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Technical Level

Management Accounting (MA1.2) WorkbooK

Institute of Certified Public Accountants of Rwanda

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Contents

Overview of the Module

CPA level	Technical level
Title	Management Accounting
Guided learning hours	200
Exam length	3 hrs

Introduction to the Module

The overall aim of this module is to develop your knowledge and understanding of management accounting techniques to support management in planning, controlling and monitoring performance in a variety of business contexts.

We use the term "management accounts" to refer to activities, reports, analyses, etc that are prepared for internal managers of an organisation. This is in contrast to financial accounting (or financial reporting) statements, which are prepared for individuals and groups that are external to an organisation. Financial accounts detail the performance of an organisation over a period of time (usually a year) and the state of affairs at the end of that period. This syllabus is about management accounting but it's important that you know the difference between management and financial accounting. The main purpose of management accounting is to aid management with planning, control and decision making within the organisation. Management accounts are both an historical record and a future planning tool.

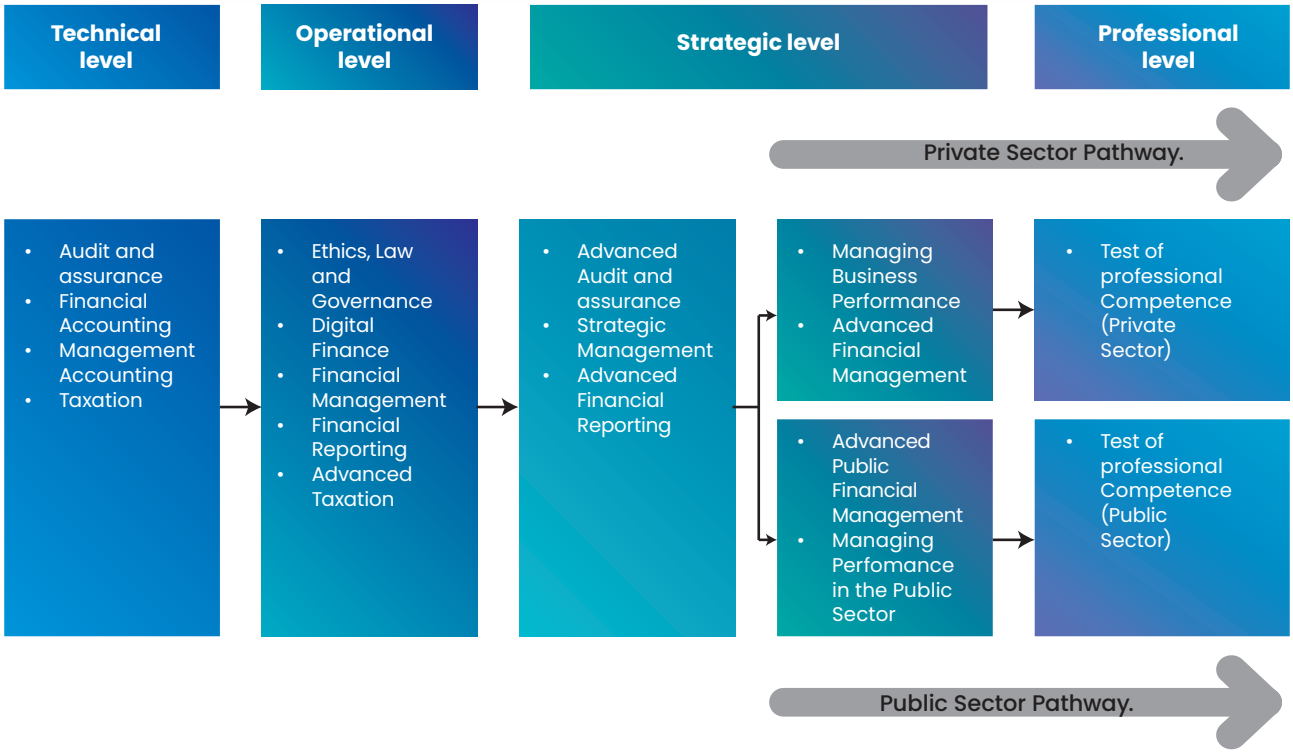
This module helps students to develop professional skills and behaviours needed in the workplace. The module is set in the context of an accounting function, however, skills gained are transferable to many other working environments.

The learning materials comprise 14 Units, A to N. Units A to F address budgets, which are one of the most important financial tools in an organisation. The materials look at aspects of budgets and budgeting, from overall understanding of the purpose, context, and influences on budgets, through to preparation, monitoring, and controlling of budgets during the budget period.

Units G to L are focused on financial performance of an organization, including use of performance indicators and performance reporting. Within these units, different types of costing techniques are covered, and the various aspects of cost behaviour are applied.

Finally, Units M and N look at accounting systems, how these are designed, assessed, and improved where appropriate.

This module is one of four completed at the technical level of the CPA.



Key competencies

The following are the key competencies that are addressed in this module, and the unit structure of the module's learning materials follows this structure (although there are inevitably some topics that are relevant to more than one of the competencies that are in the list:

A. Demonstrate an understanding of the impact of internal and external business factors on budgets.

B. Demonstrate an understanding of why budgets are used.

C. Demonstrate an understanding of the skills needed in budget preparation.

D. Prepare forecasts and budgets.

E. Demonstrate an understanding of the impact that changes in the economic environment will have on the budget.

F. Use budgetary control to ensure organisational targets are met.

G. Demonstrate an accurate understanding of the internal and external factors that affect organisations.

H. Be aware of the cost accounting techniques needed in monitoring financial performance.

I. Demonstrate an understanding of the techniques necessary for measuring performance and managing costs.

J. Collate information from various sources and prepare routine cost reports.

K. Make suggestions for improving financial performance by monitoring and analysing information.

L. Prepare performance reports for management.

M. Evaluate the accounting system and identify areas for improvement.

N. Make recommendations to improve the accounting system.

Unit A: Impact of internal and external business factors on budgets.

Learning outcomes

A.1 Explain the structure of the organisation, responsibility centres and the relationships between the departments and functions.

A.2 Identify internal and external sources of information on costs, prices, demand, availability of resources and availability and cost of finance, to include:

- Government statistics.
- Trade associations.
- Financial press.
- Quotations.
- Price lists.

A.3 Describe the impact of the external environment and any specific external costs on budgets.

A.4 Describe the internal charges made to attribute indirect costs to production.

Introduction to Unit A

Unit A sets the context for Units A to G, in which various aspects of budgeting are covered. To deal effectively with activities such as preparation and controlling of budgets, it is essential to understand how a business is structured, so that the role of budgets within that context can be discussed.

When we talk about a budget, we are referring to a management tool that is closely linked to the planning activities within the organisation, or within a section of the organisation in some cases (e.g., there may be a specific production budget, applied within the production division, and controlled by the production manager).

We can define a budget as a financial plan for a business, covering a future period

The structure of a budget will vary from one organisation to the next, as it must be appropriate for the activities of that organisation, reflecting the income generated and the costs incurred.

This unit looks at the costs incurred by different areas of a business, and how they should be allocated to different departments or "responsibility centres" within an organisation, such that they can be considered in a meaningful manner when constructing a budget.

To construct a budget, the nature of these costs must be understood in terms of whether they are direct (relating to specific units of product made, or services delivered) or indirect (costs which cannot be attributed directly to a cost unit). The costs must also be understood in terms of their behaviour as variable, semi-variable, fixed or stepped. Once these aspects of costs are known, it is possible for managers to construct forecasts of future costs, from which budgets are formed.

Organisations may be arranged into departments depending on the activities of that business. For example, a manufacturing business may have production departments (arranged by way of activity such as cutting, finishing, assembling), a maintenance department, and a purchasing team. In common with service businesses, there may also be administration, finance, IT, Human Resources, sales and marketing departments.

To structure an overall budget, the various department and functions within an organisation can be classified, in terms of their purpose and responsibilities, into responsibility centres. A responsibility centre is an identifiable part of the organisation (e.g., a department) whose performance is the direct responsibility of a specific manager. These can be divided into cost centres, profit centres, revenue centres, and investment centres.

Cost centres	Cost centres are locations for collecting costs. Costs are further analysed into cost units once they have been traced to cost centres. Cost centres may be based on a department, a production centre, a project, or a type of cost (e.g., an overhead). Cost centres are an essential building block of a costing system. They are the starting point for classifying costs, preparing cost budgets, and comparing actual and budgeted costs at the end of a period (budget control). Example – Marketing department
Profit centres	Profit centres are similar to cost centres but are accountable for both costs and revenues. Profit centre managers should normally have control over how revenue is raised and how costs are incurred. A profit centre may comprise several cost centres. The profit centre manager will be able to make decisions about both purchasing and selling and will be expected to do both as profitably as possible. A profit centre manager will want information regarding both revenues and costs. They will be judged on the profit margin achieved by their division. In practice, it may be that there are fixed costs that they cannot control, and they should therefore be judged on contribution, which is revenue less variable costs. In this case they will want information on which products yield the highest contribution. Example – Regional department servicing regional market

Revenue centres	Revenue centre managers should have control over how revenues are raised and will be held accountable for the amount of revenue generated. A revenue centre requires information on markets and new products, and they will look closely at pricing and the sales performance of competitors – in addition to monitoring revenue figures. Example – a retail outlet
Investment centres	An investment centre is a profit centre with additional responsibilities for capital investment and possibly for financing, and whose performance is measured by its return on investment. An investment centre manager will take similar decisions to a profit centre manager, but they also have additional responsibility for investment. They will be judged additionally on their handling of cash surpluses, and they will seek to make only those investments that yield a higher percentage than the company's cost of capital. The investment centre manager will want similar information to the profit centre manager. They will also require quite detailed appraisals of possible investments, and information regarding the results of investments already undertaken. They will have to make decisions regarding the purchase or lease of non-current assets and the investment of cash surpluses. Example – Division in another country which has autonomy over investment decisions in the country

In the context of budget management, performance evaluation, etc, managers are only held responsible for controllable costs, i.e., costs that they can control. Costs that are not controllable by managers are known as non-controllable costs. For example, increases in costs due to inflation, or costs that are re-allocated from a central department (such as HR). This means that each centre has responsibility for the costs or revenues in its budget, and actual results will then be compared to budgets for each centre, to monitor and control performance. It is important that managers are only allocated the task of preparing, and answering to, a budget over which they have control.

When the budgets for each of these centres are combined, a full budget is produced that covers all the organisation's activities.

Note the importance of identifying cost units, so that costs once costs have been collected, they can be allocated to the relevant cost unit. The cost unit may be a physical product, or a service (such as a patient episode in a hospital, collecting costs related to the treatments received by a specific patient).

Cost unit	A cost unit is a unit of product or service to which costs can be related. The cost unit is the basic control unit for costing purposes.

Also, the term contribution used in relation to profit centres is important for several topics across the Management Accounting module, so it is worth noting the definition here:

Contribution	The contribution is the revenue from an item (e.g., selling price of a unit) less the variable costs attributable to that item (e.g., the cost of the item being sold) Contribution, therefore, ignores fixed costs

Data and information

You may have noted in the description of responsibility centres, that it is essential to collect relevant information, particularly on costs and revenues, to manage budgets and other aspects of performance within an organisation.

The terms data and information are sometimes used interchangeably, but we can also make a distinction between them: i.e., data refers to items that can be collected, stored, analysed, or processed, and information refers to the useful and relevant results from that activity. It is possible for an organisation to collect a large amount of data, but not necessarily increase the available information in terms of what is needed for management decisions or other activities. As it can be expensive and time-consuming to collect, store and analyse data, it is important to first identify the information needs of the department or organisation, and then design a system that focuses on relevant data to support those information needs.

Note also that different types of data can be identified:

Primary data	Primary data is data that has been collected especially for a specific purpose. Raw data is primary data which have not been processed.
Secondary data	Secondary data is data that has already been collected elsewhere, for some other purpose, but which can be used or adapted for the purposes of the organisation or department
Discrete data	Discrete data is data that can only take on a finite or countable number of values within a given range (e.g., the scores achieved by students in an exam may be from zero to 100, and may only be whole numbers)
Continuous data	Continuous data is data that is measured rather than counted, and can take on any value (e.g., heights of pupils in a class)
Sample data	Sample data is data that results from a specific activity, test or survey. A sample is a selection from the population (see below), and may be conducted on a random or other basis. For example, 10 students may be interviewed out of a population of 1,000 students across the university.
Population data	Population data refers to data taken from a population as a whole
Quantitative data	Quantitative data is data that can be measured

Qualitative data	Qualitative data is data that cannot be measured. It is sometimes possible to apply a quantitative figure to qualitative data, but this needs to be done with care. For example, results from a customer feedback survey that includes responses of "poor," "average," "good'" may allocate scores of 1, 2 and 3 respectively to allow some analysis of the results and comparison with other surveys.
Internal data	For example: • Accounting records • Data on personnel • Production results • Time sheet data
External data	Primary data may be gathered externally, such as through customer or supplier surveys Secondary data may be collected from, for example: • Government sources • Media • Trade or industry publications • Research bodies • Organisation web sites • Information bureau

External environment

The economic environment affects firms at national and international level, both in the general level of economic activity and in particular variables, such as exchange rates, interest rates and inflation. Depending on the organisation, certain external factors may have very direct impacts on the organisation's activities and results.

Factor	**Impact**
Overall change in gross domestic product (GDP)	Increased or decreased demand for goods and services.
Local economic trends	House prices, local salary rates.
Inflation	This may distort some business decisions. Wage inflation (increased cost) may compensate for price inflation (increased revenues).

Interest rates	How much it costs to borrow money affects cash flow. Some businesses carry a high level of debt. How much customers can afford to spend is also affected, as rises in interest rates affect people's mortgage payments.
Tax levels	Corporation tax affects how much firms can invest or return to shareholders. Income tax and sales tax (e.g., VAT) affect how much consumers have to spend, hence demand.
Government spending	Suppliers to the Government (e.g., construction firms) are affected by spending levels.
The business cycle	Economic activity may involve cycles of increased activity followed by a period of low activity. Government policy can cause, exacerbate or mitigate such trends, but cannot abolish the business cycle.

The forecast state of the economy will influence the planning process for organisations that operate within it. In times of increased demand, the main planning problem will be to identify the demand. Conversely, in times of recession, the emphasis will be on cost effectiveness, continuing profitability, survival, and competition.

Cost classification

Being able to correctly classify costs, and to understand how different costs behave under different circumstances, is important in a number of management accounting activities – budgeting, performance measurement, costing, pricing, decision making, etc. The following table summarises the key terms in this context, and each of these will be applied in the relevant units within the module, with examples and exercises that illustrate each.

Total costs	**The total cost of making an item or providing a service, including materials, wages and salaries, and other expenses**
Direct costs	A direct cost is a cost that can be traced in full to the product, service or department that is being costed. • Direct costs can be classified as: • Direct materials costs • Direct labour costs • Other direct expenses

Indirect costs	An indirect cost (or overhead) is a cost that is incurred in the course of making a product, providing a service or running a department, but which cannot be traced directly and in full to the product, service or department. Examples include supervisors' wages, cleaning materials, and buildings insurance
Production overhead	Production overhead includes all indirect material costs, indirect wages and indirect expenses incurred in the factory
Administrative overhead	Administration overhead is all indirect material costs, wages and expenses incurred in the direction, control, and administration of an activity
Selling overhead	Selling overhead is all indirect materials costs, wages and expenses incurred in promoting sales and retaining customers
Distribution overhead	Distribution overhead is all indirect material costs, wages and expenses incurred in making the packed product ready for despatch and delivering it to the customer

The following structure is a common way of compiling costs in relation to a product, service, or activity:

	FRW '000
Production costs	
Direct materials	300
Direct wages	550
Direct expenses	150
Prime cost	1,000
Production overheads	200
Full factory cost	1,200
Administration costs	100
Selling and distribution costs	200
Full cost	1,500

Summary of Unit A and key learning outcomes

In Unit A, we looked at the Competency "Demonstrate an understanding of the impact of internal and external business factors on budgets." This involved content on four learning outcomes.

Learning outcome	
Explain the structure of the organisation, responsibility centres and the relationships between the departments and functions.	You should now be able to describe different types of responsibility centres within an organisation, and the type of information that they require.
Identify internal and external sources of information on costs, prices, demand, availability of resources and availability and cost of finance, to include: • Government statistics. • Trade associations. • Financial press. • Quotations. • Price lists.	You should now be able to describe the internal and external sources of information, and how these are used in budgeting and other activities in an organisation.
Describe the impact of the external environment and any specific external costs on budgets.	You should now be able to discuss the impact of various external factors on an organisation's activities and planning.
Describe the internal charges made to attribute indirect costs to production.	You should now be able to describe different types of cost, including direct and indirect costs.

Quiz questions

1	Learning Outcome: A1
Which of the following part of an organisation would be most interested in information on the contribution provided by various products?	
A	Profit centre
B	Cost centre
C	Responsibility centre
D	Revenue centre

1	Feedback
A	Correct A profit centre is interested in both costs and revenues. The contribution provided by each product is relevant to the overall profit of the centre.
B	Incorrect. A cost centre is focused on costs rather than contribution. A profit centre is interested in both costs and revenues. The contribution provided by each product is relevant to the overall profit of the centre.
C	Incorrect. Responsibility centre is a general term for different types of department within an organisation, not just profit centres. A profit centre is interested in both costs and revenues. The contribution provided by each product is relevant to the overall profit of the centre.
D	Incorrect. A revenue centre is focused on revenue (or income) rather than contribution. A profit centre is interested in both costs and revenues. The contribution provided by each product is relevant to the overall profit of the centre.

2	Learning Outcome: A2
Which of the following is an example of an external secondary source of data?	
A	The organisation's human resources files
B	A survey of customer opinions on a new product

2	Learning Outcome: A2
C	An industry publication
D	The previous year's statement of cash flows for the organisation

2	Feedback
A	Incorrect. The organisation's human resources files are an internal source of data An industry publication is both external and a secondary source of data
B	Incorrect. A survey of customer opinions on a new product is a primary source of data, as it is carried out specifically for the intended purpose. An industry publication is both external and a secondary source of data
C	Correct An industry publication is both external and a secondary source of data
D	Incorrect. The previous year's cash flow statement is an internal source of data. An industry publication is both external and a secondary source of data

3	Learning Outcome: A4
Which of the following is an example of a direct cost?	
A	The salary of a factory supervisor
B	Cleaning materials used in an administration office
C	The cost of the HR department
D	The wages of staff working on the assembly of a product

3	Feedback
A	Incorrect. The salary of a factory supervisor is an indirect cost The wages of staff working on the assembly of a product is an example of a direct cost
B	Incorrect. Cleaning materials used in an administration office is an indirect cost The wages of staff working on the assembly of a product is an example of a direct cost

3	Feedback
C	Incorrect. The cost of the HR department is an indirect cost The wages of staff working on the assembly of a product is an example of a direct cost
D	Correct The wages of staff working on the assembly of a product is an example of a direct cost

4	Learning Outcome: A3
Which of the following statements is true?	
A	A decrease in gross domestic product is likely to lead to increased demand for the organisation's products
B	Wage inflation may be offset by price inflation
C	Government spending has no impact on the budget of a business
D	Increases in the tax on profits can increase how much a business has available for investment

4	Feedback
A	Incorrect. A decrease in gross domestic product is likely to lead to reduced demand for the organisation's products A business may be able to increase prices during a period of inflation, which may offset having to pay higher wages to staff
B	Correct A business may be able to increase prices during a period of inflation, which may offset having to pay higher wages to staff
C	Incorrect. Government spending may have an impact on the budget of a certain businesses A business may be able to increase prices during a period of inflation, which may offset having to pay higher wages to staff
D	Incorrect. Increases in the tax on profits can reduce how much a business has available for investment A business may be able to increase prices during a period of inflation, which may offset having to pay higher wages to staff

Quiz answers

1	A
2	C
3	D
4	B

Unit B: Purpose and Objectives of Budgeting.

Learning outcomes

B.1 Explain the behavioural aspects of budgeting

B.2 Justify the uses of budgetary control for:

- a. Planning.
- b. Co-ordinating.
- c. Authorising.
- d. Cost control.

B.3 Identify the correct budget to prepare according to the organisational requirements:

- a. Income and expenditure.
- b. Production.
- c. Material.
- d. Labour (employees and other resources).
- e. Revenue.
- f. Capital.
- g. Fixed.
- h. Flexible.
- i. Cash.

B.4 Explain the relationship between budgetary control, product lifecycles, and forecasts and planning.

B.5 Explain the significance of budget variances.

B.6 Recognise the effect that capacity, production and sales constraints have on budgets.

B.7 Explain the main differences between the public and private sector and the implications for the approach to budgeting in the public sector.

Introduction to Unit B

In Unit A we looked at the context in which budgets are prepared and used in an organisation, and we introduced several important technical terms that are needed in discussing budgets and for understanding cost behaviour.

In Unit B we focus on the purpose of budgets, and on the different ways in which budgets are used in the organisation. In Unit A, we saw that a budget is a type of plan, in which numerical (i.e., monetary) amounts show the activities that the organisation plans to engage in during the period. This means that a budget is a tool for management – not just for planning, but also for controlling and reporting on activity and results during the period.

As there are different parts of the organisation (e.g., departments, divisions), and managers with different types of responsibilities (e.g., production, marketing), the way in which budgets are used during the year, and the type of information that is relevant to management needs and decisions, will tend to vary. This means that we need to be able to identify the correct type of budget to use in a particular situation (e.g., a cash budget), and the correct information that should be included in any analysis or decision making.

As budgets are used by individuals, such as departmental managers, we will begin by looking at some of the behavioural issues that are relevant to budgeting.

Behavioural aspects of budgeting

Once a budget is set, it can be seen by managers as a series of targets to achieve within the period. This inevitably raises issues regarding motivation, which is a complex area of management and psychology. In simple terms, a target can be a positive motivation, but it needs to be seen to be achievable for it to be a positive motivation. If a manager is set a budget that is double the previous period's level of achievement, they will probably not bother trying to achieve the target as it will seem impossible. However, a budget set slightly higher than the previous budget is more likely to be seen as achievable and will lead to managers taking action to meet that level of activity.

Budgetary control is a very powerful tool which highlights all departures from the agreed budget. It is therefore vitally important that all managers are involved in the budget-setting process so that they feel committed to achieving their targets. It also needs to be recognised that managers will play the "budget game" and endeavour to ensure they have achievable targets. It is quite common to find that the company's first budget estimates show it making losses: sales and marketing staff may have been cautious with their sales estimates and views on price increases, whilst line managers may have been unduly pessimistic about costs and endeavour to secure the maximum capital budget so that they can implement all their projects.

It takes time to identify their genuine expectations, and this process must be handled very carefully to avoid the appearance of imposing budgetary targets on managers. The eventual target should be realistic but challenging – to provide a motivation to the people involved.

Having constructed the budget, it is also important to recognise that some managers may attempt to act so that that adverse variances are not reported in their area. It is not unknown for managers to put incorrect codes on their purchase orders so that costs are shown in another manager's operating statement or reported elsewhere on their own. Naturally this does nothing to help define better budgets in the following years.

It is also essential that the basis of the budget-setting process is understood. In practice it is often based on the company's current position and then updated for changes expected in the forthcoming year. This can lead to established inefficiencies being built into next year's targets. An alternative approach is called zero-based budgeting, which challenges the accepted way of doing things and attempts to construct budgets based on the way operations would be established if they were being set up for the first time. The budget may start from the company's current position, but this type of analysis should encourage the company to progress towards a better way of structuring its activities.

Budgetary control is important, but the correct balance needs to be maintained between the company's short and long-term goals. Budgetary control tends to highlight short-term financial objectives, and this highlighting is sometimes reinforced by management incentive schemes that are geared to achieving the budget. Great care must therefore be exercised to ensure that decisions are not taken that protect short-term profitability at the expense of the long-term position of the company. For example, research and development costs can be cut without any immediate impact on the company; however, that is likely to have a major impact on the company's long-term position.

Use of budgetary control

We could produce a lengthy list of reasons why budgetary control is important in an organisation and list the many uses that budgetary control can be put to within an organisation. The following are some of the most important uses of budgetary control.

Planning

We have already used a definition of a budget that includes the word "plan" so planning is clearly central to a budget's objectives and uses. The link between a company's strategic or corporate plan for a period, which may in some cases be more than one year, and the company's budget for the year (or for a shorter period, in some cases), is crucial. A plan may be created in terms of products, markets, volume of sales, number of employees, etc, but all these items need to be converted into monetary amounts to prepare a budget. As well as expressing the company plan in monetary terms, a budget can help develop the plan itself, i.e., the initial budget may identify some issues that require revision of the plan before a final budget can be set.

Within the planning process, it is important to note that products may have a natural life cycle, and this must be considered in setting amounts in the budget. This can be viewed as consisting of five stages:

Development stage	During this period of the product's life there are large outgoings in terms of development expenditure, purchase of non-current assets necessary for production, the building up of inventory levels and advertising and promotion expenses. During development, sales may be at zero.
Launch stage	It is likely that sales will be quite low for a period after the launch. The product may be making a loss at this stage.

Growth stage	If the launch of the product is successful, then during the growth stage there may be rapid increases in sales and a move to profitability as the costs of the earlier stages are covered. The increase in, however, is not likely to continue indefinitely.
Maturity stage	In the maturity stage of the product life cycle, the growth in demand for the product may start to slow down and sales volumes may become more constant. In many cases this is the stage where the product is modified or improved, to sustain demand, and this may then result in a renewed increase in sales.
Decline stage	At some point in a product's life, unless it is a consumable item such as chocolate bars, the product will reach the end of its sale life; the market will have bought enough of the product and sales will decline. This is the point where the business should consider no longer producing the product.

Exercising control

It is essential for a company to achieve, if not exceed, its budget. Achievement of budget will be aided using a budgetary control system which constantly monitors actual performance against the budget. All variances will be monitored, and positive action taken to correct those areas of the business that are failing to perform.

Control of cost is a central part of this, and this is especially important during periods of economic downturn, where reducing expenditure becomes critical. A budget may also be relevant to other aspects of the business, such as exercising control over income streams, the management and stewardship of assets, the recruitment and remuneration of employees, etc.

Setting targets

Budgets establish targets for each aspect of a company's operations. These targets are set in conjunction with each budget manager. In this way, managers are committed to achieving their budgets. This commitment also acts as a motivator.

Authorising income and expenditure

In the public sector, the use of the budget as a means of giving authority to spend and/or to generate income, is a crucial aspect of its importance. In some parts of the public sector, it is a legal requirement to set a budget, and there is a formal process for approving the budgets (e.g., through an Act of Parliament, or a decision by the Council of a local authority).

In the private sector, this may be a less formalised form of authorisation, but the budget can provide managers with confidence that they are able to make decisions that are consistent with the budget (e.g., to spend FRW 5 million on research and development,

if the R&D budget can accommodate that amount), without having to seek additional approval or authorisation. This can help speed up decision making during the year, allowing managers the freedom to act, provided that the budget is not exceeded in the period.

Systems can be set up so that invoices or purchase orders cannot be approved without there being availability remaining in the relevant budget line for that amount of expenditure.

Identifying problems

Budgets systematically examine all aspects of the business and identify factors that may prevent a company achieving its objectives. If budgetary control is working properly, problems can be identified early, which in turn allows a company to take the necessary corrective action to correct the problem. For example, a budget may indicate that the company will run short of cash during part of each year because of the seasonal nature of the service being provided. By anticipating this position, the company should be able to take corrective action or arrange additional financing.

Making improvements

Budgets will identify all those areas that can be improved, thereby increasing efficiency and profitability. Positive plans for improving efficiency can be formulated and built into the agreed budget. In this way a company can ensure that its plans for improvement are implemented.

Co-ordinating activities

Budget managers need to be aware of the company's objectives for the following year. Each manager will then be asked to formulate their own plans to ensure that the company's overall objectives are achieved. Each of the plans can be combined and evaluated so that a total budget for the company can be compiled. During this process, the company can ensure that each individual plan is consistent with the company's overall objectives.

Raising finance

Any provider of finance will want reassurance that the company is being managed correctly, that a loan will be repaid, and that interest commitments will be met. The fact that a company has established a system of budgetary control will help to demonstrate that it is being managed correctly. The budget will also show that the company is able to meet all its commitments.

Types of budget and organisational requirements

There are a number of types of budget that cover the various aspects of a company's operations. These can be summarised into the following categories.

Income and expenditure - operating budget

Master budgets cover the plan of action for the whole organisation and normally include a budgeted statement of profit or loss and budgeted statement of financial position.

The master budget is analysed into subsidiary budgets that detail responsibility for generating sales and controlling costs. Detailed schedules are also prepared showing the build-up of the figures included in the various budget documents.

Functional budgets

Functional (or departmental) budgets are the budgets for the various functions and departments of an organisation. They therefore include production budgets (see below), marketing budgets, sales budgets, personnel budgets, purchasing budgets and research and development budgets.

Revenue (or sales revenue) budget

Once the expected quantity of sales has been determined, the anticipated price to be charged for the products or services can be applied to this forecast. This gives the budgeted income, usually referred to as the sales revenue budget (in monetary terms). From the sales budget, the resource budgets for production can also be prepared.

Production budget

If the principal budget factor was production capacity, then the production cost budget would be the first of the functional budgets to be prepared.

To assess whether production is the principal budget factor, the production capacity available must be determined. This should consider the following factors:

- Available labour, including idle time, overtime, and standard output rates per hour.
- Availability of raw materials, including allowances for losses during production.
- Maximum machine hours available, including expected idle time and expected output rates per machine hour.

However, it is normally sales volume that is the constraint and therefore the production budget is prepared after the sales budget and the finished goods inventory budget.

The production cost budget will show the quantities and costs for each product and product group and will tie in with the sales and inventory budgets. This co-ordinating process is likely to show any shortfalls or excesses in capacity at various times over the budget period. If there is likely to be a shortfall then consideration should be given to overtime, subcontracting, machine hire, new sources of raw materials or some other way of increasing output. A significant shortfall means that production capacity is, in fact, the limiting factor.

If capacity exceeds sales volume for a length of time, then consideration should be given to product diversification, a reduction in selling price and so on.

Once the production budget has been finalised, the labour, materials and machine budgets can be drawn up. These budgets will be based on budgeted activity levels, existing inventory positions and projected labour and material costs.

Material budget

The preparation of a material purchases budget will often require use of the expression:

Opening inventory + purchases – closing inventory = material used in production

A material purchases figure is therefore given by:

Materials purchases = closing inventory + material used in production – opening inventory

Likewise, a production budget may require manipulation of the expression:

Opening inventory + units produced – closing inventory = sales

Labour budget

A useful concept in budgeting for labour requirements is the standard hour.

A standard hour is the quantity of work achievable at standard performance, expressed in terms of a standard unit of work done in a standard period.

Budgeted output of different products or jobs in a period can be converted into standard hours of production, and a labour budget constructed accordingly.

Standard hours are particularly useful when management wants to monitor the production levels of a variety of dissimilar units. For example, product A may take 5 hours to produce, while product B takes 7 hours. If 4 units of each product are produced, instead of saying that total output is 8 units, we could state the production level as (4 * 5) + (4 * 7) standard hours = 48 standard hours.

Capital Budget

These budgets detail all the projects on which capital expenditure will be incurred during the following year, and when the expenditure is likely to be incurred. Capital expenditure is money spent on the acquisition of non-current assets such as buildings, motor cars and equipment. The capital budget enables the non-current asset section of the statement of financial position to be completed, and it provides information for the cash budget.

Cash Budget

A cash budget is a detailed budget of cash inflows and outflows incorporating both revenue and capital items. This budget analyses the cash flow implications of each of the above budgets. It is normally prepared monthly and includes details of all cash receipts and payments. The cash budget will also include the receipt of finance from loans and other sources together with forecast repayments.

The usefulness of cash budgets is that they enable management to make any forward planning decisions that may be needed, such as advising their bank of estimated overdraft requirements and strengthening their credit control procedures to ensure that customers pay more quickly.

The cash budget is one of the most important planning tools that an organisation can use. It shows the cash effect of all plans made within the budgetary process and therefore its preparation can lead to a modification of budgets if it shows that there are insufficient cash resources to finance the planned operations.

It can also give management an indication of potential problems that could arise and allows them the opportunity to take action to avoid such problems. For example, if a short-term cash shortfall is indicated, the action may include delaying payments to suppliers or arranging a bank overdraft.

Fixed and flexible budgets

In some organisations, once a budget is approved it is unlikely to be amended during the period, and so can be regarded as "fixed." This tends to be the case in the public sector, although amendments may be made to take account of pay awards or urgent and unforeseen circumstances in the period.

In commercial organisations, it can be important to allow for the budget to be "flexed" depending on the level of activity, as the volume of production, sales, etc will have a direct impact on the income and expenditure of the entity.

> A flexed budget is a budget that is prepared at the actual activity level that was achieved in the period, in order to show what the standard costs should have been at that activity level.

We will look at the process of preparing flexed budgets in more detail in Unit E.

Budget variances

During the budget period, a system is required that collects actual results (e.g., income and expenditure) in a way that allows comparison with the amounts that were included in the budget. Any difference between budgeted and actual amounts is a variance. Excessive costs and inadequate sales will be highlighted, and positive action will be required to ensure that the company corrects any adverse variances.

When a system of budgetary control is in operation, the principle of management by exception can be applied, i.e., when presenting information on actual results to management, attention should be given mainly to those areas where there is a deviation from budget.

The accounting function should be organised to produce the actual figures for comparison with the budgets at the earliest possible point of time. The accounts headings should be the same as the budget headings, so that the minimum processing work is necessary on the figures.

The expense involved in collecting the cost figures must be borne in mind. A balance should be struck between keeping costs to a minimum and obtaining the maximum amount of useful information.

The budget committee should be in possession of the comparison between actual and budget expenses shortly after the close of an accounting period. Each period should be examined in detail by the budget committee, and managerial action taken where necessary.

Prompt presentation of information is important because any adverse trends will probably be continuing while data is being collected and analysed. If action is to be taken that will have an impact on the results for the succeeding period, it must be taken quickly, so the time required to collect and analyse the data must be minimised.

Variance Interpretation

Any variances shown by the budget statements should be interpreted by the budget manager. They should give their view on whether the variance is regarded as controllable or non-controllable.

This part of the operation is most important. The skill and experience of the budget manager will be of the greatest value to management, who wish to know not only the extent of any deviation from plan, but more importantly, the reasons for it and any action being taken to correct it.

Note that the purpose of such information is not to punish any individual for not keeping to their budget (though it may sometimes be necessary to point out that results are unacceptable), but rather to obtain information that will assist management to ensure that future budgets are accurate, and that greater effort is made to achieve them. The budget may also need to be updated in the light of results achieved to date, by preparing a re-forecast.

Note that one potential cause of variances is poor initial forecasting and budgeting. Techniques should be kept under constant review and improved over time in the light of experience.

Limiting factors

Some reference has already been made in this unit to constraints or limiting factors as an influence in how a budget is prepared. For example, if a company has a factory with a physical capacity to produce 1 million products per annum, there is little point in setting a budget based on a production level of 2 million items. There may be ways of getting around such constraints, e.g., by sub-contracting some manufacture to another entity or by increasing local capacity, but these may be long-term rather than short-term options.

When we look at the preparation of budgets in more detail in Units D and E, we will need to take account of constraints or limiting factors in specific examples, but it is useful at this point to note the most common factors and how these might impact on a budget.

Demand for a product	Demand for a product, or a company's ability to meet the demand may be limited, and this impacts on the sales volume budget.
Supply of materials	Shortage of materials may be a constraint. This was a major issue in recent years when events such as pandemic, conflicts, etc had an impact on the availability (and therefore price) of some materials. This may be a general issue affecting a wide range of materials, or may be related to specific, key components of production.
Labour	Specific skills or labour resources more generally may be limited. Training may address some skills issues, but this may not be possible in the short term.
Production capacity	It is possible for a lack of production capacity in terms of machinery or floor space in the factory to be the key budget factor. The production level will be dependent upon the maximum capacity of the factory.

Public sector budgets

There are many differences between public and private sector approaches to budgeting, and some of these are quite complex. The following is a summary of some of the key points to note about public sector budgeting, which in some cases differs from what is typically found in the private sector.

Legal basis	Many public sector organisations are legally required to prepare a budget for a set period (usually a financial year). There may also be specific requirements in the way this is carried out, for example: There may be a requirement to have a balanced budget (i.e., expenditure is within projected or known resources). The budget may need to distinguish between recurring and non-recurring (capital) expenditure and may need to fund these from different income sources. The process may involve specific steps, such as a local authority being required to engage in consultation with other groups before the budget is finalised. Some activities may be legally required, and to a specified level or standard. This means there is no option to remove or reduce these activities in setting the budget. There may be legal restrictions on income sources. For example: a local authority may be restricted in how much it can increase local taxes by; or it may not be permissible to charge for some services.
Budget methods	Public sector organisations often use incremental budgeting. This involves taking the previous year's budget and adjusting for known changes, inflation, etc. Periodically, an organisation may use a zero-based budgeting approach, which involves requiring all activities to be justified before inclusion in the budget, rather than assuming last year's activities will continue.
Objectives	Profit is not an over-riding objective, and activities may be included in the budget even though they are loss-making or involve large amounts of expenditure with little or no income. Governments and local authorities have a wide range of services, each with different objectives (i.e., providing education, improving health, protecting the public from crime, etc). This can make budgeting more complex.
Focus on expenditure	Many public sector organisations have a relatively fixed level of income (e.g., in the form of an annual government grant), and so the budget focus is on how to spend that income on the organisations functions and activities.

Fund accounting	Some income is provided on the basis of it being spent on a specific activity. For example, government may provide specific grant funding for education, and it may not be allowed for this to be spent on other services. Restrictions on other income sources may mean they cannot be used elsewhere, such as rent income from housing tenants only being used to support the housing service. This impacts on budgeting, as each "fund" needs to have a balanced budget, and cross-subsidisation may be limited.
Focus on budget lines rather than the overall outcome	Public sector budgets must be largely spent on a line-by-line basis, rather than simply keeping within an overall total. For example, a government body may not be allowed to overspend on its staff budget by underspending elsewhere.
Public accountability	Budgets are often used in the public sector to demonstrate financial accountability. This means that the budget is publicly available, and overspends need to be explained in committees, reports, etc.

Summary of Unit B and key learning outcomes

In Unit A, we looked at the Competency "Demonstrate an understanding of why budgets are used." This involved content on seven learning outcomes.

Learning outcome	
Explain the behavioural aspects of budgeting	You should now be able to explain the importance of taking behavioural issues, such as motivation, into account when setting and managing budgets.
Justify the uses of budgetary control for: • Planning • Co-ordinating • Authorising • Cost control	You should now be able to explain how budgets assist an organisation in carrying out these and other activities.
Identify the correct budget to prepare according to the organisational requirements.	You should now be able to discuss different functional budgets, as well as fixed and flexible budgets.
Explain the relationship between budgetary control, product lifecycles, and forecasts and planning.	You should now be able to discuss the way in which budgets are linked to other management activities.

Explain the significance of budget variances.	You should now be able to discuss the importance of variances and how these are addressed by an organisation.
Recognise the effect that capacity, production and sales constraints have on budgets.	You should now be able to identify and explain different types of constraint on a budget.
Explain the main differences between the public and private sector and the implications for the approach to budgeting in the public sector.	You should now be able to summarise the key differences between public and private sector budgets.

Quiz questions

1	Learning Outcome: B1
Which of the following statements is true in relation to setting a budget?	
A	A budget should include targets that are always the same as the previous year's results
B	A budget should include targets that easy to achieve
C	A budget should include targets that are higher than what is realistically achievable
D	A budget should include targets that are challenging but achievable

1	Feedback
A	Incorrect A budget should include targets that are challenging but achievable
B	Incorrect A budget should include targets that are challenging but achievable
C	Incorrect A budget should include targets that are challenging but achievable
D	Correct A budget should include targets that are challenging but achievable

2	Learning Outcome: B3
Which of the following statements describes a flexed budget?	
A	A budget that does not change in response to a change in activity levels
B	A budget that is varied in response to a change in activity levels
C	A budget that is different for each function within an organisation
D	A budget that is based on the previous year's budget, adjusted for inflation

2	**Feedback**
A	Incorrect A flexed budget is a budget that is varied in response to a change in activity levels
B	Correct A flexed budget is a budget that is varied in response to a change in activity levels
C	Incorrect A flexed budget is a budget that is varied in response to a change in activity levels
D	Incorrect A flexed budget is a budget that is varied in response to a change in activity levels

3	Learning Outcome: B7
Which of the following statements is often true of public sector budgets?	
A	A zero-based budgeting approach is applied each year in preparing the budget
B	The budget is prepared externally
C	There is a legal requirement to prepare an annual budget
D	Income is ignored in the budgeting process

3	Feedback
A	Incorrect. Incremental budgeting is more common, although zero-based budgeting may be applied periodically There is often a legal requirement to prepare an annual budget
B	Incorrect. The budget is a responsibility of each entity, so would be prepared internally. There is often a legal requirement to prepare an annual budget
C	Correct There is often a legal requirement to prepare an annual budget

3	Feedback
D	Incorrect. There may be a focus on expenditure, but income is not ignored and may often be significant, depending on the service involved. There is often a legal requirement to prepare an annual budget

4	Learning Outcome: B5
Which of the following statements is an example of a budget variance?	
A	The difference between budgeted income and budgeted expenditure for the period
B	The difference between budgeted sales of Product X and the actual sales of Product Y
C	The difference between budgeted and actual staff costs for the period
D	The difference between actual rent expenses for 20X5 and actual rent expenses in 20X6

4	Feedback
A	Incorrect. A variance is a comparison of budgeted and actual results for the same budget line, but income and expenditure are different budget lines. The difference between budgeted and actual staff costs for the period is a variance
B	Incorrect. A variance is a comparison of budgeted and actual results for the same budget line, not between different products. The difference between budgeted and actual staff costs for the period is a variance
C	Correct The difference between budgeted and actual staff costs for the period is a variance

D	Incorrect. A variance is a comparison of budgeted and actual results for the budget period, not between different periods. The difference between budgeted and actual staff costs for the period is a variance

5	Learning Outcome: B3
Which of the following would be an appropriate management action if the cash budget indicated a short-term cash surplus?	
A	Delay payments to suppliers
B	Sell short-term investments
C	Arrange an overdraft
D	Pay suppliers early to obtain a discount

5	Feedback
A	Incorrect Paying suppliers early to obtain a discount would be an appropriate action
B	Incorrect Paying suppliers early to obtain a discount would be an appropriate action
C	Incorrect Paying suppliers early to obtain a discount would be an appropriate action
D	Correct Paying suppliers early to obtain a discount would be an appropriate action

Quiz answers

1	D
2	B
3	C
4	C
5	D

Unit C: Budget Preparation Skills and Techniques.

Learning outcomes

C.1 Explain the principles of standard costing.

C.2 Describe the purpose of revenue and cost forecasts and how they link to budgets.

C.3 Identify when to use the following techniques:

a. Indexing

b. Sampling

c. Moving averages

d. Linear regression

e. Seasonal trends.

C.4 Recognise expenses as different types of costs (direct or indirect, overhead, fixed, variable, semi-variable or stepped) have on budgeting.

C.5 Identify the sources of relevant data used in budget proposals.

Introduction to Unit C

In Units A and B we discussed the budgeting context and the main purposes of budgets in an organisation. During these units we referred to various tools, techniques, activities, etc that are involved in preparing, applying, and managing budgets. We noted that a budget is a management tool that expresses the organisation's plans in numerical/monetary terms. It, therefore, involves looking at a future period (i.e., the budget period), and identifying relevant figures to include in the period's budget. This means there is an element of estimating or forecasting involved, as we cannot predict future activity or future costs with certainty. This raises questions about what kind of data we can use to help in determining budget amounts, and what techniques can help us do this with a greater degree of reliability.

In Unit C, we will look more closely at the process of estimating or forecasting into the future, the techniques that are commonly used in that regard, and the data that is most relevant to support these processes.

An understanding of cost behaviour is crucial in this context, and so we include a reminder of how fixed, variable, semi-variable and step-fixed costs are relevant to budgeting.

Principles of standard costing

Standard costing is a technique that evolved from the manufacturing sector. It is based on the premise that when the same product or service is produced consistently, then

standards can be set in relation to that product or service. Ultimately a review is made of the actual costs incurred and incomes earned to compare with the standards set.

The formality of a standard costing system will vary from organisation to organisation. There are considerable differences between manufacturing and service organisations. For tactical budgets to be effective, some degree of estimation at cost unit (i.e. operational) level is necessary, and can offer several advantages, such as improving the accuracy of budgets and supporting detailed analysis for budget control.

Standard costing problems

Despite the advantages, standard costing may also present some difficulties in practice:

Setting an acceptable standard	Where direct labour is a significant element in the output process, setting an appropriate standard for efficiency is important.
Inapplicability to varied output	Standard costing is well suited to situations where output procedures consist of repetitive processes and where the output itself is standardised. If the output is not standard, then there cannot be a single standard cost.
Incorporating inflation	Even where inflation rates are low, this may still be troublesome as it is a subjective estimate that if incorrect will create variances. Frequent changes in pay and/or prices will require standards to be updated.
Cost	Standard costing systems can be costly to introduce and maintain.

How does standard costing operate?

Standard costing uses a concept called variance analysis. As the name implies, variance analysis looks at variances between standard and actual costs, i.e., between what it should have cost and what it actually cost. Variance analysis will act as a means of focusing management attention on operations but especially on those areas (the biggest variances) which merit attention first.

Standard costing and variance analysis are frequently used in the manufacturing sector. The main headings for variance analysis are:

- materials
- labour
- variable overheads
- fixed overheads
- sales

Manufacturing organisations would hold a standard cost card, usually computerised, for each product in their portfolio and will use it to monitor costs and levels of inventory. It contains details on each of the resources consumed in production, in both amounts and cost.

Standard cost and variance calculations

Some situations require budgets that are capable of being flexed to allow a meaningful comparison of performance.

As standard costing is comparing budgeted and actual costs, we need to bear in mind the need to be "flex" the budget to ensure that any volume variances are kept separate and to allow the variances between the flexed budget and the actual costs to be established.

In standard costing the flexed budget is called the standard and the original budget remains the budget.

Consider the following example:

A Company has a budget for April to make 1,000 units of its product each using 3 kg of materials at a cost of FRW 2,500 per kilo.

At the end of April 1,200 units had actually been produced.

The materials budget is:

1,000 x 3 kg x 2,500 = FRW 7,500,000

However, the standard cost for materials to be compared to the actual costs needs to reflect the actual level of activity and so the standard cost of materials would be

1,200 x 3 kg x FRW 2,500 = FRW 9,000,000

It should have taken 3 kg of materials per unit and these should have cost FRW 2,500 per kilo, but 1,200 units was actually produced. Standard costs are based on the standard amount of resources per unit but on the actual number of units.

Similar estimates will be prepared for direct labour of standard hours (labour hours per unit of output) and standard rate (labour rate per hour). Predetermined overhead absorption rates will be developed allowing a standard overhead cost per unit to be calculated. In addition to estimating the input resources necessary per unit of output, a standard selling price will be set and standard profit (or standard contribution) per unit determined.

The detailed estimates that support standard costs (e.g. of materials usage or labour time per unit) often require considerable expertise to produce. Direct materials requirements, for example, may result from engineering analysis of inputs and outputs and a work study as in example above.

Actual versus standard costs (using materials as the example)

In general, there are two reasons why actual and standard material costs might differ. Actual and standard material cost may differ because either or both the purchase cost and usage differ.

It is important to note that variances (regardless of their level of detail) are merely indicative of possible problem areas, but without further investigation do not constitute conclusive evidence of personal responsibility.

Consider an example where the flexed budget/actual comparison reveals variances such as:

Materials cost variance = FRW 5,000,000 Adverse (A)

This undoubtedly indicates that actual spending on materials was FRW 5,000,000 higher

than the budget based on an identical output volume, but does it tell us anything about what aspect of material cost may be causing problems, or about where, within a responsibility accounting system, the locus of managerial responsibility might lie?

Suppose that, within a responsibility accounting system, purchase of materials is the responsibility of the Chief Buyer whereas usage is the responsibility of the Operations Manager. The subdivision of this materials cost variance into price and usage elements may help decide to whom the respective variances should be reported.

But this is not the same as suggesting that the Chief Buyer and Operations Manager are responsible, respectively, for the price and usage elements of the budget variance. The reporting of detailed variances may help identify the individual who is in the best position to investigate and initiate corrective action.

Standard cost card

A standard cost card shows full details of the standard cost of each product. The following is an example of a cost card for an item produced by a company:

Standard Cost Card – Product 1234

	FRW '000	FRW '000
Direct materials		
Material X – 3 kg at FRW 4,000 per kg	12	
Material Y – 9 litres at FRW 2,000 per litre	18	
		30
Direct labour		
Grade A – 6 hours at FRW 1,500 per hour	9	
Grade B – 8 hours at FRW 2,000 per hour	16	
		25
Standard direct cost		55
Variable production overhead – 14 hours at FRW 500 per hour	7	
Standard variable cost of production		62
Fixed production overhead – 14 hours at FRW 4,500 per hour	63	
Standard full production cost		125
Administration and marketing overhead		15
Standard cost of sale		140

Standard profit		20
Standard sales price		160

The total standard cost is built up from standards for each cost element: standard quantities of materials at standard prices, standard quantities of labour time at standard rates and so on. It is therefore determined by management's estimates of the following.

- The expected prices of materials, labour, and expenses
- Efficiency levels in the use of materials and labour
- Budgeted overhead costs and budgeted volumes of activity

Forecasting and budgeting

It is important to consider how to make reliable forecasts from which a budget can be constructed. These forecasts should be consistent with the plans or intentions of the business and the impact of external factors. There are a number of methods that can be used for this, including:

- Indexing
- Sampling
- Moving averages
- Linear Regression
- Seasonal trends

Indexing

An index is a measure, over time, of the average changes in the value (price or quantity) of a group of items relative to the situation at some period in the past. Index numbers are a very useful way of summarising a large amount of data in a single series of numbers.

Indexing is a simple and convenient method of examining the trend of an expense or revenue item over time. The actual figures are converted into a series of index numbers.

Index numbers measure the change in value of a figure over time, by reference to its value at a fixed point.

This is done by determining a base period, which is the period for which the actual figure is given an index of 100. Each subsequent period's figure is converted to the equivalent index using the following formula:

Index = (Current period's figure / Base period figure) × 100

Indexing is useful for analysing figures for income (or cost) collected over a period. From this, management have a greater awareness of the trend of this cost or income, and by extrapolating this trend, sales and other forecasts can be produced. However, the trend will not continue indefinitely, and external factors regarding things like a product's life cycle should also be considered.

One example of a commonly used index is the Consumer Price Index (CPI), as illustrated in the following example:

Year	CPI
20X1	140.7
20X2	144.1
20X3	149.1
20X4	152.7

We can apply the CPI to annual sales figures in order to show the adjusted sales figure for each year during the period using the following formula:

Adjusted sales = Sales for current year × (CPI for year 1)/CPI for current year

Year	Sales	Adjusted sales
	FRW '000	**FRW '000**
20X1	513,600	513,600
20X2	516,300	504,118
20X3	518,400	489,194
20X4	522,400	481,347

This shows that, although sales appear to have increased during the period, when we adjust for CPI we find that the figures are actually falling in "real" terms, i.e., without inflationary effects.

This could be due to:

- falling sales volumes
- selling prices failing to keep up with general inflation
- or a combination of these.

What has been done here is to turn each period's sales into 20X1 price terms to illustrate that, in terms of the prices then prevailing, the sales over time have decreased.

This is important for budgeting, as a trend over previous years can sometimes be used as a basis for forecasting. If a company made a forecast based on sales figures only, this may assume an increasing trend. However, the company in the example above needs to understand that sales volumes have been falling, and the trend is therefore a reduction in sales.

Sampling

Sampling plays a part in many aspects of management accounting, where it is not practical or necessary to analyse the entire set of results or data (i.e., the "population")

within an aspect of the entity's performance, and so a selection of results or data (the "sample") is taken as representative of the population. This is a technical part of statistics or quantitative methods, and the Management Accounting syllabus does not require us to get into the detail of how sampling and the analysis of information from a sample are carried out. However, it is important that you understand the role that sampling can play, and the different methods of carrying out a sample.

A sample may play a part in budget preparation. A sample may be taken from an aspect of the entity's results in the previous period, to obtain information that is helpful in preparing that part of the next period's budget. For example, a company with 100 retail outlets may analyse the information from 10 shops in detail and use that analysis to prepare the budget for the whole organisation. One question that then arises is "how do we select the 10 shops in the sample?" – and there are several ways of deciding that, as discussed below.

A probability sampling method is a sampling method in which there is a known chance of each member of the population appearing in the sample. Types of probability sampling are:

- Random
- Stratified random
- Systematic
- Multistage
- Cluster

Random sampling

A simple random sample is a sample selected in such a way that every item in the population has an equal chance of being included.

If a sample is selected using random sampling, it will be free from bias (since every item will have an equal chance of being selected). Once the sample has been selected, valid inferences about the population being sampled can be made.

Random sampling has several potential drawbacks:

- Selected items are subject to the full range of variation inherent in the population.
- An unrepresentative sample may result.
- An adequate sampling frame might not exist.
- The numbering of the population might be laborious.
- It might be difficult to obtain the data if the selected items cover a wide area.
- It might be costly to obtain the data if the selected items cover a wide area.

Stratified random sampling

Stratified random sampling is a method of sampling which involves dividing the population into strata or categories. Random samples are then taken from each stratum or category.

In many situations, stratified sampling is the best method of choosing a sample. For example, you may wish to sample 1,000 people from a city population of 1 million. If you know that the city population is 51% female and 49% male, a stratified random sample ensures there are 510 females in the sample, and 490 males.

Systematic sampling

Systematic sampling is a sampling method which works by selecting every "nth" item after a random starting point. This is, for example, one way for an auditor to select a sample of invoices or inventory items to check during an audit.

If it were decided to select a sample of 20 from a population of 800, then every 40th (800 / 20) item after a random starting point in the first 40 should be selected. The starting point could be found using random number tables. If (say) 23 was chosen, then the sample would include the 23rd, 63rd, 103rd, 143rd ... 783rd items. The gap of 40 is known as the sampling interval.

The advantages of systematic sampling are that it is easy to use, and it is cheap. However, it is possible that a biased sample might be chosen if there is a regular pattern to the population which coincides with the sampling method.

Multistage sampling

Multistage sampling is a probability sampling method that involves dividing the population into several sub-populations and then selecting a small sample of these sub-populations at random. Each sub-population is then divided further, and then a small sample is again selected at random. This process is repeated as many times as is necessary.

For example, a country may be divided into regions, and then into smaller districts, and finally into localities. First, a small sample of regions is selected at random. For each of the regions selected, a selection is made of the districts within these regions. And then the same is done for a selection of localities within these districts. This process can be repeated as many times as necessary and finally, a random sample of the relevant people living in each of the smallest units is taken. A fair approximation to a random sample can be obtained in this way.

The method is not truly random, as once the final sampling areas have been selected the rest of the population cannot be in the sample. If the population is heterogeneous, the areas chosen should reflect the full range of the diversity. Otherwise, choosing some areas and excluding others (even if it is done randomly) will result in a biased sample.

Cluster sampling

Cluster sampling is a non-random sampling method that involves selecting one definable subsection of the population as the sample, and that subsection is taken to be representative of the population in question. For example, the pupils of one school might be taken as a cluster sample of all children at school in one region.

This can be a suitable alternative to multistage sampling, but there is potential for considerable bias (e.g., by selecting a school that is known to have high standards).

Quota sampling

Quota sampling is a non-probability sampling method. It is not a random sampling method but does have the advantages of being inexpensive and simple to administer. The process involves selecting the first items that meet the criteria until a set number, or quota, has been reached.

The method can result in certain biases. For example, an interviewer in a shopping centre may fill the quota by only meeting people who can go shopping on that day of the week or early in the morning.

Linear regression

As we consider the linear regression technique, it is important to understand the concept of correlation. Two variables are said to be correlated if a change in the value of one variable is accompanied by a change in the value of another variable.

Perfect correlation	Where a change in one variable results in an equal change of the same magnitude in the other variable.
Partial correlation	Where a change in one variable results in a change in the other variable, but not necessarily to the same degree.
Positive correlation	Where an increase in one variable results in an increase in the other variable.
Negative correlation	Where an increase in one variable results in a decrease in the other variable.
Absence of correlation	Where a change in one variable does not result in any change in the other variable.

Correlation enables us to determine the strength of any relationship between two variables, but it does not offer us any method of forecasting values for a dependent variable, Y, given values of an independent variable, X.

If we assume that there is a linear relationship between the two variables, however, and we determine the equation of a straight line ($Y = a + bX$) which is a good fit for the available data plotted on a scatter graph, we can use the equation for forecasting. This means that we can substitute values for X (the independent variable) into the equation and derive values for Y (the dependent variable). For example, the total cost of materials purchases depends on the budgeted number of units of production. The number of production units is the independent variable (X) and the total cost is the dependent variable (Y). There may be an element of fixed costs involved in materials purchasing (e.g., the salary of a purchasing officer, the cost of placing an order and processing invoices, etc), and this will be represented by a in the formula, with b being the variable costs of each unit purchased (usually the purchase price, but there may be other costs also). This may also be complicated by things like discounts for bulk purchases, so the equation $Y = a + bX$ approximates the cost of future purchases, based on a history of previous purchasing activity, as it determines a line of best fit that defines the relationship between the variables.

There are several advantages of regression analysis, including the following:

- It gives a definitive line of best fit, taking account of all the data.
- Linear regression makes efficient use of data and good results can be obtained with relatively small data sets.
- The significance/reliability of the relationship between variables can be statistically tested.
- Many processes are linear so are well described by regression analysis. Even many non-linear relationships can be well approximated by a linear model over a short range.

As with all forecasting techniques, the results from regression analysis will not be wholly reliable. There are several factors which affect the reliability of forecasts made using regression analysis.

It assumes a linear relationship exists between the two variables (since linear regression analysis produces an equation in the linear format), whereas a non-linear relationship might exist.
It assumes that the value of one variable, Y, can be predicted or estimated from the value of one other variable, X. The value of Y might depend on several other variables, not just X. For example, sales volumes of a product (variable Y) might be predicted using marketing spend (variable X) when other factors may also affect sales volumes such as selling price and availability.
When it is used for forecasting, it assumes that what has happened in the past will provide a reliable guide to the future.
When calculating a line of best fit, there will be a range of values for X. For example, we may base the calculation on data with output values ranging from X = 16 to X = 24. Depending on the degree of correlation between X and Y, we might safely use the estimated line of best fit to predict values for Y in the future, provided that the value of X remains within the range 16 to 24. We would be on less safe ground if we used the formula to predict a value for Y when X = 10, or 30, or any other value outside the range 16 to 24, because we would have to assume that the trend line applies outside the range of X values used to establish the line in the first place.
As with any forecasting process, the amount of data available is very important. Even if correlation is high, if we have fewer than ten pairs of values, we must regard any forecast as being somewhat unreliable.
The reliability of a forecast will depend on the reliability of the data collected to determine the regression analysis equation. If the data is not collected accurately or if data used is false, forecasts are unlikely to be acceptable.

Seasonal trends – time series

A time series is a series of figures or values recorded over time. There are four components of a time series:

Trend	The trend is the underlying long-term movement over time in the values of the data recorded
Seasonal variations	Seasonal variations are short-term fluctuations in recorded values, due to different circumstances which affect results at different times of the year, on different days of the week, at different times of day, etc
Cyclical variations	Cyclical variations are fluctuations which take place over a longer time than seasonal variations.

Random variations	These are variations that cannot be explained by the other components of change. These may be caused by unforeseen circumstances, such as a change in the government of the country, a war, the collapse of a company, technological change, etc.

Example A company selling laptops may have experienced a growth in sales income averaging 5% per annum in Years 1 to 5. Further analysis shows that the increase was greater in Years 1 to 3 and less in Years 4 to 5. Also, sales income each year was higher in the final quarter than in the rest of the year.	
Trend	The trend appears to be an increase of 5% per annum, but this can be further analysed using the moving averages technique (see below)
Seasonal variations	Each year sees an increase from October to December, which may be due to the Christmas period or special sales events
Cyclical variations	The product life cycle may mean that sales of one or more types of laptop were falling in later years, possibly due to them becoming obsolete
Random variations	Other events such as competitors launching products may have an impact at different times

Moving averages

The moving averages method attempts to remove seasonal (or cyclical) variations from a time series by a process of averaging, resulting in a set of figures that show the trend.

A moving average is an average of the results of a fixed number of periods. Since it is an average of several time periods, it is related to the mid-point of the overall period.

Example:

Year	Sales units
20X0	390
20X1	380
20X2	460
20X3	450
20X4	470
20X5	440
20X6	500

We need to identify the moving average of the annual sales over a period of three years.

Solution

Three-year period	Calculation	Average sales	Mid-point
20X0 – 20X2	(390+380+460)/3	410	20X1
20X1 – 20X3	(380+460+450)/3	430	20X2
20X2 – 20X4	(460+450+470)/3	460	20X3
20X3 – 20X5	(450+470+440)/3	453	20X4
20X4 – 20X6	(470+440+500)/3	470	20X5

From this analysis, we can note the following:

- The moving average series has five figures relating to the years from 20X1 to 20X5. The original series had seven figures for the years from 20X0 to 20X6.
- There is an upward trend in sales, which is more noticeable from the series of moving averages than from the original series of actual sales each year.

If a moving average were taken of results in an even number of time periods (e.g., over four quarters of a year), the basic technique would be the same, but the mid-point of the overall period would not relate to a single period. To overcome this difficulty, we take a moving average of the moving average. For example, we can calculate the moving average for Quarters 1 to 4, and then for Quarters 2 to 5. An average of these two moving averages, will give us the moving average for Quarter 3. An average of the results for Quarters 2 to 5 and Quarters 3 to 6 will give the moving average for Quarter 4, and so on.

Types of cost

Labour, materials and expenses

All expenditure can be classified into three main groups - labour, materials and expenses.

Each of the expenses may be subdivided into one of two categories:

- Items directly applicable to the product, i.e. direct.
- Items which cannot be directly applied to the product, i.e. indirect.

The total of indirect materials, indirect labour and indirect expenses is called overhead.

Fixed and variable costs

There is a further subdivision of costs which we may briefly note here, and that is between fixed costs and variable costs. Fixed costs are those which remain constant (in total) over a wide range of output levels, while variable costs are those which vary (in total) according to the level of output.

Further analysis can classify some costs as semi-fixed or semi variable. Semi-fixed costs are those that are fixed over a certain level of activity but increase to a higher amount

when that level is exceeded. These costs are then fixed at that higher amount until another level of activity is reached at which point they will increase again. As each increase in cost is like a step up if shown graphically, these are also sometimes referred to as "step-fixed" costs. Semi variable costs are those that have a fixed element and will therefore incur a cost at a zero level of activity, and also have a variable element, and therefore increase in proportion to the activity.

Examples of types of cost	
Fixed costs	Rent, rates, insurance, depreciation of buildings, management salaries.
Variable costs	Raw materials, commission on sales, piece-work earnings.
Semi-fixed costs	Hire of machinery where each machine costs a fixed amount per month and where production beyond a certain level requires an additional machine.
Semi-variable costs	Some staff costs where there is a monthly salary plus a bonus for additional work. Hire of a vehicle where there is a daily charge plus a charge for mileage.

Direct labour cost

This is the cost of remuneration for employees' efforts applied directly to a product or saleable service that can be identified separately in product costs.

Examples of direct labour would include the costs of employing bricklayers, machine operators, bakers, miners, bus drivers. There is no doubt as to where you would charge these labour costs. Doubt would arise, however, with a truck driver's wage in a factory. Their wage cannot be charged direct to any product, as they are helping many departments and operators. Therefore, their wage would have to be classified as indirect. In a few exceptional circumstances it may be established that the truck driver is employed only to transport materials for the manufacture of one product. If this were the case, the wages could be charged direct to the product.

Direct materials cost

This is the cost of materials entering into and becoming constituent elements of a product or saleable service and which can be identified separately in product cost. The following materials fall within this definition:

- All materials specially purchased for a particular job, order, or process
- All materials requisitioned from the stores for particular production orders
- Components or parts produced or purchased and requisitioned from the finished goods store
- Material passed from one operation to another

In many cases the raw material of one industry or process is the finished product of another. Thus, bread constitutes the finished product of a bakery, but would be a material in a sandwich production process.

Other direct expenses

These are costs, other than materials or labour, which are incurred for a specific product or saleable service.

An example of a direct expense would be electric power to a machine, provided that the power is metered and the exact consumption by the machine is known. We can then charge the cost of power directly to the job. If we will know only the electricity bill for the whole factory, this will be an indirect expense.

Prime cost

Ther prime cost of an item or activity is the total of direct wages, direct material, and direct expenses.

Indirect costs

These are items that are related to production and that cannot be directly attributed to a particular cost centre or cost unit. These costs must be shared over a number of cost centres in order to be attributed subsequently to cost units.

Note: It is common for the term overheads to be used to describe costs which are not direct.

The classification of costs as direct or indirect depends on:

- The definition of the cost unit/object
- The practicality of tracing a cost item to the cost unit/object
- The information availability can be a limitation and affect classification

The cost of the salary of the finance manager within an organisation would be a direct cost if the cost object is the finance department. The finance manager salary relates directly to running the finance department. If object is the cost of the accounts payable team, the cost may be an indirect cost. It is likely that the finance manager supervises this team, but will also support other teams within the finance department.

Overhead

Overhead is the total cost of indirect labour, indirect materials, and indirect expenses. Examples of indirect materials include lubricants, cleaning materials, etc. Examples of indirect labour include the costs of employing maintenance workers, cleaners, and supervisors. Examples of indirect expenses include lighting, rent and depreciation.

Overheads may be divided into four main groups:

- Works or factory expense.
- Administration expense.
- Selling expense.
- Distribution expense.

Overheads are usually included in cost units using a process of absorption costing. This method involves calculating the full production cost per unit by including a proportion of the production overheads from each of the production and service cost centres on a fair basis (such as the number of labour hours or machine hours that each cost unit uses).

Absorption of all the overheads of each production cost centre into the cost of cost units on some fair basis, such as the number of labour hours or machine hours that each cost unit uses. The reason that the absorption of overheads is important in budgeting is that the budget constructed must be consistent with the method of attribution of indirect costs used in reporting the organisation's actual results. Otherwise, meaningful comparisons, which are required to fulfil the control aspect of a budget, cannot be made. In Unit H, we will look at absorption costing in more detail.

Budget data

We have noted that budgets are prepared using various types and sources of data. This includes historical data, such as the previous period's sales and production figures, and may also include an element of forecasting, such as a projection of sales for the forthcoming period. We have also noted the importance of sample data in preparing budget figures.

Careful management of data is crucial for effective budget preparation and budget management. As well as ensuring that the budget is prepared in a systematic and effective manner, it is necessary to ensure that managers have a good understanding of the basis on which figures have been prepared, otherwise it will not be possible for them to interpret budget monitoring information properly. A key tool in this regard is the budget manual. This document is a collection of instructions governing the responsibilities of individuals, and the procedures, forms and records relating to the preparation and use of budgetary data.

One of the functions of the budget is to improve communication. A budget manual should be produced so that everyone can refer to it for information and guidance about the budgeting process. The budget manual does not contain the actual budgets for the forthcoming period; it is more of an instruction or information manual about the way budgeting operates in that organisation.

The budget manual may contain information on the following:

- An explanation of the objectives of the budgeting process
- Organisational structures
- Outline of the principal budgets
- Administrative details
- A budget timetable
- Procedural matters, such as forms, reports and the budget coding system

Summary of Unit C and key learning outcomes

In Unit C, we looked at the Competency "Demonstrate an understanding of the skills needed in budget preparation." This involved content on five learning outcomes.

Learning outcome	
Explain the principles of standard costing.	You should now be able to explain the standard costing method and discuss its application in budget preparation and control.
Describe the purpose of revenue and cost forecasts and how they link to budgets.	You should now be able to discuss the issues relating to forecasting costs and revenues for use in budgeting.
Identify when to use the following techniques: • Indexing. • Sampling. • Moving averages. • Linear regression. • Seasonal trends.	You should now be able to explain the situations in which these techniques can be utilised, what the results indicate, and the advantages and disadvantages of each.
Recognise expenses as different types of costs (direct or indirect, overhead, fixed, variable, semi-variable or stepped have on budgeting.	You should now be able to recognise and discuss each type of cost behaviour in the context of budgeting.
Identify the sources of relevant data used in budget proposals.	You should now be able to identify and discuss how different types of data are collected and used in budgeting.

Quiz questions

1	Learning Outcome: C1
Company PZ has a materials budget of FRW 20 million, which is based on forecast production of 5,000 units, using 8 litres of material X per unit, costing FRW 500 per litre. The actual materials expenditure in the period was FRW 19 million, and actual production was 4,500 units. What is the standard cost for materials to be compared to the actual costs in the period?	
A	FRW 20 million
B	FRW 18 million
C	FRW 21 million
D	FRW 19 million

1	Feedback
A	Incorrect 4,500 * 8 * 500 = 18,000,000
B	Correct 4,500 * 8 * 500 = 18,000,000
C	Incorrect 4,500 * 8 * 500 = 18,000,000
D	Incorrect 4,500 * 8 * 500 = 18,000,000

2	Learning Outcome: C3
Company FG has identified that sales have been lower October to December period each year over the past 5 years. Which of the following terms would describe this?	
A	Cyclical variation
B	Trend

C	Random variation
D	Seasonal variation

2	Feedback
A	Incorrect This would be a seasonal variation
B	Incorrect This would be a seasonal variation
C	Incorrect This would be a seasonal variation
D	Correct

3	Learning Outcome: C3
Which of the following is a non-probability sampling method?	
A	Random sampling
B	Quota sampling
C	Multistage sampling
D	Systematic sampling

2	Feedback
A	Incorrect Quota sampling is a non-probability sampling method
B	Correct
C	Incorrect Quota sampling is a non-probability sampling method
D	Incorrect Quota sampling is a non-probability sampling method

4	Learning Outcome: C
Which of the following statements is true of the linear regression method?	
A	Linear regression a technique for estimating a line of best fit
B	Linear regression is used to identify seasonal variation
C	Linear regression is applied to sales revenue, but is not used for analysing costs
D	Linear regression can be used even if there is no correlation between two variables

4	Feedback
A	Correct
B	Incorrect Linear regression analysis a technique for estimating a line of best fit
C	Incorrect Linear regression analysis a technique for estimating a line of best fit
D	Incorrect Linear regression analysis a technique for estimating a line of best fit

5	Learning Outcome: C4
Which of the following is an example of a semi-fixed (or stepped) cost?	
A	A manager's salary
B	Factory electricity expenses
C	Interest payments on an overdraft
D	Hire of an additional vehicle when production exceeds 1,000 units

5	Feedback
A	Incorrect Hire of an additional vehicle when production exceeds 1,000 units would be a semi-fixed cost

B	Incorrect Hire of an additional vehicle when production exceeds 1,000 units would be a semi-fixed cost
C	Incorrect Hire of an additional vehicle when production exceeds 1,000 units would be a semi-fixed cost
D	Correct

6	Learning Outcome: C5
In which of the following would you find guidance on the budget timetable?	
A	A budget monitoring report
B	An internal audit report
C	A budget manual
D	A job description for a budget manager

5	Feedback
A	Incorrect A budget manual would provide guidance on the budget timetable
B	Incorrect A budget manual would provide guidance on the budget timetable
C	Correct
D	Incorrect A budget manual would provide guidance on the budget timetable

Quiz answers

1	B
2	D
3	B
4	A
5	D
6	C

Exercise 1

Company MK makes one product, the Fada. Two types of labour are involved in the preparation of a Fada, skilled and semi-skilled. Skilled labour is paid FRW 10,000 per hour and semi-skilled FRW 5,000 per hour. 8 hours of skilled labour hours and 4 hours of semi-skilled labour are needed to produce a Fada.

A Fada is made up of three different direct materials. 7 kilograms of direct material A, 4 litres of direct material B and 3 metres of direct material C are needed. Direct material A costs FRW 1,000 per kilogram, direct material B costs FRW 2,000 per litre and direct material C costs FRW 3,000 per metre.

Variable production overheads are incurred at Company MK at the rate of FRW 2,500 per direct labour (skilled) hour.

A system of absorption costing is in operation at Company MK. The basis of absorption is direct labour (skilled) hours. For the forthcoming accounting period, budgeted fixed production overheads are FRW 250,000,000 and budgeted production of the Fada is 5,000 units.

Administration, selling, and distribution overheads are added to products at the rate of FRW 10,000 per unit.

A mark-up of 25% is made on the Fada.

Using the above information, prepare a standard cost card for the Fada.

Exercise 1 solution		
Standard Cost Card – Product Fada		
Direct materials	FRW '000	FRW '000
A – 7 kg x FRW 1,000	7	

Exercise 1 solution		
B – 4 litres x FRW 2,000	8	
C – 3 m x FRW 3,000	9	
		24
Direct labour		
Skilled – 8 x FRW 10,000	80	
Semi-skilled – 4 x FRW 5,000	20	
		100
Standard direct cost		124
Variable production overhead – 8 x FRW 2,500		20
Standard variable cost of production		144
Fixed production overhead – 8 x FRW 6,250 (see working)	50	
Standard full production cost		194
Administration, selling and distribution overhead		10
Standard cost of sale		204
Standard profit (25% x 204)		51
Standard sales price		255
Working		
Overhead absorption rate	= FRW 250,000,000/(5,000 × 8)	
	= FRW 6,250 per skilled labour hour	

Exercise 2

Calculate the moving average trend line from the following data:

Year	Quarter	Sales volume
9	1	3,100
	2	3,200
	3	3,000
	4	3,500
10	1	3,400
	2	3,400
	3	3,200
	4	3,900

Exercise 2 solution

Year	Quarter	Sales volume	A (see below)	B (see below)
9	1	3,100		
	2	3,200		
	3	3,000	3,200	3,238
	4	3,500	3,275	3,300
10	1	3,400	3,325	3,350
	2	3,400	3,375	3,425
	3	3,200	3,475	
	4	3,900		

A = the moving average of 4 quarters' sales volume – e.g., (3,100+3,200+3,000+3,500)/4 = 3,200

B = trend line, based on the mid-point of 2 moving averages – e.g., (3,200+3,275)/2 = 3,238

Unit D: Forecasting and Budget Preparation.

Learning outcomes

D.1	Identify relevant data for forecasting income and expenditure from internal and external sources.
D.2	Correctly code, classify and allocate cost and revenue data to responsibility centres.
D.3	Forecast future income from relevant internal and external data.
D.4	Schedule the required production resources (materials, labour and production facilities) to meet forecasts.
D.5	Budget in accordance with the organisation's costing systems stating any assumptions made.
D.6	Prepare accurate cash flow forecast to facilitate the achievement of organisational objectives.
D.7	Prepare draft budgets from forecast data.
D.8	Break down budgets into time periods according to organisational needs.
D.9	Plan and agree draft budgets with all parties involved.

Introduction to Unit D

In Units A to C, we introduced various aspects of budgets and budgeting, including how budgets are used in an organisation, the type of data that is needed for preparing a budget, techniques used to analyse data, and make forecasts that can be input to the budget process.

In Unit D, we will bring these topics together and identify how they are all applied by an organisation to develop and finalise a full budget for a period. In discussing this topic, it's important to remember the definition of a budget – i.e., it is an organisation's plan (or plans) expressed in numerical and monetary terms. In other words, as well as the organisation stating, "this is what we plan to do in the next period," they are also saying "this is what these activities will cost during that time."

Budget and forecasting data

In Unit A, we identified different types of data, and noted how it was important to identify data that was relevant to the type of responsibility centre that is to apply the budget:

- Primary data.
- Secondary data.
- Internal data.

- External data.
- Continuous data.
- Discrete data.
- Etc.

And in Unit C we introduced several methods of using data to make forecasts:

- Indexing.
- Sampling.
- Moving averages.
- Linear regression.
- Seasonal trends.

As well as requiring individual skills in relation to use of data, an understanding of organisational structures, and ability to select and apply appropriate forecasting techniques, budget preparation is an activity that requires management to bring together a wide range of such skills to construct a useful and relevant tool.

For a budget to be relevant to an organisation (or department within an organisation), it is first necessary to be clear on what the main objectives are, and what the information needs of management will be during the budget period, so that the budget can be designed with these objectives and needs in mind.

For example, if the organisation has an objective to increase sales in all geographical areas during the next year, budget monitoring information should support this by providing a breakdown of sales figures on a geographical basis. If the only breakdown is by product, management will have no way of assessing progress towards their main objective, without carrying out extra work to gather separate data. Also, if management are required to provide monthly reports on sales and other results, the budget monitoring information needs to be available monthly and in time for these reports to be submitted.

Although budgeting may be regarded as a financial or accounting discipline, its use will be much wider than a finance department, so it is crucial to involve managers from across the organisation to provide input to the design of the systems involved in budgeting and budgetary control.

Classifying and coding costs and revenues

In Unit C we introduced several terms used in the classification of costs, and it is important that you understand these as we look at budget preparation in this unit, i.e.:

- Direct costs:
- Direct labour.
- Direct materials.
- Other direct expenses.
- Prime costs.
- Production costs.
- Indirect costs.
- Overhead costs.

- Cost units.
- Cost objects.
- Cost centres (and other responsibility centres).
- Fixed costs.
- Variable costs.
- Semi-variable costs.
- Semi-fixed costs.

When specifically considering control of budgets there are two steps that must be undertaken for meaningful information to be generated so that budget managers can exercise control over the budget, i.e., profiling and coding.

Profiling

This shows how the total annual budget will be split between months (or shorter periods, depending on the needs of the company), giving the timing of the budget spend over the year.

The phasing of expenditure may be based on previous experience, forecasts, or other information.

For example:

- There may be a contract in place requiring monthly payment of equal amounts for the building insurance expense
- Staff bonuses may be paid in one amount at the end of the year
- Expenditure on power may be higher in the months that make up the hot or rainy seasons
- Sales in previous years may show a higher-level during December each year
- Staff pay awards may be applied from month 4 in each year

Coding

In practice, an organisation's costs are classified by a coding system whereby each cost centre is given a code. For example, the finance team may be given the code FIN. This is known as an objective code as it links the cost to the cost objective (the area we need to know the cost of), such as establishing the cost of the finance department.

Within a cost centre the various types of costs and incomes will then also be coded. For example, salaries may be coded 001 and stationery 009. These are known as subjective codes as the code does not aid the connection of the cost with the cost object.

Every cost and income is therefore coded with both an objective and a subjective code. Salaries in the finance team would be coded as FIN 001. This type of classification then allows the organisation to track costs at both objective and subjective levels. Additional codes may also be included to provide more sophisticated analysis, but there is a danger of adding too many levels or forms of identification, which can become confusing, costly, and more subject to error. For example, some organisations may have an additional code for capital expenditure, to keep this separately identified from recurrent expenditure. Or cost centres may need to be grouped together (e.g., into divisions), and a further code included for this purpose.

Coding enables budgetary control information to be produced quickly. You can request a report from the finance system detailing all costs beginning with the code FIN and therefore see the full cost of the finance department. Or it may be that you want to know the total costs of staff in the whole organisation, in which case you would request a report for all costs ending in 001.

Features of a good coding system

An efficient and effective coding system, whether manual or computerised, should incorporate the following features.

(a) The code must be easy to use and communicate.

(b) Each item should have a unique code.

(c) The coding system must allow for expansion.

(d) If there is conflict between the ease of using the code by the people involved and its manipulation on a computer, the human interest should dominate.

(e) The code should be flexible so that small changes in a cost's classification can be incorporated without major changes to the coding system itself.

(f) The coding system should provide a comprehensive system, whereby every recorded item can be suitably coded.

(g) The coding system should be brief, to save clerical time in writing out codes and to save storage space in computer memory and on computer files. At the same time, codes must be long enough to allow for the suitable coding of all items.

(h) The likelihood of errors going undetected should be minimised.

(i) There should be a readily available index or reference book of codes.

(j) Existing codes should be reviewed regularly, and out of date codes should be removed.

(k) Code numbers should be issued from a single central point. Different people should not be allowed to add new codes to the existing list independently.

(l) The code should be either entirely numeric or entirely alphabetic. In a computerised system, numeric characters are preferable. The use of dots, dashes, colons and so on should be avoided.

(m) Codes should be uniform (that is, have the same length and the same structure) to assist in the detection of missing characters and to facilitate processing.

(n) The coding system should avoid problems such as confusion between the letter I and the number 1, or between the letter O and the number 0 (zero), etc.

(o) The coding system should, if possible, be significant (in other words, the actual code should signify something about the item being coded).

(p) If the code consists of alphabetic characters, it should be derived from the item's description or name (that is, mnemonics should be used).

Types of code

Composite codes	Brief accurate reference designed to assist classifications of items by facilitating entry, collation, and analysis. For example, in costing, the first three digits in the composite code 211.392 might indicate the nature of the expenditure (subjective classification) and the last three digits might indicate the cost centre or cost unit to be charged (objective classification). (CIMA Official Terminology)
Sequence (or progressive) codes	Numbers are given to items in ordinary numerical sequence, so that there is no obvious connection between an item and its code. In this situation, the code for office paper may appear numerically between the codes for cleaning staff costs and car insurance costs.
Group classification codes	These are an improvement on simple sequences codes, in that a digit (often the first one) indicates the classification of an item, e.g., all staff costs beginning with a 4, all materials costs beginning with a 5, etc.
Faceted codes	These are a refinement of group classification codes, in that each digit of the code gives information about an item, e.g., 40 for staff salaries, 41 for staff overtime, 42 for staff travel, etc.
Significant digit codes	These incorporate some digits that are part of the description of the item being coded. This may be useful for physical items, such as inventory, e.g., 80 gm paper may have code 5680, and 50 gm paper have code 5650.
Hierarchical codes	This is a type of faceted code where each digit represents a classification, and each digit further to the right represents a smaller subset than those to the left, e.g., 5680 is 80gm white paper, 5780 is 80gm coloured paper, etc.

A coding system does not have to be structured entirely on any one of the above systems. It can mix the various features according to the items which need to be coded.

The main advantages of a coding system should be relatively clear from the discussion in this Unit, but in summary they are:

- A code is usually briefer than a description, thereby saving clerical time in a manual system and storage space in a computerised system.
- A code is more precise than a description and therefore reduces ambiguity
- Coding facilitates data processing.

Scheduling and resources

Forecasting, based on previous experience, can help to plan for a future budget period. Rather than this just being figures in a spreadsheet, the practical aspects need to be put in place. For example, a forecast may show a 20% in sales in the next budget period, but

if the resources such as factory space, machinery, labour, sales personnel, etc are not in place to accommodate this 20% increase, there is no point in basing a budget on that figure.

Coordination of the various budgets within the organisation is therefore essential. This is illustrated in this unit as we consider examples of budgets for production, sales, materials, etc, and note how these are linked together.

It is also important to consider limiting factors, and to approach the individual budgets in an order that makes sense in practical terms. As mentioned above, if the company's factory space is limited, then preparation of a production budget first would be appropriate. Companies can, of course, look at options to increase production capacity or other aspects of the operations, but separate analyses of these decisions is needed as they can involve additional costs and other implications.

The budget manual can also be supportive in setting out clear procedures, timetables, forms, spreadsheet templates, etc, that act as guides through the budget setting process.

Note that timing through the budget year is important, not just preparation of annual budget figures. This is important in the form of accurate profiles (i.e., monthly break down of the budget lines), as this is essential for effective budgetary control. It is also relevant to cash budgets, as cash needs to be available at the correct time, not just as annual totals of receipts and payments. There may also be practical issues in relation to things like the phasing of production in relation to sales, as this will have an impact on things like warehouse storage of finished goods.

Budget preparation

Some of the learning outcomes set out at the beginning of this unit relate directly to the processes involved in preparing a budget, i.e.:

- Forecast future income from relevant internal and external data.
- Schedule the required production resources (materials, labour, and production facilities) to meet forecasts.
- Budget in accordance with the organisation's costing systems stating any assumptions made.
- Prepare accurate cash flow forecasts to facilitate the achievement of organisational objectives.
- Prepare draft budgets from forecast data.
- Break down budgets into time periods according to organisational needs.
- Plan and agree draft budgets with all parties involved.

The following examples illustrate various activities and techniques that are required within each of these steps in the budget preparation process, starting with functional budgets, and leading to cash budgets and master budgets.

Functional budgets

Example

Eriskay Company produces two products, X and Y. The products pass through two departments - Department 1 and Department 2. The following standards have been

prepared for direct materials and direct wages:

	Product	
	X	Y
Material A	5 kg	8 kg
Material B	4 kg	9 kg

Direct labour:

Department 1	3 hours	2 hours
Department 2	2 hours	4 hours

The standard costs for direct material and direct labour are:

	FRW per kg	
Material A	2,000	
Material B	1,200	
Direct wages:	FRW per hr	
	Department 1	3,000
	Department 2	3,500

Standard selling prices are:

Product	FRW per unit
X	50,000
Y	80,000

The budgeted sales for each product for the coming year are:

Product	Units
X	8,000
Y	10,000

The company plans to increase the inventory of finished goods, so that the closing inventory of product X will be 2,000 units and the closing inventory of product Y will be 3,000 units.

Opening inventory of finished goods are:

Product	Units
X	1,000
Y	2,000

Finished goods are valued at variable production cost.

Opening inventory of direct material:

Material	kg
A	12,000
B	15,000

The required closing inventory of materials is: material A 19,000kg, material B 15,000kg

	Department 1	Department 2
	per direct	per direct
	labour hour	labour hour
	FRW	FRW
Light, heat, power	200	200
Consumable stores, indirect materials	400	300
Indirect wages	300	500
Repairs and maintenance	200	300

Standard variable selling and distribution expenses are:

	Product X	Product Y
	% of	% of
	sales value	sales value
Commission	5	5
Carriage, packing, transport	4	2.5
Telephone, postage, stationery	2	2

Fixed production, selling and distribution, and administration overheads are budgeted to be as follows:

	Production FRW '000	Selling and distribution FRW '000	Administration FRW '000
Salaries			
Department 1	10,000		
Department 2	12,000		
Selling and distribution			
Product X		20,000	
Product Y		30,000	
Administration			22,000
Depreciation			
Department 1	20,000		
Department 2	22,000		
Selling and distribution			
Product X		5,000	
Product Y		6,000	
Administration			6,000
Stationery, postage, telephone			
Department 1	1,100		
Department 2	1,200		
Selling and distribution			
Product X		800	
Product Y		1,000	

	Production FRW '000	Selling and distribution FRW '000	Administration FRW '000
Administration			2,500
Sundry expenses			
Department 1	1,400		
Department 2	1,300		
Selling and distribution			
Product X		1,200	
Product Y		1,500	
Administration			1,500

The company's statement of financial position at the beginning of the year was as follows:

	FRW '000	FRW '000
Non-current assets at cost		1,000,000
Less accumulated depreciation		(200,000)
		800,000

Current assets

Inventory – materials	42,000	
Inventory – finished goods	145,100	
Receivables	150,000	
Cash	40,000	
	377,100	
Current liabilities		
Payables	(110,000)	

Net current assets	267,100
	1,067,100
Represented by:	
Share capital	800,000
Reserves	267,100
	1,067,100

The budgeted cash flows per quarter are:

FRW '000	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Inflows:				
From sales	250,000	200,000	300,000	300,000
Outflows:				
To suppliers	110,000	100,000	100,000	122,000
Wages	90,000	90,000	92,000	92,0000
Expenses	83,000	84,000	87,000	88,000

We need to prepare the following budgets from the information given above:

- Sales.
- Production.
- Materials purchases.
- Direct materials cost.
- Direct labour cost.
- Production overheads.
- Selling and distribution overheads.
- Administration overheads.
- Statement of profit or loss account.
- Statement of financial position at year-end.
- Cash.

Sales budget

The sales budget will frequently be the starting point of the budget, and it is in our example. The sales figures will usually determine the production requirements - subject, as in this case, to any required adjustment to the inventory of finished goods. The sales budget will be derived from salespeople's reports, market research, or other intelligence or information bearing on future sales levels and demand for the company's products. The sales budget would be analysed according to the regions or territories involved, with monthly budget figures for territories, salespeople, and products, so that sales representatives would have specific targets against which actual performances could be measured.

The total sales budget in terms of units and values for the two products will be:			
Product	Units	Unit Price	Sales Value
		FRW '000	FRW '000
X	8,000	50	400,000
Y	10,000	80	800,000
			1,200,000

Production budget

The purpose of this budget is to show the required production for the coming year, so that production scheduling can be completed in advance and individual machine loading schedules can be prepared. This will enable the production department to assess the budgeted usage of plant, the labour requirements, and the extent of any under capacity or over capacity. As with the sales budget, the total annual requirements must be analysed into monthly figures.

The total budget for the year is:

Product (units)

	X	**Y**
Sales	8,000	10,000
Plus closing inventory required	2,000	3,000
	10,000	13,000
Less opening inventory	(1 ,000)	(2,000)
Production requirement	9,000	11,000

Materials purchase budget

This budget sets out the purchasing requirements for each type of material used by the organisation, so that the purchasing department can place orders for deliveries, to take place in accordance with production requirements - the key requirement being that production should not be held up for lack of materials. Purchase orders should be placed, and deliveries phased, according to the production schedules, care being taken that no excessive inventory is held. The standard for the products will also specify the quality of material required, so that the purchasing department will be responsible for obtaining the materials required, of the standard quality.

As with other budgets, the purchasing budget should show the monthly quantities to be purchased, allowing for any lead time in suppliers' deliveries. The production requirement (i.e., 9,000 for X, and 11,000 for Y) is multiplied by the amount required of the material for each product.

	A (kg)	B (kg)
Production: Product X (9,000 x 5kg; 9,000 x 4kg)	45,000	36,000
Product Y (11,000 x 8 kg; 11,000 x 9kg)	88,000	99,000
	133,000	135,000
Plus required closing inventory	19,000	15,000
	152,000	150,000
Less opening inventory	(12,000)	(15,000)
Purchases required	140,000	135,000

A similar approach needs to be taken for other budgets: e.g., sales budget (units x sales price for each product).

Direct materials cost budget

The figures for this budget flow from the materials purchases budget, and they show the financial implications of the planned purchases, for purposes of financial control and cash flow requirements.

	Material A	Material B
Purchases required	140,000 kg	135,000 kg
Price per kg FRW '000	2	1.2
Cost of purchases FRW '000	280,000	162,000

Note that the quantities for production represent the number of production units in the production budget multiplied by the kg per unit.

Direct labour cost budget

This budget shows the number of direct labour hours required to fulfil the production requirements and the monetary value of those hours. Departmental figures are given, so that departmental supervisors are made aware of the labour hours and costs over which they are expected to exercise control. Periodic reports would be made to supervisors, showing the output achieved and the relevant standard hours and costs for that output (and, where necessary, the reports required on any significant variances from the standards).

Direct labour hours:

Department	**X**			**Y**			
	Units	Hours per unit	Total hours	Units	Hours per unit	Total hours	Combined totals
1	9,000	3	27,000	11,000	2	22,000	49,000
2	9,000	2	18,000	11,000	4	44,000	62,000

Direct labour costs:

Department	Hours	Rate FRW '000 M	FRW '000
1	49,000	3	147,000
2	62,000	3.5	217,000
	111,000		364,000

Production overhead budget

The variable and fixed overheads are shown by department. The departmental supervisors will be expected to exercise control over those items for which they are responsible, and monthly reports, highlighting the variances from budget, will be provided to assist them. The variable overheads are expressed as amounts per direct labour hour - but these could also be shown in relation to some other factor, such as machine time, units of production, or materials to be consumed. In practice a combination of these factors might be used.

Variable overheads	Department 1		Department 2	
	Per hour	Total	Per hour	Total
	FRW	FRW '000	FRW	FRW '000
Light, heat, power	200	9,800	200	12,400

Consumable stores, indirect materials	400	19,600	300	18,600
Indirect wages	300	14,700	500	31,000
Repairs and maintenance	200	9,800	300	18,600
		53,900		80,600

Fixed overheads:

	Department 1 FRW '000	**Department 2 FRW '000**
	FRW '000	FRW '000
Salaries	10,000	12,000
Depreciation	20,000	22,000
Stationery, postage, telephone	1,100	1,200
Sundry expenses	1,400	1,300
	32,500	36,500

Selling and distribution overheads budget

As with other overhead budgets, the object of this budget is to identify the overheads to be controlled by the management, in this case the sales management. Further analyses of the overheads would be required to show the budgeted costs monthly, and by regions and representatives where appropriate.

Variable overheads	**Product X**		**Product Y**	
Sales	FRW 400 million		FRW 800 million	
	% of sales	FRW '000	% of sales	FRW '000
Commission	5	20,000	5	40,000
Carriage, packing, despatch	4	16,000	2.5	20,000
Telephone, postage, stationery	2	8,000	2	16,000
		44,000		76,000
Fixed overheads:				

Variable overheads	Product X	Product Y
Salaries	20,000	30,000
Depreciation	5,000	6,000
Stationery, postage, telephone	800	1,000
Sundry	1,200	1,500
	27,000	38,500

Administration overheads budget

The administration overheads are likely to be mainly of a fixed character, and not affected by production or sales levels, except where there are wide fluctuations. These overheads will cover the general administration and accounting services of the organisation, and they will be the responsibility of the chief executive concerned. Separate budgets for the accounting, company secretarial and other departments will be required in larger organisations. The budgets will be prepared after detailed studies have been made of the level of service required to provide the necessary accounting, secretarial and other administrative services needed. Where a complete review is required, an organisation and methods study may be undertaken. Monthly reports will show actual and budgeted results, as with other functions, and variances shown for further investigation. (The costs in this problem have been assumed to be entirely fixed.)

	FRW '000
Salaries	22,000
Depreciation	6,000
Stationery, postage, telephone	2,500
Sundry expenses	1,500
	32,000

Master budgets

Budgeted statement of profit or loss

This account is part of the master budget as it brings together all the functional and subsidiary budgets and it shows the expected profit or loss based on the sales and cost budgets previously prepared. In the light of these results, the management may decide to recommend changes to the sales and cost figures, to bring the expected results into line with a required return on capital or gross and net profit percentages related to sales. Once the final figures have been approved, the budgeted profit figure become the target

for the whole company. Using the figures arising from the previous budgets, the budgeted statement of profit or loss would be as follows:

Eriskay Company

Budgeted statement of profit or loss for the year:

	FRW '000	FRW '000
Sales		1,200,000
Opening inventory of materials	42,000	
Purchases	442,000	
	484,000	
Less Closing inventory of materials	(56,000)	
	428,000	
Direct wages	364,000	
Variable production overheads	134,500	
	926,500	
Opening inventory of finished goods	145,000	
	1,071,500	
Less Closing inventory of finished goods	(236,000)	(835,500)
Gross profit		364,500
Overhead Expenses		
Variable selling and distribution overhead	120,000	
Fixed selling and distribution overhead	65,500	
Administration overhead	32,000	
Fixed production overhead	69,000	(286,500)
Net profit		78,000

Budgeted statement of financial position

This also forms part of the master budget, and it shows the expected overall financial position resulting from the budgets. It enables assessments to be made of the return on capital and ratios of profitability and liquidity. This may also be part of a review process in which some revisions may be required before final approval is given.

Eriskay Company- Budgeted statement of financial position

	FRW '000	FRW '000
Non-current assets at cost		1,000,000
Less: accumulated depreciation		(259,000)
		741,000
Current Assets		
Inventory of materials	56,000	
Inventory of finished goods	236,000	
Receivables	300,000	
	592,000	
Current Liabilities		
Payables	120,000	
Bank overdraft	48,000	
	168,000	
Net current assets		424,000
		1,165,000
Represented by:		
Share capital		800,000
Reserves		365,000
		1,165,000

Cash budget

This budget enables management to see the timing of projected cash flows and the net cash flow position for each period. Monthly cash flow figures would be provided to show the anticipated cash position at each point. In the light of this budget, it may be necessary to plan for overdraft facilities for short-term needs or investment of surplus funds. In very large organisations, the management of funds may require constant attention to ensure that effective use is made of all available funds. Also, separate cash budgets may be required for operational cash flows and financing cash flows. The operational cash flows relate to trading operations, and financing cash flows to longer-term financing with related interest charges.

Example

Grimsy Ltd's budgeted financial statements over a three-month period are as follows:

Budgeted statement of profit or loss (FRW '000)

	January		**February**		**March**	
Sales		80,000		70,000		90,000
Opening inventory	7,000		13,000		11,000	
Purchases	30,000		19,000		30,000	
	37,000		32,000		41,000	
Closing inventory	(13,000)		(11,000)		(14,000)	
Cost of sales		(24,000)		(21 ,000)		(27,000)
Gross profit		56,000		49,000		63,000
Overheads						
Wages and salaries	10,000		10,000		10,000	
Depreciation	4,000		4,000		4,000	
Other overheads	20,000	(34,000)	18,000	(32,000)	22,000	(36,000)
Net profit		22,000		17,000		27,000

Budgeted statements of financial position

Non-current Assets	As at 1 January FRW '000	FRW '000	As at 31 March FRW '000	FRW '000
Cost	175,000		200,000	
Depreciation	(20,000)		(32,000)	
Net book value		155,000		168,000
Current Assets				
Inventory	7,000		14,000	
Receivables	100,000		90,000	
Cash	10,000	117,000	81,000	185,000
Current Liabilities				
Trade payables	(50,000)		(52,000)	
Taxation	(24,000)		-	
Dividends	(7,000)	(81,000)	-	(52,000)
Capital employed		191 ,000		301 ,000
Financed by:				
Share capital	100,000		150,000	
Reserves	25,000		91,000	
Shareholders' funds		125,000		241,000
Loans		66,000		60,000
		191,000		301,000

Additional Notes:

- All sales, purchases, and other overhead expenses payments are made on one month's credit.
- Wages and salaries are paid in the same month as the expense is incurred.
- The increase in the value of fixed assets results from the purchase of equipment costing FRW 25 million. The cash payment was made in March.
- The receivables balance as at 1 January will be received in January.
- The trade payables balance as at 1 January will be paid in January.
- The balance sheet taxation figure shown as part of current liabilities relates to a tax provision made on a previous year's profits. The tax is due for payment in February.

- The balance sheet dividends figure shown as part of current liabilities relates to a proposed dividend payable on the previous year's profits. This dividend is payable in March.
- The increase in share capital results from the issue of new shares. Cash to the value of FRW 25 million is receivable in February with the balance due in March.
- A FRW 6 million loan repayment is to be made in January.

Solution

Cash budget	**January** FRW '000	**February** FRW '000	**March** FRW '000
Receipts:			
Cash from sales	100,000	80,000	70,000
Issue of shares		25,000	25,000
Total receipts	100,000	105,000	95,000
Payments:			
Purchases	(50,000)	(30,000)	(19,000)
Wages and salaries	(10,000)	(10,000)	(10,000)
Other overheads	-	(20,000)	(18,000)
Purchase of fixed assets	-	-	(25,000)
Taxation	-	(24,000)	-
Dividends	-	-	(7,000)
Loan repayment	(6,000)	-	-
Total payments	(66,000)	(84,000)	(79,000)
Net cash flow for month	34,000	21,000	16,000
Opening cash position	10,000	44,000	65,000
Cash inflow	34,000	21,000	16,000
Closing cash position	44,000	65,000	81,000

Explanatory notes on preparation of cash budget:

Sales: All sales are made on one month's credit. This means that January's sales will be paid for in February, February's sales will be paid for in March and March's sales will be paid for in April. Cash from March's sales will be received in April, which is not covered by the cash budget. At the end of March, FRW 90 million is owed to the company which will be shown as receivables in March's statement of financial position.

Purchases: The company obtains one month's credit on all its purchases. January's purchases will be paid for in February. February's purchases will be paid for in March and March's purchases will be paid for in April. At the end of March, the company owes its suppliers FRW 30 million, which will be shown as part of payables in March's statement of financial position.

Wages and Salaries: Wages are paid out in the same month as the expense is incurred.

Depreciation: Depreciation covers the reduction in value of a company's fixed assets. Depreciation is not a cash payment. It is an accounting provision which reduces profits and the value of assets in the statement of financial position. Cash flow statements are concerned only with cash payments and cash receipts. As depreciation does not affect cash, it will not appear in a budgeted cash flow statement.

Other Overheads: Other overheads are bought on one month's credit. The cost, included in January's statement of profit or loss, is included in February's cash flow, and so on. At the end of March, the company owes its suppliers FRW 22 million which will be shown as part of payables together with the FRW 30 million owed for its other purchases.

Cash Balances: The opening cash position in January is taken from the statement of financial position as at 1 January. The closing cash position for January becomes the opening cash position in February. February's closing cash position becomes the opening cash position in March.

Benefits of Cash Budgets

- Cash budgeting highlights the impact that all other decisions have on a company's financial resource.
- Cash may be a limiting factor and restrict a company's plans. The preparation of a cash budget will indicate if this is the case.
- Budgeting will identify any cash problems that may occur during the period covered by the budget. Advance warning will enable a company to take corrective action.
- Cash budgets are very useful documents when talking to banks and other financial institutions. These organisations want to see that a company is controlling its cash, and that it will be in a position to meet its obligations as they fall due.

Agreeing and approving the budget

In Unit B, we looked at the connections between budgeting, the company's overall planning process, the budgetary control system, and the various roles and responsibilities of budget managers, a budget committee, etc.

The budget manual should set out the budget timetable, which may be constructed around the following key activities:

- Communicating details of the budget policy and budget guidelines.

- Determining the factor (or factors) that restricts output.
- Preparation of the sales budget.
- Initial preparation of budgets.
- Negotiation of budgets with superiors.
- Co-ordination and review of budgets.
- Final acceptance of the budgets.
- Budget review.

At some point, the preparation process needs to be completed and the finalised budget needs to be formally agreed. This may be after a period of negotiation and an iterative revision of the budget components, but it needs to be clear to all involved in the budgeting process when the budget has been finalised and agreed/approved, and what the details of the finalised budget are.

It also needs to be clear who has the authority to finalise the budget, or to arbitrate between budget managers with differing views or aspirations. This may be a budget committee, or a specified director, or the company Board, etc. In the public sector, there may be a legal authority, in the form of an individual, committee or separate entity, making that decision.

Once finalised, the full budget should be documented and circulated in its official form to all who require this information. In the public sector, this may be a public document. In the private sector, it needs to be at least available to all budget managers, so that they have a clear, official version of the budget that they are responsible for executing.

The budgeting process does not stop once the budgets have been agreed. Actual results should be compared on a regular basis with the budgeted results. The frequency with which such comparisons are made depends very much on the organisation's circumstances and the sophistication of its control systems, but for most organisations it should occur at least monthly. Management should receive a report detailing the differences and should investigate the reasons for the differences. If the differences are within the control of management, corrective action should be taken to bring the reasons for the difference under control, and to ensure that such inefficiencies do not occur in the future.

Summary of Unit D and key learning outcomes

In Unit D, we looked at the Competency "Prepare forecasts and budgets." This involved content on nine learning outcomes.

Learning outcome	
Identify relevant data for forecasting income and expenditure from internal and external sources.	You should now be able to use forecasting data in the preparation of budgets.
Correctly code, classify and allocate cost and revenue data to responsibility centres.	You should now be able to discuss the features of an effective coding system.

Forecast future income from relevant internal and external data.	You should now be able to apply relevant techniques to prepare future a sales budget.
Schedule the required production resources (materials, labour and production facilities) to meet forecasts.	You should now be able to prepare production, materials, labour and other functional budgets.
Budget in accordance with the organisation's costing systems stating any assumptions made.	You should now be able to prepare functional budgets.
Prepare accurate cash flow forecast to facilitate the achievement of organisational objectives.	You should now be able to prepare cash budgets.
Prepare draft budgets from forecast data.	You should now be able to prepare master budgets.
Break down budgets into time periods according to organisational needs.	You should now be able to prepare profiled budgets and discuss their use in budgetary control.
Plan and agree draft budgets with all parties involved.	You should now be able to discuss the process of agreeing and communicating the finalised budget.

Quiz questions

1	Learning Outcome: D6
Which of the following is true of cash budgets?	
A	Cash is not a limiting factor in a company's plans
B	Cash budgets are a legal requirement for companies
C	Cash may be a limiting factor and restrict a company's plans. The preparation of a cash budget will indicate if this is the case.
D	Cash budgets are usually prepared at the beginning of the financial year, and then reviewed at the end of 12 months

1	Feedback
A	Incorrect Cash may be a limiting factor and restrict a company's plans. The preparation of a cash budget will indicate if this is the case.
B	Incorrect Cash may be a limiting factor and restrict a company's plans. The preparation of a cash budget will indicate if this is the case.
C	Correct
D	Incorrect. Reviews should be at least monthly Cash may be a limiting factor and restrict a company's plans. The preparation of a cash budget will indicate if this is the case.

2	Learning Outcome: D7
Which of the following statements is true of administration overheads?	
A	The administration overheads are likely to be mainly of a fixed character
B	The administration overheads are likely to be mainly of a variable character
C	The administration overheads are likely to be mainly of a semi-fixed character
D	The administration overheads are likely to be mainly of a semi-variable character

2	Feedback
A	Correct
B	Incorrect The administration overheads are likely to be mainly of a fixed character
C	Incorrect The administration overheads are likely to be mainly of a fixed character
D	Incorrect The administration overheads are likely to be mainly of a fixed character

3	Learning Outcome: D2
Which of the following statements is true for a company's coding system?	
A	All materials purchases should be allocated the same code, irrespective of the type of material involved
B	The coding system should only use alphabetic characters
C	Codes should be no more than 4 digits
D	The coding system should allow for expansion

3	Feedback
A	Incorrect The coding system should allow for expansion
B	Incorrect The coding system should allow for expansion
C	Incorrect The coding system should allow for expansion
D	Correct

4	Learning Outcome: D8
Which of the following is the result of dividing the annual budget across periods (e.g., months) to show the timing of income and expenditure	
A	Flexed budget
B	Profiled budget
C	Master budget
D	Cash budget

4	Feedback
A	Incorrect Profiled budget
B	Correct
C	Incorrect Profiled budget
D	Incorrect Profiled budget

5	Learning Outcome: D7
Which of the following is most likely to be the starting point for a company's annual budget?	
A	Sales budget
B	Cash budget
C	Master budget
D	Administration overheads budget

5	Feedback
A	Correct
B	Incorrect Sales budget
C	Incorrect Sales budget
D	Incorrect Sales budget

6	Learning Outcome: D7
Which of the following enables the non-current asset section of the statement of financial position to be completed?	
A	Production budget
B	Capital budget
C	Cash budget
D	Functional budget

6	Feedback
A	Incorrect Cash budget
B	Correct
C	Incorrect Cash budget
D	Incorrect Cash budget

Quiz solutions

1	C
2	A
3	D
4	B
5	A
6	B

Unit E: Impact of changes in the economic environment on the budget.

Learning outcomes

E.1	Calculate the effect that variations in capacity on costs, production and sales will have on budgeted costs and revenues.
E.2	Prepare an accurately flexed budget.
E.3	Analyse critical factors affecting costs and revenues and draw clear conclusions.
E.4	Identify and evaluate options and solutions to increase profitability or reduce financial losses or exposure to risk.

Introduction to Unit E

In previous units, we looked at terminology, techniques, processes and calculations related to the preparation of budgets. However, budgets do not exist in a static environment, and it is essential that they are monitored, maintained, adapted, and modified as circumstances change during a budget period. This may be because of internal developments, such as decisions being taken to increase or decrease certain activities, or events leading to reduced production capacity. It may also be due to changes in the external environment, such as the general economic conditions, or changes in the level of demand for specific products.

Unit E focuses on the ways in which external changes can impact on the budget of an organisation, and the actions that need to be taken to respond to these changes. We return to the concept of flexed or flexible budgets, which was explained briefly in Unit B.

Limiting factors

In Unit B, we introduced the concept of a limiting factor, or constraint, which needs to be included as part of the basis for budget preparation. For example, if a manufacturer has a factory that has a physical capacity to produce 1 million units per annum, and warehouse space for 100,000 units of finished goods, that will represent the maximum level that the company can budget for in the next year's production and storage, and so these act as a constraint on the total budget. There may be other key constraints, of course, such as demand levels, cash availability, skills in the work force, etc.

Consider the following examples:

Production capacity	
Company DX has a production facility that has 10 machines, each of which can produce 500 units per week. However, on average, 1 machine is unavailable due to breakdown, maintenance, training, or other reasons. The factory is closed for two weeks per annum for the holiday period. What is the maximum annual production? How might this be increased in the short term, if required?	Company DX can produce: (10-1) x 500 x 50 = 225,000 units Company DX could increase this by the following actions, but extra costs may be incurred: Renting additional machines (if there is space) Sub-contracting work to another company Reducing breakdowns by buying new machines Increasing the length of shifts, to allow each machine to produce more units per week Continuing production during the holiday period
Labour capacity	
Company PZ uses 5 hours of skilled technicians' labour in the production of 1 unit of product 9F. They estimate they will have, on average, 17 full-time technicians available for 48 weeks over the 52-week budget period, each working 32 hours per week. Demand for product 9F is estimated to be 10,000 units in the next budget period. What is the maximum annual production of 9F? How might this be increased in the short term, if required?	Company PZ can produce the following units of 9F: (17 x 32 x 48) / 5 = 5,222 units This could be increased by the following actions, but additional costs may be incurred: Hiring more staff, on short-term contracts or other flexible arrangements Training other staff to be able to do the work Paying for overtime above the 32 hours per week Note that demand of 10,000 units suggests it may be beneficial to increase production above 5,222, depending on what the additional costs are
Materials availability	

Company GG manufactures product P5, which requires 50 litres of material Q and 30 kg of material R. Suppliers have indicated that the maximum availability in the annual budget period for Q is 1.4 million litres, and material R is 7 million kg. Demand in the period for P5 is estimated to be 150,000 units. What is the maximum annual production of P5? How might this be increased in the short term, if required?	Company GG can produce the following units of P5: Material Q (1.4 million litres) = 1,400,000 / 50 = 28,000 units Material R (7 million kg) = 7,000,000 / 30 = 233,333 units Material R is not a limiting factor, as there is enough supply to meet the demand level. Material Q is below the demand level, so this is a constraint. This could be increased by, the following actions, but additional costs may be incurred, or other adverse impacts: Using an alternative material, but this may lead to quality issues if the quality is different Transferring production from P5 to a different product Reducing wastage, so that less than 50 litres is required for each unit

Flexed budgets

Fixed budgets are used to plan the activity of the organisation. Cost control begins by comparing actual expenditure with budget. Remember, though, that if the level of activity differs from that expected, some costs will change, and the individual manager cannot be expected to control the whole of that change. If activity is greater than budgeted, some costs will rise; if activity is less than budgeted, some costs will fall. The question is whether the manager has kept costs within the level to be expected, given the activity level.

A flexible budget is one which, by recognising the difference in behaviour between fixed and variable costs in relation to fluctuations in output, turnover, or other variable factors, such as number of employees. is designed to change appropriately with such fluctuations. It is the flexible budget that is used for control purposes, not the initial budget, as that may have been based on an activity level that is no longer relevant.

In order to understand flexible budgets, your need to be clear on the different types of cost behaviour – fixed, variable, semi-fixed, and semi-variable.

There are two main methods of predicting semi-variable costs at various levels of output or turnover:

Method 1 - Separation of Fixed and Variable Elements	Provided the cost is known for two different levels of output/turnover, the fixed and variable elements can be separated, and the level of cost at any other level of output/turnover predicted. If more than two items of data are available, the highest and lowest are selected (the high and low point method).

Example:

Output (units)	1,000	1,200	1,800
Cost (FRW)	2,000,000	2,500,000	2,800,000
Comparing the high and low points:			
Increase in output	1,800 – 1,000 = 800 units		
Increase in costs	2,800,000- 2,000,000 = FRW 800,000		
Variable cost = 800,000 / 800 = 1,000 per unit			
We can then use the variable cost per unit amount to determine the fixed cost element. Using the total cost at 1,000 units, we can calculate fixed costs by calculating the variable cost and deducting that from the total cost at that level of activity:			
Total cost		FRW 2,000,000	
Less: Variable cost	(1,000 * 1,000)	FRW (1,000,000)	
Fixed costs		FRW 1,000,000	

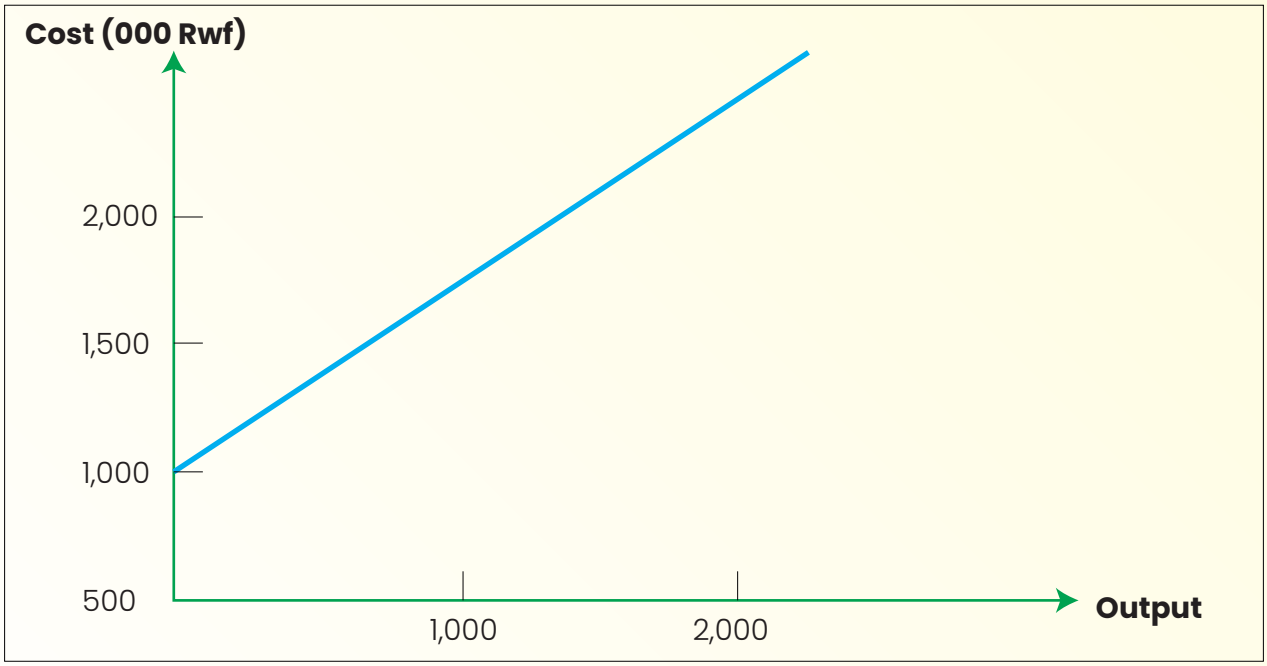
Worked example

Method 2 - Graphical Method for Curve Expenses

The calculation made in Method 1 is an oversimplification of the situation that is found in practice in respect of semi-variable costs: it was assumed that, after a certain initial expense, incremental costs varied in direct proportion to output. In other words, that the graph of the cost looked like that in the figure below, i.e., a straight line:

In practice, the graph of semi-variable expenses appears as a curve. The following procedure should be adopted:

- Find the expense level for various levels of activity (not just the high and low points).
- Plot these levels of cost on a graph.
- Draw a line of best fit, so that the cost for any other activity level can be found by interpolation.



Discretionary costs

Discretionary costs are those that may or may not be incurred, at the manager's discretion. It is not directly necessary to achieving production or sales, even though the expenditure may be desirable. Examples are research and development expenditure, training, maintenance.

Discretionary costs such as this are a prime target for cost reduction when funds are scarce, precisely because they are not related to current production or sales levels. This might be a very short-sighted policy - nevertheless, it is useful to have these costs separately identified in the budget.

Controllable costs or managed costs

A controllable cost is one chargeable to a budget or cost centre which can be influenced by the actions of the person in control of the centre. The aim must be to give each manager the information about those costs that they can control, and not to overburden them with information about other costs.

Given a long enough time-period, all costs are ultimately controllable by someone in the organisation (e.g. a decision could be taken to move to a new location, if factory rent became too high). Controllable costs may, however, be controllable only to a limited extent. Fixed costs are generally controllable only given a reasonably long time span. Variable costs may be controlled by ensuring that there is no wastage, but they will still, of course, rise in proportion to output.

Preparation of flexible budgets

Example

The fixed budget for budget centre A is shown below. This is the budget based on the expected level of output, and it will therefore be the budget used to plan the resources needed in that department. Note that the activity level is given in standard hours. Remember that the standard hour is a measure of output, not of time: it is the quantity of output or amount of work which should be performed in 1 hour.

Budget centre A - Budget period 3 – Activity 1,000 standard hours:

	Fixed	Variable	Total
		FRW '000	FRW '000
Process labour		2,000	2,000
Indirect labour	50	85	135
Fuel and power	450	800	1,250
Consumable stores	5	15	20
			3,405

From the above figures, we can evaluate and determine the cost that applies to any level of output, within broad limits. The figures have been set as the total allowance of expense which is expected to be incurred at an output level of 1,000 standard hours. Should, however, the output not be as envisaged, the allowance of cost can be varied to compensate for the change in level of activity. This adjustment is known as flexing a budget for activity.

We would expect that if 1,000 standard hours were produced, the cost incurred would be FRW 3,405,000. If the level of output changes for some reason, the level of cost usually changes. We will assume that the level of output attained was 750 standard hours in period 4. The budget would be flexed to compensate for the changes which have taken place in the actual output compared with those anticipated.

Budget Centre A – Budget period 4

Actual output 750 std hours; Budgeted output 1,000 standard hours; Production volume ratio = 75%

(FRW '000)	Basic budget			Flexed budget			Actual
	Fixed	Variable	Total	Fixed	Variable	Total	
Process labour		2,000	2,000		1,500	1,500	1,509
Indirect labour	50	85	135	50	64	114	126
Fuel and power	450	800	1,250	450	600	1,050	986
Consumable stores	5	15	20	5	11	16	19

In this instance, the fixed expenses are deemed to have remained the same, but the variable figures have been allowed at only 75% of the full budget. We thus attempt to show that activity has had its effect on cost. For example, we expected that only FRW 1,500,000 would be spent on process labour for the output achieved but, in fact, we spent FRW 1,509,000, and we exceeded the budgeted cost by FRW 9,000.

Now consider the effect on the budget in period 5 of having gained a greater output than that envisaged originally:

Note: Budget centre A involved a production budget. The flexing for activity was therefore carried out according to different levels of output. The definition of flexible budgets given earlier referred to fluctuations in output, turnover, or other factors. Obviously, the selling costs budget will be flexed according to turnover (i.e. number of units sold) rather than to output levels, while the canteen may be flexed according to number of employees.

Product mix

In the examples so far in this unit, we have assumed the company is focusing on the production of one item or product. The situation is more complex when there is more than one product and a limiting factor. In that situation, overall profit is maximised by concentrating production on the products with the highest contribution per limiting factor unit. As fixed costs in total are assumed to be constant, whatever combination of product is made, maximisation of profit will be achieved by maximising contribution.

The contribution per unit is the sales price less the variable costs per unit (usually materials and labour).

If a business has more than one product, and one limiting factor, the technique to use to maximise contribution is to determine the contribution per unit of the scarce resource or limiting factor and concentrate first upon the production of the product with the highest contribution per limiting factor unit.

Example

Company FO produces 2 products, TT5 and GG4. Labour availability is limited to 120,000 hours in January.

- TT5 requires 4 hours of labour, and GG4 requires 2 hours.
- Variable costs are FRW 5,000 for TT5 and FRW 4,000 for GG4.
- TT5 is sold for FRW 9,000 per item, and GG4 for FRW 7,000.
- Maximum demand for TT5 is 50,000 units, and 30,000 for GG4.

How much of TT5 and GG4 should Company FO plan to produce in January?

Solution

The limiting factor in this example is labour hours, so we need to calculate the contribution per labour hour. Contribution is found by deducting variable costs from the selling price per unit. Contribution per hour is then calculated by dividing the contribution by the hours required to produce each unit.

TT5 contribution	9,000 – 5,000	FRW 4,000
Contribution per labour hour	4,000 / 4	FRW 1,000
GG4 contribution	7,000 – 4,000	FRW 3,000
Contribution per labour hour	3,000 / 2	FRW 1,500

As GG4 gives higher contribution per limiting factor (FRW 1,500), this should be produced before TT5.

Maximum demand for GG4		30,000 unit
Hours required	30,000 x 2	60,000 hours
Overall hours available		120,000 hours
Hours available for TT%	120,000 – 60,000	60,000 hours
Maximum units of TT5	60,000 / 4	15,000 units

As 15,000 units is within forecast demand for TT5, the production budget can be set as:

GG4	30,000 units
TT5	15,000 units

Summary of Unit E and key learning outcomes

In Unit E, we looked at the Competency "Demonstrate an understanding of the impact that changes in the economic environment will have on the budget." This involved content on four learning outcomes.

Learning outcome	
Calculate the effect that variations in capacity on costs, production and sales will have on budgeted costs and revenues.	You should now be able to calculate how limiting factors impact on the budget.
Prepare an accurately flexed budget.	You should now be able to prepare a flexed budget to take account of varying activity levels.
Analyse critical factors affecting costs and revenues and draw clear conclusions.	You should now be able to assess how critical factors and constraints impact on the budgeted amounts, and discuss management actions in response to these.
Identify and evaluate options and solutions to increase profitability or reduce financial losses or exposure to risk.	You should now be able to explain how management can use product contributions and other information to identify how to improve overall profitability or achieve other organisational objectives.

Quiz questions

1	Learning Outcome: E1
Tolstar manufactures a product that uses 4 hours of inspector time per unit. The company have 3 full-time inspectors, working 36 hours per week, and 1 part-time inspector working 20 hours per week. Demand for the product is forecast to be 2,500 units in the year. What is the maximum number of units that Tolstar can produce in the year, assuming a 50-week working period?	
A	6,400
B	1,600
C	2,500
D	1,350

1	Feedback
A	Incorrect Inspector time available = ((3 * 36) + (1 * 20)) * 50 = 6,400 Maximum units = 6,400 / 4 = 1,600
B	Correct Inspector time available = ((3 * 36) + (1 * 20)) * 50 = 6,400 Maximum units = 6,400 / 4 = 1,600
C	Incorrect Inspector time available = ((3 * 36) + (1 * 20)) * 50 = 6,400 Maximum units = 6,400 / 4 = 1,600
D	Incorrect Inspector time available = ((3 * 36) + (1 * 20)) * 50 = 6,400 Maximum units = 6,400 / 4 = 1,600

2	Learning Outcome: E2

Company DS has a flexed budget, which shows the electricity costs as follows:

Production (units)	Cost (FRW '000)
30,000	15,000
60,000	30,000

Which of the following describes the cost behaviour of electricity costs for Company DS?

A	Fixed cost
B	Step-fixed cost
C	Variable cost
D	Semi-variable cost

2	Feedback
A	Incorrect Variable cost
B	Incorrect Variable cost
C	Correct
D	Incorrect Variable cost

3	Learning Outcome: E2

Company XP produces a single car component. During the month of December, production is budgeted to be 22,000 components. Previous experience indicates the following costs of production for Company XP:

Fixed costs up to 10,000 units per month	FRW 80 million
Fixed costs from 20,000 to 50,000 per month	FRW 130 million
Variable costs per unit	FRW 8,500

What is the budgeted cost of production for December?

A	FRW 317 million
B	FRW 187 million
C	FRW 267 million
D	FRW 130 million

3	Feedback
A	Correct Fixed costs 130 million. Variable costs 22,000 x 8,500 = 187 million. Total = FRW 317 million
B	Incorrect Fixed costs 130 million. Variable costs 22,000 x 8,500 = 187 million. Total = FRW 317 million
C	Incorrect Fixed costs 130 million. Variable costs 22,000 x 8,500 = 187 million. Total = FRW 317 million
D	Incorrect Fixed costs 130 million. Variable costs 22,000 x 8,500 = 187 million. Total = FRW 317 million

4	Learning Outcome: E3

Nahine Company produces two products.

Product A requires 2 litres of material, has variable costs of FRW 10,000 and sells for FRW 20,000. Product B requires 4 litres of material has variable costs of FRW 16,000 and sells for FRW 40,000.

What is the contribution per limiting factor for Products A and B?

A	Product A: FRW 10,000 Product B: FRW 24,000
B	Product A: FRW 6,000 Product B: FRW 5,000

C	Product A: FRW 2,500 Product B: FRW 12,000
D	Product A: FRW 5,000 Product B: FRW 6,000

4	Feedback
A	Incorrect Product A: (20,000-10,000)/2 = FRW 5,000 Product B: (40,000-24,000)/4 = FRW 6,000
B	Incorrect Product A: (20,000-10,000)/2 = FRW 5,000 Product B: (40,000-24,000)/4 = FRW 6,000
C	Incorrect Product A: (20,000-10,000)/2 = FRW 5,000 Product B: (40,000-24,000)/4 = FRW 6,000
D	Correct Product A: (20,000-10,000)/2 = FRW 5,000 Product B: (40,000-24,000)/4 = FRW 6,000

Quiz solutions

1	B
2	C
3	A
4	D

Exercises

Exercise 1

The flexible budget for the transport department of a manufacturing company contains the following extract, covering the four weeks of Period 8:

Ton-miles to be operated	80,000	100,000	120,000
Costs:	FRW '000	FRW '000	FRW '000
Depreciation	240	240	240
Insurance and vehicle tax	80	80	80
Maintenance materials	160	190	190
Maintenance wages	120	120	160
Replacement of tyres	40	50	60
Rent and rates	110	110	110
Supervision	130	130	130
Drivers' expenses	200	400	600
	1,080	1,320	1,570

In the four-week Period 8, the budgeted activity was 100,000 ton-miles but the actual activity was 90,000 ton-miles. The actual expenditure during that period was:

Costs:	FRW '000
Depreciation	240
Insurance and vehicle tax	80
Maintenance materials	165
Maintenance wages	115
Replacement of tyres	35
Rent and rates	110
Supervision	130
Drivers' expenses	315
	1,190

Prepare an analysis of the variances from budget in relation to Period 8.

Exercise 1 solution

	Budgeted activity	Flexed budget	Actual expense	Expense variance
Ton-miles	100,000	90,000	90,000	
Expense:	FRW '000	FRW '000	FRW '000	FRW '000
Depreciation (fixed)	240	240	240	-
Insurance and vehicle tax (fixed)	80	80	80	-
Maintenance materials (semi-fixed)	190	190	165	25 saving
Maintenance wages (semi-fixed)	120	120	115	5 saving

Replacement of tyres (variable)	50	45	35	10 saving
Rent and rates (fixed)	110	110	110	-
Supervision (fixed	130	130	130	-
Drivers' expenses (variable)	400	300	315	15 overspending
	1,320	1,215	1,190	25 saving

Maintenance materials may cause a little difficulty. There is no indication in the problem at what level of activity the rise from FRW 160,000 to FRW 190,000 takes place. From the information given, it could be taken as 80,000 ton-miles or 99,999 ton-miles.

Unit F: Budgetary Control.

Learning outcomes

F.1 Set clear targets and performance indicators to enable the budgets to be monitored.

F.2 Check and reconcile budget figures on an ongoing basis.

F.3 Review and revise the validity of budgets in the light of any significant anticipated changes.

F.4 Identify variances between budget and actual income/expenditure.

F.5 Analyse the variances and explain the impact that this will have on the organisation.

F.6 Inform management of any significant issues arising from budgetary control.

F.7 Present any recommendations with a clear rationale to appropriate people.

Introduction to Unit F

In this unit, we focus on the use of budget information to prepare variance analysis and other information that is relevant to management for budgetary monitoring and control.

This includes information in the form of performance indicators or performance measures, which may be financial or non-financial in nature, but our emphasis will be on financial information. Performance measurement is a vital part of the control process. For control to be effective, actual performance needs to be compared with a standard or target that was established previously.

Performance indicators

The use of performance indicators by management can be an effective way of assessing whether actual performance in a period has been in line with expectations. They can act as summaries of the performance of the business during the period. For example, a sales director may be told that sales have been 15,000 units per sales employee for the period. This would be a summary about the number of sales made in relation to the number of sales employees in the form of a simple performance indicator, without the need for management to have the detailed sales figures.

There is a danger in looking at performance indicators in isolation. They are more useful if they are compared to other figures, for example, in comparison to previous period's performance or in comparison to a competitor.

When performance indicators are used for comparison with another measure, it is important that we compare like with like. In general, performance indicators are a good method of providing consistent information. Provided the same formula is used in each

period, the performance indicators can be compared over time to reveal the trend of performance.

However, care must be taken to ensure that other factors do not distort the results. For example, if the performance indicators of a business are compared with those of a competitor and the two businesses have different accounting policies (e.g., on the valuation of assets), then the resulting comparison of costs and profit margins may be distorted.

Inflation also needs to be considered. In such instances, before the performance indicators are calculated the figures should be made comparable by using an appropriate price index to adjust them to the same price level.

Types of performance measure

The following is a summary of different ways of measuring performance.

Productivity: This is a measure of how hard the employees are working or how productive they are being in their hours at work.	The number of items manufactured per day in a factory. The number of invoices processed per week by a payments unit.
Efficiency ratio: A measure of how efficiently the workforce has operated during a period and is expressed as a percentage.	Standard hours for actual production/ actual hours worked x 100
Capacity ratio: A measure of the hours worked compared with the budgeted hours.	Actual hours worked/budgeted hours x 100
Activity ratio: An indicator of how actual output compares to the budgeted output	Standard hours for actual production/ budgeted hours x 100
Note: Efficiency ratio x Capacity ratio = Activity ratio	
Gross profit margin	Gross profit/ Sales x 100
Operating profit margin	Operating profit/ Sales x 100
Expenses: Expresses individual item of expense in relation to sales	Expense/Sales x 100

Return on capital employed (ROCE): An indicator of how well a business has invested the capital available to it.	Profit/Capital employed x 100
Asset turnover	Revenue/Capital employed
Note: ROCE = Asset turnover x Operating profit margin	
Non-current asset turnover: An indicator of how well a business is using its non-current assets	Revenue/Non-current assets
Current ratio: A measure of liquidity (the company's ability to meet its short-term liabilities)	Current assets/Current liabilities
Quick ratio: A measure of liquidity, excluding inventory	Current assets – inventory/Current liabilities
Inventory turnover	Cost of sales/average or closing inventory
Receivables collection period: How quickly cash is received from customers	Trade receivables/sales x 365
Payables payment period: How quickly cash is paid to suppliers	Trade payables/purchases x 365
Gearing: A measure of the amount of loan capital	Total debt capital/(Debt capital + Equity) x 100

Each performance measure can indicate a need for improvement, if the result is not in line with standards, targets, or expectations. Improvements can be achieved by changing one or more elements of each ratio as defined above. For example, for the ratios related to liquidity or working capital, these can be improved by reducing inventory days, or reducing the receivables collection period, or by increasing the length of the payment period for payables.

Management needs to understand how changes in each element of a ratio will impact on the overall result. It is also important to be aware of other consequences, e.g., reducing inventory days may increase the risk of running out of inventory and adversely impact on production schedules.

Variances

In this section, we will look at different types of variance and the potential reasons for these variances occurring.

The main types of variances are materials, labour, and overheads.

Materials variance

The total cost of material in a period depends on:

- the price of the material (per kg, per litre, etc)
- the usage of the material per unit.

Therefore, a materials variance may be due to differences between the budget and actual in terms of price, or of usage, or of both. It may even be the case that the same reason/action would cause one of these factors to affect the cost favourably and the other adversely, with the overall variance being a combination of the two. For example, if a cheaper material is purchased, the low cost will lead to a favourable price variance, but may give rise to much more wastage, and therefore a poor usage variance.

Materials variances	
Unfavourable price factors	An unexpected price increase from a supplier. Loss of a previous discount from a supplier. Purchase of a higher grade of materials.
Unfavourable usage factors	Greater wastage due to a lower grade of material. Greater wastage due to use of a lower grade of labour. Problems with machinery.
Favourable price factors	Negotiation of a better price or a discount from a supplier. Purchase of a lower grade of materials.
Favourable usage factors	Use of a higher grade of material, resulting in less wastage. Use of more skilled labour resulting in less wastage than normal. New machinery providing greater efficiency.

Example

The following is an extract from the flexed budget and actual results for a business for the last month.

FRW '000	Flexed budget	Actual results
Materials cost	144,000	142,800

The price of material per kg was 5% more expensive than expected, but the material purchased was of greater quality.

Solution

The materials variance is FRW144,000,000 – FRW142,800,000 = FRW1,200,000 favourable, because the actual costs are lower than budgeted.

The increase in materials price would have been expected to give an adverse variance of 5% (ie material costs would be expected as FRW144,000,000 x 1.05 = FRW151,200,000). However, the overall variance is favourable because the improved quality must have reduced the materials usage by more than the effect of the increased price.

Labour variances	
Unfavourable rate factors	Unexpected increase in the rates of pay for employees. Use of a higher grade of labour than anticipated. Unexpectedly high levels of overtime.
Unfavourable hours factors	Use of a less skilled grade of labour. Use of a lower grade of material. More idle time than budgeted. Poor supervision of the workforce. Problems with machinery.
Favourable rate factors	Use of a lower grade of labour than budgeted for. Less overtime than budgeted for.
Favourable hours factors	Use of a more skilled grade of labour. Use of a higher grade of material that requires less time. Less idle time than budgeted. Use of new or more efficient machinery.

Overhead variances	
Adverse or favourable variances	• An unexpected increase or decrease in the cost of any element of overheads. • Investment in a new machine may result in favourable material and labour variances but may also lead to increased power costs and increased depreciation charges. • The costs of materials maintenance may decrease.

Responsibility for variances

Investigating the causes of variances and determining any interdependence between the variances is an important aspect of management control. In a system of responsibility accounting, the managers responsible for various elements of the business will be held accountable for the relevant variances. For example, the purchase of lower grade material may have conflicting effects on the materials price and usage variances. The initial reaction might be to praise the purchasing manager for reduced cost and to lay blame for poor usage on the production manager. However, the true picture may be that, in the absence of any further reasons for the variance, the responsibility lies solely with the purchasing manager.

In Unit A we considered responsibility centres. These are areas of the business for which costs or revenues are gathered and compared to budgets for control purposes. They can be cost, profit or investment centres, depending upon the type of cost and/or revenue that the centre deals with. Responsibility accounting is a method of budgeting and comparing actual costs to budgets for each of the responsibility centres.

It follows that the manager responsible for a cost centre has authority regarding the costs incurred by their area of responsibility and should be held responsible for cost variances. The manager of the profit centre has authority over both costs and income and is responsible for the profit, and therefore the associated variances, for both costs and revenues.

The manager of an investment centre not only has authority over the costs and income of the centre but also over its assets and liabilities. The capital budget, and whether this has been adhered to, will therefore be the responsibility of that manager.

Investigating variances	
Control factors	Managers need to make control decisions during a budget period, such as buying material of a lower grade than planned, or taking advantage of a discount offered, that had not been anticipated at the planning stage.

Investigating variances	
Planning factors	In terms of planning, one fundamental reason for a variance, particularly one that recurs each period, may be that the standard costs being used to construct the budget are out of date. If the standard does not reflect the reality of the cost or usage of materials or labour, then this will be a significant cause of any variances.

Standards should be regularly reviewed, at least annually, and kept up to date in terms of the costs of materials, labour and fixed overheads and in terms of the usage of materials and labour hours required for each product.

Further causes of variances may be one-off events such as a power cut or the breakdown of machinery, which are neither under the control of the manager involved, nor have been planned for.

The decision to alter a standard cost should only be taken when there is a long-term or permanent change in the cost of the resource or the usage.

Selection of variances for reporting

The main reason for identifying and quantifying variances is to provide information that gives management greater control over their budgets and the opportunity to take decisions that will improve performance. Not every variance will shed light on how to improve performance, and therefore it is important to be selective in the use and presentation of variance information. The following points can assist in determining where to focus attention.

Controllability of variances	Attention should be focused on controllable variances. In some cases, the actual cost and resulting variance may be outside the control of the manager, e.g., an adverse production overhead variance resulting from a rent increase imposed by the property owner.
Materiality of variances	Materiality refers to the size of the variance, so the manager may focus on the variances with the highest values, whereas variances that are very small in FRW terms may be ignored. Focusing on material variances is more likely to lead to action that addresses significant problems or opportunities. Materiality may be set at a specific amount in FRW, or as a percentage of budget.

Trend of variances	A small variance in a series of periods may indicate a significant trend and require investigation. For example, a small increase in materials wastage each month over a 6-month period may indicate a problem such as pilfering by staff or a gradual deterioration of the efficiency of machinery.
Organisational objectives	It is important to motivate managers to act in ways that directly impact on achieving the organisation's objectives. For example, if a company sets an objective to increase sales in the year by 20%, it is essential to look closely at sales variances in each period to track achievement towards that objective.

Summary of Unit F and key learning outcomes

In Unit F, we looked at the Competency "Use budgetary control to ensure organisational targets are met." This involved content on seven learning outcomes.

Learning outcome	
Set clear targets and performance indicators to enable the budgets to be monitored.	You should now be able to define and discuss different types of performance indicator.
Check and reconcile budget figures on an ongoing basis.	You should now be able to explain the process of budget monitoring and control.
Review and revise the validity of budgets in the light of any significant anticipated changes.	You should now be able to flex a budget to reflect changing circumstances.
Identify variances between budget and actual income/expenditure.	You should now be able to identify and calculate a range of relevant variances.
Analyse the variances and explain the impact that this will have on the organisation.	You should now be able to use variance analysis to identify problems and determine appropriate action.
Inform management of any significant issues arising from budgetary control.	You should now be able to communicate relevant variance information for management.
Present any recommendations with a clear rationale to appropriate people.	You should now be able to select the most pertinent variance information in order to put forward effective courses of action for decision makers.

Quiz questions

1	Learning Outcome: F1
Which type of performance indicator is calculated as follows: Standard hours for actual production / actual hours worked x 100	
A	Productivity ratio
B	Capacity ratio
C	Activity ratio
D	Efficiency ratio

1	Feedback
A	Incorrect. Efficiency ratio
B	Incorrect. Efficiency ratio
C	Incorrect. Efficiency ratio
D	Correct

2	Learning Outcome: F4
Which of the following might result from purchasing lower grade materials?	
A	Unfavourable price variance
B	Favourable price variance

C	Favourable usage variance
D	Unfavourable usage variance

2	**Feedback**
A	Incorrect. Favourable price variance
B	Correct
C	Incorrect. Favourable price variance
D	Incorrect. Favourable price variance

3	Learning Outcome: F1
Which of the following is true for the use of performance indicators?	
A	It is useful to use performance indictors to compare an organisation with another organisation that is very different
B	A performance indicator that has increased in line with inflation suggests the organisation is performing better than before
C	Comparison with another organisation can be distorted by the use of different accounting policies
D	Performance indicators should always be considered on their own

3	Feedback
A	Incorrect. Comparison with another organisation can be distorted by the use of different accounting policies.

3	Feedback
B	Incorrect. Comparison with another organisation can be distorted by the use of different accounting policies.
C	Correct
D	Incorrect. Comparison with another organisation can be distorted by the use of different accounting policies.

4	**Learning Outcome: F1**
Which of the following is true of the return on capital employed (ROCE) ratio?	
A	ROCE = Asset turnover / Operating profit margin
B	ROCE = Asset turnover x Gross profit margin
C	ROCE = Asset turnover x Operating profit margin
D	ROCE = Asset turnover / Gross profit margin

4	Feedback
A	Incorrect. ROCE = Asset turnover x Operating profit margin
B	Incorrect. ROCE = Asset turnover x Operating profit margin
C	Correct
D	Incorrect. ROCE = Asset turnover x Operating profit margin

Quiz solutions

1	D
2	B
3	C
4	C

Unit G: Effects of internal and external factors on organizational costs.

Learning outcomes

G.1 Explain the purpose and structure of reporting systems within the organisation.

G.2 Describe the contribution of an organisation's functional specialists to cost reduction and value enhancement.

G.3 Explain the organisation's external environment and the specific external costs.

G.4 Identify costs correctly (materials, labour and expenses) and the sources of information about these costs, including:

a. Government statistics.

b. Professional or trade associations.

c. Quotations.

d. Price lists.

Introduction to Unit G

In Unit A, we noted that management accounting, unlike financial reporting, is essentially an internal activity. The analyses and reports prepared by management accountants are not formally or legally required by any outside entity or authority and are directed mainly at the needs of decision makers within the organisation. It is important, however, not to view management accounting as being completely protected from the external environment and from the dynamic events that may be taking place externally.

In this unit, we will look briefly at the internal management accounting activities in the form of reports, cost analysis, etc, and how these are impacted by external events, forces, or agencies. During this discussion, we will look in more detail at cost reduction as a specific aspect of management accounting, and at the role of various specialists in that activity.

Internal reporting systems

In Unit A, we described different types of responsibility centre within an organisation, and the type of information that they require. The information, it was noted, can be internally generated, or can be derived from external sources. We also noted in Unit B, and elsewhere in this module, how activities like budgeting involve clear and systematic reporting systems for them to achieve their intended purposes. For example, a budget manager will require profiled budget figures and appropriate monthly actual income and

expenditure figures to compare with budgeted amounts.

Most of that information is generated and presented using internal systems. There can also be some use of external information; for example, it may be necessary for a manufacturer to use data provided by retail organisations that it supplies with its products. A central unit within the organisation (e.g., a finance department) may rely on other parts of the organisation (e.g., sales, production, warehousing, administration) to provide data that can be collated into an organisational report.

Note also that reports are prepared for different levels of management and for different purposes. For example, a chief executive officer may receive a summary report showing overall results for each department, while departmental managers may require more detailed reports on their own part of the organisation.

The time-scales of reports can also differ, and reports need to be designed to reflect these needs:

- Strategic reporting deals with the organisation as a whole, and tends to look at periods over 3 to 5 years
- Tactical reporting deals with a defined part of the organisation (e.g., a department), and looks at decisions affecting the short-term to medium-term, such as over the next 3 to 12 months
- Operational reporting focuses on specific activities (e.g., production, sales) in the short term, such as the current week or month

Functional specialists

Another error that can sometimes be made, is to assume that all management accounting activities can be carried out entirely by accounting specialists, without using inputs from other functions or specialisms.

If we take the activity of forecasting as an example, this will often require specialist input. To forecast the level of sales in the next period, the skills and knowledge of sales staff will be required, as they are closer to the information on demand and the expectations of the market than other staff. Forecasts on production will require the input of production managers and will also need to take note of information on things like the availability of materials; this means that the input of external stakeholders such as suppliers will be required, and there may be a need to consult sources such as trade publications to gather wider information on supply of specific materials.

Note also the role of various specialisms in the preparation or creation of internal reports. Although budget reporting is a part of management accounting, the information generated for these reports requires use of various systems. There is a reliance, therefore, on specialists such as IT staff, who design and operate the IT systems that support the preparation of budget reports. In a manufacturing environment, there may also be input from engineers, designers, researchers, etc, who will all have specific knowledge and experience that may be essential for effective budget reporting.

Cost reduction

In previous units, we looked at the various aspects of budgeting and budget management, and how budget reports need to highlight where unfavourable variances have been recorded, such as overspending on specific cost lines. It has also been noted that budget managers need to take action to address overspends when these are identified, to exercise budgetary control. In many instances, the appropriate action is to reduce costs to restore control over the budget line. For example, if the overtime budget is overspent in Month 1, the manager may look at ways of limiting overtime in the next period. Cost reduction is also an ongoing management accounting activity in the context of achieving efficiency, improving competitiveness, increasing profit margins, etc.

Cost reduction is a planned and positive approach to reducing expenditure

In this section we will look at various types of cost, and the ways in which these can be controlled and reduced where necessary. The approach to cost reduction can be either through a campaign of cost reduction at a particular time (e.g., in response to a crisis), or a more planned approach to reduce costs as part of overall efficiency.

A crisis or urgent need for cost reduction can take the form of problems with profitability or cash flow. This may lead to some existing projects might be abandoned or delayed, capital expenditures deferred, employees made redundant, or recruitment of new employees stopped. The absence of careful planning might make such urgent campaigns look like panic measures. Poorly planned campaigns to reduce costs could result in reductions in operational efficiency. For example, decisions by a company to reduce the size of its legal department or its internal audit section might cut staff costs in the short term but increase costs in the longer term.

A more effective approach to cost reduction would be to have continual assessments of the organisation's products, production methods, services, internal administration systems, etc. Cost reduction should therefore involve a planned approach to cut expenditure. It should preferably be continuous and long term, so that short-term cost reductions are not soon reversed and forgotten.

Difficulties introducing cost reduction programmes
There may be resistance from employees to the pressure to reduce costs. They may feel threatened by the change. The purpose and scope of the campaign should be fully explained to employees to reduce uncertainty and (hopefully) resistance.
The programme may be limited to a small area of the business with the result that costs are reduced in one cost centre, only to reappear as an extra cost in another cost centre.
Cost reduction campaigns are often introduced as a rushed, desperate measure instead of a carefully organised, well thought out exercise.

The following points also need to be considered in any action that management take to reduce costs:

- A planned programme of cost reduction must begin with the assumption that some

costs can be significantly reduced.

- The benefits of cost savings must be worthwhile and should exceed the costs of achieving them.
- Areas for potential cost reduction should be investigated, and unnecessary costs identified.
- Cost reduction measures should be proposed, agreed, implemented and then monitored.

We have noted that cost reduction can be the result of a short-term event or crisis, such as a cash flow problem. But it is essential to be aware of both the short-term and long-term aspects of any action, and action by management should include long-term objectives to reduce costs.

One situation where short and long-term impacts need to be taken together, is where it is identified that spending money in the short term will lead to longer-term savings. For example, a programme to re-train staff will result in short-term expenditure, but it may be the case that this will reduce production times and wastage in the future, thus saving money overall. Organisations do not always have the flexibility to make this kind of decision, but giving managers some flexibility to identify areas where they can spend to save, will be in the organisation's interests in the longer term.

In previous units, we noted the importance of understanding different types of cost behaviour, and this impacts on the approach to cost reduction also.

- It may only be possible to reduce some variable costs in the short term, while most fixed costs (as the term "fixed" indicates) are not easily changed.
- Discretionary fixed costs may be subject to cost reduction in the short term. These are costs that do not vary with activity levels, but management have discretion over the level of expenditure (e.g., insurance costs, where the insurance policy can be set at different levels)
- In the long term most costs can be either reduced or avoided. This includes fixed cost as well as variable cost expenditure items.

Improvements in efficiency

An organisation can reduce costs by addressing the efficiency of materials usage, the productivity of labour or the efficiency of machinery or other equipment.

Improved materials usage	• By reducing levels of wastage, if wastage is currently high
Improving labour productivity	• Giving pay incentives for better productivity. • Changing work methods to eliminate unnecessary procedures and make better use of labour time. • Improving the methods for achieving co-operation between groups or departments.

	• Setting more challenging standards of efficiency. Standards should be tight but achievable. If efficiency standards are too lax, it is likely that the work force will put in the minimum effort needed to achieve the required standard. Given the right motivation among the workforce, more challenging standards will encourage greater effort. • Introducing standards where they did not exist before.
Improving the efficiency of equipment usage	• Making better use of equipment resources. For example, if an office PC is only in use for 50% of its available time, it might be possible to put another application onto it, and so improve office productivity. • Achieving a better balance between preventive maintenance and machine down time for repairs.

Materials costs

As well as reducing the level of wastage, management can consider the following actions to reduce materials costs:

- Taking advantage of price incentives and options:
  - A company could obtain lower prices for purchases of materials and components.
  - Bulk purchase discounts might be obtainable.
  - Putting purchase contracts out to tender.
- Controlling stores:
  - Identifying the economic ordering quantity (i.e., the optimum level of inventory to order) will minimise the combined costs of ordering items for inventory and stockholding costs.
  - Stockholding costs might be reduced by dealing with problems of obsolescence, deterioration of items in store, or theft.
- Using alternative materials:
  - Cheaper substitute materials might be available.
  - An alternative product mix might be feasible.
  - Re-engineering products may identify ways of using cheaper components.

Labour costs

The cost of employing staff is often an organisation's most expensive area of expenditure, particularly in the public sector and in service organisations, but also in some aspects of manufacturing. There are several different mechanisms that an organisation can employ with an aim of reducing labour costs.

A wide review of labour costs may employ an in-depth method, such as using human resource specialists to carry out a review of the activities currently carried out by staff to identify what activities are essential and where activities can be reduced or eliminated. This can be a time-consuming process, and is costly, but can identify savings that will benefit the organisation over the longer term.

Such "organisation and methods" (O&M) studies are used where there is a need for a fundamental review of work practices or may be employed to support a specific programme of cost reduction.

The remit of an O&M study may include looking at opportunities for automating some process, i.e., replacing human activities with machines or computer applications, which may be cheaper, quicker, and more reliable.

An O&M study also needs to have regard to the employment law in the country and the documentation relating to individual members of staff (i.e., employment contracts, job descriptions, bonus arrangements, etc).

External costs and the economic environment

In Unit A, we noted the importance of access to relevant external data, both primary and secondary data, so that an organisation has an overall context for its internal decision making and planning.

A commercial organisation needs to continually update its planning assumptions to ensure that these are relevant to the changing external environment. For example, a company may introduce a product in Year 1, and forecast a constant level of sales for Years 1 to 5. However, the introduction of a competitor's product in Year 3 may take some of this market share, so the company will need to revise its plans and forecasts for Years 4 to 5.

To do so, it needs information on the sales by the competitor or on the opinions of customers, and it needs to continue scanning the market for other competitor activity, and for opportunities such as new markets for their products.

Trade magazines, economic analyses of the industry, and other publications can play a part in informing the organisation on the external economic environment as it impacts on their activities and products. More specific data, such as consulting a competitor's price lists or product specifications can provide more detailed information in relation to a particular product or market segment.

Some data is, however, confidential. Companies that bid for contracts through tendering processes are not entitled to see the details of a competitor's bid, and there are legal restrictions on what organisations can and cannot do in relation to accessing information on other companies.

The product life cycle is a fundamental part of a company's planning assumptions, and so understanding this, and the impact of changes in the environment on the cycle, is crucial.

In Unit B, we noted the following stages in the product life cycle:

- Development and launch stages
- Growth stage
- Maturity stage
- Decline stage

The life cycle can be used as a way of assessing the costs of an asset, a product, or some other part of the organisation's activities.

For example, a company is to invest in a machine with an immediate cash outflow of FRW 100,000 million. The machine will have annual running costs of FRW 20,000 million for the next three years paid in arrears. At the end of its three-year life the machine will have an estimated residual value of FRW 30,000 million. The interest rate applicable to the company is 8% and the discount factors at this rate are given below.

Period	Discount factor @ 8%
1	0.926
2	0.857
3	0.794

We can determine the life-cycle cost of the machine as follows:

Time	Cash flow factor	@ 8% Present value	
	FRW million		FRW million
0	(100,000)	1.000	(100,000)
1	(20,000)	0.926	(18,520)
2	(20,000)	0.857	(17,140)
3 (30,000 – 20,000)	10,000	0.794	7,940
Life cycle cost	130,000		
Net present cost over life cycle			(127,720)

Summary of Unit G and key learning outcomes

In Unit G, we looked at the Competency "Demonstrate an accurate understanding of the internal and external factors that affect organisations." This involved content on four learning outcomes.

Learning outcome	
Explain the purpose and structure of reporting systems within the organisation.	You should now be able to explain how reporting systems make use of internal and external information, including cost information
Describe the contribution of an organisation's functional specialists to cost reduction and value enhancement.	You should now be able to discuss the role of internal and external specialists in cost reduction and value enhancement
Explain the organisation's external environment and the specific external costs.	You should now be able to explain how the external environment impacts on cost reduction
Identify costs correctly (materials, labour and expenses) and the sources of information about these costs, including: government statistics professional or trade associations quotations price lists	You should now be able to discuss the specific actions relevant to reducing material, labour, and other costs, and the data needed to inform these decisions

Quiz questions

1	Learning Outcome: G4
Which of the following actions would improve labour productivity?	
A	Changing work methods to eliminate unnecessary procedures
B	Reducing levels of wastage
C	Achieving a better balance between preventive maintenance and machine "down time" for repairs
D	Removing pay incentives to reduce costs

1	Feedback
A	Correct
B	Incorrect Changing work methods to eliminate unnecessary procedures
C	Incorrect Changing work methods to eliminate unnecessary procedures
D	Incorrect Changing work methods to eliminate unnecessary procedures

2	Learning Outcome: G4
Which of the following describes the product life cycle in the correct order?	
A	Development and launch stages Growth stage Maturity stage Decline stage
B	Maturity stage Growth stage Development and launch stages Decline stage

C	Growth stage Development and launch stages Decline stage Maturity stage
D	Development and launch stages Decline stage Maturity stage Growth stage

2	Feedback
A	Correct
B	Incorrect. Development and launch stages Growth stage Maturity stage Decline stage
C	Incorrect. Development and launch stages Growth stage Maturity stage Decline stage
D	Incorrect. Development and launch stages Growth stage Maturity stage Decline stage

3	Learning Outcome: G1
Which of the following is the definition of cost reduction?	
A	Cost reduction is a short-term response to cash flow problems

B	Cost reduction is a negative approach to reducing expenditure
C	Cost reduction is a planned and positive approach to reducing expenditure
D	Cost reduction is a planned programme to reduce sales prices

3	Feedback
A	Incorrect Cost reduction is a planned and positive approach to reducing expenditure
B	Incorrect Cost reduction is a planned and positive approach to reducing expenditure
C	Correct
D	Incorrect Cost reduction is a planned and positive approach to reducing expenditure

4	Learning Outcome: G
Which of the following is a legitimate external source of data?	
A	Human resource pay grades
B	Competitor price list
C	Competitor tender bid
D	Warehouse inventory levels

4	Feedback
A	Incorrect Competitor price list
B	Correct
C	Incorrect Competitor price list
D	Incorrect Competitor price list

Quiz solutions

1	A
2	A
3	C
4	B

Unit H: Cost Accounting Techniques for financial Performance Monitoring.

Learning outcomes

1. Explain the types of cost centres, profit centres and investment centres.
2. Describe the use of standard units of inputs and outputs.
3. Recognise the differences between standard, marginal and absorption costing in terms of cost recording, cost reporting and cost behaviour.
4. Explain the use of variance analysis in labour, materials and overhead costing.
5. Accurately identify fixed, variable, semi-variable and stepped costs and explain their use in cost recording, cost reporting and cost analysis.

Introduction to Unit H

Some of the topics we will look at in this unit have been introduced earlier in the module, i.e.:

- Types of responsibility centre – in Unit A.
- Standard costs – in Unit C.
- Calculation and use of variances – in Unit B.
- Variance – in Unit F.
- Cost behaviour – in Unit C.

You may need to review the relevant section of these units before tackling Unit H.

The focus of Unit H is the way in which cost accounting is used in an organisation to ensure that financial performance is monitored and managed effectively. This involves an understanding of cost behaviour, variance analysis, and other fundamental aspects of cost or management accounting, and requires application of these techniques in numerical examples.

Standard costing

We saw in Unit C that standard costing has two main applications:

- To value inventories and cost production for cost accounting purposes.
- To act as a control device by establishing standards (planned costs), highlighting (via variance analysis) activities that are not conforming to plan, and thus alerting management to areas which may be out of control and in need of corrective action.

In Unit H, we will focus on the second application, and will look at how standard inputs and outputs are determined for use in management of financial performance. It is also important to note how this approach is linked to marginal costing and absorption costing.

Standard costing involves:

- Establishing predetermined estimates of the costs of products or services.
- Collecting of actual costs.
- Comparing the actual costs with the predetermined estimates.

The predetermined costs are known as standard costs, and the difference between standard and actual cost is known as a variance. The process by which the total difference between standard and actual results is analysed is known as variance analysis.

Although standard costing can be used in a variety of costing situations it is most suited to mass production and repetitive assembly work.

Standard costs may be used in both absorption costing and in marginal costing systems. We shall, however, confine our description to standard costs in absorption costing systems.

As we noted earlier, the standard cost of a product (or service) is made up of several different standards, one for each cost element, each of which must be set by management. We have divided this topic into two: the first part looks at setting the monetary part of each standard, whereas the second part looks at setting the resources requirement part of each standard.

There are four types of performance standard, which are used to set per efficiency targets. Each has an impact on employee motivation, so it is important to consider which level of standard is appropriate in order to achieve optimum performance.

Ideal	These are based on perfect operating conditions: no wastage, no spoilage, no inefficiencies, no idle time, no breakdowns. Variances from ideal standards are useful for pinpointing areas where a close examination may result in large savings to maximise efficiency and minimise waste. However, ideal standards are likely to have an unfavourable motivational impact because reported variances will always be adverse. Employees will often feel that the goals are unattainable and not work so hard.

Attainable	These are based on the hope that a standard amount of work will be carried out efficiently, machines properly operated, or materials properly used. Some allowance is made for wastage and inefficiencies. If well set, they provide a useful psychological incentive by giving employees a realistic but challenging target of efficiency. The consent and co-operation of employees involved in improving the standard are required.
Current	These are based on current working conditions (current wastage, current inefficiencies). The disadvantage of current standards is that they do not attempt to improve on current levels of efficiency.
Basic	These are kept unaltered over a long period of time and may be out of date. They are used to show changes in efficiency or performance over a long period of time. Basic standards are perhaps the least useful and least common type of standard in use.

These four levels may be simplistic in some respects, and it may be possible to identify further levels within this range. Some would recommend adding the term challenging to the analysis, to encourage improvement. Thus, a standard that is challenging and attainable may be appropriate in many instances, as being both realistic and representing an improved performance.

Direct material prices

Direct material prices will be estimated by the purchasing department from their knowledge of the following.

- Purchase contracts already agreed.
- Pricing discussions with regular suppliers.
- The forecast movement of prices in the market.
- The availability of bulk purchase discounts.

Price inflation can cause difficulties in setting realistic standard prices:

- If the current price is used in the standard, the reported price variance will become adverse as soon as prices go up, which might be very early in the year. If prices go up gradually rather than in one big jump, it would be difficult to select an appropriate time for revising the standard.
- If an estimated mid-year price is used, price variances should be favourable in the first half of the year and adverse in the second half of the year, again if prices go up gradually throughout the year. Management could only really check that in any month, the price variance did not become excessively adverse (or favourable) and that the price variance switched from being favourable to adverse around month six or seven and not sooner.

Direct labour rates

Direct labour rates per hour will be set by discussion with the human resources department and by reference to the payroll and to any agreements on pay rises with trade union

representatives of the employees.

- A separate hourly rate or weekly wage will be set for each different labour grade/ type of employee.
- An average hourly rate will be applied for each grade (even though individual rates of pay may vary according to age and experience).

Similar problems when dealing with inflation to those described for material prices can be met when setting labour standards.

Absorption costing and marginal costing

Absorption costing	Absorption costing is a method of building up a full product cost, which adds direct costs and a proportion of production overhead costs by means of one or several overhead absorption rates. For example, overheads may be absorbed to products based on the amount of production time they require, or the amount of labour time.
Marginal costing	The marginal cost of an item is its variable cost. The marginal production cost of an item is the sum of its direct materials cost, direct labour cost, direct expenses cost (if any) and variable production overhead cost. So as the volume of production and sales increases, total variable costs rise proportionately. Fixed costs, in contrast are cost that remain unchanged in a time period, regardless of the volume of production and sale. Marginal production cost is the part of the cost of one unit of product or service that would be avoided if that unit were not produced, or which would increase if one extra unit were produced.

Overhead absorption rates

When standard costs are fully absorbed costs, the absorption rate of fixed production overheads will be predetermined, usually each year when the budget is prepared, and based in the usual manner on budgeted fixed production overhead expenditure and budgeted production.

For selling and distribution costs, standard costs might be absorbed as a percentage of the standard selling price. For example, if a company expects to make sales of FRW 500 million in a period, and selling and distribution costs are FRW 10 million, the selling and distribution costs can be absorbed at a rate of 10/500 = 0.02; i.e., a product with a sales price of FRW 5,000 will have selling and distribution costs allocated at 5,000 x 0.2 = FRW 100 per unit. This approach means that products with a higher selling price will have more selling and distribution costs allocated to them than items with a lower selling price.

Standard costs under marginal costing will not include any element of absorbed overheads.

Standard resource requirements

To estimate the materials required to make each product (material usage) and the labour hours required (labour efficiency), technical specifications must be prepared for each product by production experts (either in the production department or the work study department).

- The "standard product specification" for materials must list the quantities required per unit of each material in the product. These standard input quantities must be made known to the operators in the production department so that control action by management to deal with excess material wastage will be understood by them.
- The "standard operation sheet" for labour will specify the expected hours required by each grade of labour in each department to make one unit of product. These standard times must be carefully set (for example by work study) and must be understood by the labour force. Where necessary, standard procedures or operating methods should be stated.

Including overheads in costs

Absorption costing	The production overheads are included in the cost of each cost unit
Marginal costing	Only variable overheads are included in the cost of cost units with the fixed overheads being charged to the statement of profit or loss as a period cost

The absorption of overheads is important in budgeting because the budget that has been constructed must be consistent with the method of attribution of indirect costs used in reporting the organisation's actual results. Otherwise, meaningful comparisons, which are required in order to fulfil the control aspect of a budget, cannot be drawn.

Allocation and apportionment of overheads

- Overheads that clearly relate to one identifiable cost centre can be allocated to that cost centre in full. For example, the depreciation of factory machinery can be allocated to the factory cost centre.
- Overheads that relate to several cost centres need to be apportioned to each of the cost centres on some fair basis. For example, the rent of a building can be apportioned to the cost centres that use the building based on floor space that each occupies.
- Service cost centre costs can be re-apportioned to the production cost centres, to ensure that all overheads are then included within the production cost centre costs.
- The overheads of each production cost centre can be absorbed into the cost of cost units (e.g., a product item) on some fair basis, such as the number of labour hours or machine hours that each cost unit uses.

There are three main methods of calculating a cost per unit:

Absorption costing	A full production cost per unit is calculated by including in the cost of the cost unit a proportion of the production overheads from each of the production and service cost centres. This is done by allocating, apportioning and absorbing the overheads. Note that even when applying absorption costing, it is usually only the production overheads of the production and service cost centres which are absorbed. Administrative overheads (e.g., the salaries of the finance team, the depreciation of the office building) or selling overheads (e.g., the cost of an advertising campaign) will remain outside the cost units.
Activity based costing (ABC)	This is a method of absorption costing that uses more sophisticated methods of allocating overheads to cost units than the normal methods of overhead allocation and apportionment. This method is discussed in Unit I of this module
Marginal (or variable) costing	Under this method, only the variable costs (or marginal costs) of production are included in the cost per cost unit. The fixed overheads are treated as period costs and not as part of the cost unit. The fixed overheads are charged to the statement of profit or loss as an expense for the period.

Example

Giramahoro Ltd produce one product, the G. The factory has two production departments, assembly and packing, and there is one service department, maintenance. 75% of the maintenance department's time is spent in the assembly department and the remainder in the packing department.

The expected costs of producing 100,000 units in the next quarter are as follows:

Direct materials	FRW24,000 per unit
Direct labour	2 hours assembly @ FRW7,000 per hour
	1 hour packing @ FRW6,000 per hour
Assembly overheads	FRW320,000,000
Packing overheads	FRW240,000,000
Maintenance overheads	FRW200,000,000

In each of the production and service departments it is estimated that 40% of the overheads are variable and the remainder are fixed. Overheads are absorbed on the basis of labour hours.

Calculate the cost per unit using the following costing methods:

- absorption costing
- marginal costing

Solution

Absorption costing approach

Production overheads	Assembly	Packing	Maintenance
	FRW'000	FRW'000	FRW'000
Allocated and apportioned	320,000	240,000	200,000
Reapportioned – maintenance			
(75%/25%)	150,000	50,000	(200,000)
Total overhead	470,000	290,000	

The total overhead for Assembly ad Packing can now be used to determine the absorption rate for each function:

Assembly;	
Total hours 2 × 100,000 =	200,000
Absorption rate 470,000/200,000 =	FRW 2,340 per labour hour
Packing;	
Total hours 1 × 100,000 =	100,000
Absorption rate 290,000/100,000 =	FRW 2,900 per labour hour

This means that, for every one hour that the product is worked on in the assembly department, it is charged with a FRW 2,350 share of the overheads incurred.

And for every one hour that the product is worked on in the packing department, it is charged with a FRW 2,900 share of the overheads incurred.

Unit cost:	**FRW**
Direct materials	24,000
Direct labour – assembly 2 hours × FRW 7,000	14,000
Direct labour – packing 1 hour × FRW 6,000	6,000
Overheads – assembly 2 hours × FRW 2,350	4,700
– packing 1 hour × FRW 2,900	2,900
Unit cost (total absorption costing)	51,600

Marginal costing approach

In this method only variable overheads are included in the cost per unit, so these must be determined:

	Assembly	Packing
	FRW'000	FRW'000
Total overhead	470,000	290,000
Variable element (40%)	188,000	116,000

Absorption rates:

Assembly 188,000,000/200,000 = FRW 940 per labour hour

Packing 116,000,000/100,000 = FRW 1,160 per labour hour

Unit cost:	FRW
Direct materials	24,000
Direct labour – assembly	14,000
Direct labour – packing	6,000
Variable overhead	
– assembly (2 hours × FRW 940)	1,880
– packing (1 hour × FRW 1,160)	1,160
Unit cost (marginal costing)	47,040

When considering on what basis a production overhead should be absorbed (i.e., on the basis of units, labour hours or machine hours), we need to consider the nature of that

specific business. If the business is labour-intensive, involving many labour hours, then absorption on a labour hour basis is appropriate. Alternatively, if the production process involves the heavy use of machinery, then machine hours would be a more suitable absorption basis.

As we have seen in the example above, the unit cost can be very different under marginal costing from that calculated under absorption costing. Under absorption costing the fixed overhead is absorbed into the units produced in the period, and therefore the full production cost of the units sold in the period is charged to the statement of profit or loss as part of cost of sales. However, under marginal costing a lower value is assigned to cost of sales as the cost per unit only includes variable costs. The fixed costs are then charged to the statement of profit or loss as a period cost. This difference is also reflected in the valuation of inventory. Under absorption costing, inventory is valued at full production cost, which includes the absorbed fixed overhead. However, under marginal costing a lower value is assigned to the value of inventory, as the cost per unit only includes variable costs.

The following implications follow on from the different approaches to costing:

- If inventory levels are rising, then absorption costing will give higher profits (as the fixed overheads are being carried forward into the next accounting period)
- If inventory levels are falling, then absorption costing will give a lower profit figure (as more fixed overheads from the previous period are charged to the income statement in this period)
- Where inventory levels are constant (if unit costs are constant), then absorption costing and marginal costing will give the same level of profit

Variance analysis

In Unit F, we looked at variances in the context of budgetary control. The objective in that context is to identify where actual income or expenditure is significantly different from budgeted figures, so that action can be taken to maintain or regain budgetary control.

Variance analysis is important in other contexts also, as part of standard costing. Flexed budgets allow for variance analysis in the budgeting context to take account of changes in activity levels. In standard costing, this is taken further, with an objective to analyse in more detail the specific changes that have led to the variances, so that action can be targeted at the underlying cause, rather than taking a more general approach to budget maintenance. There is a further objective also, ie to gather data in order to refine the standard costs to be used in future, based on the evidence from variances in the current period.

For example, if a company has a labour budget for Month 5 of FRW 2 million, and expenditure on labour in the month is FRW 2.1 million, then the budget report will require action to address the overspend of FRW 0.1 million. The budget manager may decide to delay the appointment of new staff to reduce future expenditure or may cancel overtime in the next period. However, if the manager has more detailed analysis of the labour cost variance, they might be able to take more targeted action, and will have better information for future budgeting. If the variance of FRW 0.1 million is a favourable labour usage variance of FRW 0.1 million and an unfavourable labour price variance of FRW 0.2 million, it would follow that the main issue is the level of salaries and wages paid to employees, not the number of employees or the hours they are working. This may lead the manager to look at the level of remuneration (to the extent that it is controllable), rather than focusing on

the number of employees. It will also indicate a need to review the standard cost figure being used in future periods, and the salary levels assumed in this.

A range of variances can be calculated using the formula in the following table:

Sales:	Sales price variance	SPV	=	(AP-SP)AQs
	Sales volume variance	SVV	=	(AQ-SQ)Sπ
Materials:	Materials price variance	MPV	=	(SP-AP)AQ
	Materials usage variance	MUV	=	(SQ-AQ)SP
Labour:	Labour rate variance	LRV	=	(SR-AR)AH
	Labour efficiency variance	LEV	=	(SH-AH)SR
Variable overheads:	Variable overhead expenditure variance	VExV	=	(SR-AR)AH
	Variable overhead efficiency variance	VEfV	=	(SH-AH)SR
Fixed overheads:	Fixed overhead expenditure variance	FExV	=	BFO-AFO
	Fixed overhead volume variance	FVV	=	SFO – BFO or (SH-BH)SR
	Fixed overhead efficiency variance	FEfV	=	(SH-AH)SR
	Fixed overhead capacity variance	FCV	=	(AH-BH)SR

Key to formulae:		
AP = Actual Price	SP = Standard Price	Sπ = Standard Profit
AQ = Actual Quantity	AQs = Actual Quantity Sold	SQ = Standard Quantity
AR = Actual Rate per hour	SR = Standard Rate per hour	
AH = Actual Hours	SH = Standard Hours	BH = Budgeted Hours
AFO = Actual Fixed Overhead	BFO = Budgeted Fixed Overhead	

The following example illustrates the main standard costing variances and how they are calculated.

Example

The following details are taken from the standard cost card of a product:

Production of 1 unit of product

Costs	Details	FRW
Raw materials	2.8 kg at FRW 5,000 per kg	14,000
Direct labour	6.0 hours at FRW 4,500 per hour	27,000
Standard cost	(for 1 unit)	41,000

During Month10, actual results were as follows:

Item	Results
Production	1,100 units of product
Direct materials purchased and used	3,200 kilos at a price of FRW 4,700 per kilo
Direct labour wages	7,100 hours worked at a total cost of FRW 30,150,000

Calculate materials and labour variances for Month 10

Solution

(Note, favourable variances are indicated as F, and adverse or unfavourable variances are indicated as A)

Materials price

(SP – AP)AQ = (5,000 – 4,700) x 3,200kg = FRW 960,000 F

Materials usage

(SQ – AQ)SP = ((2.8 x 1,100) – 3,200kg) x 5,000 = FRW 600,000 A

Materials cost

(1,100 x 14,000 = 15,400,000) - (3,200kg x 4,700 = 15,040,000) = FRW 360,000 F

Another way to arrive at the materials cost variance is to add together the price and usage variance. The price and usage variances break down the cost variance into more detail and therefore the total should be the same.

Labour rate

(SR – AR)AH = (4,500 – (30,150,000/7,100)) x 7,100 = FRW 1,800,000 F

Labour efficiency

(SH – AH)SR = (6,600 – 7,100) x 4,500 per hour = FRW 2,250,000 A

Labour cost

(1,100 x 27,000) – 30,150,000 = FRW 450,000 A

Or 1,800,000 F + 2,250,000 A = FRW 450,000 A

Note that it is important to flex the standards for the usage and efficiency variances in order to compare like with like: i.e., the amount of materials that it should have taken, and the amount of time it should have taken, given the actual level of output. This allows a direct comparison with the actual amounts used.

The following example illustrates sales and overheads variance calculations.

Example

The following details were extracted from the standard cost card of a product:

Raw materials	3.0 kg at a price of FRW 4,800 per kilo
Direct labour	6.5 hours at a wage rate of FRW 4,000 per hour
Variable overheads	FRW 2,500 per labour hour
Fixed overheads	FRW 3,000 per labour hour

Last month the total budget was to make and sell 1,000 units of the product at a selling price of FRW 100,000 each.

During last month actual results were as follows:

Production	1,100 components were produced and sold at FRW 95,000 each
Direct materials purchased and used on production	3,150 kilos at a total cost of FRW 15,100,000
Wages paid	FRW 27,056,000 for a total of 7,120 hours
Variable overheads paid	FRW 17,250,000
Fixed overheads paid	FRW 22,000,000

You are required to calculate sales, materials, labour and overhead variances.

Solution

Sales price variance

The sales price variance compares the sales revenue that should have been generated from the actual level of sales with the actual level of revenue generated:

Should have generated	FRW 100,000 per unit x 1,100 units	=	FRW 110,000,000
Did generate	FRW 95,000 x 1,100 units	=	FRW 104,500,000
Variance		=	FRW 5,500,000 A

Or: Sales price variance: (AP – SP)AQs = (95,000 – 100,000) x 1,100 = FRW 5,500,000 A

Sales volume variance

We need to calculate the standard profit from the standard cost card: Profit = revenue – costs

= 100 – ((3 x 4,800 – (6.5 x 4,000) – (6.5 x 2,500) – (6.5 x 3,000)) = FRW 23,850

Budgeted volume of activity	=	1,000 units
Actual level of activity	=	1,100 units
Variance	=	100 units
x standard profit of 23,850	=	FRW 2,385,000 F

(favourable as selling more should result in higher profits)

The total sales margin variance can be arrived at by adding together the sales price and sales volume variances.

Variable overhead expenditure variance

The variable overhead expenditure variance is very similar to materials price and labour rate variances. It compares what we should have paid for the variable overheads consumed and the actual price paid for those overheads based on the hourly rate for variable overheads.

Should pay	FRW 2,500 per labour hour x 7,120 hours consumed	=	FRW 17,800,000
Did pay		=	FRW 17,250,000
Variance		=	FRW 550,000 F

Or: Variable overhead expenditure variance = (SR – AR)AH = (2,500 – (17,250,000 / 7,120)) x 7,120 = FRW 550,000 F

Variable overhead efficiency variance

The variable overhead efficiency variance measures the financial implication on the variable overheads as a result of labour efficiency and so the starting point is the efficiency of the workers (or lack thereof) taken directly from the labour efficiency variance:

Should take	6.5 hours per unit x 1,100 units produced	=	7,150 hours
Did take		=	7,120 hours
Variance		=	30 hours

To get the financial implication we multiply the hours saved by the standard hourly rate of variable overheads, ie FRW 2,500 per hour: 30 x 2,500 = FRW 75,000 F

Or: Variable overhead efficiency = (SH – AH)SR = (7,150 – 7,120) x 2,500 = FRW 75,000 F

Fixed overhead efficiency variance

The fixed overhead efficiency is also related to the efficiency of the workforce and begins with the comparison between how long it should have and did take the workforce to complete the work:

Should take	6.5 hours per unit x 1,100 units produced	=	7,150 hours
Did take		=	7,120 hours
Variance		=	30 hours

To get the financial implication we multiply the hours saved by the standard hourly rate of fixed overheads, ie 3,000 per hour: 3,000 x 30 = FRW 90,000 F

Or: Fixed overhead efficiency = (SH – AH)SR = (7,150 – 7,120) x 3,000 = FRW 90,000 F

The FRW 3,000 is the expected fixed overheads spread over the budgeted number of labour hours. From this we can deduce that the total amount of fixed overheads was expected to be:

3,000 per hour x 6.5 hours per unit x 1,000 budgeted units = FRW 19,500,000.

In theory, these overheads should not have changed as a result of making 1,100 units. The very definition of a fixed cost is that it is not related to the volume of units that we produced. Therefore, there is no requirement to flex fixed overheads to get a standard that should have been paid for the given level of output. Fixed overheads should, therefore, have cost FRW 19,500,000. This leads into the fixed overhead expenditure variance.

Fixed overhead expenditure variance

The fixed overhead expenditure variance measures the difference between the budgeted level of fixed overheads and the actual level of fixed overheads.

Budgeted fixed overheads	=	FRW 19,500,000
Actual fixed overheads	=	FRW 22,000,000
Variance	=	FRW 2,500,000 A

Or: BFO – AFO = 19,500,000 – 22,000,000 = FRW 2,500,000 A

Remember that this variance is not due to the change in volume but, for example, may be due to the fact that any rent increase was higher than had been anticipated.

Fixed overhead capacity variance

The final overhead variance is the fixed overhead capacity variance. This measures the financial impact of the capacity that has been purchased through the payment of fixed overheads.

For example, we may assume for now that the fixed overheads in this example is the rent of a factory. When the budget was set, it was expected that the total capacity for the month would be:

6.5 hours per unit x 1,000 budgeted units = 6,500 hours of capacity.

If the actual number of hours utilised in the factory increases or decreases, this does not change the amount of rent that will be charged as this is a fixed fee for the month. However, utilising hours does change the value for money that has been achieved from the rent, and this has a financial implication that is measured through the fixed overhead capacity variance.

This variance compares the number of hours of capacity that was budgeted to be utilised with the number of hours capacity that was actually utilised:

Budgeted capacity per above is	6,500 hours
Actual capacity utilised is	7,120 hours
Variance	620 hours

This is a favourable variance as it represents increased value for money from the rent that was paid; ie we have been able to utilise more hours for the same rent payment than was expected.

As previously we must give a financial valuation to this variance and as before this is done using the standard rate per hour, ie FRW 3,000 per hour: 620 x 3,000 = FRW 1,860,000 F

Or: Fixed overhead capacity variance = (AH – BH) x SR = (7,120 – 6,500) x 3,000 = FRW 1,860,000 F

When we add together the fixed overhead efficiency, expenditure and capacity variances, we arrive at the fixed overhead cost variance.

These variances can then be placed into a reconciliation statement as follows:

Profit reconciliation statement

Variance	Favourable variances FRW '000	Adverse variances FRW '000	Cost variances FRW '000
Budgeted profit			23,850
Sales price variance		(5,500)	
Sales volume variance	2,385		
Total sales variance			(3,115)
Materials price	20		
Materials usage	720		
Materials cost			740
Labour rate	1,424		
Labour efficiency	120		
Labour cost			1,544
Variable overhead expenditure	550		
Variable overhead efficiency	75		
Variable overhead cost			625
Fixed overhead expenditure		(2,500)	
Fixed overhead efficiency	90		
Fixed overhead capacity	1,860		
Fixed overhead cost			(550)
Actual profit			23,094

Workings for materials and labour variances:

MPV	(SP - AP) x AQ	(FRW 4,800 – (FRW 15,100,000/3,150)) x 3,150	20,000 F
MUV	(SQ - AQ)x SP	((3 x 1,100)–3,150) x FRW 4,800	720,000 F
LRV	(SR – AR) x AH	(FRW 4,000 – (FRW 27,056,000/7,120 hours)) x 7,120 hours	1,424,000 F
LEV	(SH - AH)x SR	((6.5 hours x 1,100) - 7,120 hours) x FRW 4,000	120,000 F

Summary of Unit H and key learning outcomes

In Unit H, we looked at the Competency "Be aware of the cost accounting techniques needed in monitoring financial performance." This involved content on five learning outcomes.

Learning outcome	
Explain the types of cost centres, profit centres and investment centres.	You should now be able to explain how performance is managed in different types of responsibility centre.
Describe the use of standard units of inputs and outputs.	You should now be able to describe the use of standard units of inputs and outputs.
Recognise the differences between standard, marginal and absorption costing in terms of cost recording, cost reporting and cost behaviour.	You should now be able to apply standard, marginal and absorption costing in performance management.
Explain the use of variance analysis in labour, materials and overhead costing.	You should now be able to calculate and explain different types of variance.
Accurately identify fixed, variable, semi-variable and stepped costs and explain their use in cost recording, cost reporting and cost analysis.	You should now be able to discuss and apply different forms of cost behaviour.

Quiz questions

1	Learning Outcome: H4
Keos Company budgeted materials costs of FRW 14,784,000 for the period, but actual costs were FRW 15,100,000. Which of the following would account for this difference?	
A	A favourable materials price variance of FRW 260,000 and a favourable materials usage variance of FRW 576,000
B	An unfavourable materials price variance of FRW 260,000 and an unfavourable materials usage variance of FRW 576,000
C	An unfavourable materials price variance of FRW 260,000 and a favourable materials usage variance of FRW 576,000
D	A favourable materials price variance of FRW 260,000 and an unfavourable materials usage variance of FRW 576,000

1	Feedback
A	Incorrect A favourable materials price variance of FRW 260,000 and an unfavourable materials usage variance of FRW 576,000
B	Incorrect A favourable materials price variance of FRW 260,000 and an unfavourable materials usage variance of FRW 576,000
C	Incorrect A favourable materials price variance of FRW 260,000 and an unfavourable materials usage variance of FRW 576,000
D	Correct

2	Learning Outcome: H4
Shand Company has a standard labour cost for Product HH of 6.4 hours at FRW 3,750 per hour. If the actual labour cost in the period was FRW 27,056,000 for 1,100 products, what is the labour cost variance?	
A	FRW 300,000 favourable
B	FRW 356,000 unfavourable

C	FRW 356,000 favourable
D	FRW 656,000 unfavourable

2	Feedback
A	Incorrect Standard cost = 1,100 x 6.4 x 3,750 = 26,400,000. Labour cost variance = 26,400,000 – 27,056,000 = 656,000 unfavourable (or adverse)
B	Incorrect Standard cost = 1,100 x 6.4 x 3,750 = 26,400,000. Labour cost variance = 26,400,000 – 27,056,000 = 656,000 unfavourable (or adverse)
C	Correct Standard cost = 1,100 x 6.4 x 3,750 = 26,400,000. Labour cost variance = 26,400,000 – 27,056,000 = 656,000 unfavourable (or adverse)
D	Incorrect Standard cost = 1,100 x 6.4 x 3,750 = 26,400,000. Labour cost variance = 26,400,000 – 27,056,000 = 656,000 unfavourable (or adverse)

3	Learning Outcome: H3
Which of the following is described as "under this method, only the variable costs of production are included in the cost per cost unit"?	
A	Marginal costing
B	Activity based costing
C	Absorption costing
D	Full costing

3	Feedback
A	Correct
B	Incorrect Marginal costing
C	Incorrect Marginal costing

D	Incorrect Marginal costing

4	Learning Outcome: H3
Which of the following statement is correct?	
A	If inventory levels are falling then absorption costing will give higher profits
B	If inventory levels are falling then absorption costing will give a lower profit figure
C	Where inventory levels are constant (provided that unit costs are constant), then absorption costing and marginal costing will give different levels of profit
D	Marginal costing will always give a higher level of profit

4	Feedback
A	Incorrect If inventory levels are falling then absorption costing will give a lower profit figure (as more fixed overheads from the previous period are charged to the income statement in this period)
B	Correct
C	Incorrect If inventory levels are falling then absorption costing will give a lower profit figure (as more fixed overheads from the previous period are charged to the income statement in this period)
D	Incorrect If inventory levels are falling then absorption costing will give a lower profit figure (as more fixed overheads from the previous period are charged to the income statement in this period)

5	Learning Outcome: H1
If a budget target provides "a useful psychological incentive by giving employees a realistic but challenging target of efficiency," which of the following would be used to describe the target?	
A	Attainable

B	Ideal
C	Current
D	Basic

5	Feedback
A	Correct
B	Incorrect Attainable
C	Incorrect Attainable
D	Incorrect Attainable

Quiz solutions

1	D
2	C
3	A
4	B
5	A

Exercises

Exercise 1

Upper C Engineering Ltd has the following costs. Select, from the list below, the appropriate accounting treatments for these when constructing a budget.

Costs:

- Salaries of office staff
- Maintenance of machinery
- Depreciation of finance director's car
- Depreciation of machinery
- Packaging material for units of finished goods

Available accounting treatments:

- Direct cost, allocated to the relevant cost centre
- Allocate to marketing overheads
- Allocate to administrative overheads
- Charge to production using a machine hour overhead rate

Exercise 1 solution

Salaries of office staff	These are not production costs and so are charged directly to the income statement after gross profit ie allocate to administrative overheads.
Maintenance of machinery	This is a cost of production and is likely to depend on the use of the machinery, therefore charge to production using a machine hour overhead rate.
Depreciation of finance director's car	Allocate to administrative overheads – again, not a production cost. If this had been the sales director's car, then it may have been appropriate to allocate it to marketing overheads.
Depreciation of machinery	This does relate to production, like maintenance of machinery, and so charge to production using a machine hour overhead rate.
Packaging material for units of finished goods	This is a raw material cost of production – a direct cost.

Exercise 2

Using the data below, you are required to calculate a machine-hour absorption rate for multi-drilling machine no. 5.

Relating specifically to machine no. 5:

- Original cost: FRW 13.3 million
- Estimate life span: 10 years
- Estimated scrap value after 10 years
- FRW 300 Floor space occupied: 250 square metres
- Number of operators: 2
- Estimated running hours: 1,800 per annum
- Estimated cost of repairs: FRW 240,000 per annum
- Estimated cost of power: FRW 1,000,000 per annum

Relating to the department in which machine no. 5 is situated:

- Floor area: 5,000 square metres
- Number of operators: 60
- Rent: FRW 4.4 million per annum
- Supervision: FRW 3.6 million per annum

Exercise 2 solution

In addition to the costs specifically relating to machine no. 5, the following apportioned costs must be taken into account:

- Rent - on the basis of floor area occupied.
- Supervision - on the basis of number of operators for machine no. 5 compared with the number employed in the whole department.

Therefore, the total costs appropriate to machine no. 5 are as follows:

		FRW '000 per annum
Depreciation	(13,000-300)/10	1,300
Rent	1/20th of department's cost	220
Supervision	1/30th of department's cost	120
Repairs		240
Power		1,000
Total		2,990

Therefore, the machine hour rate is:

2,880,000/1,800 = FRW 1,600 per machine hour

Exercise 3

Flesherin Company expects to produce 5,000 units of its single product in the next month with the following costs being incurred:

	FRW million
Direct materials	12
Direct labour	15
Variable overheads	23
Fixed overheads	25

What is the budgeted cost per unit under both absorption costing and marginal costing methods?

Exercise 3 solution

Absorption costing

		FRW million
	Direct materials	12
	Direct labour	15
	Variable overheads	23
	Fixed overheads	25
	Total cost	75
Cost per unit	= FRW 75 million/5,000	
	= FRW 15,000 per unit	

Marginal costing

		FRW million
	Direct materials	12
	Direct labour	15
	Variable overheads	23
	Total cost	50
Cost per unit	= FRW 50 million/5,000	
	= FRW 10,000 per unit	

Unit I: Techniques for measuring performance and managing costs.

Learning outcomes

I.1 Identify the relevant performance and quality measures to use to monitor financial performance.

I.2 Explain the principles of discounted cash flow.

I.3 Identify appropriate performance indicators to use for

- a. Efficiency.
- b. Effectiveness.
- c. Productivity.
- d. Cost per unit.
- e. Balanced scorecard.
- f. Benchmarking.
- g. Control ratios (efficiency, capacity and activity).
- h. Scenario planning ("what-if" analysis).

I.4 Explain the use and purpose of techniques:

- a. Indexing.
- b. Sampling.
- c. Time series (e.g., moving averages, linear regression and seasonal trends).

I.5 Identify the correct ratios used to monitor financial performance.

I.6 Describe a range of cost management techniques and recognise when these should be used

- a. Life cycle costing.
- b. Target costing (including value engineering).
- c. Activity-based costing.

I.7 Explain the problems of measuring performance in public sector organisations.

I.8 Describe how performance can be measured in public sector organisations.

Introduction to Unit I

Some of the topics we will look at in this unit have been introduced earlier in the module, i.e.:

- Performance measures and performance indicators – in Unit F.
- Standard costs – in Unit C.
- Costing and forecasting techniques – in Unit C.
- Ratios – in Unit F.

You should refer to these units for discussion of these topics, but they are also reviewed and applied in this unit in relation to performance management specifically.

Principles of discounted cash flow (DCF)

Discounted cash flow takes account of the "time-value of money." Time value of money is a concept that states that FRW 1,000 earned or spent sooner is worth more than FRW 1,000 earned or spent later. The reasons for that are that there is more uncertainty related to later amounts, individuals will tend to give more weight to current opportunities rather than future ones, and earlier inflows allow the possibility of investment of those funds for a period.

Example

If you invest FRW 100,000 and are guaranteed a return of 10% per annum we can work out how much the investment is worth at the end of each year.

	Present value		Future value
End of Year 1	FRW 100,000 x (1.10)	=	FRW 110,000
End of Year 2	FRW 100,000 x (1.10)(1.10)	=	FRW 121,000
End of Year 3	FRW 100,000 x (1.10)(1.10)(1.10)	=	FRW 133,000
We can use the formula PV (1 + i)n = FV to identify the future value of an investment			
Where:	PV = present value		
	I = Rate of Interest		
	n = Number of years/periods		
	FV = Future value		

We are starting with a present value (FRW 100,000) and depending on the rate of interest used (10%) and the duration of the investment (n) we can find the future value, using compound interest.

Discounting is compound interest in reverse. Thus, using the statement PV (1 + i)n = FV we can turn it around to get:

$(FV/(1 + i)n = PV$ or

$FV \times 1/(1 + i)n = PV$

Again, taking the example above, we can use the future value to determine the present value.

	Future value		Present value
End of Year 1	FRW 100,000 x (1/(1.10)1	=	FRW 90,909
End of Year 2	FRW 121,000 x (1/(1.10)2	=	FRW 82,644
End of Year 3	FRW 133,000 x (1/(1.10)3	=	FRW 75,131

In converting the future value to a present value, it is multiplied by a factor (discount factor), which varies depending on the discount rate (i) selected and the number of years/ periods (n) into the future. Fortunately, it is not necessary to individually calculate each factor, as these can be easily obtained from discounting tables, or by using the appropriate function in a spreadsheet. The tables supply a factor for all % rates and periods.

Net present value (NPV)

This technique converts future cash flows to a common point in time (present value), by discounting them. The present values of the individual cash flows are aggregated to arrive at the net present value (NPV).

The NPV figure represents the change in shareholders' wealth from accepting the project. It produces an absolute value and, therefore, the impact of the project is identified.

For independent projects the decision rule is:

- Accept if the NPV is positive
- Reject if the NPV is negative

For mutually exclusive projects (where it is only possible to select one of many choices) – calculate the NPV of each project and select the one with the highest NPV.

In calculating the NPV, the selection of a discount rate is important. It is generally taken as the cost to the business of long-term funds used to fund the project.

Cost of capital

The discount rate used in NPV calculations will usually be based on, or at least will consider, the company's cost of capital. The cost of capital is in simple terms the overall cost of the funds that are used to finance a business. It therefore depends on the form of financing used in the company, which may be a combination of debt financing (loans, debentures, preference shares) or equity financing (ordinary shares).

Since the cost of capital represents a cost to the company, it must generate a return more than the cost of capital in order to generate value. It is commonly used in the capital appraisal process to determine whether a company should proceed with a project. For example, if a company has a cost of capital of 12%, it should not normally proceed with a project that has an estimated return of 10%, but it should consider a project that has a projected return of 18%.

Example

A company is considering a project, which is expected to last for 4 years, and requires an immediate investment of FRW 20 million on plant and machinery. Inflows are estimated at FRW 7 million for each of the first two years and FRW 6 million for each of the last two years. The company's cost of capital is 10% and the plant would have zero scrap value at the end of the 4 years.

Calculate the NPV and recommend if the project should be accepted.

Solution

Year	Cash flows	Discount Factor	Present value
	FRW '000	10%	FRW '000
0	(20,000)	1.0	(20,000)
1	7,000	0.909	6,364
2	7,000	0.826	5,782
3	6,000	0.751	4,506
4	6,000	0.683	4,098
		Net Present Value	+750

The project should be accepted as it produces a positive NPV. This indicates that the project provides a return in excess of 10% (the discount rate used).

Performance measures and performance indicators

In Unit F, we looked at the purpose of performance measures and performance indicators, and identified different forms of performance indicator, including the use of ratios. We also noted that these can be both financial and non-financial.

The topic of performance measurement is closely related to that of value for money (VFM). In its simplest form, VFM is about assessing the organisation's economy, efficiency and effectiveness.

Economy	Acquiring resources of appropriate quality and quantity at the lowest cost
Efficiency	Maximising the useful output from the resources used, or minimising the level of work in producing a given level of output
Effectiveness	The extent to which objectives are achieved

For example, the following measures could be used to assess value for money in a production function:

- Economy – the cost per unit of production

- Efficiency – the number of units produced each hour of production
- Effectiveness – the percentage of units produced that pass quality control inspections

Note that there can be conflict between these measures, and part of management involves determining how to balance these to meet organisational objectives. For example, purchasing cheap materials may improve economy, but is likely to have negative impacts on efficiency and effectiveness.

Balanced scorecard

The scorecard considers the business from four distinct but interrelated perspectives, as seen in the diagram below:

- Financial perspective.
- Customer perspective.
- Internal business perspective.
- Innovation and learning perspective.

The four perspectives need to be considered separately and then collectively when assessing the performance of an organisation. Preparing a balanced scorecard starts with the objectives of the organisation or department. It involves the following steps:

Step 1 – identify and select KPIs	Financial perspective – focus on costs and staying within budget (in the private sector this will include profitability measures). Customer perspective – focus on satisfying user expectations. Innovation and learning perspective – focus on continuing to improve and add value. Internal business perspective – focusing on improving business processes.
Step 2 – set targets	
Step 3 – Communicate the vision and the strategy for achieving targets	The scorecard provides a means of enabling managers at all levels of the organisation to understand the long-term strategy and both departmental and individual objectives should be aligned with it. Supporting initiatives should be developed to ensure the targets are achieved.
Step 4 – Establish a system to record and monitor performance.	The assessment of the actual results will allow management to judge the success of the strategy adopted.

For example, the environmental health department of a local council may set a KPI within the internal business perspective that high-risk premises should be inspected for food hygiene.

The target may be set at 100% of high-risk premises visited within six months.

This target is then communicated to those responsible and they would be charged with developing supporting strategies; for example, producing a register of high-risk premises and re-prioritising staff workloads.

Finally, a monitoring system would need to be established to track inspections.

Benchmarking

Benchmarking can be described as:

> A systematic and continuous measurement process…comparing and measuring an organisation's business processes against business leaders referred to as *role models* or *best practice*.

The standard set by the leading player in each area of activity is referred to as the "benchmark". Benchmarking can involve a comparison of performance indicators, or an in-depth review and comparison of business processes. Such comparisons may be made within the organisation itself or between organisations, but the process should involve more than simply the making of a comparison. The aim of benchmarking is for the organisation to take action that will result in the improvement of performance.

Strategic benchmarking	Strategic benchmarking is used where an organisation needs to improve overall performance and focuses on comparisons relating to its long-term strategy.
Operational benchmarking	Operational benchmarking, also known as activity or process benchmarking, focuses on the day-to-day operational activities of the business, and is used to highlight areas for improvement, service enhancement or cost saving. In operational benchmarking it is possible to compare with very different entities, provided both have similar processes.
Customer benchmarking	Customer benchmarking is focused on the customer experience. For example, research could be carried out into customer perceptions of competitors, and from this, quality and service problems and opportunities could be identified.
Internal benchmarking	This is the comparison of internal processes against: • Historical performance • The performance of other parts of the same organisation with the aim of spreading good practice
Competitive benchmarking	This is the comparison of performance processes with those of competitors. For example, trade organisations sometimes provide data from their members, showing best and average values, without naming any companies involved.

The benchmarking process

1. Identify what has to be benchmarked.
    - It would be impracticable to benchmark every process within an organisation. A selection of processes will be required, using criteria such as the process's significance to the achievement of the organisation's critical success factors. In the public sector this may take the form of Key Performance Indicators as discussed above.
2. Map the organisation's activities and processes.
    - Documentation should be prepared showing the actions, inputs and process flows throughout the entity, including flow diagrams and detailed narrative.
3. Identify comparable organisations.
    - Many sources are available which will be discussed in more detail shortly.
4. Determine the best methods for collecting the data.
    - Methods include mailshots, telephone calls, using published details and comparing these with in-house records, visiting comparator's premises, and so on.
    - It is important at the outset to discuss in detail with the comparator the terms of the benchmark process. This will include establishing a data collection plan and method; establishing a code for confidentiality regarding shared information; and developing a formal position on ethical and legal issues.
5. Collect the benchmark information.
6. Determine the current performance gap.
    - This requires looking at best practice comparators and assessing the difference between current performance and that of the other organisations to determine what improvement levels are desired.
7. Identify how to improve on procedures to achieve best practice as identified in the benchmarks collected.
8. Project future performance levels, given that the improvements are to be put in place.
9. Develop and agree action plans for improvements.
10. Implement the specific actions and monitor progress.

Scenario planning

Scenario planning is an important part of strategic management and has applications in other aspects of management also. In its simplest terms, scenario planning is about looking at the future and asking, "what if X happened?" Identifying plausible events or circumstances helps the organisation to prepare for these in a way that minimises risk and maximises opportunities. This is a complex and wide topic, but we will just look at the key points here.

Note that we only need to consider plausible scenarios – there is no need to look at the implications of events that are very unlikely to happen. However, the COVID pandemic has highlighted that infrequent and unpredicted events can have a devastating effect on an organisation, so some consideration of may be relevant.

Also, the organisation needs to focus on events that have a direct impact on their key activities and objectives. For example, if an organisation is dependent on the sales of one product, they need to consider what the implications would be of a competitor introducing a similar product at a cheaper price, or of a change in customer expectations affected the demand for this type of product.

The process involves the following steps:

- Identify the main forces that affect the business
- Consider where there are uncertainties in relation to these
- Build a picture of different scenarios, based on changes in these forces and uncertainties
- Construct a series of actions to build resilience against these changes, or to respond to future developments.

For example, a clothes retailer (using shops and online selling) may find the following:

- The main forces are changes in fashion, increases in online shopping, competition from foreign competitors
- The main uncertainty may be in online shopping
- Scenario may include moves to online shopping at different levels – e.g., increases of 25%, 50%, 75%
- The company may conclude that a 25% increase can be accommodated in its current structures, but a 50% increase will require some small shops to be closed, and a 75% increase will mean complete closure of all shops and a concentration exclusively on online selling

Measuring and managing quality

> Quality can be described as the "degree of excellence of the product or service" or "how well the product or service serves its purpose."

In one sense, quality is judged by the customer. A product or service has quality only if it satisfies the customer. To do this the product or service must have two main elements:

- It must be fit for the purpose for which it has been acquired
- It must represent value for money to the customer

This does not mean that products or services need to be made more expensive by using better materials or more highly skilled staff. Provided that the product or service does what it is meant to do, and it is viewed as value for money by the customer, then this product or service will have quality. For example, high quality in a car does not have to mean producing an expensive car. A customer may think that a low-priced but economical car is excellent value for money and meets their need for a small car to drive in a city. Note how this links to the value for money definitions discussed above: ie the low price represents economy, but this also needs to be combined with meeting the needs of the customer, ie effectiveness.

Many industries are now highly competitive, with many businesses providing the same type of goods or services and competing for customers. In these situations, value can

be enhanced by considering what the customer requires and adapting the product or service to improve the perceived value of the product or service.

If we consider the banking system, there are many commercial banks that provide the same basic services of current and deposit accounts, debit cards and so on. In order to compete for customers, many of these banks have attempted to enhance the value of the service that they provide, by offering additional services that are thought to enhance the value of the basic service to the customer, with no additional cost to the customer. Therefore, many banks now try to compete by offering services such as telephone banking, internet banking and text message banking.

Costs of quality

One approach to the management of quality is to measure and manage the cost of quality. The aim should be to achieve a desirable standard of quality for the least cost. The costs of quality are the costs of ensuring and assuring quality, and also any losses incurred when quality is not achieved.

There are four main areas of quality related costs:

Prevention costs	Prevention costs are the costs incurred prior to, or during, production in order to prevent or reduce defects in products or mistakes in services. In other words, they are the costs of preventing quality failures. For example, improvements in systems and procedures that are designed to reduce mistakes in the provision of services would be prevention costs.
Appraisal costs	Appraisal costs are the costs incurred in initially monitoring how the product or service conforms to quality requirements. They are the costs associated with assessing the level of quality achieved. Typically, appraisal costs are associated with costs of inspection and testing.
Internal failure costs	Internal failure costs are the costs arising from inadequate quality before the goods or services are sold to the customer. Therefore, they are costs arising within the organisation due to the failure to achieve the required level of quality. A large part of internal failure costs are associated with the cost of correcting faults that are found in products and correcting procedural errors in service provision – but before the goods or service are delivered to the customer.
External failure costs	External failure costs are costs arising from inadequate quality discovered after the goods or services have been sold to the customer. These costs include the costs of running a customer service department.

Managing quality costs can be difficult. To reduce some quality costs, it may be necessary to increase others. For example:

- To reduce external failure costs, it may be necessary to increase spending on appraisal costs and internal failure costs, to reduce the number of defective items sold to customers.
- To reduce internal and external failure costs, it may be necessary to spend much more on prevention costs, such as costs of better product design and staff training.

Measuring the costs of quality

Normally the cost accounting system of an organisation must be adapted to record the costs of quality. For example, in a traditional cost accounting system there is an allowance for "normal losses" in the cost of production. Therefore, the costs of wasted materials, scrapping of defective products and reworking of products with faults are all included in the production cost of finished output, and they are not separately identifiable or highlighted for management attention. Similarly costs of inspections are included in production overheads without being separately identified.

Therefore, if the costs of quality are to be measured, the cost accounting system must be amended so that the costs of quality can be separately identified, recorded and reported to management.

The costs of quality that can be quantified from the cost accounting records are known as explicit quality costs. However, there are other types of cost which are not recorded in the accounting records, and which can only be estimated – these are known as implicit quality costs.

Implicit costs include:

- The opportunity cost of lost sales to existing customers who have bought a defective product and so will not purchase from the organisation again.
- Loss of goodwill or reputation due to factors such as the widespread recall of one of an organisation's products, affecting potential customers.
- Costs of disruption to production due to reworking of faulty products – these costs will be included in normal production costs and will not be separately recorded.
- Costs incurred due to the practice of holding higher levels of inventory of raw materials to allow faulty materials to be replaced without disruption to production

Example

AB Ltd estimates that two out of every 1,000 of its products that are sold are defective in some way. When the goods are returned, they are replaced free of charge. It is estimated that every customer who buys a faulty product will return it and will not buy AB Ltd's goods again. Each unit costs FRW 30,000 to manufacture and is sold at a price of FRW 40,000.

Due to quality inspections, it is also estimated that 10,000 defective units a year are discovered before they are sold and these can then be sold as "seconds" at a price of FRW 25,000. The quality inspections cost FRW 450 million each year.

The unit sales of the product are 20 million each year.

We can analyse and calculate the explicit costs of quality:

If unit sales are 20 million and two out of every 1,000 units sold are defective, then the number of defective units is 20,000,000/1,000 × 2 = 40,000 units.

	FRW million
Appraisal costs – inspection costs	450
Internal failure costs – lost contribution on seconds	
(10,000 units × (FRW 40,000 – FRW 25,000))	150
External failure costs – cost of replacement products	
(40,000 × FRW 30,000)	1,200
	1,800

There is also the implicit cost of the loss of up to 40,000 customers each year who may not buy AB Ltd's items again.

Performance indicators for quality

In just the same way that performance indicators are produced to summarise the production operations for a business, performance indicators can also be produced to assess the quality of an organisation's products or services. Most of these performance indicators are measures of customer satisfaction. These can be a mixture of financial and non-financial performance indicators.

Financial indicators	Financial indicators to assess customer satisfaction with a product and therefore the quality of the product may include the following: • Cost per customer of the customer service department • Cost per customer of after-sales service • The sales value of returned goods as a percentage of total sales value • Unit cost of returned goods • Unit cost of repair of returned goods • Cost of reworking defective goods as a percentage of total production cost
Non-financial indicators	Number of goods returned • Number of goods returned as a percentage of the number of goods sold • Number of warranty claims as a percentage of total units sold • Number of customer complaints as a percentage of total number of sales orders

At this stage a distinction should be drawn between quality control (prevention – before the event) and quality inspections (detection – after the event). Quality control is about prevention of defective products or mistakes in provision of a service. Quality inspections are to do with detection and identification of defective products or mistakes in the provision of a service. Ideally an organisation would plan to have zero defects. However, the costs of quality assurance needed to prevent all errors and guarantee zero defects may be so high as to be prohibitive, and so some defects may be tolerated because it would cost too much to eliminate them.

Deciding on performance indicators for the quality of manufactured goods is much more straightforward than finding performance indicators for the quality of services.

Measuring the quality of a service again involves measuring customer satisfaction, therefore the first stage is to ensure that the organisation knows what the customer expects from the service.

Some performance indicators for quality of a service may be qualitative, such as surveys of customer opinion. A further method of assessing the quality of a service may be by inspection, either by an internal or an external body, such as government inspections of schools.

There can also be quantitative (often non-financial) performance indicators for a service, such as average waiting times for hospital operations or the percentage of train journeys that did not arrive on time.

Total quality management (TQM)

Total quality management (TQM) is a quality management system in an organisation that involves all activities of the organisation, not just the production activities. The philosophy behind Total Quality Management must be applied to all the activities of the business – design, production, marketing, administration, purchasing, sales and even the finance function.

> Total quality management (TQM) can be defined as "a continuous improvement in quality, productivity and effectiveness obtained by establishing management responsibility for processes as well as output. In this system every process has an identified process owner and every person in an entity operates within a process and contributes to its improvement."
>
> Chartered Institute of Management Accountant's (CIMA) Official Terminology

One principle of TQM is continuous improvement. An organisation should continually look for ways of improving performance. These improvements will all be small improvements, but the cumulative effect of many small improvements over time will be substantial. An organisation should never stop looking for and finding more improvements that can be made.

Another principle is getting it right first time. Faults and errors should not happen. If these are eliminated, internal and external failure costs will not exist. Costs of prevention are less than the costs of correction.

Another concept in TQM is that every employee is involved with quality and anyone with an idea should be allowed to put this forward. This is often done by forming discussion groups of employees within the organisation, known as quality circles.

Quality circles normally consist of about ten employees with a range of skills, roles and seniority who meet regularly to discuss problems of quality and quality control and to perhaps suggest ways of improving processes and output. This means that there is input from all levels within the organisation and from different disciplines such as marketing, design, engineering, information technology and office administration as well as production.

Target costing

When a company is designing a new product, it may have a good idea of how much customers will pay for it. This might be used as the target selling price. The company will also know how much profit margin it will want from the new product. If it knows the target selling price and the required profit margin, it can identify a target cost for the new product.

The target cost is determined by taking the fixed target selling price and deducting the required profit margin. Once determined, this target cost is then presented to the product designers for them to achieve. The product will not be put into commercial production unless and until the target cost is achieved. Often it may be necessary to change the product design in order to reduce costs. One technique that may be used for target costing is value analysis.

Example

A car manufacturer wants to calculate a target cost for a new car, the price of which will be set at FRW27,950,000. The company requires an 8% profit margin.

What is the target cost?

Solution

Profit required	8% x FRW 27,950,000	FRW 2,236,000
Target cost	FRW 27,950,000 – FRW 2,236,000	FRW 25,714,000

There may be some costs that a business is unable to influence or reduce (particularly in the short term), for example certain fixed overheads. Such costs must be deducted from the target cost to ascertain the maximum amount that is then available to the business to spend on other costs - for example, materials or labour.

Example

A manufacturer, operating in a competitive market, can sell its product at FRW 25,000 per unit. It wishes to make a profit margin of 40%. Each unit of product requires 0.5 hours of labour at FRW 6,000 per hour and incurs other overheads at a rate of FRW 8,000 per labour hour. The product requires 2kg of material per unit.

What is the maximum that the manufacturer can afford to pay for each kg of material?

Solution

	FRW '000
Selling price	25
40% margin	10
Target cost	15
Less:	
Labour 0.5 hrs @ FRW 6,000/hr	(3)
Overheads 0.5 hrs @ FRW 8,000/hr	(4)
Available for 2kg material	8
Maximum price per kg = 8,000/2 = FRW 4,000	

Value analysis

Value analysis is a planned, scientific approach to cost reduction, which reviews the material composition of a product and the product's design so that modifications and improvements can be made that do not reduce the value of the product to the customer or user.

Value engineering is the application of similar techniques to new products.

Value analysis considers four aspects of value:	
Cost value	the cost of producing and selling an item
Exchange value	the market value of the product or service
Use value	what the article does; the purposes it fulfils
Esteem value	the prestige the customer attaches to the product

Value engineering is the application of value analysis techniques to new products, so that new products are designed and developed to a given value at minimum cost. Technically, value analysis is applied to products or services already being produced or provided. If this process takes place during the design stage of a new product or in the planning stage of a service, then it is known as value engineering.

Specialists in design, engineering, work methods and technology, amongst others, will be involved in this process. When designing a product or planning a service each element of the product or service must be considered to determine whether it adds value to the

product or service for the consumer and then to ensure that this is included in the product or service at the lowest possible cost.

There is usually much greater scope for reducing costs through value engineering at the new product design stage than there is for reducing costs through value analysis of existing products.

If value analysis and cost reduction procedures are successfully carried out in an organisation this can have a number of benefits for both the organisation and the customer:

- Reduced costs for the organisation and potentially reduced prices for the customer with no loss of value
- Continuous improvement in the design and manufacture of products
- Improvement of customer service due to the use of standard components
- Design of products and services with customer value always considered

Value analysis and value engineering can help an organisation to reduce costs while still maintaining the quality of the product or service that it provides.

Activity based costing

The two traditional costing methods are absorption costing and marginal costing, as discussed in Unit H and elsewhere in this module. Absorption costing allocates and apportions all overheads to products. To do this, companies must allocate and apportion service overheads to the main production departments. Direct labour and machine-hour rates are then derived, which are used to calculate the overheads attributable to each product. The approach was developed in the early part of the 20th century and assumes that overheads directly relate to the level of production. This is not always the case under current production methods, as factors such as sales mix, complexity, range, and production techniques all influence overhead costs. The method of apportionment can also seem arbitrary and the resulting product costs are sometimes difficult to interpret.

Traditional absorption costing systems, which assume that all products consume all support resources in proportion to production volumes, tend to allocate:

- Too great a proportion of overheads to high volume products, which cause relatively little diversity and hence use fewer support services; and
- Too small a proportion of overheads to low volume products, which cause greater diversity and therefore use more support services.

Activity based costing (ABC) attempts to overcome this problem.

> Activity based costing (ABC) is a method of costing which involves identifying the costs of the main support activities and the factors that "drive" the costs of each activity.
>
> Support overheads are charged to products by absorbing cost on the basis of the product's usage of the factor driving the overheads.

The main assumptions in ABC are.

- Activities cause costs. Activities include ordering, materials handling, machining, assembly, production scheduling, and despatching.

- Manufacturing products creates demand for the support activities.
- Costs are assigned to a product on the basis of the product's consumption of these activities.

The following table outlines the way an ABC system operates:

Step 1	Identify an organisation's major activities that support the manufacture of the organisation's products or the provision of its services.
Step 2	Use cost allocation and apportionment methods to charge overhead costs to each of these activities. The costs that accumulate for each activity cost centre is called a cost pool.
Step 3	Identify the factors which determine the size of the costs of an activity/affect the costs of an activity. These are known as cost drivers. A cost driver is a factor which has most influence on the cost of an activity, for example: • Machine setup costs – number of machine set-ups • Machine operating costs – number of machine hours • Despatching costs – number of orders despatched
Step 4	For each cost pool/activity cost centre, calculate an absorption rate per unit of cost driver.
Step 5	Charge overhead costs to products for each activity, on the basis of their usage of the activity (the number of cost drivers they use). Overheads are charged by absorbing them into product costs at a rate per unit of cost driver.

Example

Berner College is a privately owned college in a central African country, providing a range of third-level courses to students from the country and from abroad. The courses consist of a mix of business and computing programmes, all of which are accredited by a national accreditation body. The courses also enjoy widespread acceptance throughout Africa under an agreed system of Africa-wide criteria.

You have recently gained employment as an assistant to John, the financial controller of the college. John has been directed to investigate the costs per student of running all of the different classes expected to enrol for the forthcoming academic year using Activity-Based Costing [ABC] principles. He has provided you with the following data for the next academic year:

Programmes offered by Berner College

	Certificate	Diploma	Degree
Total number of students next year	500	300	200
Students from other African countries included in totals	20	40	20
Number of class groups	4	3	5
Teaching contact hours per class group per annum:			
Junior staff	600	400	150
Senior staff	100	200	250
Allocation of teaching hours per class group (see note 3 below):			
Spent in lecture rooms	400	400	300
Spent in language labs	100	100	50
Spent in computer labs	200	100	50

Staff employed by Olivers College

Grades	Junior staff	Senior staff	International support staff
Number of each grade	9	7	1
Average gross pay per annum FRW '000	19,000	30,000	15,000
Total lecturing hours per staff member per annum	500	350	

Note: the international support staff member is an administrative member of staff. She spends approximately 33% of her time exclusively catering to the administration of forms and records of African students.

Rooms available to class groups:

Room type	Lecture rooms	Language labs	Computer labs
Number of rooms	20	4	6
Operating costs per room per annum FRW '000	2,500	3,200	4,800

(1) Compute the budgeted total staff (including international student support costs) and total room operating costs for the next academic year.

(2) Using Activity Based Costing principles, show how the total staff costs and total room operating costs you have computed in the previous step should be allocated to each programme.

Solution

(1) Total staff/ support costs

Staff grade	Number of staff	Annual salary FRW '000	Total FRW '000
Junior staff	9	19,000	171,000
Senior staff	7	30,000	210,000
Student support	1/3	15,000	5,000
Total staff/student support costs			386,000

Note: Since the administrative staff member only spends 1/3rd of her time on student support activities, this proportion of her total annual salary has been taken as the relevant amount referable to such activities.

Total room operating costs

Room type	Number of rooms	Annual cost per room FRW '000	Total FRW '000
Lecture room	20	2,500	50,000
Language lab	4	3,200	12,800
Computer lab	6	4,800	28,800
			91,600

(2) The basic approach taken to answering this question is as follows:

- Identify appropriate cost drivers for staff costs and room costs. These should reasonably represent the proportion of the staff and room resources consumed by the different academic programmes.
- Determine the quantity or number of cost drivers applying to each academic programme offered.
- Allocate the lecturing costs and room costs calculated above to each academic programme using the relative proportions determined in the previous step.

The first two steps are carried out in the following table:

Cost category	Relevant cost driver	Total number of cost drivers	Certificate courses	Diploma course	Degree course
Junior staff	Lecturing hours per course	4,350 hours	2,400 hours	1,200 hours	750 hours
Senior staff	Lecturing hours per course	2,250 hours	400 hours	600 hours	1,250 hours
Student support	Africa student numbers	80 students	20 students	40 students	20 students
Lecture rooms	Hours occupancy per stream	4,300 hours	1,600 hours	1,200 hours	1,500 hours
Language labs	Hours occupancy per stream	950 hours	400 hours	300 hours	250 hours
Computer labs	Hours occupancy per stream	1,350 hours	800 hours	300 hours	250 hours

Notes:

Total lecturing hours by junior staff : (600 hrs * 4 certificate streams)+ (400 hrs * 3 diploma streams) + (150 hrs * 5 degree streams) = 4,350 hours

Total lecturing hours by senior staff : (100 hrs * 4 certificate streams)+ (200 hrs * 3 diploma streams) + (250 hrs * 5 degree streams) = 2,250 hours

Total hours occupancy of lecture rooms: (400 hrs * 4 certificate streams)+ (400 * 3 diploma streams) + (300 hrs * 5 degree streams) = 4,300 hours

Total hours occupancy of language labs: (100 hrs * 4 certificate streams)+ (100 * 3 diploma streams) + (50 hrs * 5 degree streams) = 950 hours

Total hours occupancy of computer labs: (200 hrs * 4 certificate streams)+ (100 * 3 diploma streams) + (50 hrs * 5 degree streams) = 1,350 hours

Resource	Total cost	Certificate		Diploma		Degree	
Staff costs							
Junior staff	171,000	94,345	1	47,172	2	29,483	3
Senior staff	210,000	37,333	4	56,000	5	116,667	6
Support staff	5,000	1,250	7	2,500	8	1,250	9
Total staff costs	386,000	132,928		105,672		147,400	
Room costs							
Lecture rooms	50,000	18,605	10	13,954	11	17,441	12
Language labs	12,800	5,389	13	4,042	14	3,369	15
Computer labs	28,800	17,067	16	6,400	17	5,333	18
Total room costs	91,600	41,061		24,396		26,143	

Notes:

1 171,000 x (2,400/4,350)
2 171,000 x (1,200/4,350)
3 171,000 x (750/4,350)
4 210,000 x (400/2,250)
5 210,000 x (600/2,250)
6 210,000 x (1,250/2,250)
7 5,000 x (20/80)
8 5,000 x (40/80)
9 5,000 x (20/80)
10 50,000 x (1,600/4,300)
11 50,000 x (1,200/4,300)
12 50,000 x (1,500/4,300)
13 12,800 x (400/950)
14 12,800 x (300/950)
15 12,800 x (250/950)
16 28,800 x (800/1,350)
17 28,800 x (300/1,350)
18 28,800 x (250/1,350)

FRW '000	Staff costs	Room operating costs	Total for course
Certificate course	132,928	41,061	173,989
Diploma course	105,672	24,396	130,068
Degree course	147,400	26,143	173,543
Total allocated	386,000	91,600	

Use of techniques in performance measurement

Performance measurement, as an aspect of management accounting, involves knowledge and skills across the range of the subject. For example, it is not possible to assess financial performance reliably without a clear understanding of the different types of cost behaviour and how these impact on the entity's activities.

The following are some of the techniques that have been covered in previous units of this module, and that need to be considered and applied appropriately when assessing performance.

Technique	Application in performance measurement
Indexing (Unit C)	An index is a measure, over time, of the average changes in the value (price or quantity) of a group of items relative to the situation at some period in the past. Index numbers are a very useful way of summarising a large amount of data in a single series of numbers. When measuring performance, it is essential to ensure that a fair comparison is being made, e.g., between current period results and results from a previous period. A simple application of indexing is comparing last year's sales revenue with this year by applying a suitable index (e.g., the retail price index) to remove the impact of inflation during the period. Note that there are different types of indices for inflation, so selecting the most appropriate one is important.

Sampling (Unit C)	Sampling involves taking a small selection of results and using these as an indication of the overall results (i.e., the population). For example, using feedback from 100 customers as representative of customer satisfaction. Sampling is often the most cost-effective method of assessing results, and may be the only practical method (e.g., if there are thousands of customers in a period). In performance measurement, the method of sampling that is used can be crucial – see Unit C for a list of different sampling methods. Otherwise, there is a danger of obtaining an unrepresentative or skewed set of data. For example, a sales manager may have a target of selling 500 units per week. A sample could be taken of one week in the year, and the number of units sold is found to be 400 units, suggesting a below-target performance. However, the week chosen may not be representative, e.g., if the manager was required to attend training during that week, or if the week is during a period when sales are always lower than the rest of the year.
Time series (Unit C)	A time series is a series of figures or values recorded over time. There are four components of a time series: • Trend • Seasonal variations • Cyclical variations • Random variations The moving averages method attempts to remove seasonal (or cyclical) variations from a time series by a process of averaging, resulting in a set of figures that show the trend. In performance measurement, it is important to understand how the four components of a time series affect the business, so that changes in performance can be understood in that context. For example, sales in Quarter 3 of a year may be down on Quarter 2 by 10%. That may look like a deterioration in performance but may simply be a seasonal trend. Comparison with the pattern of sales across quarters in previous years can show this, and calculating the seasonal variation as a numerical factor enables the manager to adjust for it in order to make a fair comparison between quarters.

Linear regression (Unit C)	Linear regression is closely linked to the topic of correlation The use of correlation enables an organisation to determine the extent to which two variables are related, and whether an increase on one variable will lead to a corresponding increase in the other. If this correlation is reasonably strong, linear regression can be used to predict the value of one variable based on the value of the other variable. A line of best fit indicates how two variables would be related if they had perfect correlation ($r = +1$ or $r = -1$) and enables us to estimate or forecast other values from the data given. This relationship has an important role in performance measurement. For example, if we know the relationship between advertising expenditure and sales income, we can predict the sales income that will result from a specified level of advertising expenditure. We can use this to assess the actual performance, bearing in mind the increase in sales that would be expected from the level of advertising expenditure. If the increase in sales is more than expected, this may indicate that management have performed well in other ways.
Ratio analysis (Unit F)	Ratios use financial reporting information to provide analysis of financial performance, e.g., a gross profit margin (gross profit/sales x 100) gives a percentage figure to indicate the profitability of the company in the period. Ratios are subject to several disadvantages, including the subjectivity of some accounting adjustments (e.g., the depreciation rate), and the fact that figures may be several weeks or months out of date by the time they are available. Performance measurement needs to take account of such disadvantages in interpreting ratios. However, they can provide some easily understood results that individually and collectively provide some feedback on performance. For example, setting a manager a gross profit margin target for a period may encourage greater efficiency in areas such as procurement (to reduce the cost of sales) and sales (to increase sales revenue), to the extent that the manager has control over these.

	It is essential to select appropriate ratios to assess different aspects of performance: **Profitability –** gross profit margin, net profit margin **Liquidity –** current ratio, quick ratio **Debt management –** interest cover ratio, gearing ratio A company may design or select ratios for specific areas of performance. For example, control of administration costs may be assessed by a ratio of [administration costs/sales x 100], showing this as a percentage.
Life cycle costing (Unit G)	The product life cycle is a fundamental part of a company's planning assumptions, and so understanding this, and the impact of changes in the environment on the cycle, is crucial. In Unit B, we noted the following stages in the product life cycle: Development and launch stages • Growth stage • Maturity stage • Decline stage The life cycle can be used as a way of assessing the costs of an asset, a product, or some other part of the organisation's activities. For example, the maintenance cost of a machine may increase towards the end of its life cycle, as it becomes less efficient. An increase in repair and maintenance costs in its final year should, therefore, not be interpreted as a deterioration in cost control performance by the production manager.

Target costing (Unit I)	If a company knows the target selling price and the required profit margin, it can identify a target cost for the new product. The target cost is determined by taking the fixed target selling price and deducting the required profit margin. Virtually any target can be used in performance measurement, i.e., once a target is set, actual results can be compared with it to assess performance. Target costing can be an appropriate performance measure where a company is not able to increase sales prices (e.g., because of competition), and so keeping costs below a target level can be a useful way of encouraging cost control and overall profitability.
Activity based costing (Unit I)	Activity based costing (ABC) is a method of costing which involves identifying the costs of the main support activities and the factors that drive the costs of each activity. Support overheads are charged to products by absorbing cost based on the product's usage of the factor driving the overheads. One of the main assumptions in ABC is that activities cause costs. This is important in performance measurement, especially where products or services are not uniform, so separate activities need to be identified and costed. For example, a hospital may utilise an operating theatre for 20 days each month. Costs in Month 10 may be found to be 15% higher than in Month 9, even though the same number of days usage occurred in each month. Analysis of activity may show that in Month 10 there was a greater number of operations, with a shorter average time per operation. As the theatre needs to be sterilised between operations, the cost of the sterilisation activity will be higher in Month 10. This demonstrates that the number of operations (not the number of operating days or hours) is the cost driver for the theatre.

Performance measurement in the public sector

Most, if not all, of the techniques discussed in this unit are applicable in the public sector. However, there are ways in which the approach in the public sector needs to be adapted.

Use of both financial and non-financial performance indicators is common in the public sector, for example:

- Cost per pupil
- Average time taken to issue a licence
- Average length of waiting time for an operation

- Cost per mile in maintenance of a motorway
- Number of patients seen by a doctor

One key difference from the private sector, as discussed in Unit B, is that public sector organisations are not usually driven by the profit motive, so we need to note the objectives that are relevant to the organisation or service being delivered.

Also, public sector organisations are often subject to constraints, which may restrict their performance. For example, there may be a legal maximum on the number of children in each class of a primary school. So, an education authority may not be able to improve its efficiency by increasing the number of children per class.

Another complicating factor is that some services are more focused on outcomes (which are hard to measure) rather than outputs. For example, a police service may be seen as providing increased safety for the population it serves. This is difficult to measure, other than asking people if they feel safe. Using other measures, such as number of cases solved, may provide information on some aspects of the service, but not on the overall goal of the service.

We also need to note the danger of "perverse incentives." For example, if the number of arrests or convictions is set as a target, it may encourage officers to arrest people without justification, or to fabricate evidence to convict innocent people.

Another issue is that public sector organisations often provide a range of services, with very different objectives, outputs, and outcomes. Central and local governments, for example, may provide services such as education, transport, public protection, licensing, etc, and each will require quite different performance indicators or measures. Services may also have objectives that are potentially in conflict or contradictory; for example, a government department with an environmental role may be aiming to reduce industrial emissions, whereas a business department may be encouraging companies to set up factories in the country.

We should also note that some outcomes may be measured, but it may not be clear what has led to any change in performance. For example, the health of children between the ages of 10 and 18 may be measured in terms of incidence of diseases, hospitalization, days missed from school, etc. If these show an improvement, is this because of better performance by the health services, or is it because of better sanitation, better housing, better education (including health education), or some other factors?

Summary of Unit I and key learning outcomes

In Unit I, we looked at the Competency "Demonstrate an understanding of the techniques necessary for measuring performance and managing costs." This involved content on eight learning outcomes.

Learning outcome	
Identify the relevant performance and quality measures to use to monitor financial performance.	You should now be able to identify relevant measures of performance.

Explain the principles of discounted cash flow.	You should now be able to explain DCF.
Identify appropriate performance indicators to use for: efficiency, effectiveness, productivity, cost per unit, balanced scorecard, benchmarking, control ratios (efficiency, capacity and activity), scenario planning ("what-if" analysis).	You should now be able to identify performance indicators for a range of applications.
Explain the use and purpose of techniques: indexing, time series, sampling,	You should now be able to explain techniques can be applied in performance measurement to ensure comparisons are valid.
Identify the correct ratios used to monitor financial performance.	You should now be able to discuss the use of ratios in different parts of an organisation's activities.
Describe a range of cost management techniques and recognise when these should be used: life cycle costing, target costing, activity-based costing	You should now be able to interpret cost information appropriately in order to assess performance.
Explain the problems of measuring performance in public sector organisations.	You should now be able to explain problems of measuring performance in public sector organisations.
Describe how performance can be measured in public sector organisations.	You should now be able to provide examples of performance measurement in the public sector.

Quiz questions

1	Learning Outcome: I2
A company has a cost of capital of 10%. It makes an investment of FRW 2 million that will provide a cash inflow of FRW 500,000 per annum. What is the present value of the cash inflow in Year 2?	
A	FRW 500,000
B	FRW 413,000
C	FRW 454,500
D	FRW 605,326

1	Feedback
A	Incorrect 0.826 x 500,000 = 413,000 Or 500,000/(1.1 x 1.1) = 413,000
B	Correct 0.826 x 500,000 = 413,000 Or 500,000/(1.1 x 1.1) = 413,000
C	Incorrect 0.826 x 500,000 = 413,000 Or 500,000/(1.1 x 1.1) = 413,000
D	Incorrect 0.826 x 500,000 = 413,000 Or 500,000/(1.1 x 1.1) = 413,000

2	Learning Outcome: I3
Which of the following is the correct definition of "economy"?	
A	Ensuring that the output from any activity is achieving the desired result
B	Maximising the useful output from the resources input

C	Minimising the level of inputs needed to produce a given level of output
D	Acquiring resources of appropriate quality and quantity at the lowest cost

2	Feedback
A	Incorrect Acquiring resources of appropriate quality and quantity at the lowest cost
B	Incorrect Acquiring resources of appropriate quality and quantity at the lowest cost
C	Incorrect Acquiring resources of appropriate quality and quantity at the lowest cost
D	Correct

3	Learning Outcome: I6
Which of the following would be classed as an internal failure cost?	
A	Improvements in product design or specification to reduce defective products
B	Loss of future custom from dissatisfied customers
C	Lost contribution on defective units scrapped or sold at a lower price than normal
D	Sample testing of finished production

3	**Feedback**
A	Incorrect Lost contribution on defective units scrapped or sold at a lower price than normal
B	Incorrect Lost contribution on defective units scrapped or sold at a lower price than normal
C	Correct
D	Incorrect Lost contribution on defective units scrapped or sold at a lower price than normal

4	Learning Outcome: I6

Which of the following definitions best describes a cost driver?	
A	A collection of costs associated with a particular activity
B	Any activity that causes an increase in costs
C	Any factor that causes a change in the cost of an activity
D	A cost that varies with production levels

4	Feedback
A	Incorrect Any factor that causes a change in the cost of an activity
B	Incorrect Any factor that causes a change in the cost of an activity
C	Correct
D	Incorrect Any factor that causes a change in the cost of an activity

5	Learning Outcome: I8
Which of the following describes a difficulty with measuring performance in a public sector organisation?	
A	Public sector organisations may have multiple objectives, making selection of performance measures difficult
B	Public sector organisations should only use non-financial performance measures
C	Public sector organisations do not need to assess performance as their activities are controlled by central government
D	Public sector managers should select performance measures that ignore income as this is provided through taxation

5	Feedback
A	Correct

B	Incorrect Public sector organisations may have multiple objectives, making selection of performance measures difficult
C	Incorrect Public sector organisations may have multiple objectives, making selection of performance measures difficult
D	Incorrect Public sector organisations may have multiple objectives, making selection of performance measures difficult

6	Learning Outcome: I4
Which of the following is true of the use of time series analysis in performance measurement?	
A	Time series analysis is not applicable to performance measurement
B	Time series analysis is a way of ensuring that performance measurement adjusts for inflation
C	Cyclical variations can be used to adjust a month's results so that they can be compared with the previous month
D	Performance measurement should take account of seasonal variations

6	**Feedback**
A	Incorrect Performance measurement should take account of seasonal variations
B	Incorrect Performance measurement should take account of seasonal variations
C	Incorrect Performance measurement should take account of seasonal variations
D	Correct

Quiz solutions

1	B
2	D
3	C
4	C
5	A
6	D

Exercises

Exercise 1

A manufacturing business estimates that it has to sell 3,000 defective units of its product at a seconds price of FRW 12,000 per unit. The normal selling price is FRW 25,000 per unit and the inspection procedure that identifies these defective units costs FRW 20 million.

What is the total cost of quality and what type of quality costs has the business incurred?

Exercise 1 solution

	FRW million
Inspection costs – Appraisal cost	20
Lost contribution on seconds – Internal failure cost	
3,000 units × (FRW 25,000 – FRW 12,000)	39
Total quality cost	59

Unit J: Cost Data Collection and Reporting.

Learning outcomes

J.1 Obtain income and expenditure information from different units within the organisation and consolidate in an appropriate form.

J.2 Reconcile income and expenditure information collected from various departments or information systems within the organisation.

J.3 Account for transactions between the separate units of the organisation, in accordance with the organisation's procedures.

J.4 Identify other valid relevant information from internal and external sources.

J.5 Prepare routine cost reports.

J.6 Analyse routine cost reports and compare with budget and standard costs to accurately identify any differences and the implications of these.

J.7 Correctly identify variances and prepare relevant reports for management.

Introduction to Unit J

Management accounting is largely focused on internal decision making, and we have noted in preceding units how this requires several different forms of report, using financial systems and techniques to provide relevant information for decision makers. In the introduction to this module, it was noted that we use the term "management accounts" to refer to activities, reports, analyses, etc that are prepared for internal managers of an organisation. This contrasts with financial accounting (or financial reporting) statements, which are prepared for individuals and groups that are external to an organisation.

Unit J highlighted that management accounting reports are prepared for different levels of management and for different purposes. For example, a chief executive officer may receive a summary report showing overall results for each department, while departmental managers may require more detailed reports on their own part of the organisation.

The timescales of reports can also differ, and reports need to be designed to reflect these needs:

- Strategic reporting deals with the organisation, and tends to look at periods over 3 to 5 years.
- Tactical reporting deals with a defined part of the organisation (e.g., a department), and looks at decisions affecting the short-term to medium-term, such as over the next 3 to 12 months.

- Operational reporting focuses on specific activities (e.g., production, sales) in the short term, such as the current week or month.

The main internal reports that require management accounting content can be summarised as:

- Budget reports
- Cost reports
- Decision-making reports

Budget reports

Units A to F covered the range of topics within budgeting, from budget preparation through to budget reporting and budget control. Reports may be required at any of these stages, but the focus of reporting in this area will be periodic budget reports that compare actual results (income and expenditure, primarily) with the budgeted amounts, highlight variances, and provide a basis for accountability and action by the budget committee and budget managers.

The information used in these reports is mainly internal, but some external information may also be relevant. For example, an overspend on fuel costs may require reference to external price information to clarify why the overspend has occurred.

The form and content of a budget report will vary according to the needs of the organisation, but the following example for a maintenance department is typical of the main content expected.

Example

Maintenance Department – Month of May

	Month				Cumulative		
Description	Budget	Actual	Variance		Budget	Actual	Variance
Salaries	16,000	15,500	500		70,000	67,000	3,000
Wages	51,000	53,000	(2,000)		250,000	255,000	(5,000)
Indirect materials	2,000	1,900	100		10,000	12,000	(2,000)
Maintenance	6,000	6,000	-		24,000	23,900	100
Electricity	8,000	10,000	(2,000)		40,000	39,000	1,000
Gas	6,500	7,000	(500)		26,000	28,000	(2,000)
Total	89,500	93,400	(3,900)		420,000	424,900	(4,900)

This statement includes all expenditure under the control of the maintenance manager. It details expenditure for the month of May and the cumulative position for the year to date.

The statement identifies the month's main areas of overspend as wages, electricity and gas. For the year to date the main problem areas are wages, indirect materials and gas.

Under a system of budgetary control, the maintenance manager will be asked to prepare a report explaining all variances and the action being taken to bring the department back onto budget. These actions will be monitored in the following months to ensure that the corrective measures have been taken.

The following example illustrates the way that a budget manager can use the monitoring information to present a report that includes both analysis and proposed action.

Example

The following is an extract from the operating statement for Benside Company for the month of October. The budget has already been flexed to reflect actual levels of production and sales.

	Budget	Actual	Variance
	FRW '000	FRW '000	FRW '000
Materials	48,800	47,600	1,200
Labour	55,800	58,400	(2,600)
Fixed overheads	62,000	57,000	5,000

The following information is also available:

- The supplier of the materials has permanently increased its prices, but has also significantly improved the quality of the material
- Some of the workforce used in the period were of a lower grade than normal, and they were not as familiar with the production process as the normal workforce
- During the period there was a machine breakdown that caused a significant amount of idle time during which the workforce was not actually able to make the product
- Due to the machine breakdown, the power costs for the period were lower than anticipated
- Benside has recently reduced the amount of factory space that it rents, but the standard rental cost has not been adjusted.

A report is required by the Operations Manager, identifying possible causes of the variances and making any suggestions for action that should be taken.

Solution

The report should contain points similar to the following:

- The supplier of the materials has permanently increased its prices, which might be expected to give an adverse materials variance. However, the quality of the material has also been improved, meaning that the usage of the material has improved by more than the effect of the increased price, leading to the overall favourable materials variance.
- We should consider other suppliers for the supply of our materials, but if their prices are the same as our supplier's, or the material quality is not as good, then the standard cost of the materials should be altered. If it can be shown that the higher quality material has caused the favourable variance through reduced usage, then consideration should also be given to alteration of the standard materials usage per unit i.e., to budgeted material costs in future periods.
- A favourable labour variance may have been expected due to the use of lower grade labour than normal for some of the period, but the adverse labour variance suggests that the lower grade labour may be less efficient than the previous labour, i.e., take longer to perform the same tasks. These inefficiencies have overridden any benefit of the lower labour rate. Labour inefficiencies (and so an adverse labour variance) may also have been caused by the machine breakdown during the period, which meant that labour hours were paid for when no productive work was achieved (idle time).
- The machine breakdown is a one-off event which should not be built into the budgeted costs for subsequent periods. However, if it is anticipated that the lower grade of labour will now normally be used for production, then the standard labour rate and hours should be changed.
- The fixed overhead variance was favourable due to lower power costs (from the machine breakdown), and also a reduction in factory rental. This is despite additional costs of repair which may have been incurred because of the breakdown (and which would have been expected to lead to an adverse variance). The reduction in rent is a permanent reduction and therefore the budgeted fixed overhead should be altered to reflect this in future periods.

Cost reports

Cost reporting is also part of the budget reporting process, where variances can be highlighted on cost items and action taken to ensure that the budget is controlled over the period.

Additional, or more tailored cost reports may be required in specific situations. For example, in Unit G we discussed cost reduction as a specific activity, and there may a need for additional reports to support a cost reduction programme at a particular point in time.

Detailed reports may be required by individual managers to assist in control of particular costs. For example, in a manufacturing context, a production manager may require frequent reports on the availability of crucial materials, and the usage of these materials in the production process. Monthly monitoring as part of the overall production budget would not be sufficient, as the production process requires constant and up-to-date

information, so that stock-outs (i.e., a particular material not being available, as all inventory has been used up) are avoided (and the associated stoppages in production).

External information may also be required in such situations. For example, information from suppliers on the schedule of future deliveries of key materials will be necessary. This will enable the production manager, or procurement specialists, to make alternative arrangements to prevent stock-outs.

This type of reporting may need to be "real time," rather than periodic. In other words, managers would expect to be able to generate immediate reports from inventory control or other internal systems, providing detailed and current information on inventory levels and usage of materials in production activities.

Decision-making reports

Reports may be required by decision makers, i.e., board members, or senior management, that focus on one-off decisions, rather than being part of a regular reporting system.

Examples include:

- Major purchasing decisions.
- Tenders and proposals (both those made by the company, and those received).
- Investments.
- New products.
- Research and development.
- Forecasts.
- Pricing.
- Use of spare capacity.
- Cessation of an operating unit/business segment.
- Continue or discontinue an existing project.
- Special orders.
- Make or Buy, for example, in-house manufacture versus the sub-contracting or buying-in of the production of a component.

These events require very different types of report and, the management accounting information that would be expected to support these decisions will also vary. For example, a forecasting report may include a cash flow forecast, or a sales forecast, and may require a technique such as time series analysis, whereas an investment decision may depend on a net present value calculation.

A common feature of these reports, however, is that the financial information should have similar characteristics, whatever the purpose of the report. For example, the cost information used in each report should always be relevant to the decision.

Relevant costs

It is fundamental to note that the costs and benefits used in the financial analysis of a decision should be relevant to the decision being made. In these situations, it is important to identify the relevant and non-relevant costs. To understand the meaning of "relevance" as it is applied to the costs and benefits of short-term decision making, two fundamental

features of all decisions need to be considered.

- Decisions involve choice between alternative courses of action.
- Decisions relate to the future.

Relevant costs/benefits are defined as {Receipts and payments that will change as a result of the decision being assessed." This implies that we focus on the following:

Future costs/benefits	For a cost to be relevant it must change because of the decision. This means that variable costs are more likely to be relevant to a decision than fixed costs. However, there are scenarios where fixed costs could change, such as closing a section of the business and therefore closing an entire factory would reduce fixed costs. Committed costs are those that will not change because of future decisions. In relevant costing "sunk cost" is the term used for costs that have already been committed or incurred. This is an important term to learn, both in terms of how it is defined and how such costs should be regarded in decision-making situations. The key point to note is that sunk costs are non-relevant (or irrelevant) costs and as such should be ignored when making future decisions as it is not possible to decide in the future that will alter the past and commitments already made. Decisions should always focus on future cash costs, so sunk costs must be disregarded as they are already committed or spent. An example would be a decision whether to build an extension to a factory. If a planning application has been submitted, and the associated non-refundable planning application fee has been paid, then this fee is a sunk cost. The decision whether to build the extension should focus on the (future) costs of actually building the extension and the additional revenue that is expected from any additional sales generated by the increased facility and should ignore the planning application fee.
Differential costs/ benefits	Where the decision being made is an option appraisal, costs or benefits that are common to all the options can be ignored as they are non-relevant. Only those costs or benefits that differ depending on the option chosen are relevant.
Cash flows only	Non-cash items such as depreciation and central recharges should be excluded as non-relevant costs.
Differential future cash flows	To summarise relevant costs and benefits will fulfil all of the above criteria - that is that they will be "differential future cash flows."

Opportunity costs

Another key concept in relevant costing principles is that of opportunity costs. Opportunity costs are relevant costs when there are scarce resources being allocated and another activity has to stop or requires further resources itself in order to allow the decision to be actioned.

Opportunity cost is defined as: "The benefit forgone as a result of pursuing one course of action, rather than pursuing the best alternative course of action."

The concept of opportunity costs is crucial in ensuring that scarce resources are used as efficiently as possible.

Internal transactions

Not that internal transactions may or may not be relevant, depending on the nature of the decision, but often they can lead to incorrect decisions if they are not removed or otherwise adjusted for in the analysis.

For example, a company may be deciding whether to close a production department whose results are causing concern. The company may have an analysis showing the department making a loss of FRW 10 million in the previous period. If that analysis includes an internal recharge from central departments of FRW 15 million, the company may still have that cost even after the department is closed – it will simply have to be recharged to other production departments.

In other words, we need to distinguish between divisible fixed costs and non-divisible fixed costs. Some fixed costs may be specifically attributable to (directly related to) the product or area of the business that is the subject of the decision. These costs are referred to as divisible fixed costs. Such a cost may be relevant to the decision to discontinue that product if they will be saved if the product is not made at all, e.g. if an entire factory is closed the rent/mortgage will no longer need to be paid. Central recharges, however, are often non-divisible.

Summary of Unit J and key learning outcomes

In Unit J, we looked at the Competency "Collate information from various sources and prepare routine cost reports." This involved content on eight learning outcomes.

Learning outcome	
Obtain income and expenditure information from different units within the organisation and consolidate in an appropriate form.	You should now be able to discuss how internal and external information is used in management accounts reports
Reconcile income and expenditure information collected from various departments or information systems within the organisation	You should now be able to discuss the comparison of budget and actual amounts in budget reports

Account for transactions between the separate units of the organisation, in accordance with the organisation's procedures	You should now be able to discuss the relevance of divisible and non-divisible fixed costs, and various types of internal recharge
Identify other valid relevant information from internal and external sources	You should now be able to discuss the use of relevant information from inside and outside the organisation in different reports
Prepare routine cost reports	You should now be able to discuss the need for regular and ad-hoc cost reports
Analyse routine cost reports and compare with budget and standard costs to accurately identify any differences and the implications of these	You should now be able to discuss the use of budgetary reports
Correctly identify variances and prepare relevant reports for management	You should now be able to discuss the use of variances and the need for action by budget managers

Quiz questions

1	Learning Outcome: J4
Which of the following would be a relevant cost in a decision to purchase new machinery?	
A	The salary of the purchasing manager
B	The cost of raw materials used in production
C	The cost of installing the machinery
D	The cost of the first year's depreciation on the machine

1	Feedback
A	Incorrect The cost of installing the machinery
B	Incorrect The cost of installing the machinery
C	Correct
D	Incorrect The cost of installing the machinery

2	Learning Outcome: J7
Which of the following would be a favourable variance?	
A	Budgeted sales of FRW 450,000 Actual sales of FRW 400,000
B	Budgeted depreciation of FRW 600,000 Actual depreciation of FRW 640,000
C	Budgeted salaries of FRW 1,500,000 Actual salaries of FRW 1,500,000

D	Budgeted rent expense of FRW 390,000 Actual income of FRW 380,000

2	Feedback
A	Incorrect Budgeted rent expense of FRW 390,000 Actual rent expense of FRW 380,000
B	Incorrect Budgeted rent expense of FRW 390,000 Actual rent expense of FRW 380,000
C	Incorrect Budgeted rent expense of FRW 390,000 Actual rent expense of FRW 380,000
D	Correct

3	Learning Outcome: J6
Company FD is considering the introduction of a new product, but this will mean using factory space that is currently used to make product T5. Product T5 currently generates FRW 7 million in sales each year. How would the Product T5 sales income be described in the context of the decision on whether to go ahead with the new product?	
A	A sunk cost
B	An opportunity cost
C	A divisible fixed cost
D	A non-relevant cost

3	Feedback
A	Incorrect An opportunity cost
B	Correct
C	Incorrect An opportunity cost
D	Incorrect An opportunity cost

Quiz solutions

1	C
2	D
3	B

Unit K: Financial Performance Analysis and Improvement.

Learning outcomes

K.1 Compare results over time using methods that allow for changing price levels.

K.2 Monitor and analyse current and forecast trends in prices and market conditions on a regular basis.

K.3 Compare trends with previous data and identify potential implications.

K.4 Consult relevant staff in the organisation about the analysis of trends and variances.

K.5 Calculate ratios, performance indicators and measures of value added in accordance with the organisation's procedures.

K.6 Prepare relevant performance indicators.

K.7 Interpret the results of relevant performance indicators, identify potential improvements and estimate the value of such improvements.

K.8 Identify ways to reduce costs and enhance values, consulting specialists as necessary.

K.9 Prepare estimates of capital investment projects using discounted cash flow techniques.

Introduction to Unit K

The focus of Unit K is on using information to achieve improvements in an organisation's performance. Many of the techniques that are relevant to this area have already been covered in previous units, i.e.:

- Performance indicators – Unit F, Unit I.
- Ratio analysis – Unit I.
- Trend analysis – Unit C.
- Discounted cash flow (DCF) – Unit I.
- Cost reduction techniques – Unit G.
- Consulting specialists – Unit G.

It is always important in management accounting to ensure that the use of a technique does not become an end in itself, and that the management accountant is able to utilise the technique correctly and combine any results with other relevant information. In some instances, the technique may appear to give a clear result, but this does not necessarily

dictate how a manager will then act, although it will of course provide useful guidance.

It is also important to put the management accounting information into the wider context of the organisation and its wider activities, and this means that consulting across the organisation and across other professions or specialisms is part of the management accountant's role.

We will cover the nine learning outcomes for this unit in the following sections:

- Trends and variances - learning outcomes 1 to 4.
- Ratios and performance indicators - learning outcomes 5 to 7.
- Cost reduction - learning outcome 8.
- Discounted cash flow - learning outcome 9.

As the main features of these topics have been covered in earlier units, the emphasis in Unit K will be on analysis of information to enable managers to make improvements.

Trends and variances

We can use an example of trend analysis to illustrate key points relating to use of trend information to monitor and interpret information to assist management decision making.

Example

The following data in the table below is available regarding the sales of tickets at a railway station. We can calculate the moving average and seasonal variation of the data below using the time series analysis, and use this to forecast the expected sales for each period of day 4.

		Ticket sales
Day 1	Morning	170
Day 1	Afternoon	140
Day 1	Evening	230
Day 2	Morning	176
Day 2	Afternoon	152
Day 2	Evening	233
Day 3	Morning	182
Day 3	Afternoon	161
Day 3	Evening	242

Predicted value for evening of Day 4

= 180 + (2.5 x 10) + 46 (seasonal variation) = 251 sales

These forecasts assume that the current trend will continue into Day 4, and beyond.

Criteria for useful time series analysis

As with all statistical techniques there are some conditions that need to be met for time series analysis to be most useful. Understanding these limitations, and therefore the limitations of any analysis, is therefore crucial when using the analysis for decision making.

Time series only works when conditions are stable. If conditions are not stable then we cannot assume that the underlying trend is going to continue, or that the pattern of the seasonal variations will be stable; and, therefore, any forecast may not be accurate.

Time series is only viable for short-term forecasting. In the longer term, circumstances, working practices and conditions are all likely to change. As time series analysis is based on recent historic data it is a reasonable reflection of what will happen in the near future, (where conditions are stable) but becomes less accurate the further into the future the forecast.

Time series analysis should only be used as a base forecast and other factors must be taken into consideration such as changing demographics, etc.

Time series analysis can be used as an indicator as to likely outcomes in the future. It is then up to management to use those indicators to aid decision making, planning and control.

Time series analysis is limited to examining only one variable over time. There are likely to be many other variables, (such as the economy, political changes, etc) that could impact on results and overall business performance.

Consulting specialists

As mentioned in the introduction to this unit, it is important that management accountants do not operate in isolation from other parts of the business and from other specialists. The technical analysis of the sales information indicates a rising trend across the three days, and this can be extrapolated to forecast sales for Day 4, as shown above. This is technically correct and is appropriate use of the results from the trend analysis.

We should, however, refine this to take account of other information, which may be provided by other specialists, for example:

Sales staff	Staff who work closely with customers may have additional information on the habits of people buying tickets. For example, they may point out that Day 1 was a school holiday, and families were buying more tickets in the morning that day than is typical. Or there may have been a special sports event on the evening of Day 2, with additional tickets being sold in that period

Ratios and performance indicators

Private sector organisations

The range of financial ratios discussed in Unit I were developed primarily for application in a commercial context, with an emphasis on profit (gross profit margin, net profit margin, return on capital employed, etc) and sales. Additional performance measures are common in certain industries (e.g., income per passenger on airlines, sales per square metre of shops in retail companies). Some companies may also develop their own specific measures, particularly if their business provides unique products or services. New measures have also been developed to reflect changes in business practices or new technology, such as online companies recording and monitoring visits to websites, time spent viewing streamed video content, etc.

It is important to view performance measurement as a flexible tool for management, that can employ financial measures, such as standard ratios, together with non-financial measures, and measures that are adapted for use in their specific industry or business.

Key performance indicators (KPIs) are used to measure performance in many different types of entity and are used to evaluate success in a particular area of activity. KPIs are set to be in line with objectives, sometimes strategic, others operational.

Examples of KPIs:

- Customer attrition
- Product rejection rate
- Customer satisfaction
- Wages costs / Sales (as a %)

These are just a few examples of thousands of KPIs used across different industries. KPIs try to measure success in a broader sense, rather than a sole focus on financial performance. Managers will use KPIs, as well as financial ratios, to build up a picture of company success.

Example

The management accountant for Lax Company has provided the following information for Quarters 1 and 2 of the year. The company sells and instals solar panels. What action should be taken by management in response to this information?

Results:	Quarter 1	Quarter 2
Sales – FRW million	1,500	1,550
Sales – number of panels	5,000	5,200
Wages – FRW million	350	350
Administration costs – FRW million	90	98
Vehicles – number of vans owned	4	5
Panels requiring replacement - number	200	415

Example

A council wishes to improve life expectancy for local residents.

Life expectancy is a very difficult outcome to design measures for, as it can be affected by very many factors relating to health, poverty, housing, sanitation, education, crime, etc.

The council could set the following KPIs:

- X% reduction in the number of smokers over the next 3 years
- X% increase in the number of adults participating in regular sports or exercise activity by Year 20XX
- X% increase in the number of five-year old children immunised against childhood diseases year on year
- X% reduction in the level of people infected by particular diseases by 20XX
- X% increase in the number of women between 45 and 55 offered breast screening by 20XX
- X% reduction in hospital admissions for alcohol-related harm year on year
- X% reduction in violent crime by 20XX
- X% increase in new housing by 20XX

Setting policies and taking corrective action when results are below expectations is challenging.

One problem is that we won't know whether life expectancy has been improved for many years, so it is difficult, if not impossible, to assess the effectiveness of current policies.

It might be possible to use proxy measures – i.e., rather than measuring the long-term outcomes, we may measure results that indicate that improvements are being made. For example, the council could collect data on the health of the population (e.g., incidence of heart disease, levels of obesity, etc) and regard improvements in these figures as an indication that life expectancy will improve as a result. This means the council is relying on *performance indicators* rather than *performance measures*.

Quality

When reviewing performance and seeking to improve results, it is important to note that an organisation needs to consider the quality of outputs and outcomes, not just the cost of activities. Quality can be described as the "degree of excellence of the product or service" or "how well the product or service serves its purpose."

It should be noted that a product or service has quality only if it satisfies the customer. To do this the product or service must have two main elements:

- It must be fit for the purpose for which it has been acquired.
- It must represent value for money to the customer.

This does not mean that products or services need to be made more expensive by using

Labour costs	Improved supervision of staff to increase productivity Using short-term staff to cover high activity periods Recruiting skilled staff Negotiating effective wage and salary rates Replacing human activities with computerised or mechanised processes Carrying out work studies to identify unnecessary activities or inefficiencies in processes
Other costs	Obtaining discounts from suppliers by early payment Borrowing at favourable rates Using hedging arrangements for foreign currency transactions Sub-contracting work Outsourcing – e.g., using external supplier for invoicing, HR services, etc Effective planning of capital expenditure and asset management

Discounted cash flow (DCF)

Unit I included discussion of the DCF technique and the way that this can be applied to activities such as an investment project. As well as being able to prepare a DCF analysis, using discount factors that reflect a company's cost of capital, it is important that management can interpret the results and take appropriate action.

There are several different techniques that can be utilised in investment appraisal, and the choice of technique depends partly on the type of investment, but also on the objectives of the organisation. If the organisation has funds that it does not need in the short term, the decision to invest this will be related to ensuring that the investment is low risk and will result in the funds being available later, say in three years' time. In this case, identifying the payback period may be sufficient. However, just getting your money back in three years may not be sufficient, as the time value of money concept dictates that funds received now are more valuable than funds received some time in the future. So, discounting the amount, using an appropriate discount rate, enables management to make a better assessment of the investment, as it will convert the funds received in future to their present value.

For example, a company may have the option to invest FRW 25 million and have a payback target of four years. An investment with a return of FRW 8 million per annum will have a payback period of just over 3 years (ie 25m/8m = 3.125).

If the company has a cost of capital of 6%, we can calculate what the discounted payback period is, i.e., when the investment will provide returns that cumulatively provide a present value of FRW 25 million

Consult relevant staff in the organisation about the analysis of trends and variances.	You should now be able to discuss the importance of consulting staff regarding trends and variances.
Calculate ratios, performance indicators and measures of value added in accordance with the organisation's procedures.	You should now be able to calculate relevant ratios and performance indicators.
Prepare relevant performance indicators.	You should now be able to make comparisons between performance indicators.
Interpret the results of relevant performance indicators, identify potential improvements, and estimate the value of such improvements.	You should now be able to interpret the results from performance indicators and make appropriate recommendations.
Identify ways to reduce costs and enhance values, consulting specialists as necessary.	You should now be able to discuss cost reduction and the role of specialists.
Prepare estimates of capital investment projects using discounted cash flow techniques.	You should now be able to prepare estimates using DCF.

D	Incorrect Year 1 = (300,000/120) x 100 = 250,000 Year 2 = (400,000/125) x 100 = 320,000 Increase = (70,000/250,000) x 100 = 28% (Or: Year 2 at Year 1 price base = 400,000 x (120/125) = 384,000 = 28% increase on 300,000)

2	Learning Outcome: K2
Company PW made sales over a 3-month period of FRW 1 million, FRW 1.5 million, FRW 1.7 million. What was the moving average for sales in the period?	
A	FRW 1.4 million,
B	FRW 4.2 million,
C	FRW 1.5 million,
D	FRW 1.6 million,

2	Feedback
A	Correct (1+1.5+1.7)/3 = 1.4
B	Incorrect (1+1.5+1.7)/3 = 1.4
C	Incorrect (1+1.5+1.7)/3 = 1.4
D	Incorrect (1+1.5+1.7)/3 = 1.4

4	**Learning Outcome: K7**
Which of the following would be appropriate action for a gym that recorded an increase in the number of customers who reported an injury during an exercise class?	
A	Arrange health and safety training for exercise instructors
B	Increase the monthly membership fees
C	Send letters to gym members to state that safety during classes is the responsibility of members and not of gym staff
D	Take no action if the level of injuries is not serious

4	Feedback
A	Correct
B	Incorrect Arrange health and safety training for exercise instructors
C	Incorrect Arrange health and safety training for exercise instructors
D	Incorrect Arrange health and safety training for exercise instructors

5	Learning Outcome: K9
Which of the following statements is true for a company with a cost of capital of 4.6%?	
A	The payback method of investment appraisal involves calculating the net present value of project inflows and outflows
B	The payback period for an investment will be longer than the discounted payback period

Unit L: Performance reports.

Learning outcomes

L.1 Prepare reports in the most appropriate format and present them to management within the required timescales.

L.2 Prepare exception reports to identify matters which require further investigation.

L.3 Make specific recommendations to management in a clear and appropriate form.

Introduction to Unit L

In Unit L, we will look briefly at the ways in which performance reports are prepared. This develops the concepts and issues discussed in Units J (measuring financial performance) and K (monitoring performance).

In Unit J, we looked at three examples of financial reports, and noted features of each in terms of form, content, and recommendations to management, i.e.:

- Budget reports.
- Cost reports.
- Decision-making reports.

Within performance measurement there is a need for management accounting information to aid good performance. This will include the setting of relevant performance measures and the preparation of timely performance reports showing regular feedback on actual performance.

Note that the type of report and the related technical content required to analyse the financial information (e.g., budget analyses, investment appraisal, cost reduction, etc) will have an impact on the form and content of the report. In the following example, you can see how the focus on performance indicators has an impact on the approach to the report.

Although there will be differences in terms of the detailed content of each report, there are several features that are normally included in performance reports, whatever the context:

- Performance reports should be prepared for a specific recipient (e.g., manager, committee, board).
- Performance reports should have a clear title, indicating the purpose of the report.
- Performance reports should provide clear financial information, indicating details such as the relevant dates, cost basis, currency, level of precision (e.g., FRW or FRW '000), etc.
- Performance reports should be brief, so that the focus and purpose are clear.

- Performance reports should be formally structured (e.g., introduction, objectives, main analysis, conclusions, recommendations, appendices).
- Performance reports should provide clear conclusions and recommendations.
- Performance reports should apply relevant techniques and explain the results from these.
- Performance reports should be understandable by both financial and non-financial readers.
- Performance reports should avoid use of unnecessary financial jargon and should use plain language as far as possible.
- Performance reports should focus on key information that is relevant to management decisions and actions, and this may involve reporting exceptions rather than full details (e.g., focusing on variances above a certain level).

Example – performance indicators

The governing board members of the education department of a local authority have expressed concerns about the performance of schools within its area of responsibility. Recent government inspections have highlighted the issue of poor performance.

In preparation for the next education department meeting, you have been asked to prepare a report for the Chair of the governing board of the education department on performance of the authority's schools in 20X3/X4, using the extracts of the cost statistics for 20X3/X4 and the unit cost of 20X2/X3 below. Your report should include:

- A review of the performance of the authority during 20X3/X4 including:
- An analysis of the cost statistics for the 20X3/X4 and comment on the relevance of the figures
- A review of the trend in performance over the two periods

a) Extract from Education Committee files: Cost statistics 20X3/X4

Total Net Cost Education Committee 20X3/X4		FRW 166,642 million
Net costs-	Primary schools	FRW 32,902 million
	Secondary schools	FRW 59,202 million
Teaching costs-	Primary schools	FRW 22,786 million
	Secondary schools	FRW 41,122 million
Average cost per teacher-	Primary	FRW 10 million
	Secondary	FRW 10 million

Population statistics 20X3/X4

District population (Registrar General estimate)		768,480
School numbers:	Primary	52,226
	Secondary	67,970
Teaching staff:	Primary	2,112
	Secondary	3,887

Pay and price rises have averaged 5% over the past financial year

b)	**Unit costs 20X2/X3**		
	Total cost per pupil	Primary	FRW 610,000
		Secondary	FRW 835,000
	Teaching costs per pupil	Primary	FRW 429,000
	Secondary		FRW 588,000
	Pupil teacher ratios	Primary	24.28 : 1
		Secondary	17.40 : 1

c) Neighbouring Authority Costs 20X2/20X3

Authority	Education cost per head (FRW '000)	Total primary cost per pupil (FRW '000)	Primary teaching cost per pupil (FRW '000)	Primary pupil / teacher ratio	Total secondary cost per pupil (FRW '000)	Secondary teaching cost per pupil (FRW '000)	Secondary pupil / teacher ratio
A	215	635	460	22.76	937	643	17.28
B	231	668	478	21.23	955	661	16.19
C	228	659	471	22.23	919	637	17.19
D	227	635	443	23.48	924	631	16.79
E	247	706	462	22.47	966	647	16.88
Average	220	655	461	22.68	940	643	16.78

Solution – performance indicators

To: Chair to the Education Department

From: Trainee Management Accountant

Subject: Review of schools in the local authority area

1.

(i) An analysis of the cost statistics

Given below are the comparative data for authority for 20X3/X4

Total unit costs:-

Cost per head	166,642 million/768,480	=	FRW 217,000

Primary:-

Total cost per pupil	32,902 million/52,226	=	FRW 630,000
Staff cost per pupil	22,786 million/52,226	=	FRW 436,000
Pupil/Teacher ratio	52,226/2112	=	24.73

Secondary:-

Total cost per pupil	59,202 million/67,970	=	FRW 871,000
Staff cost per pupil	41,122 million/67,970	=	FRW 605,000
Pupil/Teacher ratio	67,970/3887	=	17.49

(The report could also include a comparative table of the other authorities.)

(ii) The relevance of these figures

These figures will highlight that the authority has the lowest cost when compared to the neighbouring authority and the overall average but has a poorer pupil/teacher ratio.

Points to consider in analysing these figures:

- What exactly does "poorer" pupil/teacher ratio mean? Is there an ideal number? Is there a statutory requirement?
- The neighbouring authorities may be better than the national average, so having a poorer performance than them may not be a very bad result.
- Educationally, it might be good to have a low pupil/teacher ratio (i.e.. fewer pupils per teacher), but at what point does "efficiency" or "economy" become an issue? It is expensive to have a very low pupil/teacher ratio, so there is a trade-off between economy and educational effectiveness?

(Whilst not expecting full debate/educational arguments here, a good report should at least touch on some of these issues.)

2. A review of the trend in performance over the two periods

The following table adjusts the 20X2/X3 costs to enable a comparison of spending in real terms (ie with the impact of inflation removed):

		20X2/X3 (at 20X3/X4 prices)	20X3/X4
		FRW '000	FRW '000

		20X2/X3 (at 20X3/X4 prices)	20X3/X4
Total costs	Primary (FRW 610,000*1.05)	641	630
Total costs	Secondary (FRW 835,000*1.05)	877	871
Staff costs	Primary (FRW 429,000*1.05)	450	436
Staff costs	Secondary (FRW 588,000*1.05)	617	605
Pupil/Teacher ratios	Primary	24.28	24.73
Pupil/Teacher ratios	Secondary	17.40	17.49

Conclusions

- Spending is less in real terms in 20X3/X4 than it was in 20X2/X3
- The pupil/teacher ratios has deteriorated

Recommendations

- The reduction in pupil/teacher ratios should be reviewed alongside the authority's target for ratios at primary and secondary level
- If the 20X3/X4 ratios are below the target level, options action should be taken to employ additional teachers, as the fall in expenditure (in real terms) suggests that this is affordable

Summary of Unit L and key learning outcomes

In Unit L, we looked at the Competency "Prepare performance reports for management." This involved content on three learning outcomes.

Learning outcome	
Prepare reports in the most appropriate format and present them to management within the required timescales.	You should now be able to prepare relevant performance reports.
Prepare exception reports to identify matters which require further investigation.	You should now be able to discuss the focus on exceptions in reporting to decision makers.
Make specific recommendations to management in a clear and appropriate form.	You should now be able to include relevant recommendations in reports.

Quiz questions

1	Learning Outcome: L1
Which of the following statements is true?	
A	Performance reports should provide management with a list of options, but should not indicate which is the preferred option
B	Performance reports should always focus on reducing costs
C	Performance reports should provide clear recommendations to management
D	Performance reports should ignore past results and focus on future expectations

	Feedback
A	Incorrect Performance reports should provide clear recommendations to management
B	Incorrect Performance reports should provide clear recommendations to management
C	Correct
D	Incorrect Performance reports should provide clear recommendations to management

2	Learning Outcome: L1
Which of the following statements is true?	
A	Performance reports should be understandable by both financial and non-financial recipients
B	Performance reports should avoid use of financial techniques
C	Performance reports should be lengthy, to ensure that all potentially relevant issues are included
D	Performance reports do not usually have a specific recipient or user

	Feedback
A	Correct
B	Incorrect Performance reports should be understandable by both financial and non-financial recipients
C	Incorrect Performance reports should be understandable by both financial and non-financial recipients
D	Incorrect Performance reports should be understandable by both financial and non-financial recipients

Quiz solutions

1	C
2	A

Unit M: Evaluation of Accounting Systems.

Learning outcomes

M.1 Identify an organisation's accounting system requirements.

M.2 Review record keeping systems to confirm whether they meet the organisation's requirements for financial information.

M.3 Identify weaknesses in and the potential for improvements to, the accounting system and consider their impact on the operation of the organisation.

M.4 Identify potential areas of fraud arising from lack of control within the accounting system and grade the risk.

M.5 Review methods of operating for cost effectiveness, reliability and speed.

Introduction to Unit M

In Unit M, we will consider the requirements of accounting systems, the data the systems need to keep, and how this is utilised by management within the organisation.

We will also look at controls in the accounting system and how this is linked to fraud prevention.

Accounting systems need to be continually monitored for their effectiveness, and from time to time will require some changes to ensure they continue to meet the requirements of management in an effective manner. The nature of changes to systems, and how these impact on users, is discussed together with the cost implications of these.

System requirements

Any accounting system needs to meet the specific requirements of the organisation and its management. This means that it needs to be designed with the objectives of the organisation in mind, as well as the operations, environment, size, and other features of the organisation.

Although we can identify various standard features that will apply to any accounting system, there will be differences that reflect features such as the size or complexity of the organisation. For example:

- An international company will have many products, locations, divisions, markets, etc, which will lead to more complex and larger quantities of data being collected and processed.

- A small company may operate from one location, service only the local market, and focus on one product. The information needs of management in that context are much more limited.

The following are some of the more important characteristics that we can expect to see in any effective accounting system.

Reliable	Management needs to be confident that the information they receive from an accounting system is reliable, up-to-date, accurate, and compliant with any applicable regulations.
Cost-effective	The system should provide information to management that is sufficient for their needs at the lowest cost. There will be trade-offs between the desire for additional information and the additional cost that would be incurred because of gathering or processing additional data. Continual reassessment of the needs and priorities of management, and the changing cost of information, is required to ensure that cost effectiveness is maintained. Changing technology can impact on cost effectiveness in significant ways. For example, companies are now able to hold vast amounts of data through cloud computing and other IT facilities, which would have been prohibitively expensive 10 or 20 years previously.
Efficient	Information is often time dependent, so an accounting system needs to provide outputs that are either in real time (i.e., a manager can interrogate the system at any time and extract the required information), or are provided when scheduled (e.g., monthly budget reports being available shortly after the end of each month).

Record keeping

An organisation will gather financial and related data to provide information to decision makers (e.g., in budget reports), to comply with regulatory requirements (e.g., for financial reporting), and to support ongoing processes of production or service provision (e.g., monitoring inventory levels and requirements).

Accounting information supports several different activities, and relevant records need to be maintained in relation to these, e.g.:

- Cost accounting
- Budget management
- Financial reporting
- Investment appraisal
- Forecasting

It is not practical to have separate systems for each of these, therefore the accounting system needs to be designed in a way that is comprehensive but also flexible. For example, any inventory control data needs to be suitable for providing figures to include in the financial statements (opening and closing inventory, inventory written off in the period, etc) and the needs of inventory control and production staff (real-time information on

inventory levels for each type of inventory, locations, amounts on order, expected lead times for deliveries, expiry dates for specific items, etc).

Weaknesses in controls and potential for fraud

Fraud can be defined as "an intentional act by one or more individuals among management or others, involving the use of deception to obtain an unjust or illegal advantage." It can also impact on employee morale, i.e., the trust of existing employees could be damaged, and future recruitment and retention of staff might be affected

Fraud can lead to a loss of financial resources (e.g., theft of cash), or damage to an organisation's reputation (e.g., losing the trust of suppliers), or both.

Fraud:

- Is deliberate
- Is never accidental
- Involves the use of deception
- Most commonly refers to theft or misappropriation
- Is often complex in nature, with multiple actions to both commit and conceal the fraud

This results in a need for several different forms of control within an accounting system to prevent and detect fraud. Internal auditors may provide specialist support in evaluating internal controls, but it is important to note that fraud prevention is a management responsibility.

There are two types of fraud that are particularly relevant to accounting systems, i.e., fraudulent financial reporting and the misappropriation of assets.

Fraudulent financial reporting

Fraudulent financial reporting may be accomplished by:

- Manipulation of accounting records
- Misrepresentation of transactions
- Misapplication of accounting principles in classification, presentation, etc

Misappropriation of assets

Misappropriation of assets involves the theft of an entity's assets and may involve relatively small amounts.

This can be achieved by:

- Embezzling receipts (for example, misappropriating collections on accounts receivable or diverting receipts in respect of written-off accounts to personal bank accounts).
- Stealing physical assets or intellectual property (for example, stealing inventory for personal use or for sale, stealing scrap for resale, colluding with a competitor by disclosing technological data in return for payment).

- Causing an entity to pay for goods and services not received (for example, payments to fictitious vendors, kickbacks paid by vendors to the entity's purchasing agents in return for inflating prices, payments to fictitious employees).
- Using an entity's assets for personal use (for example, using the entity's assets as collateral for a personal loan or a loan to a related party).

Controls to prevent fraud and systemic weaknesses

As mentioned, the internal control within a company and the arrangements for fraud prevention are the responsibility of management

The main types of control that can help prevent fraud include controls for the accounting system can be grouped into the following categories:

- Staff controls – segregation of duties.
- Management controls – review of controls and regular checks on control activities.
- Physical controls – locking away confidential files and ensuring office security.
- Application and general computer controls – password protection, access limitations and integration of systems.
- Fraud controls are internal controls specifically against fraud in the areas of staff controls, management controls, physical controls, and IT controls.

Management should regularly review the controls that are in place. Any review should include an assessment of any new risks, both internal (such as a new computer system or management restructure) and external (increased market competition, issues with suppliers etc), that may impact the organisation. In doing so any review should assess the ability of the internal control system to respond to the risk that:

- Objectives might not be met.
- The company may be the victim of loss or fraud – this may be accidental or intended and arise from internal or external sources.
- The system may contain errors that result in misstatement in the financial statements – e.g., assets overvalued and/or liabilities understated.
- The company is engaged in unethical behaviour – either intentionally (e.g., due to pressures to achieve unrealistic sales targets) or unintentionally (e.g., poorly trained staff taking on new tasks).
- The company fails to comply with its legal obligations – such as non-compliance with company law or health and safety regulations.

The risk assessment process must be robust to reduce or avoid these risks. The main aim of analysing the risk of fraud is assessing the likelihood on the fraud occurring, its impact if it does occur, and seeking out ways to minimise the risk.

Internal controls within the accounting system should be designed not only to address weaknesses and prevent fraud and errors, but also to help detect frauds when they have occurred.

The key controls that detect whether fraud or errors have occurred are:

- Spot checks on whether control activities have taken place
- Performance reviews and comparisons, using:

- The budgetary control report: compare actual results to budgeted results.
- Ratio analysis: compare this period to the previous period.

- Reconciliation of information produced by the accounting system with external evidence, such as bank statements and supplier statements.
- Control account reconciliations where transactions are recorded in individual accounts and in total (e.g., receivables and payables).

Fraud matrix

A fraud matrix is a map of the potential frauds against an organisation, cross-referenced to the risks of each of these occurring, documenting the controls over these risks.

A fraud matrix can apply a score to a fraud risk by allocating a score (e.g., 1 to 5) for the likelihood of a risk occurring and a score for the impact of that on the organisation. For example, the risk of inventory not being sufficient for a period's production because of theft of materials may be unlikely to occur, and be scored at 2 out of 5, but the impact may be high and score 5, giving an overall score of 10 (i.e., 2 x 5 = 10). The company can then ensure that items with a high overall score (e.g., 15 or more out of 25) are given more attention in terms of design of specific controls to prevent fraud in these activities.

Internal controls cannot prevent all potential frauds. Some of the limitations include the fact that the cost of some controls may be prohibitive, and that some controls may be ignored or over-ridden by management. For example, a control may be that all purchase orders and invoices must be authorised, but some may be processed without the appropriate authorising signature being recorded on the document. Or, in a computer system, a password may be required to ensure that only certain personnel may amend records, but if the passwords are shared or not kept secure, that control can be by-passed by other personnel.

Review of methods of operating

Management can use financial information to analyse and review the performance and the controls of an organisation. Financial information can highlight issues such as potential inefficiencies as well as possible fraudulent behaviour; a reduction in the profit margin may suggest that costs are being poorly managed or may highlight an issue such as theft of inventory.

Management reports can be structured to ensure that the most useful information is available to the user of the report. The information may be summarised into a form of income and expense statement, or include additional information such as variance analysis, aged receivables analysis or capital expenditure review for the period.

Reports may also focus on exceptions, such as large variances or instances of controls not being effective. Some areas of reporting, rather than being required regularly (e.g., monthly), may only be necessary when there is an exception. For example, a fraud report, by definition, is only required when there has been an incident that requires a report. There is no need for a monthly report if there have been no incidents to report in that period.

Ideally these reports should be consistently prepared, and monitored, on a regular basis, e.g., monthly, to highlight any significant issues arising, and to prompt investigations and

corrective action where required.

A key report issued by the management accounting function is the budgetary control report, or variance analysis report. A budgetary control report compares budgeted costs and revenues with actual results, to obtain variances that highlight any deviations that managers should investigate to improve performance. It essentially brings the variances between budget and actual costs into one report which can be analysed by the management team.

Internal audit reports may also provide an independent review of the effectiveness of internal controls in certain areas, which supports management in identifying where there is a need for improvement and what kinds of modifications to internal controls will help to ensure that the systems are effective.

Summary of Unit M and key learning outcomes

In Unit M, we looked at the Competency "Evaluate the accounting system and identify areas for improvement." This involved content on five learning outcomes.

Learning outcome	
Identify an organisation's accounting system requirements.	You should now be able to identify the key requirements of an effective accounting system.
Review record keeping systems to confirm whether they meet the organisation's requirements for financial information.	You should now be able to discuss the record keeping requirements of an organisation.
Identify weaknesses in and the potential for improvements to, the accounting system and consider their impact on the operation of the organisation.	You should now be able to identify weaknesses in systems.
Identify potential areas of fraud arising from lack of control within the accounting system and grade the risk.	You should now be able to recognise the potential for fraud.
Review methods of operating for cost effectiveness, reliability and speed.	You should now be able to discuss how he effectiveness of methods of operating can be maintained.

Quiz questions

1	Learning Outcome: M4
Which of the following provides a score by multiplying the likelihood of something occurring and the impact of the occurrence on the organisation?	
A	Internal control
B	Fraud matrix
C	Internal audit
D	Accounting system

1	Feedback
A	Incorrect Fraud matrix
B	Correct
C	Incorrect Fraud matrix
D	Incorrect Fraud matrix

2	Learning Outcome: M2
Which of the following is **not** a required characteristic of an accounting system?	
A	It should provide timely information
B	It should be cost-effective to operate
C	It should provide reliable information
D	It should detect all frauds

2	Feedback
A	Incorrect It is not realistic for an accounting system to be able to detect ALL frauds

B	Incorrect It is not realistic for an accounting system to be able to detect ALL frauds
C	Incorrect It is not realistic for an accounting system to be able to detect ALL frauds
D	Correct It is not realistic for an accounting system to be able to detect ALL frauds

3	Learning Outcome: M3
Which of the following would be categorised as a staff control?	
A	Segregation of duties
B	Passwords for accessing the payroll system
C	Locks on an inventory store
D	Authorisation of invoices

3	Feedback
A	Correct
B	Incorrect Segregation of duties
C	Incorrect Segregation of duties
D	Incorrect Segregation of duties

Quiz solutions

1	B
2	D
3	A

Unit N: Accounting System Improvement and Development.

Learning outcomes

N.1	Make recommendations for changes to the accounting system in an easily understood format, with a clear rationale and an explanation of any assumptions made.
N.2	Identify the effects that any recommended changes would have on the users of the system.
N.3	Enable individuals who operate accounting systems to understand how to use the system to fulfil their responsibilities.
N.4	Identify the implications of recommended changes in terms of time, financial costs, benefits, and operating procedures.

Introduction to Unit N

In Unit M, we looked at the requirements of accounting systems, internal controls within these systems, and the need for effective and reliable information as outputs. We also noted the need to review these requirements, and the potential for improvements in the form of amended internal controls (to improve fraud prevention, for example) and more effective reports.

In Unit N, we will continue this theme and consider the ways in which accounting systems are improved and developed over time, and how this impacts on the users of the systems.

Changes to accounting systems

Once the need for a change to the system has been identified (e.g., because of an internal audit report identifying weaknesses in the system design or in internal controls), there are a number of issues that will need to be clarified before specific action is taken by management, including the following:

How serious is the issue?	A serious issue (e.g., arising from major internal control weaknesses across the system) will require more careful planning that the addition of a single additional control.
What is the scope of the required change?	Implementing a completely new accounting system is more of a challenge than revising the responsibilities of individual staff.

What is the context in which the change will occur?	Changes that are required to safeguard jobs may be easier to implement than those that staff perceive to be a threat to their job security.
What is the extent of the change required?	Transformational change is a wholesale change, e.g., integrating all accounting functions at a centralised location with a new computer system. Incremental change is a small change or may be a larger change made in small steps, e.g., gradually moving each sub-system on to an integrated accounting package.
Do the benefits outweigh any associated costs?	A cost-benefit analysis takes recommendations for changes and improvements in the accounting system and its controls and analyses them in terms of the costs and benefits of implementing them. As well as financial effects, the non-financial impacts also need to be considered. For example, a change may be inexpensive to implement, but may have a significant negative impact on employee job satisfaction.

The impact of changes on staff

The way that a change is implemented can have a huge impact on the way that staff respond, and this in turn affects the overall success of the change. Managers need to be aware of potential staff concerns and think about how best to overcome the potential resistance they may face when planning system changes. Individuals working within a system resist the change, even when it is clearly necessary.

The steps in making changes to an accounting system include the following:

Analyse the system and identify areas of weakness	Ensure that the change is necessary and appropriate
Choose how to make the change	This may involve choosing between engaging external experts or using in-house staff to make the change

Prepare a plan for making the change	The plan should identify the timescales, key deadlines, other systems impacted, resources involved, and key objectives of the change. The timescale can depend on whether the change is being imposed by something like a new regulation, which can often be achieved quickly, or requires negotiation with groups such as staff, which will take longer. Potential issues need to be identified as far as possible, with suggestions for actions to mitigate these risks.
Analyse the likely reactions of stakeholders	This should identify all affected parties, including customers, staff, suppliers, etc
Communicate the plan and its timetable	Ensuring that all groups are kept informed and have a chance to provide their inputs as appropriate. It is essential that a clear rationale is provided to support the requirement for change.
Make the change	
Monitor the effectiveness of the change	There needs to be a clear set of objectives that the results after the change can be compared with

Ensuring security of data within the system

Modern organisations are more and more reliant on data for their operational processes, marketing, staff management, etc, and it is essential to protect that data during a change in the system. This means that the transition period needs to include specific controls that address security and integrity of data.

Some of the questions that need to be considered during the change include the following:

- Will existing systems be required after the change, or can they be archived or deleted?
- Does the change require a period of parallel running, during which the old and new systems are run together?
- What process is to be used to transfer data from the old to the new system?
- How will staff be trained on the new system?
- Who is to supervise the transition and monitor its progress?
- Are the arrangements for security of access to the system to be the same as in the old system?
- How does the organisation ensure that it is able to comply with statutory regulations during and after the transition?

Summary of Unit N and key learning outcomes

In Unit N, we looked at the Competency "Make recommendations to improve the accounting system." This involved content on four learning outcomes.

Learning outcome	
Make recommendations for changes to the accounting system in an easily understood format, with a clear rationale and an explanation of any assumptions	You should now be able to make appropriate recommendations to improve accounting systems
Identify the effects that any recommended changes would have on the users of the system.	You should now be able to recognise any effects of changes on users
Enable individuals who operate accounting systems to understand how to use the system to fulfil their responsibilities.	You should now be able to communicate changes to users
Identify the implications of recommended changes in terms of time, financial costs, benefits, and operating procedures.	You should now be able to describe potential implications of changes to systems

Quiz questions

1	Learning Outcome: N1
Which of the following statements is true?	
A	Any change in an accounting system needs to be approved by the internal audit department
B	There needs to be a clear set of objectives for a major change in an accounting system
C	A change to address an internal control weakness should not be implemented if it is likely to be unpopular with staff
D	The existing system should always be switched off before implementing a new system

1	Feedback
A	Incorrect There needs to be a clear set of objectives for a major change in an accounting system
B	Correct
C	Incorrect There needs to be a clear set of objectives for a major change in an accounting system
D	Incorrect There needs to be a clear set of objectives for a major change in an accounting system

2	Learning Outcome: N
Which of the following involves analysing a recommendation for change and improvement in the accounting system and its controls	
A	Cost reduction
B	Financial plan
C	Internal audit report

D	Cost-benefit analysis

2	Feedback
A	Incorrect Cost-benefit analysis
B	Incorrect Cost-benefit analysis
C	Incorrect Cost-benefit analysis
D	Correct

Quiz solutions

1	B
2	D

ICPAR
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Contact Us
Institute of Certified Public Accountants of Rwanda (ICPAR)
KG 686 ST, House #10, Kamutwa, Kacyiru
P.O. Box: 3213 Kigali
Tel: +250 784103930
Email: info@icparwanda.com
www.icparwanda.com