</i>
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Set out *one* question relating to planning, *one* question relating to control and *one* question relating to decision making. Explain how the table of cost classification will help answer each of these questions.