Chapter 2
COST ANALYSIS AND DECISION MAKING

Key Learning Objectives

By the time you have finished studying this chapter, you should be able to:

- describe how costs may be classified in both subjective and objective ways;
- define and identify direct and indirect costs and categorise them into their subdivisions of labour, materials and overheads;
- explain how costs behave at various levels of activity;
- classify costs for control and decision-making purposes.

Introduction

In Chapter 1 we explained the meaning and nature of management accounting, described the scope and content of the discipline, discussed past and current issues in management accounting and, finally, outlined the factors which are important when designing management accounting systems. In this chapter we begin to develop the fundamentals of cost accounting which underpin these concepts and issues. This chapter is therefore aimed at ensuring that you have a fundamental grasp of the basics as this is the bedrock upon which an ability to develop the interpretation skills of the management accountant is founded. In essence, these skills are based on the ability to understand the basis on which financial information is compiled and provided in a business environment. This applies whether the business operates in the private sector or is regarded as providing public sector services. The chapter thus contains a number of basic definitions in addition to fostering the development of analytical and critical skills.

The chapter develops what has been described as 'basic knowing' (Coombs *et al.*, 2000), in that basic concepts have to be understood before moving on to develop more advanced skills of interpretation. Hence, this explains their introduction at this stage of the text. We also introduce these concepts in a variety of organisations to show that management accounting is relevant not only to what is traditionally seen as its home in

manufacturing industry but also to a wide range of other sectors of the economy, including the public sector. This move away from manufacturing industry has been highlighted by the changing nature of western economies with their reduced emphasis on heavy industry, the growth in the service sector and the almost infinite demand for public sector services despite finite resources.

Cost Management Essentials – The Basic Process and Requirements

The basic requirement in the management of the business process is for the provision of information for decision-making purposes. The nature of these decisions depends on the task in hand. Information has to be tailored to the needs and abilities of managers making decisions, but its foundation in a management accounting context is based on the attribution of costs to cost objectives. A cost objective is a purpose or activity for which a distinctly identifiable measurement of cost is desired in order that a decision can be made. In essence, the purpose is to attract the attention of managers so that they can then move into problem-solving mode. It will be noted that this emphasises the importance of information being in a format that is relevant to the decision required and the level of managers making the decision. It also implies that information, in addition to being relevant, has to be meaningful, accurate, timely and in a format suitable for use by the decision maker. This is inevitably a challenge for any accounting system or, indeed, management accountant designing the accounting information system to provide what is required by decision makers.

Fundamental in this process is the definition of the cost unit, the unit of product or service that an organisation produces. As Upchurch (1998: 35) points out, this 'must be an accurate reflection of the nature of the output to which costs are attributed', otherwise, if it is wrongly defined, then there is every chance that cost attribution will be incorrect.

It is conventional in management accounting texts to assume that all businesses aim to maximise profits as per the traditional view expressed in the neo-classical economics model. This is rather a simplistic assumption of the real world and is further discussed in Chapter 10, where agency and other theories are raised. It is presented here, however, since profit under this definition is seen as the sole function of business and is presented in many management accounting texts as somehow being self-explanatory without any attempt being made to discuss the problems of measuring 'profit'.

There are numerous definitions of what 'profit' is, as profit can be measured, for example, from an accountant's, an economist's and a taxation authority's perspective. Under these various definitions we can have a wide range of potential profit figures even in relatively straightforward companies.

Simplified definitions are as follows:

- Accounting profit is an improvement in the financial position through the excess of accounting revenue over accounting cost over a defined accounting period.

- In micro-economics economists consider the opportunity cost of capital provided by entrepreneurs (also termed 'normal profits') as a cost of production. In macro-economics the term 'profit' excludes interest on borrowed capital but not the return on the capital provided by the owners (Baring Asset Management, 1997: 217).
- Taxable profits depend on the rules set by the tax body. In the United Kingdom depreciation is normally disallowable (excluding certain intangible assets and finance leases) in computing taxable profits, being replaced by a system of capital allowances.

In the accounting context the use of various legally acceptable financial accounting techniques in stock valuation, assessing the provision for bad and doubtful debts, the treatment of an item as capital expenditure as opposed to revenue expenditure, the depreciation rates judged appropriate and applied to plant and machinery, the definition of materiality of an item and so on will have a significant impact on the financial results shown. Large-scale publicly quoted companies have been known to use these techniques to smooth profit figures (with or without the knowledge and agreement of their auditors) to manage stock market expectations, their share price and their dividend distribution policy.

As has just been indicated, a wide range of 'profits' are possible, yet profit is used as an essential measurement basis to assess the performance of a business by a wide range of commentators both internal and external to any business organisation. By using it as such a measure we are attempting to show whether it has been worth an enterprise undertaking any activity in the period of operation being measured (year, six months, week or whatever). This concept of performance measurement and the difficulties associated with measuring profit also applies to future projections of profitability and should be borne in mind when the reader comes to budgeting in subsequent chapters. It can thus be argued that the term 'profit' should carry a health warning for readers and any analyst on the figures produced.

'Profit' therefore depends on how the managers of the business define (whether actively, or passively through ignorance of accounting techniques) the profits that they wish to achieve. This will have obvious implications for the management accounting reporting system and the actions taken as a result of information produced. It may well be there is a surplus of financial benefits over financial costs in an accounting period. This would, however, be specific to the company as it defines the term 'surplus' since it expresses the financial performance the company is attempting to measure through the targets set by management. Readers should also remember that we are not talking about cash flows but about the benefits earned and costs expended in a period arising from the productive activity of the business during that period. These costs in measuring profit thus include non-cash flows such as depreciation.

In 'not for profit' organisations, as is self-evident, the organisation exists to achieve some benefit other than profit. Thus, we have charities which exist to further the cause of the specific charitable functions for which they were established and organisations such as the NHS and local government providing a national health service and local

services such as education and leisure. In the case of a charity, its objective will be to maximise its revenue over its costs to maximise the achievement of its charitable functions. Thus its management accounting system will be established and run to report on how well the organisation is doing in achieving this objective. In the case of the NHS, the more economically, efficiently and effectively it use its resources, the greater the potential impact on satisfying patient needs. Where it provides services to the private health sector it will need to know the cost of those services so that it can make decisions on how it recovers those costs and at what price. Local government will have services for which it charges and may even aim to make profits (such as leisure centres), but many local government services will be provided below cost. The financial objective of local government (as with the NHS) therefore is to manage all its services on the general principles of economy, efficiency and effectiveness to reduce the calls on both local and national taxpayers who fund the majority of local government expenditure.

To turn to cost analysis, all expenditure can be divided into the groups corresponding to the activities of the concern under consideration. If we consider a manufacturing environment, the activities of the enterprise can be divided into expenditure on manufacturing, administration expenses, selling expenses and distribution expenses. For the service industry, expenditure on manufacturing can be substituted with expenditure on service delivered.

The total expenditure of a manufacturing business can be subdivided as shown in Figure 2.1. Ultimately the total cost of sales can be compared with the total income for the period resulting in a profit or loss for that period, as discussed above. A similar analysis could be performed for a service industry but excluding, of course, the manufacturing elements.

Direct labour, direct materials and direct expenses comprise *prime cost* and, together with production overheads, comprise total production costs. In more detail:

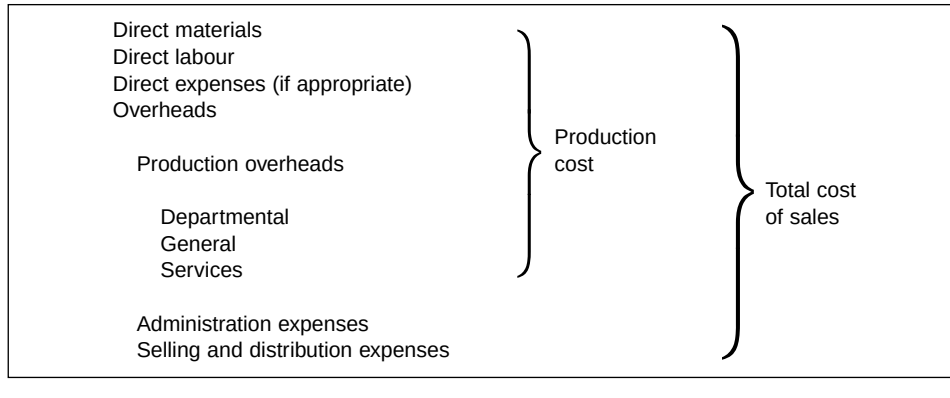

Figure 2.1 Total cost of sales analysis, manufacturing industry

- *Direct materials* comprises all material purchased for a particular job, material acquired and later issued from stores, components purchased or produced material passing from one process to another, and primary packaging materials. Items such as import duties, transport costs are also part of direct materials costs. A *de minimus* rule will also apply to items of minimal cost – meaning that there are items below which it is not worth the time, cost or effort of charging what could be regarded as the direct expenditure of manufacturing a product directly to that product. These costs will be treated as indirect expenditure (overheads). An example of direct materials where the product is a car would be the metal used to make the body shell. In essence, direct materials can be clearly observed in the product manufactured.
- *Direct labour* is the labour expended in making the product. Wages paid to skilled and unskilled workers for work rendered can be charged directly to products, hence the term direct labour. Other similar terms include process labour, productive labour and operating labour. In our car example the direct labour element would be the person who assembled the vehicle. Where the product is a service such as a taught class in a university, the direct labour is the lecturer standing in front of the class. Wages of foremen, storespersons and internal transport drivers would be regarded as indirect as they cannot be traced directly to a particular job. In the university case indirect costs would be the academic registry as it does not have direct teaching contact with students.
- *Direct expenses* are those costs other than direct materials or direct labour that are incurred in the production of a product. An example would include the hire of special tools to manufacture a particular product or deliver a specific service in the service sector.

You will have noticed that all the above costs are described as *direct*. All other costs are *indirect* – that is, overheads. While there are elements of subjectivity in the classification of direct costs, technical expertise exercised through subjective judgements plays a major part in dealing with overheads, particularly in any allocation to products. It should also be pointed out that employees working in a marketing department, for example, are a direct cost of the marketing function. In terms of the production department, however, such individuals are an overhead as they do not produce the company's product. We can further classify overheads as follows:

- *Production overheads* This category of cost covers all indirect expenditure incurred, from the receipt of the order to the dispatch of the completed goods. Other terms which describe such expenditure include 'factory overhead' and 'works overhead'. Examples are: rents, rates and insurance, excluding those that can be apportioned to the general administrative office, selling departments or warehousing and distribution areas; indirect labour, such as supervision costs, salary of the works manager, storespersons, gauging and testing, idle time of operatives, works security; consumable stores and all types of indirect material, including such items as oil and greases; depreciation of factory plant, vehicles and buildings; sundry expenses, for example, performance rights licences for factory music.

- *Administration overheads* comprise all costs and expenses incurred in the direction, control and day-to-day administration of the organisation. Examples include office lighting and heating, accountants' salaries, credit management, and directors' salaries.
- *Selling and distribution overheads* comprise the costs of selling and distributing goods to the customer or client. They therefore include the payment of salaries and commissions to sales staff, training costs, preparation of tenders, rent of sales offices, costs of transportation, packaging, despatching and so on. Selling and distribution costs can be analysed by function (e.g. warehousing or advertising) or by location (e.g. by sales territory).

The distinction between direct and indirect costs is directly related to the cost objective. If the cost objective is the establishment of the costs of selling and marketing then the salaries of salesmen and cost of promotion will be regarded as a direct cost. The costs cannot, however, be traced directly to products and are thus indirect for product valuation purposes. It should also be remembered that, for example, in a public sector organisation the cost of an accountant working in the central finance department will be a direct cost of that department. It is, however, an indirect cost of say, the education department which uses the individual to provide financial advice on the education service.

Cost Classification

Costs can basically be divided into costs for stock valuation, costs for control and costs for decision making. Stock valuation is closely linked with profit measurement and the matching concept familiar to students of financial accounting and is covered in Chapter 3. Unexpired costs are those costs that are expected to make a contribution to profit in some future accounting period and are carried forward as assets on the balance sheet. They will become an expense in some later period. Any cost consumed during a period and thus seen as having no future earnings potential is charged to revenue in the current period and is thus treated as an expired cost. In a manufacturing environment all manufacturing costs are regarded as product costs and non-manufacturing costs are treated as period costs.

Allocating costs for control is concerned with responsibility accounting. Product costs in themselves are inadequate to perform this function as a product may go through several manufacturing processes. In this case it is likely that these processes would be managed by several different people. Responsibility accounting is based on the principle of recognising an individual's area of responsibility and holding that individual accountable for his/her performance for costs (and revenues as appropriate) incurred where they are under that individual's control.

Responsibility centres are divided into three types:

- cost centres where managers are held responsible for expenses under their control;
- profit centres where managers are held responsible for both sales revenue and expenses;
- investment centres where managers are normally held responsible not only for sales revenue and expenses but also for capital investment decisions.

In the previous paragraph it was stated that managers should be only held accountable for items within their control. While ultimately all costs are controllable by someone within an organisation, clearly the costs which are controllable at the highest level of management differ from those controllable lower down the organisation. This has significant implications for accountants in terms of the design of performance reports.

As a general rule, the lower down within an organisation that a manager operates the more detailed is the performance report, although again it should only contain information on costs controllable by that manager otherwise negative behavioural implications can arise (Argyris, 1953). It also leads on to the concept of exception reporting, so that management can concentrate on those items which are important and controllable by them in a given situation.

A controllable cost can be defined as a cost over which a manager has the ability to influence behaviour. If the manager has no ability to control or influence a cost it is clearly uncontrollable at that manager's level – it is beyond the manager's span of control. As an illustration, a production manager may be able to control the usage of material but contracts for that material are let through a central purchasing department which negotiates price. In any budget variance for materials the usage variance of the material is controllable by the production manager, but any price variance is the responsibility of the purchasing arm of the organisation. Responsibility has thus been identified with the power to control.

While cost accounting is concerned with cost collation and the calculation of product costs for profit measurement, management accounting is concerned with the proactive generation of financial and non-financial information for decision making. In the public sector, costing information (to simplify) is concerned with creating budgets for agreed policy goals and monitoring those budgets. Costing information is accumulated via the accounting system of an organisation. Management accounting information is accumulated both within and outside the standard cost-gathering system with the objective of helping managers evaluate alternative courses of action to reach a decision. By its very nature, management accounting information is non-standard and decision-specific. The more complex the decision, the more complex the probable information set although managers need to be aware of the danger of being overwhelmed by the volume of data (Simon, 1953).

This leads into the discussion of various costs classifications for decision making:

- cost behaviour by volume of activity;
- sunk costs;
- relevant and non-relevant costs;
- avoidable and unavoidable costs;
- opportunity costs;
- marginal or incremental costs.

Cost Behaviour by Volume of Activity

Costs can vary by the level of activity, and this has important implications for decision making. A manager therefore has to be aware of how costs will behave in a specific situation. Typically managers might ask:

- What will happen to material costs if output rises?
- What sales level of units do we need to sell to cover our costs and at what price?
- If we expand production, what will happen to labour costs?
- How do energy costs behave at various levels of production?

These questions raise issues about how accountants estimate costs and revenues for a variety of activity levels and how they present that information to managers.

The traditional terms used in this respect are fixed costs, variable costs, semi-variable costs and stepped or semi-fixed costs. Figure 2.2 illustrates these how these categories of costs behave in relation to output changes.

- *Fixed costs* remain constant over a wide range of activity levels for a specific period of time. Examples of fixed costs include depreciation of buildings, rent and rates, and management salaries.
- *Variable costs* are assumed to vary in the short term directly in proportion to output. These costs are thus assumed to be linear and can thus be represented by a straight line. Examples of variable costs include fuel for motor vehicles (directly variable with mileage covered), sales commissions (directly variable with product sold), piecework labour costs (directly variable with produced units) and direct material costs (directly variable with product manufactured).
- *Semi-variable costs* can be illustrated by activities such as photocopier rental. Under such agreements there may be a fixed rental change followed by charge per copy made. The rental is thus fixed but total cost will depend on the addition of the variable element. A similar cost pattern exists for any utility bill which has a standing charge element.
- *Stepped* or *semi-fixed costs* remain constant within a band of activity. Here we find that over a band of productive activity there is no change, but if production levels fall or rise we may need to either lay off or employ extra labour thus progressing to the next step up or down.

It will be noted from Figure 2.2 that it is assumed that all costs exhibit straight-line behaviour. In the economist's model the economist assumes that the average unit cost declines on the basis, for example, that a firm obtains discounts for bulk buying of material and can also benefit from the division of labour as it expands. These are regarded as economies of scale. At the other extreme, as the firm becomes too large it suffers diseconomies of scale. These factors inevitable lead to a different cost function for the economist from that of the accountant. The key factor to remember, however, is that the accountant is interested in representing costs over the range of output that a firm reasonably expects to correspond to the reality of its operating environment. This is the concept of *relevant range* and also broadly represents the output levels over which the firm has gained experience of operating and for which cost data are available from the business's accounting records.

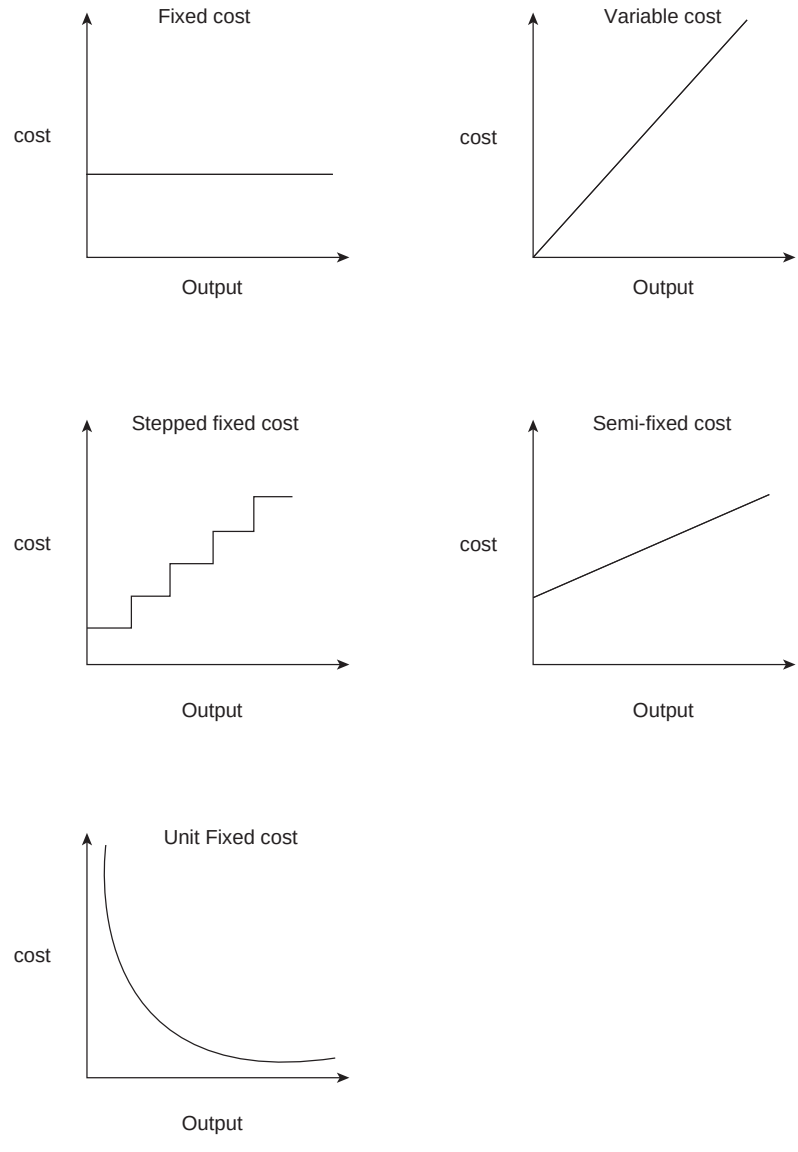

Figure 2.2 Cost behaviour against output change

Sunk Costs

These are costs which are the result of previous decisions of the enterprise and which will be unaffected by any future decision as they have already been incurred. An example is expenditure on materials that were bought in anticipation of a contract which never came to fruition. The materials are still in store and the decision to buy cannot be undone.

Relevant and Non-Relevant Costs and Revenues

In making decisions managers, in whatever enterprise they work, are primarily concerned with those costs and revenues which will be changed by their decisions. They are not interested in costs and revenues which will be unchanged by their decisions. In the short term not all costs and revenues are relevant for decision making. Costs which will be unaltered in the short term are fixed costs and include such items as rents and rates. When considering a decision on transporting goods the road tax and insurance already paid on a vehicle are fixed. Consequently, the only costs that will be altered by a decision to transport goods by road by the company's own vehicles will be any variable costs that the firm will incur (e.g. extra fuel costs, and possible bonuses paid to drivers).

Avoidable and Unavoidable Costs

These are effectively an alternative perspective on relevant and non-relevant costs. Avoidable costs are those costs that have to be incurred if a particular course of action is taken. Unavoidable costs cannot be saved.

Opportunity Costs

These measure the cost of an opportunity forgone to pursue a particular course of action. By their nature, opportunity costs are not based on past payments but are an estimate of the costs of following or not following a particular course of action. The cost arises because of the scarcity of resources and because there is competition for the use of these resources.

Marginal or Incremental Costs

These are additional costs or revenues that arise as a result of following a particular course of action. Incremental costs may include fixed costs depending on the nature of the decision being taken. Suppose an estate agent is considering increasing the size of the office accommodation available to the business by renting premises next door. Rent, while a fixed cost for the current premises, will increase on signing the contract for the new office and thus constitute an incremental cost to the business.

Unit Costs

Unit costs are widely used across all sectors of the economy to compare and control financial performance. At its most basic a unit cost is simply the total cost of producing a number of units divided by the number of units produced. If, for example, a restaurant produced

Table 2.1 Example of a unit cost statement: comparative food costs for four schools providing school meals, March–December 2004

	School A		School B		School C		School D		TOTAL	
	Cost (£000)	Unit cost (p)	Cost (£000)	Unit cost (p)	Cost (£000)	Unit cost (p)	Cost (£000)	Unit cost (p)	Cost (£000)	Unit cost (p)
Food	16.00	35	31.50	40	27.50	45	10.00	28	85.00	38
Energy	3.60	8	4.10	5	2.00	3	3.00	9	12.7	6
Kitchen staff										
Cooks	9.00	20	18.00	23	18.00	29	9.00	26	54.00	25
Asst. Cooks	12.00	27	6.00	8	12.00	20	12.00	35	42.00	19
Maids	13.50	30	13.50	17	13.50	22	13.50	39	54.00	24
Cleaners	3.00	7	7.00	9	6.00	10	5.00	14	21.00	10
Overheads	3.75	8	4.45	6	4.95	8	3.95	11	17.10	8
Supervisor	5.00	11	5.00	6	5.00	8	5.00	14	20.00	9
Capital charges										
Depreciation	10.00	22	9.00	12	9.00	15	7.00	20	35.00	16
Interest	4.00	9	2.00	2	2.00	3	2.50	7	10.50	5
Admin charge	9.00	20	15.60	20	12.24	20	6.97	20	43.81	20
Total	88.85	197	116.15	148	112.19	183	77.92	223	395.11	180
Meals provided	45,000		78,000		61,200		34,850		219,050	
No. of pupils	400		650		550		320		1920	

10,000 meals at a cost of £20,000 during an accounting period the unit cost of a meal would be £2. If all meals had been sold for £4 we would have made £20,000 profit. If we are looking forward the £2 unit cost could be the benchmark against which to measure and control future performance.

Table 2.1 is an example of a unit cost statement. The objective is the provision of school meals, and we are interested in the cost per meal provided. The categorisation of costs into their individual elements such as pay, food and energy is the subjective element of the statement. In such public sector examples the objective is defined as the service being provided (e.g. education), while the individual categories of expense represent the subjective elements as a decision has to be made on how to code items of expenditure. This

example has been developed as many readers will be familiar with the provision of school meals through personal experience (good or bad!) and it could obviously be extended to a restaurant or even a hotel with relatively minor changes. Indeed, in the school situation depicted we could add in the income received from the sale of meals and work out the profit or loss on the provision of school meals.

In Table 2.1 it is evident that the provision of meals in kitchen B is considerably more efficient in cost terms than in A, C or D. Its cost per meal provided, 148p, is 75% of A, 81% of C and 66% of D. No income per meal has been shown for each kitchen to simplify the example, but it could be common across all three kitchens, given the subject of the example. Examination of the individual cost components reveals that kitchen B's lower unit costs are the result of a variety of factors. Food costs are the highest of all four kitchens but the unit costs for staff are the lowest. Managers would be interested in establishing the reasons for these variations and in doing something about them. It might be possible to direct any savings in the kitchens to the provision of further teaching support.

Food costs vary considerably. This might be caused by:

- overstocking, leading to waste;
- overprovision of portions, indicating a lack of menu and portion control;
- fraud and theft;
- buying from local suppliers rather than cheaper contractors;
- quality of food in the meals varying between the kitchens;
- special dietary needs of certain pupils (e.g. diabetic meals).

Note that we have no answers, but managers are in a position to raise questions.

Energy costs per meal vary between kitchens but judgementally are rather low when compared to total cost. It may not be possible to influence these costs other than by relatively simple measures, such as encouraging staff to turn off lights and gas when the kitchens or equipment are not in use.

Further analysis of Table 2.1 reveals cooks are paid £9,000 per annum, assistant cooks £6,000 per annum and kitchen maids £4,500 per annum. This gives the ability to produce a workload analysis, as set out in Table 2.2. The table does not tell us which kitchen is the most efficient, but it demonstrates considerable variation in workloads between staff and kitchens. This would require further study to see if the solution was to relocate staff or make staff redundant. This might be achieved via work study analysis.

Table 2.2 Workload analysis of meals per worker

Staff	Kitchen A	Kitchen B	Kitchen C	Kitchen D
Cooks	45,000	44,000	30,600	34,850
Asst. cooks	22,500	78,000	30,600	17,425
Kitch. maids	15,000	26,000	20,400	11,617

Cleaning costs vary per meal (although no mention has been made of floor area). It might be possible to contract out the cleaners if this has not already been done.

The original table/report can also be designed to highlight responsibilities. The upper part of the table focuses on costs directly incurred in the preparation of meals and presumably within the control of the cook. Kitchen staff are appointed by someone – the question is who? The employment of staff generates overheads on wages and salaries. These overheads (pension and national insurance) may be outside the direct control of the supervisor if he/she did not appoint but will depend on the number of staff employed. The supervisor line itself will also be the responsibility of a higher-level manager who may be the head teacher but is more likely to be based at a central office running the school meals service for the organisation. It should be noted that the statement is a nine-month analysis, implying that this type of data is gathered regularly. It could be used to project expenditure forward to compare against projected costs and income to act as a budgetary control statement. It is clearly meant to stimulate action or at least identify that action may be required.

The administration charge represents a fixed charge and in the example is aimed at recovering in the cost of the meal a set contribution (20p) towards the administration costs of the scheme. It thus assumes a central administration function somewhere within the organisation. This cost can only be reduced by questioning the value for money provided by that function.

It should be noted that the emphasis in Table 2.1 is on unit costs; nothing is said about the quality of meals. This is an emphasis on throughputs as opposed to outcomes. In compiling any report on the provision of meals the views of users of the service should be sought to present a more rounded picture when considering how well the provision of meals is going.

Unit cost statements broadly contribute to the management of an organisation in three main ways. First, they serve as an indicator of efficiency relative to other similar functions or providers within an organisation or between organisations. For the school meals service, they allow it to compare its cost with other internally generated data for any other kitchens or possibly those of other school meals organisations if it is part of a trade association. In the UK public sector, where data are readily available on comparative performance, the Audit Commission in England and Wales makes considerable use of unit costs for this purpose, generating batteries of comparative statistics which it can use as a starting point for analysis.

Second, unit costs can be used as an indicator of efficiency over time as data builds up on performance. This allows us to measure and compare the outputs (and outcomes) of the same function from year to year. This can show whether efficiency is increasing or decreasing over the period being measured. It also hopefully will enable us to judge if the outcomes (including qualitative factors) are also improving. Over time inflation will tend to create a problem as it increases the costs of providing a service. In order, therefore, to make costs (and income) truly comparable, the effects of inflation will need to be considered and removed from the calculation such that the ‘real’ picture may be understood. This is done by using price index data which are specific to the cost element, such as pay awards for salaries and wages and the utility cost index for such services as gas and electricity.

Third, unit costs can be used to set unit cost standards against which actual performance can be monitored. They thus allow managers to develop an understanding of cost behaviour and facilitate cost control.

Unit cost measures need to be used with considerable care. Some of their limitations are outlined below:

- Rather than outcomes, they emphasise throughputs.
- The quality of performance maybe be ignored in a simplistic analysis.
- They may not recognise case mix differences (e.g. open plan offices as opposed to traditional offices would distort any analysis).
- Comparisons need to be made against best practice if efficiency gains are to be maximised.
- Overheads may be charged in different ways between comparators, thus distorting any comparisons.
- Alternative depreciation techniques may affect costs and thus comparisons.

There is a danger that throughputs can be taken as a proxy for outcomes. This assumes (dangerously) that there is a linear and direct relationship between throughputs and outcomes. It also implies the assumption that all outcomes can be proxied by the throughput indicator (e.g. the number of meals in Table 2.1), but this is simplistic and significant extra information is therefore required to inform management decisions.

Throughput provides no indicator concerning the quality of performance; as indicated above, the meals may be provided to different standards of quality in each of the four kitchens, and this may explain all or part of the variations in, say, food costs. If differences in standard are laid down by the school meals service, then such differences may be acceptable. If they are not, and differences in meal standards are observed, then action needs to be taken.

This could be related to the problem of case mix. If we now turn to another example, the cleaning of offices, one cannot usefully compare the costs of three offices where one is a modern office block but not open plan (A), one is modern and open plan (B) and the third is old-fashioned and cramped (C). No information is available on best practice, so even if one office achieves greater efficiencies and cost reductions it may still be operating sub-optimally. Office C will require more time to clean and possibly a higher cleaning staff ratio than either A or B. What the cost statement and attendant commentary should do for managers is to reinforce the need to recognise qualitative factors in any cost analysis.

While overheads are discussed in a subsequent chapter, in the school meals example the cost of the supervisor is an overhead and his/her costs have been allocated equally to the kitchens. This distorts the cost of each kitchen as the allocation could have been done on a variety of other bases, for example, the number of staff supervised, the number of meals provided by each kitchen, or even floor area. While these bases for allocation have varying technical merits, the total cost of the supervisor has to be borne by the business and it is only the subjective allocation of cost between the kitchens in this case that could change since the total cost of the supervisor is fixed at £20,000. Similarly, if cooks, assistant cooks or kitchen maids were reallocated between the three kitchens there would be a

transfer of costs (including staff-related overheads) between kitchens. No savings would be incurred unless some staff were made redundant and this could incur a one-off redundancy payment in the year of the redundancy. This could cause the budget to overspend in that year but in the longer term should lead to savings.

Capital costs in Table 2.1 represent depreciation (the wearing out of an asset) and interest on the assets employed in the service. This concept of effectively an 'asset rent' was recently introduced in the public sector. Here, to simplify, many government assets had been acquired through paying cash and as such no cost appeared other than in the year of account when the assets were acquired. In effect, they became regarded as 'free' goods by managers. In this context public sector assets were revalued and then depreciated (where appropriate). In addition an interest charge was added to reflect the cost of capital for assets employed in the public sector based on this current value. The combined depreciation and interest charge then forms the asset rent which managers are required to cover in, for example, their pricing policies (for a fuller explanation of asset rents see Coombs and Jenkins, 2002: 26–7). The interest charge of the asset rent effectively represents the opportunity cost of tying up money in the school meals service. Asset rents are fixed costs to managers. In this example of the school meals service the greater the number of meals served by each of the four kitchens the lower the unit fixed costs per meal. A similar logic applies to the supervisor, who also is assumed to be a fixed cost.

For a fuller explanation of unit costing in the public sector, see Coombs and Jenkins (2002).

Service Costing

As mentioned in the introduction to this chapter, the UK economy has seen a growth in the service sector. In this 'industry' there is the same need to cost and price activities as in the manufacturing sector. The service sector can include elements of the public sector and services provided within organisations to other parts of the same organisation at an internal price, as with service level agreements (see the discussion of Coombs and Evans in the recommended further reading section at the end of this chapter, and Chapter 3). The latter might include the provision of IT services within a supermarket, or financial advice from the finance department of a government body. The provision of advice raises special characteristics in that each piece of advice is unique unlike, for example, a manufactured product which tends to be uniform. Advice may need to be provided instantly and once given is intangible as it cannot be undone. Advice may expire virtually instantly or have a very limited 'shelf' life, unlike a product which may have a long production cycle – although with technological advancement and consumer changes in taste, product life cycles tend to be shorter today.

In the case of a service industry, such as accounting or the provision of financial services such as investment advice, it is not realistic to attempt to cost every job or individual piece of advice. In such cases it is normal to use a cost unit based on time – cost per client hour. In this case, the more complex the case, the more time is likely to be

spent with the client. In the public sector costs may be attributed to a number of different categories of work. In the NHS the cost per in-patient day may be calculated, while additional information will be provided on the cost of different surgical procedures. These costs are often related to quality measures such as patient waiting time for a specific operation such as a hip replacement. In a university the cost per student will be available and information will also be provided on the cost per subject studied. Quality data, for example, on retention rates or examination success will also be available. Inevitably, in both of these cases there may be an element of overlap between the cost data being provided, but the financial information is being provided for different purposes and decisions.

Conclusions

This chapter has:

- considered the issue of profit and problems of its definition;
- developed an understanding of cost definitions and cost behaviour and shown that it is essential that managers understand these concepts when making decisions;
- shown that costs behave differently at various levels of activity, depending on whether they are fixed or variable;
- stated that all costs in the long run are variable;
- demonstrated that cost allocation can be subjective and therefore there is no such thing as a 'true' cost;
- indicated that all costs are controllable at a certain level within an organisation, but managers should only be allocated costs over which they have specific control under responsibility accounting;
- shown that cost data say little about performance or the non-quantitative factors that are increasingly vital in decision making.

Summary

This chapter has set out the important definitions of cost and demonstrated how costs behave in different circumstances. It has also stressed that an understanding of cost and cost behaviour is essential for managers if they are to make the right decisions. Important in this is that management accounting information is presented in a format that is understandable to the manager, relevant to the decision being taken, as accurate as is relevant to the decision and timely with respect to the decision horizon.

Cost classification was shown as a fundamental requirement of this process, with costs identified with a cost objective. The cost objective is a separate measure for which the measurement of costs is desirable. Classification into period and product costs was

outlined for stock valuation purposes. Costs for decision making were classified into various cost behaviour patterns and also whether they were regarded as sunk, marginal, incremental, opportunity or irrelevant costs. Finally, for cost control purposes costs were identified as controllable or not controllable and fixed or variable.

It has been stressed that cost alone tells the decision-maker little about the quality of the product or service. With unit costs it was shown that the provision of unit cost data can be seen merely as a measure of the resources devoted to an activity but gives no information on the quality of such output, and is therefore in itself a measure solely concerned with throughput.

EXHIBIT 2.1

Cost Classification

David Green is the newly appointed management accountant for a small manufacturing company which until now has not been particularly efficient at cost control or classifying its costs. The business is under severe financial pressure and as part of an efficiency drive is beginning the process of improving cost classification as an initial stage of improving its financial systems.

As part of his initial review of the business, David has identified the following costs:

- lubricant for machines;
- holiday pay of machine operatives;
- carriage on purchase of raw materials;
- raw materials;
- factory security guards;
- wages of store keeper in raw materials store;
- audit fees;
- salaries of administrative staff;
- rent of finished goods warehouse;
- salaries of sales staff;
- factory floor supervisors' wages;
- sales commissions;
- licenses with performing rights society for music played in factory;
- road fund licenses on delivery vehicles;
- wages of forklift truck drivers in materials store;
- fees to advertising agency;
- direct marketing campaigns;
- insurance of company's premises;
- protective clothing for machine operatives;
- depreciation of factory plant and equipment;
- interest on bank overdraft;
- royalties payable on units of production;
- trade discounts given to customers;
- production operatives' wages.

Table 2.3 Illustration of cost classification

Direct labour	Production operative
Direct materials	Raw materials Carriage on purchase of raw materials
Direct expenses	Lubricant for machines Protective clothing Depreciation of factory plant and equipment Royalties on units produced
Indirect production overheads	Wages of storekeeper Performing rights licences Holiday pay of machine operatives Forklift drivers' wages Factory insurance Security guards Supervisors' wages Rent of finished goods warehouse
Selling and distribution costs	Advertising fees Trade discounts Direct marketing campaigns Road fund licences Salesperson salaries Salesperson commissions
Admin. costs	Audit fees Admin. staff salaries
Finance costs	Interest on bank overdraft

Table 2.3 shows the subsequent classification for the costs identified. It should be remembered that this is based on David's definitions. As such it is subjective, and there may be other definitions that are equally sound. Whatever categorization is used, it should be technically sound and produce information relevant to the decision-making needs of the company.

EXHIBIT 2.2

Fixed and Variable Costs

Compass Limited is a small building company that tenders for work on a regular basis. One element contained within its tenders is for the provision of transport to carry building materials and labour to construction sites. Compass owns one lorry and bases this cost in its tenders on the estimated cost per mile of operating the lorry before adding in the cost of the driver. These calculations are done prior to the start of Compass's financial year. This coincides with the calendar year.

It is now December, and Compass wishes to calculate the estimated cost of operating its lorry fleet for the next year. Base data for the purposes of this calculation for the vehicle are as follows:

Cost of purchasing vehicle	£20,000
Life of vehicle	4 years
Residual value	£5,000
Insurance cost	£500
Road fund licence	£400
Annual estimated mileage	25,000
Set of tyres – replacement after 12,500 miles	£600
Fuel per 5 litres	£3.50
Average mileage for 5 litres	20
Estimated vehicle inflation over life	5%
Maintenance (5 times per year)	£350

For the purpose of this exhibit we are required to calculate the cost per vehicle mile for the following year.

The *fixed costs* include the purchase price, insurance costs, road fund licence and regular maintenance. The cost of the vehicle was £20,000, and Compass assumes that vehicle inflation will be 5%, giving a replacement cost of £21,000. With a predicted resale value of £5,000, this results in an annual charge for capital consumption of £4,000 (£16,000/4). Compass could wish to recover the anticipated cost of a new vehicle rather than the historic cost as a means of attempting to ensure that it has sufficient funds to replace the vehicle at the end of its useful life. Some organisations might also build in a charge for interest based on the capital value of the asset. This is to ensure that the asset gives a return that is at least equal to that which could be earned by investing funds elsewhere. This is particularly relevant in the public sector where recent changes in central government accounting have extended this concept from the NHS and local government (H.M. Government, 1994).

	£
Cost of capital consumption	4,000
Vehicle licence	400
Insurance	500
Maintenance	1,750
Annual fixed cost	6,650
Unit fixed cost per mile (£6,650/25,000 miles)	£0.266

The variable costs are as follows:

	£
Tyres replaced after 12,500 miles (2 × 600)	1,200
Fuel (25,000/20 × £3.50)	4,375
	5,575
Variable cost per mile (£5575/25,000)	£0.223
Cost per mile	£0.489

Compass Ltd has data through this exercise that enable it to monitor and control the cost of transport. The fixed costs will not change as the vehicle undertakes more miles, but the costs incurred will be spread over more miles thus reducing the unit cost per mile. Variable costs, on the other hand, will change in direct proportion to the changed activity level.

This information is useful to Compass in that when tendering for work if the company has used the vehicle up to the budgeted figure of 25,000 miles it will have covered the fixed costs of operating the vehicle. In any future tenders, therefore, it need only build in the variable costs of operating the vehicle. Obviously Compass would be well advised to monitor costs and usage of the vehicle in order to maintain up-to-date financial information so that it can take corrective action should its financial projections prove to be inaccurate. It should also be remembered that there are other ways of calculating the costs of vehicle use. As an alternative to cost per mile, Compass might choose to use an hourly charge-out rate.

EXHIBIT 2.3

Incremental Costs and Revenue

Coral Limited is a medium-sized company based in South Wales. It has had a number of years of relative success but, being conservative by nature, it has tended to serve the local market only. This market has shown signs of a decline and the directors are now considering whether to expand the operation from its South Wales base into the West of England. They are attempting to judge how successful this strategy will be over the next six months.

The following figures are an extract from the company's existing budgeted profit and loss account for the next six months.

	£
Sales (20,000 units at £20 per unit)	400,000
Selling costs:	
Marketing	60,000
Salaries of sales personnel	20,000

Commission costs (1% of sales)	4,000
Travelling expenses of sales personnel	1,000
Sales office costs	10,000
Telephones	9,000
Stationery	5,000

The company accountant has calculated that marketing expenditure will need to double in order to achieve penetration of what has historically been a difficult area for the company to achieve even modest sales. Two new sales staff will be employed at a cost of £20,000 on six-month contracts, plus there will be the need to train them at a cost of £2,000. If the operation is judged a success the salespersons' contracts will be extended. A new office will be opened up at a rental cost of £5,000 for six months. Additional telephone equipment will cost £1,000 and existing telephone costs are projected to rise by 50%. Stationery costs will increase by £2,000. Travelling costs will rise by £1,500. An additional office assistant will be required in the finance department to process orders and monitor commissions at a salary of £8,000 for six months. Estimated sales will rise by 1000 units per month for the first two months and revenue per unit will fall to £18 per unit in order to achieve initial market penetration. It is anticipated that this discount will only be necessary for two months and that sales from month 3 will rise to 2000 units per month. The variable cost of producing each extra unit is projected to remain at the current cost of £6.

Table 2.4 Incremental analysis of proposed expansion

	Existing budget for next six months		Projected budget for next six months		Incremental costs and revenues	
	£	£	£	£	£	£
Sales		400,000		596,000		196,000
Marketing	60,000		120,000		60,000	
Sales salaries	20,000		60,000		40,000	
Commission	4,000		5,960		1,960	
Travelling	1,000		2,500		1,500	
Sales office	10,000		15,000		5,000	
Telephones	9,000		14,500		5,500	
Stationery	5,000		7,000		2,000	
Admin. asst.	0		8,000		8,000	
Training	0		2,000		2,000	
Variable production costs	120,000	229,000	180,000	414,960	60,000	185,960

The decision requires an incremental analysis of the impact on Coral to give the estimated financial position first. It should always be remembered that these are financial projections only and other issues will be relevant to any proposed new strategy. These issues are touched upon after the calculations have been demonstrated.

It will be seen from Table 2.4 that the effect of the expansion is to increase incremental revenue by £185,960 and, as such, on a financial basis the expansion is justified.

It should be remembered that the projections are simply estimates and may prove incorrect. Coral would have to consider the impact of reducing the selling price of its product on existing markets and indeed whether in its new market it will be able to raise prices as easily as is suggested. We already know from the above that Coral has struggled in this new market before and as such there is a doubt over the potential market. We are also aware that there has been a slowdown in the 'home' market that may indicate that there is a more fundamental problem with the product. There is, however, a large margin for error within the results obtained. It can also be seen in this exhibit that both fixed costs and variable costs have been subject to incremental changes.

Recommended Further Reading

Coombs, H.M. and Evans, A. (2001) 'Managing central support costs in local authorities', *Journal of Finance and Management in Public Services*, 2(1): 9–20.
How to treat central overheads in local government is not a new issue. Since 1979, with the greater competitive pressure local authority services have been under, it has become vital that overheads be allocated on a basis which is transparent, flexible and real. Coombs and Evans first look at the definitions of central overheads in local government, dividing them into corporate costs such as council meetings which are regarded as the cost of democracy and not allocated, specialist costs such as back funding pensions which are again not allocated, and the essential central support functions essential to run the 'business' which are fully allocated to services. Under a traditional approach these costs would have broadly been allocated to services primarily on a timesheet basis. Administrative building costs would be allocated on a floor area basis.

As an alternative to these arrangements the paper looks at service level agreements (SLAs) which are seen as written internal 'informal contracts' specifying the responsibilities of and the relationships between a client or service department and the support service provider. The written agreement:

- identified the providers and users of the service;
- clarified the responsibilities between both parties over quality and costs of services delivered;
- enabled users and providers to monitor what was happening;
- clearly identified the costs and charging mechanisms.

In terms of the practice of SLAs the research discovered that typical charging mechanisms included:

- payroll/salary systems – per employee, per transaction, cost per payslip processed;
- internal audit – rate per hour, rate per person day, fixed charge plus time element;
- revenue accounting – rate per hour, charge per person day;
- cash management – per transaction, per posting;

- creditor payments – per payment, per invoice raised;
- insurance – on-cost to premiums, rate per hour.

Drawbacks of SLAs were seen as the bureaucracy associated with the agreements and procrastination by the overhead service providers. This was seen as a deliberate attempt by the providers to sabotage the initiative as it was not in their interests to pursue this policy. Other issues related to the question of under- and over-recovery of the costs of providing the central support. In addition, many managers in service departments felt they did not have the experience to negotiate with, for example, the finance department which to them held all the 'aces' in any negotiation.

In the conclusions the traditional system of apportionment of overheads to service departments without attention to the costs and quality of those services given by central support departments was seen as increasingly at odds with the pressure on resources faced by local government (and, indeed, all public sector services). There was also a discovery of variations in the type of overhead apportionment systems used in the survey, although the basic system was staff time based. Resources realised by the proper management of central services overhead costs can potentially result in these resources being redirected into frontline service delivery. Service level agreements were seen as having the potential to improve service delivery by support departments to service departments and improve the quality of delivery of overhead services. They lead to emphasis on the customer given the central component of quality at a cost the service department is willing to pay. The survey used revealed that of the 31 authorities who responded 29 had either introduced, were developing or considering introducing SLAs. While two authorities had rejected the principle of SLAs on the basis of the potential additional bureaucratic burden, they had recognised that their current systems of charging for central support services were in need of review. Discussions with employees of the local authorities showed that on balance there was support for the idea of SLAs and that in some cases poor-quality service and price had meant that potential clients to the local authority had been lost in the area of education. It was pointed out, however, that the stimulus for these developments was statutory regulation and not the result of internal pressures. Interviewees felt that in some cases the delay in introducing SLAs was the result of central departments procrastinating.

The paper also pointed out that as well as the existence of actual SLAs it is the spirit in which those agreements are operated that is equally important if any such system is to operate effectively. Thus whether SLAs are a solution to a problem, a bureaucratic nightmare or fall somewhere in between in terms of their ability to meet the needs of local government service managers, only time will tell. They are clearly not suited for many small support services as the costs of setting up and maintaining such agreements would outweigh any benefits, although there may be benefits in establishing a small-scale memorandum of understanding between providers and users setting out quality standards for service delivery. However, if implemented and managed correctly, they do appear to have considerable potential to improve the quality of services delivered by larger-scale central support departments at a price and quality that service managers are prepared to pay. This can only benefit the community the local authority is supposed to serve as extra resources are released, or protected, for frontline service delivery.

Ezzamel M., Morris J., and Smith J.A. (2004) Accounting for New Organisational Forms. Research Update, 8–9 September, CIMA.

At the time of writing this is an ongoing project which aims to identify the ways in which management accounting is informed by developments of new organisational forms which are emerging because of increased business competition and developments in IT. The project methodology was to use face-to-face interviews to build a limited number of case studies across a range of organisations and postal questionnaires to widen the sample base. Provisional results (pending publication of the final research study) indicate that change was evolutionary and incremental rather than revolutionary or transformational. Important factors as change agents were new management teams and general market conditions. There was also a desire to reduce the staff base and fixed costs. In the public sector new cost centres were found to have been created and there had been the development of non-financial measures. An increase in outsourcing was also noted. In terms of the supply chain this had evidenced itself by contracting out non-core services such as cleaning, IT and recruitment and training. Overhead costs were thus reduced as opposed to the creation of service level agreements. The role of management accounting was discovered to have changed from broadly recording to one of financial analysis and the provision of advice.

Case Study: SHB

SHB is a retailing company which has numerous retail outlets distributed throughout the United Kingdom selling a wide range of goods to the public. These goods include furniture and food, although primarily it sells clothes. It has also diversified its functions to include financial services such as credit cards and loans and insurance. Stores vary in size, with a number of medium-sized central town developments and 20 superstores nationwide. It has also, as part of its expansion programme, opened a number of new outlets in Europe. In the UK it has recently begun to develop smaller stores on out-of-town 'discount' shopping parks which it uses to sell last season's fashions and designs at reduced prices. This strategy has so far proved very successful as demand for product is high, rents relatively cheap in comparison with many of its traditional stores located in town centres and staffing costs low. It is also currently looking at establishing more of these outlets but selling food.

The stores operate with a managerial framework which gives considerable local autonomy to managers, allowing them to make local decisions appropriate to local needs. It retains a number of head office functions for such activities as purchasing, accountancy and audit, legal services and human resources management. Store managers deal with the recruitment and dismissal of store staff but consult with central head office on corporate human resource policies and complex issues such as trade union matters. The head office is responsible for corporate decision making. Store managers are expected to have worked in head office and at store level before they can manage a superstore.

The corporate head office is sited in Birmingham as it represents the best location given the distribution of the company's stores. There are, in additon, a number of satellite offices which provide local contacts with the stores on a number of central support issues, but excluding corporate strategy, IT and legal advice. The continental operation is managed directly from Birmingham in terms of central office functions although store managers on the Continent have the same roles and responsibilities as those in the United Kingdom. The head office deals with all financial services and related products.

The cost of the head office and regional support offices in the last year (2004) was as follows:

Category of cost	Budget for year £	Revised budget June 2004 £	Actual expense for year £
Accountancy and audit	2,850,000	2,555,000	2,750,000
IT	5,575,000	5,850,000	5,650,000
Legal	4,500,000	5,750,000	6,950,000
Human resources	1,850,000	1,950,000	1,975,000
Corporate strategy	1,110,000	1,111,000	1,116,000
Corporate governance	9,255,000	8,260,000	8,760,000

Head office expenditure in the previous two financial years was £23,400,000 and £22,000,000, respectively. The major overspend on the legal budget in 2004 is concerned with a legal case against the Inland Revenue over the interpretation of tax legislation under European Union law.

The staffing compliment for each section was last formally agreed in January 2002. These numbers are as follows:

	Agreed establishment (January 2002)	Actual numbers in post (December 2004)
Accountancy and audit	45	48
IT	120	118
Legal	25	31
Human Resources	47	55
Corporate Strategy	198	200
Corporate governance	60	80

The majority of the staff over the agreed establishment are on fixed term contracts expiring in September 2005. Head office management staff at team level can employ these staff without formally increasing the establishment and with limited need for higher authorisation.

The central office is supposed to be driven by the needs of the stores, but costs have to be recharged. At the moment these are done simply on a staff time analysis based on 'actual' time spent on each location by each function when the accounts are being closed in readiness for publication. 'Actual' time is recalculated every three years when a staff timesheet for a section is completed by the manager of a section. These section returns are ultimately aggregated by function (e.g. Human Resources). This detailed information is not disclosed to the shareholders but is used by managers after the year end to monitor store performance. No information is provided during the course of the year, although head office costs are supposed to be controlled within the annual budget. Some stores have started to employ their own specialists such as in accountancy and audit under their discretionary budget powers. Store managers have also expressed some concern over the company's central buying policy as the quality of clothing has deteriorated and styles are seen as old-fashioned. Store managers are held responsible for any unsold stock and not central buying. Central buying is done by the Corporate Strategy division at head office. Finally, the costs of financial services and related operations are separately identified together with the income on those products and allocated to the regional superstore nearest to the client's home address to give a geographical picture of where business is generated. Marketing campaigns, for example, are then directed based on such information.

1. Critically assess the above system of allocating head office costs to stores from both a head office and store manager's point of view. Discuss the advantages and disadvantages of the system from both points of view.
2. Discuss any possible alternatives available, including their advantages and disadvantages, from both the head office and store manager's perspective.
3. What are the main features of any alternatives and how would you go about implementing them? Cover both qualitative and quantitative issues.
4. Prepare a report for management incorporating your critical analysis with recommendations on a way forward.

Questions

1. The Tuba Company commenced business on 1 April 2004 and during its first production period produced 200,000 identical units of a product termed 'the valve'. The company sold 175,000 units of 'the valve' during this period. As this was the company's first period of operation there was no opening stock at the start. The 25,000 units unsold are closing stock.

The costs for this period were as follows:

Manufacturing costs	£
Direct labour	800,000
Direct materials	400,000
Manufacturing overheads	150,000

Non-manufacturing costs amounted to £175,000.

(i) Prepare the profit and loss account for the period.

(ii) Explain what you understand by 'period costs' and discuss your treatment of them in the calculations you have carried out. Explain fully why you have treated them as you have.

(iii) The company believes that in period 2 it will only sell 50 per cent of the items left in stock at the end of period 1. What implications do you think this has for the Tuba Company.

2. Euphonium Ltd. has an opportunity to obtain a new contract for the production of a new valve. The valve requires 200 hours of processing on machine A, which is already working at full capacity on the production of another product. There is thus no way in which production of the valve can be accommodated unless production of the other product is reduced. The lost contribution from the displaced product amounts to £500. In addition, the variable costs of the new valve amount to £1500.

(i) What price is the minimum that should be accepted?

(ii) What implications are there for the company, in both the short term and the long term, of accepting this special order?

3. Where would you allocate the following costs (e.g. selling and distribution, production, etc.) and who would you hold responsible for incurring these costs for control purposes? Would you regard them as fixed, variable, semi-variable or stepped fixed costs? Are they direct or indirect costs?

Raw materials used in the manufacture of a company's main product
Security services for the warehouse
Performing rights payments for music piped to the factory floor
Direct labour payments
Oil used to lubricate productive machinery
Costs of a sales promotion campaign
Depreciation of factory machinery
Contract price for raw materials
Overtime payments on the factory floor
Supervision costs on the factory floor
Forklift truck driver

Rent where at production above 5000 units additional workspace is required to be contracted
Audit fee
Food costs in the works canteen
Photocopy rental in sales office with additional costs incurred by use
Fire insurance costs for factory
Power used in the factory
Supervision of production operatives
Royalty payments
Factory rental
Indirect materials
Quality audit engineer
Accountancy office staff
Research and development
Membership fee to the CBI
Company's pension contributions for factory workers
Company's pension contributions for office staff
Delivery vehicle expenses
Wages to factory temporary production operatives
Television marketing campaign
Maintenance mechanic's wages
Foreman wages
Office stationery
Managing director's salary
Cost of board meetings, including non-executive salaries
Payments to focus groups for comments on new products
Payments for trade magazines
Annual awards dinner for factory employees
Head of marketing's salary
Storeman's wages
Petrol costs for salesmen

4. David is thinking of setting up a new van hire business. He has no experience of this business and is not financially qualified, but has had a go at estimating the costs he will incur. Initially he will start with one van and has come to you for financial and business advice as his financial adviser with the figures he has managed to obtain.

David's figures are set out below:

	£
Purchase cost of van	15,000
Service maintenance cost (twice per year)	500 per service

Spares/replacement parts per 2000 miles	100
Insurance per year	1,500
Vehicle licence	250
Tyres (after 30,000 miles), four at £75 each	300
Trade in value (after 3 years or 120,000 miles)	1,000
Diesel per gallon	2.80
Average mileage per gallon of diesel is 25 miles	
Estimated annual mileage 40,000	
MOT cost after 3 years	30
Maintenance and service costs after 3 years	4,500 per annum

The average mileage per gallon of diesel is 25 miles and the estimated annual mileage is 40,000.

(i) Prepare a schedule for David of the costs of operating the van over annual mileages of 20,000, 30,000, 40,000 and 50,000 miles. This schedule should clearly identify: total fixed costs; total variable costs; total costs; fixed costs per mile; variable costs per mile; total costs per mile. Critically assess your results and prepare a report for David in which you clearly explain what you have done and any assumptions you have made in your calculations. Your report should clearly advise David an the factors he should consider in his decision as to whether or not to set up this business.

(ii) You have completed task (i). David has just rushed in to your office to advise you he has discovered he can lease the van over the three years at a cost of £150 per week. This cost covers all service and maintenance charges and includes tyres. David would, however, be responsible for any damage caused by neglect of the vehicle. As a safety measure he thinks he should set aside £500 per year for this factor. What are the implications of this alternative for David and his business idea?

(iii) 'The unit costs of operating a business fall as output increases'. Assess this statement critically.

5. There are numerous classifications of cost available. These might include, for example, classification by type, by decision relevance, and by controllability. The objective of management accounting is to assist managers and decision makers in an organisation. Discuss the relationship between cost classification and the needs of managers and decision makers in a critical context.

6. You are working for an NHS Trust. The Trust manages three hospitals. Two of these, Triumph and BSA, are district general hospitals, while the third, Norton, is a small cottage-style hospital. The cleaning service contract for these hospitals is managed in-house by the Trust's own cleaning services. The target for the cleaning contract is the breakeven of revenue and expenditure. The contract was let two years ago and is due for renewal on 1 April 2005 so has one year to run.

At the request of your section head you are monitoring the performance of the contract for the financial year ending the 31 March 2004 and have obtained the following information.

(1) Financial data: payments 2003/04

	Triumph **£**	**BSA** **£**	**Norton** **£**
Cleaning staff – pay	66,320	79,500	39,000
Employment taxes	2,750	3,650	1,600
Pension costs	3,750	7,240	1,250
Travelling expenses	880	720	180
Cleaning materials	42,250	56,530	36,390
Window cleaning contract (external)	6,160	5,680	9,000
Other contract services	800	1,210	1,980
Miscellaneous	1,350	850	1,680
Equipment purchased (revenue)	760	820	930

(2) Statistical data

Floor area (square metres)	110,000	125,000	27,250
Average number of available staffed beds	590	720	130

(3) Additional Information

(a) Sundry creditors were:

	31 March 2003 £	31 March 2004 £
Triumph		
Equipment	180	120
Cleaning materials	1,230	1,960
BSA		
Window cleaning	2,520	1,100
Norton		
Cleaning materials	2,440	3,690

(b) Cleaning materials issued from the central stores have not been included in part (1) payments as they were issued in the last week of March 2004 and the Finance Department has only just been informed. These stock issues were: Triumph, £1,260; BSA, £1,140; Norton, £2,460.

(c) Stocks of cleaning materials in hand at each hospital at the year end were:

	31 March 2003 £	31 March 2004 £
Triumph	3,150	4,550
BSA	2,540	1,980
Norton	1,000	1,110

(d) The central stores cost for managing cleaning materials is to be apportioned to the three hospitals and has been calculated for 2003/04 at £66,000. There is no agreed basis of allocation of this cost to the three hospitals.

(e) During 2003/2004 BSA hospital required that a cleaning equipment maintenance contract be negotiated for £600 per annum payable annually in advance on 1 February in each year. This payment is included in (1) under other contract services. The contract is renewable annually now it has been signed.

(f) Outstanding bonuses in respect of BSA and Norton at the 31 March 2004 are 1.5% of wages paid in the year. This has no effect on other wage related costs.

(g) The cost of management supervision by the cleaning supervisor is £18,000 including overheads.

(h) Staff time for finance services provided by the Finance Department has yet to be charged to the cleaning contract and is to be allocated to each hospital on the basis of floor area. The costs calculated by the finance department are £20,000 for these services. This is in part based on the work that this year went into preparing a bid for the renewal (£10,000) of the contract on 1 April 2005. There will be significantly more work in the next financial year to prepare for the retendering exercise.

(i) Cleaning the hospitals requires no capital equipment.

(j) The value of the cleaning contract is £530,000. It is not broken down by individual hospital.

As a management accountant working for the Trust you have been requested to prepare a report on the cleaning service.

(i) Include a statement showing the cleaning costs for each hospital in comparison with the tendered price.

(ii) Discuss the relative cleaning costs for each hospital and outline the possible reasons for variations between them.

(iii) Comment on any qualitative factors you believe are relevant.

(iv) Make appropriate recommendations based on your analysis in the context of 2003/04 and the retendering exercise due in 2005/06.