OpenTuition.com
Free resources for accountancy students

March/June 2017 Exams

ACCA Paper

P5 Advanced Performance Management

Please spread the word about OpenTuition, so that all ACCA students can benefit.

ONLY with your support can the site exist and continue to provide free study materials!

Visit opentuition.com for the latest updates - watch the free lectures that accompany these notes; attempt free tests online; get free tutor support, and much more.

The best things in life are free

IMPORTANT!!! PLEASE READ CAREFULLY

To benefit from these notes you **must** watch the free lectures on the OpenTuition website in which we explain and expand on the topics covered

In addition question practice is vital!!

You **must** obtain a current edition of a Revision / Exam Kit from one of the ACCA approved content providers. They contain a great number of exam standard questions (and answers) to practice on.

You should also use the free "Online Multiple Choice Tests" and the "Flashcards" which you can find on the OpenTuition website.
http://opentuition.com/acca/

Contents

Syllabus

1. The aim of the paper

The aim of this paper is to apply relevant knowledge, skills and exercise professional judgement in selecting and applying strategic management techniques in different business contexts and to contribute to the evaluation of the performance of an organisation and its strategic development.

2. The syllabus and the exam

2.1 Syllabus overview

There are six areas detailed in the syllabus:

- Strategic planning and control
- External influences on organisational performance
- Performance measurement systems and design
- Strategic performance measurement
- Performance evaluation and corporate failure
- Current developments and emerging issues in performance management

Each of these areas are dealt with in the following chapters of these Course Notes.

2.2 The examination will be a three hour paper in two sections:

	Marks
Section A: one compulsory question	50
Section B: two from three question of 25 marks each	50
Total	100

2.3 Paper F5

Paper P5 builds on Paper F5 (Performance Management) and you are expected to have a thorough understanding of the Paper F5 syllabus. Although some of the topics from Paper F5 are revised in these notes, it is impossible to revise all of them. If (because of previous syllabus changes) you did not take Paper F5, or if you have forgotten F5, then it is vital that you obtain a set of F5 notes and work through them properly yourself. F5 Notes and lectures are available on the Opentuition.com site.

2.4 Paper P3

In addition, there is considerable overlap between Papers P5 and P3 in the area of strategic planning and control. Although this area is revised briefly in these notes you should make sure that you are prepared to demonstrate your P3 knowledge in the Paper P5 exam.

2.5 Finally!

Because of the overlap of P5 with both F5 and P3, it will appear that there is not a lot new to learn for P5. In one way that is true with respect to the technical content of the syllabus, but it is certainly not true with respect o the style of questions and skills needed to pass this exam. Question practice is essential.

The examiner has written an article explaining his approach to the exam You can find the article on the ACCA website:

(http://www.accaglobal.com/uk/en/student/acca-qual-student-journey/qual-resource/acca-qualification/p5/technical-articles/examiner-approach-to-paper-p5.html)

It is strongly recommended that you read this article before (and after!) your studies.

Chapter 1

THE NATURE OF PERFORMANCE MANAGEMENT

1. Introduction

This chapter looks at what is meant by "performance management". It is essential to understand that term if you are going to succeed in this paper as questions are directed at describing, improving and reporting on performance management systems.

2. Performance management

It is presumably obvious that organisations will want to improve their performance. However, it is not at all obvious how good performance should be defined. This will differ between organisations and departments within those organisations, and will often vary over time within a single organization or department.

For example:

Type of organisation	*Possible signs of good performance*
Profit seeking/commercial	Rising share price, increasing profits, dividends and EPS.
A city council's waste management services	Regular rubbish collection, clean streets, few complaints, no smell.
A school	Good exam results, good pupil attendance, low rates of bullying, success at sport.
A charity for the supply of medicines and medical care	Number of patients helped, number of patients cured, number of people vaccinated.

You might disagree with some of the signs of good performance listed. For example, not everyone might think that good sports performance is relevant to schools; others feel strongly that it is. Some people might believe that vaccination is wrong. Additionally, some indicators can be contradictory. For example, the relationship between increasing profits, increasing dividends and increasing share value is complex.

Furthermore, identifying desirable performance such as an increasing share price does not say anything about what behaviours are needed to produce that. For example, it could be dependent on more advertising, cost cutting, moving-up market, withdrawing certain products and from certain markets, spending on research and development to invent new unique and popular products. If increased share price depends on innovation then successful innovation becomes essential performance.

So, to where do managers look to see what might be regarded as markers of performance? The answer is that they must look to the organisation's mission and its stakeholders.

3. Performance management

Once desirable performances have been defined, the next step is to manage it so that individuals, cost centres, divisions and subsidiaries all work towards achieving those behaviours and targets. This requires three steps:

(1) Design ways in which to measure the desired behaviours and achievements

(1) Measure them

(2) Provide suitable feedback

There can be many measures in a large company, but the most important are called key performance indicators (KPIs). These are just what the name implies: measurements, or indicators, of performance where the organization must do well if it is to succeed. Achievement of the KPIs should be high on everyone's agenda.

4. The mission statement, goals and objectives

4.1 The mission statement

In section 2, above, we asked how good performance could be identified or defined and the mission or mission statement is very important here.

The mission statement is an expression of the overall purpose and scope of the organisation, which is in line with the values and expectations of the stakeholders.

It answers the question: What sort of business are we, or do we want to be?

A mission statement will generally contain four elements:

• a purpose	What, and for whom, the company exists for.
• a strategy	The range of businesses in which the firm seeks to compete and some indication of how it intends to compete.
• policies and behaviour standards	Guidelines which help staff decide what to do on a day-to-day basis to carry out the strategy.
• values	The beliefs and moral principles which lie behind the firm's culture.

So a mission and mission statement is a public statement about what the organisation is for, how it intends to achieve those aims and also statements about its ethics and values.

Achieving the mission can therefore be taken as a strong indication of what is meant by of good performance.

Examples of three 'real-life' mission statements are reproduced below:

Mission Statement

The mission of The Walt Disney Company is to be one of the world's leading producers and providers of entertainment and information. Using our portfolio of brands to differentiate our content, services and consumer products, we seek to develop the most creative, innovative and profitable entertainment experiences and related products in the world.

McDonald's vision is to be the world's best quick service restaurant experience. Being the best means providing outstanding quality, service, cleanliness, and value, so that we make every customer in every restaurant smile.

The mission of the Office of the United Nations High Commissioner for Human Rights (OHCHR) is to protect and promote all human rights for all.

So, performance in The Walt Disney Company includes:

- Creativity
- Innovation
- Differentiated content
- Profit

McDonalds lists:

- Quality
- Service
- Cleanliness
- Value
- Customer satisfaction (smiles!)

No doubt profit is also important to McDonalds, but some companies are reluctant to refer to that in their mission statements.

The mission of the Office of the United Nations High Commissioner for Human Rights (OHCHR) is to protect and promote all human rights for all is somewhat fuzzy. It would be better if it were more precise in defining human rights and how it might resolve conflicting views.

Although the purpose of the Mission Statement is to communicate to stakeholders the nature of the organisation, and to focus strategy, in practice they are often full of meaningless phrases!

4.2 Goals and objectives

Missions can be very grand and not very specific. It's all very well for a company to say that it has 'quality' as one of its mission, but what does quality mean? What frequency and type of defect must be eliminated and which will be tolerated? By when must a quality level be attained? Something more specific is needed.

Goals and objectives are often put together with no distinction made between them. However, strictly speaking, **goals** are statements of general intentions (not that much different to a mission), whereas **objectives** are more specific.

An example of a **goal** is:	to improve profits
An example of an **objective** is:	to achieve a Return on Capital Employed of 25% within two years.

4.3 'Good' objectives should be SMART:

Specific: sales, rejects, cost per unit are all specific. Better and improve are not

Measurable: usually that the specific aspects of performance have to be quantified

Agreed/accepted/achievable: imposing an unrealistic or impossible target will be ineffective

Relevant: relevant to the person responsible (ie they can affect it); relevant to the organisation's mission. If objectives are seen as irrelevant, arbitrary and merely an exercise in management power they will fall into disrepute.

Time-bound: objectives should be attained within a specified time frame.

An example of 'real-life' objectives is printed below:

Financial objectives over the next 3 years:

- To increase the operating profit before taxes by 15%
- Return on equity of at least 20%
- Cost-income ratio below 45%
- Net credit losses below 0.5%

4.4 Critical success factors

An organisation can easily end up with many objectives and there is a danger that the more easily attained objectives is what people concentrate on. However, there are some objectives which are more important or fundamental to success than others. These are the organisation's **critical success factors.**

Here are two definitions:

Johnson, Scholes & Whittington:

- 'Those product features that are particularly valued by a group of customers, and, therefore, where the organisation must excel to outperform the competition'

Or:

- Where an organisation must perform well if it is to succeed.

The second definition is simpler, but the first is more useful because is places emphasis on the idea that success is caused by customers: it is vital (critical) to meet customers' expectations.

Examples of critical factors could be:

- Profitability
- Market position
- Reputation
- Market share
- Productivity
- Product leadership
- Personnel development
- Employee attitudes
- Public responsibility

They depend on:

- Structure of the industry
- Competitive strategy
- Industry position
- Geographical location
- Environmental factors
- Temporary factors
- Functional managerial position

Classification:

- Internal eg inventory control; delivery times
- External eg exchange rates
- Monitoring eg actual vs budget
- Building eg targets to launch new products or updates

Johnson and Scholes suggested a six step process for developing CSFs:

- Identify the success factors that are critical for profitability.
- Identify what is necessary (the 'critical competencies') in order to achieve a superior performance in the critical success factors.
- Develop the level of critical competence so that a competitive advantage is obtained.
- Identify appropriate key performance indicators for each critical competence.
- Give emphasis to developing critical competencies that competitors will find it difficult to match.
- Monitor the firm's and competitors' achievement.

4.5 Stakeholders

A stakeholder is anyone, or any organization, affected by an organization.

Stakeholders include: shareholders, employees, suppliers, customers, the local populace, government. Stakeholders have different requirements and these will affect what is meant by performance. Consideration of stakeholders is important because:

- Generally, the organization is being run for the benefit of at least some stakeholders. For example, a profit-seeking organization is run primarily for the benefit of shareholders; a hospital is run primarily for the benefit of patients.
- Other stakeholders can influence the success of the organization. For example, if employees go on strike then this will put the organisation's profits at risk or might prevent further admissions of patients to a hospital

Therefore, when devising strategies, managers must bear in mind:

- What the principal stakeholders want
- What the stakeholders will tolerate.

Mendelow's matrix can help managers to decide on how best to handle stakeholders:

Power = the amount of power a stakeholder can exercise

Interest = how likely a stakeholder is to take action

The four categories of stakeholder are:

- Key players: these people have the power and will take action. Therefore management needs to keep them happy.
- Keep satisfied: they have power but are reluctant to exercise that power provided they are kept satisfied. If really unhappy, they might turn into key players.
- Keep informed: no power, but lots of noise. Management will aim to keep them informed as a matter of politeness.
- Minimal effort: this group is at the back of the queue when management is making decisions.

Chapter 2

STRATEGIC MANAGEMENT ACCOUNTING

1. Introduction

This chapter contains a general review of the different levels at which planning, decision making and control take place within an organization so as to manage both its long-term and short term performance.

Additionally, more detailed consideration is given to the nature and purpose of strategic planning.

2. Hierarchy of management

Planning, decision making and control can be classified into three levels:

2.1 Strategic planning:

This is the process of developing the long-term (for example 5 to 10 years) plans for the company.

For example: what new products to launch?

what new markets to develop?

This sort of planning, together with the decision making involved, will be done at Board level. It tends to be more outline rather than detailed planning.

2.2 Management control / Tactical planning:

This is the more detailed, short-term planning (for example, the one year budgets) in order to ensure resources are obtained and used effectively in order to achieve the long-term plans of the company

For example: how many staff will the company need next year?

Control will be exercised against budget using, for example, variance analysis.

2.3 Operational control:

This is the day-to-day management of the business in order to ensure that specific tasks are carried out effectively and efficiently.

For example: ensuring that the budgeted production is achieved each day.

The information used will be very detailed and will be quantitative, but will often be expressed in terms of (for example) units or hours instead of purely in monetary terms.

3. The work of Burns and Scapens

Burns and Scapens have studied changes in the management accounting function and noted that it has changed focus from

- financial control

to

- business support.

This means that management accountants have become more generalists within businesses and are providing an internal consulting service for managers. They have named this new role a hybrid accountant.

Burns and Scapens state that there are three main forces for change:

- Technology,
- Management structure
- Competition.

Technology: Over the past 20 years in the quality and quantity of information technology has dramatically increased. In the past, the accountant was one of the few people in the organisation who had access to the IT system and the information generated, as the outputs from the IT system and data input was strictly controlled. Now, however, management information systems (MIS) and Decision Support Systems (DSS) allow users throughout the organisation to input data and run analyses to produce reports once only provided by the management accountant. So, the management accountant now just acts as another user of the system.

Management structure: Changes in management structure have forced change on the accountant. For example, responsibility for budgeting has often moved from the head office to operational management, and strategic business unit managers take more of the decisions that would have been reserved for the head office management accountant. These managers will be using financial and non-financial indicators and they will be producing forecasts. The management accountant will be providing reports alongside the SBU reports, often trying to provide a link between the operational reports, the financial consequences and the strategic outcomes desired by the board.

Competition: Over the last 20 years increasing competition has forced organisations to adopt a more strategic focus and for competitive advantage to be understood and emphasised. As a result, the traditional accountant's focus on the final profit figure has been seen as short term and this has led organisations to focus on a range of measures to try to capture the longer-term trends in their performance.

These changes mean that management accountants have to understand the needs of particular managers and then work with them to extract valuable reports from the MIS. It may also require the development of different performance measures beyond the traditional measure of profit. From the organisation's perspective, the accountant will be a guide to the SBU manager to ensure that strategic goals are reflected in their performance management

4. Strategic planning

As previously stated, strategic planning is the developing of a long-term plan for the company. The various stages involved are illustrated in the diagram below (P3 revision):

4.1 Strategic planning model

Each of the stages involved is explained in the following paragraphs.

4.2 Mission statement

As described above: the mission tries to encapsulate the purpose and values of the organization.

4.3 Stakeholders

As described above: strategy should be determined by what stakeholders want or tolerate.

4.4 Ethics

Strategic decisions cannot be separated from a consideration of the ethical consequences of those decisions. For example, if management decides to close down an operation, employees there will lose their jobs and there is an ethical issue there'. Similarly, starting to drill for oil in an area of natural beauty will also have an ethical dimension.

Ethics will have been comprehensively covered in P1. In P5, you are simply expected to be aware that strategies can have ethical repercussions and you should be able to discuss those at a relatively simple level. In particular unethical behavior can have serious financial consequences such as reputational damage, fines, compensation payments and loss of trading licences.

4.5 Corporate Appraisal

Corporate appraisal is a critical assessment of the strengths and weaknesses, opportunities and threats in relation to the internal and external (environmental) factors affecting an organisation. The purpose is to establish the condition of the organisation prior to preparing a long-term, strategic plan.

The term 'Position Audit' is sometimes used as an alternative to 'Corporate Appraisal' and sometimes used to refer to an organisation's internal factors.

Corporate appraisal requires organization to look at:

- External (environmental) factors. These can be categorized as opportunities or threats
- Internal factors (resources and competences). These can be categorized as strengths or weaknesses.

4.6 External factors can be assessed using PESTEL or a Porter's five forces analysis:

PESTEL

- Political
- Economic
- Social
- Technological
- Environmental/ecological
- Legal

Although organisations usually can't do much to change PESTEL factors, they might be able to avoid threats (for example do not try to develop markets which technology is likely to make redundant) or make use of opportunities (for example, expand into a country that has become economically and politically attractive).

Porter's five forces (industry level): looks at industry attractiveness.

- Threat of new entrants
- Threat of substitutes
- Bargaining power of buyers
- Bargaining power of suppliers
- Rivalry between existing competitors

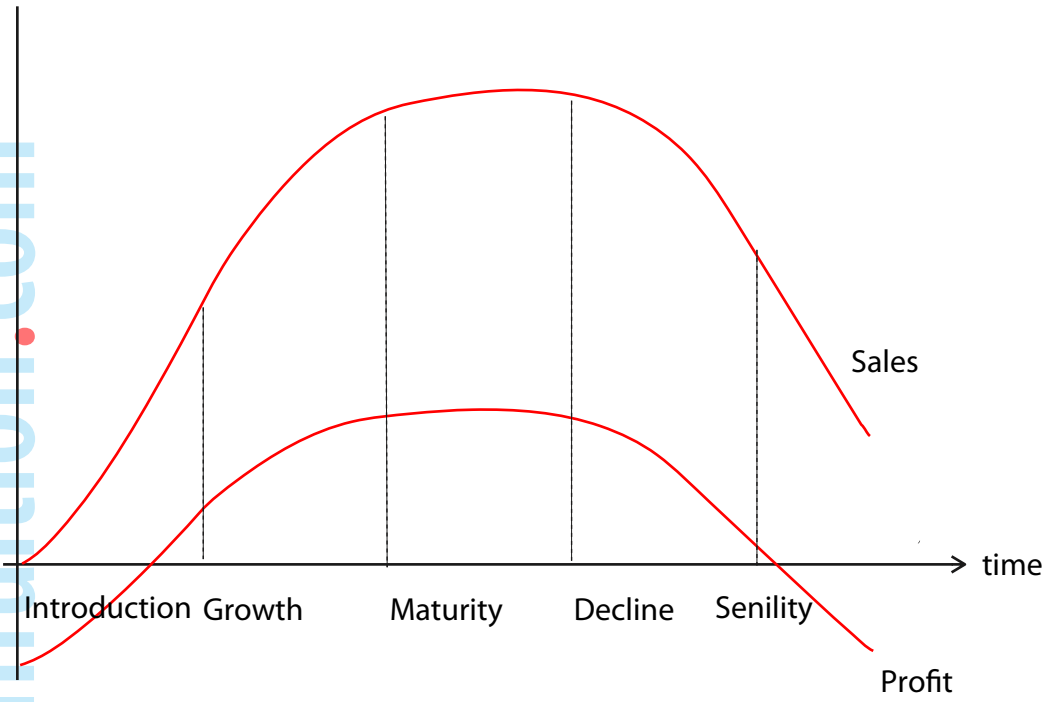
Oganisations can assess which industries are most attractive and may also be able to change the effect of the five forces. So, if competition (rivalry) is fierce perhaps the organisation should consider a takeover or merger; if there is intense bargaining power from suppliers, performance might be improved by backwards integration by setting up or taking over a supplier.

4.7 Internal factors – resource analysis (M words)

- Money
- Men and women
- Manufacturing/machinery
- Material
- Methods (knowhow)
- Management
- Management information systems (IT)
- Marque/make (brand)
- Markets and marketing

4.8 Internal factors - produce life cycle

This helps an organization to decide on which products should be continued and promoted, and which products should perhaps be phased out or abandoned as this is influenced by where products are positioned on its 'product life cycle'.



Remember this is not very good at forecasting when a new phase might start.

It can be useful to think about what aspects of performance should be concentrated on at each phase of the life cycle to try to maximise performance:

Introduction: It is vital that the product has a successful launch. Successful advertising and promotion to generate good early sales is essential. If the product does not have a successful launch it can be very difficult to rescue it later. Essential performance measures could be advertising effectiveness and sales volumes achieving their budget levels. Profits are note really expected at this stage.

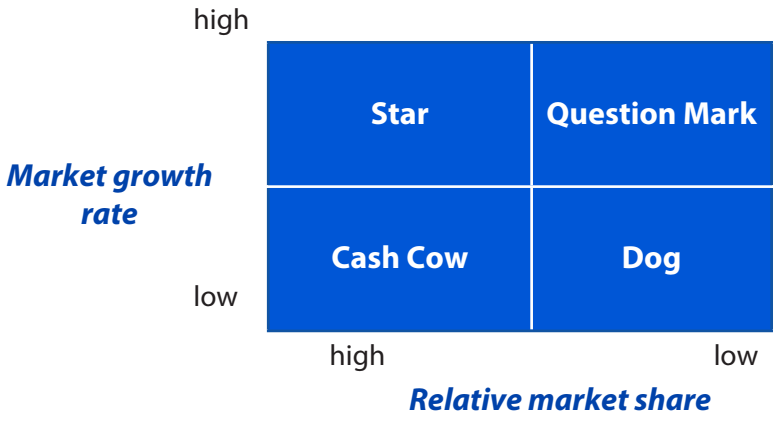
Growth: The product is going to be successful. Copycats will enter the market. Continuing good performance depends on trying to stay in the lead. The company should be keeping a careful watch on competitors' activities: prices, promotions, sales volumes.

Maturity: The market has stopped growing and there will be considerable competition. Prices will be forced down and good performance (profits) depends on large efficient operations, often global, with low unit costs.

Decline: Decline can be slow and profitable and performance depends on hanging onto a niche market. Alternatively, the company could decide to exit from the industry.

4.9 Boston consulting group (BCG) matrix.

A potentially useful approach to considering each existing product is to position them on a Boston Matrix (or Boston Grid).



Having positioned the products on the grid, it can then be used to consider future strategies for each of them.

Question mark: Because there is a high growth rate, this product is relatively new with (perhaps) a big future. It's a product the company should be interested in selling. However, BCG places a lot of emphasis on 'big is beautiful' and says that there is no hope of profitable survival if the market share is low. Therefore decide whether to withdraw or to work to increase market share. This will be cash negative and profits are unlikely to be made as the company fights for an increased market share. Suitable performance will be successful market growth. Profit targets would not be very relevant.

Star: Not as good as it sounds. Usually cash neutral as the company fights to keep market dominance. Sustained market share is what's wanted here.

Cash cow: now the payback for all that earlier effort. Conserve cash, go for profits and set appropriate targets. You should not expect a major assault on this product because it is perceived as an old product on its way out. Stretch its life out as long as you can.

Dog: Divest either by closure or sale. No growth and a small market share – going nowhere

4.10 SWOT analysis

Having analysed the internal and external factors, they can be arranged as a SWOT analysis

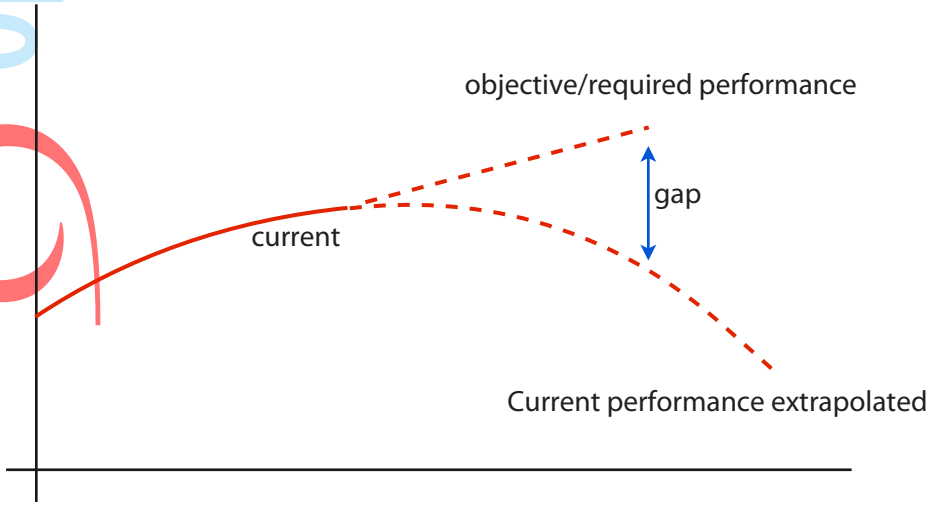
(S = strengths, W = weaknesses, O = opportunities, T = threats).

It can be useful to arrange these factors in a grid as follows so that appropriate responses can be generated - again with the hope of optimising performance:

	Opportunities	***Threats***
Strengths	This is a perfect match: strengths can be used to exploit opportunities.	Use strengths to defend against threats.
Weakness	An opportunity will be difficult to exploit if it depends on an area of weakness.	The organization could be in trouble: it must defend itself, but is weak.

4.11 Gap analysis

A gap analysis compares what an organization is likely to do it is continues more or less as it is doing, and what its owners (or other stakeholders) want to organization to achieve.



It is often very useful to think of the organization as having a gap in the profits expected and required so that the organization must close a profit gap. Ansoff 's product-market matrix sets out how this might be achieved.

4.12 Ansoff's matrix

Ansoff 's matrix is commonly used by businesses that have growth as their main objective, and is used to focus management's attention on the four main alternative strategic options available for growth, particularly profit growth:

	Existing products	***New products***
Existing markets	Market penetration/growth Efficiency gains/cost savings Withdrawal Consolidation	Product development
New markets	Market development	Diversification

Ansoff's matrix is very useful: in a simple diagram all classifications of growth options are set out.

In general, staying with existing markets and products is a low-risk, low-return strategy. Exploring new markets or new products will be higher risk and return. Venturing into diversification might be sometimes seen as a sign of desperation: what is driving an organisation to risk so much on the success of a radically different business?

5. Strategic choice

Having carried out a corporate appraisal and having identified potential strategies, it is then necessary to appraise them and formulate a strategic plan. The types of techniques that may be employed in appraising the strategies are discussed in the chapter on decision making.

6. Strategy implementation

The strategic plan will generally be formulated at Board level. Once it has been prepared, it will normally be the managers of the company who will be expected to implement it. This then becomes the second tier of decision making identified at the start of this chapter – Management control / Tactical planning.

7. Special considerations for multinational companies

A multinational company is one which undertakes a substantial proportion of its business in countries other than the one in which it is based.

The strategic planning process in these companies and the strategic choices made must take account of certain special features, and you must be able to briefly describe these for the examination.

- **Process specialisation**

  e.g. place labour intensive operations in countries with low wage rates

- **Product specialisation**

  e.g. consumers in different countries have different requirements and 'tastes'

- **International trade issues**

  e.g. the economics of a business may be particularly sensitive to exchange rate fluctuations. There could be import restrictions. There might be transportation problems.

- **Political sensitivities**

  e.g. particular countries may have particular political risks.

- **Administrative issues**

  e.g. the transfer of profits may result in tax being payable twice. Ownership of foreign companies might be subject to special rules.

8. Benchmarking

An organisation's objectives, capabilities, performance and strategic plans should be assessed in relative terms since its success depends on beating competitors or on improvement of previous performance. **Benchmarking** means comparing performances and there are a number of bases that can be used:

- Historical: compare to own performance in previous periods.
- Industry/sector: compare to the performance seen in other similar industries.
- Best-in-class: compare to the performance seen in the best competitor.

Additionally, the factors that are benchmarked can be:

- Functional benchmarking: comparing specific functions with the same functions in other companies (which do not have to be in the same industry)
- Product benchmarking: comparing specific products with those produced by competitors (sometimes involving reverse engineering)
- Financial benchmarking: comparing financial performance with that of competitors
- Strategic benchmarking: comparing with how other companies compete.

The typical stages involved are:

- The identification of problem areas
- The identification of other industries with similar processes, and from them the industry leaders
- The detailed surveying of the other company's business practices.
- The implementation of new, improved business practices.
- The monitoring of improvements.

There can be considerable difficulties in obtaining from competitors data needed for benchmarking. For example, no competitor is likely to volunteer how long it takes to make a product or what internal quality standards it sets. Even not-for profit organisations can be reluctant to supply benchmarking data as they are sensitive about their performance. Sometimes governments step in to ensure that comparative data is made available. For example, in the UK the government insists that schools and hospitals publish performance data. School head teachers and hospital administrators often disapprove, stating that the published data does not take into account many important factors, such as the nature of the population making use of the school or hospital.

Chapter 3

PERFORMANCE MANAGEMENT AND CONTROL OF THE ORGANISATION

1. Introduction

This chapter looks at budgeting used as a method of control within an organisation.You will already have been examined on budgeting in previous examinations, and much of this chapter is therefore revision.

In this examination, questions are more likely to focus on written aspects, and the syllabus includes budgeting in not-for-profit organisations; modern developments; and behavioural aspects.

2. Functions of budgeting

Forecasting

Planning

Communication

Co-ordination

Control

Authorising and delegating

Motivation

Evaluation of performance

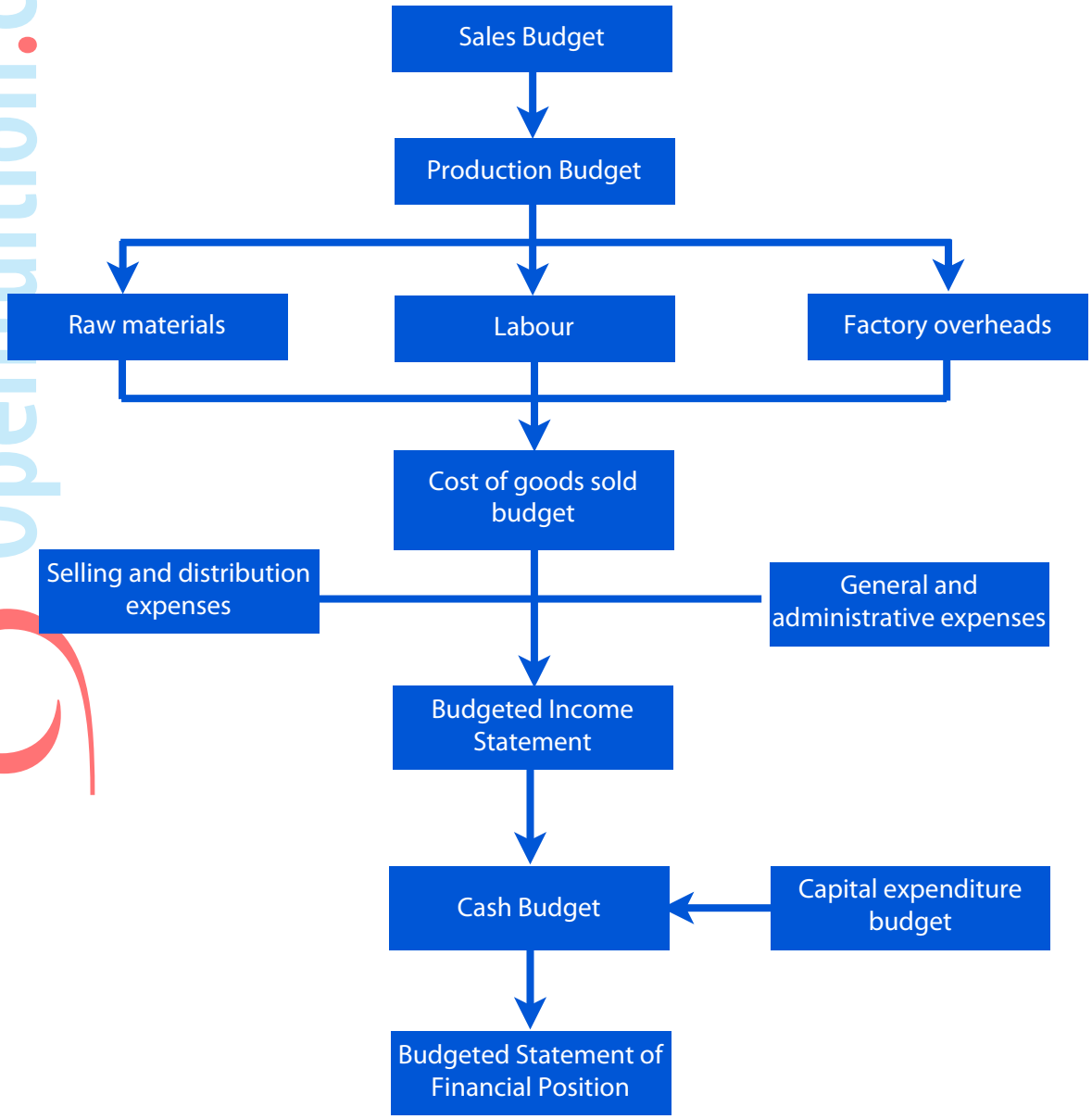
[Mnemonic: Few People Can Comfortable Carry A Male Elephant!]

3. Principal budget factor

The principal budget factor is the factor that limits the activity for the budget period. Normally this is the level of sales and therefore the sales budget is usually the first budget to be prepared – this then leads to the others.

However, it could be (for example) a limit on the availability of raw materials that limits activity. In this case raw materials would be the principal budget factor, and this would be the first budget to be prepared.

4. The preparation of budgets



5. Types of budget

5.1 Fixed budget

This is a budget prepared at the anticipated level of activity.

If the expected level of activity changes during the period, then the fixed budget becomes unrealistic and will usually be flexed (see below) for use as control.

However, the original fixed budget still very often remains as an overall target – for instance, the profit from the fixed budget will often have been given to head office and used as the target for the period.

5.2 Flexed budget

A flexed budget is when the budget is revised (or flexed) to reflect the actual level of activity.

This budget is useful particularly for control purposes and is what we use in our variance analysis.

5.3 Rolling budget

A rolling budget is one that is kept continually up-to-date by revising at the end of each month and also adding a further month.

For example, on 1 January 2008 prepare a budget for the year to 31 December 2008.

At the end of January 2008, revise the budget for the remaining 11 months of 2008 (in the light of what happened in January), and also prepare a budget for January 2009.

In this way there is always a budget for the coming 12 month period.

The benefits of rolling budgets are that they are likely to be more accurate, and also the work-load of budgeting is spread throughout the year and becomes part of the normal job – again leading to more accurate budgeting.

Example 1

A company has prepared the following fixed budget for the coming year.

Sales	10,000 units
Production	10,000 units

	$
Direct materials	50,000
Direct labour	25,000
Variable overheads	12,500
Fixed overheads	10,000
	$97,500

Budgeted selling price $10 per unit.

At the end of the year, the following costs had been incurred for the actual production of 12,000 units.

	$
Direct materials	60,000
Direct labour	28,500
Variable overheads	15,000
Fixed overheads	11,000
	$114,500

The actual sales were 12,000 units for $122,000

(a) Prepare a flexed budget for the actual activity for the year

(b) Calculate the variances between actual and flexed budget, and summarise in a form suitable for management.

(Use a marginal costing approach)

6. Methods of budgeting

6.1 Incremental budgeting

This approach is to take the previous year's results and then to adjust them by an amount to cover inflation and any other known changes.

It is the most common approach, is a reasonably quick approach, and for stable companies it tends to be fairly accurate.

However, one large potential problem is that it can encourage the continuation of previous problems and inefficiencies. All too often the new budget is worked out by taking last year's figures, then adding an amount for inflation (and often adding another amount for 'padding'). If we require a wages budget, we will probably ask the wages department to produce it and they (using an incremental approach) will assume that our workers will continue to operate as before. They will therefore simply adjust by any expected wage increases.

As a result, the 'plan' for our workers stays the same as before. Nobody has been encouraged to consider critically different ways of operating that may be more efficient. It is at budget time that we perhaps should be considering different ways of operating.

6.2 Zero-based budgeting

With zero-based budgeting we do not consider the previous period. Instead, we consider each activity on its own merits and draw up the costs and benefits of the different ways of performing it (and indeed whether or not the activity should continue).

We then decide on the most effective way of performing each activity.

Clearly any changes to the way an activity is performed may require funding, and there may not be sufficient funding available for all changes proposed, and therefore they are ranked to decide which changes are made.

Although this approach is in principle a much better approach to budgeting, it is time-consuming and also requires much more expertise than incremental budgeting. For this reason, it is often restricted just to a few activities each year in order that training and help may be given to the people involved. Other activities are budgeted using the incremental approach.

6.3 Activity Based budgeting

This is the application of the idea of Activity Based Costing to the process of budgeting, and as such has particular relevance to budgeting for fixed overheads.

At the planning stage, attempts are made to identify which activities drive (cause) various overheads. Costs are spread over these cost drivers using whatever basis appears to be appropriate in the circumstances. A better understanding between costs and their causes should result in better budgets better decision making and better performance.

7. Behavioural aspects

7.1 Participation

If the budget process is not handled properly, it can easily cause dysfunctional activity. It is therefore necessary to give thought to the behavioural aspects.

- **Top-down budgeting**

  This is where budgets are imposed by top management without the participation of the people who will actually be involved in implementing it.

- **Bottom-up budgeting**

  Here the budget-holders do participate in the setting of their own budgets.

7.2 Target setting and motivation

Targets can assist motivation and appraisal if they are set at the right level.

- if they are too difficult then they will demotivate
- if they are too easy then managers are less likely to strive for optimal performance
- ideally they should be slightly above the anticipated performance level

Good targets should be:

- agreed in advance
- dependent on factors controllable by the individual
- measurable
- linked to appropriate rewards and penalties
- chosen carefully to ensure goal congruence

7.3 Budgets and evaluation

Budgets are often used for the evaluation of performance: hit a budget and you've done well, miss it and you could be in trouble. However, proper evaluation requires care as performance might not be controllable and, indeed the budget could have been or could become incorrect.

Hopwood identified three approaches to the use of budget information by managers in performance evaluation:

Budget constrained style: A cost overrun or a revenue shortfall is always bad and is always the subordinate's fault. Even if the subordinate had spent more for a good reason (for example to appease a very important customer who had had poor service), that expenditure would be criticized - even though it might have led to the customer being retained. This approach leads to very bad relations between superior and subordinate; it can also lead to misreporting.

Profit conscious style: Long–term profitability and long term performance are the important measures. Cost overruns will be looked at, but will usually be tolerated for the sake of long-term success. This is probably how most of us would like to be managed.

Non-accounting style: Here, the manager is not particularly interested in accounting and budgets. At one stage this approach would have been found in many hospitals in the UK. Treatments were relatively basic and cheap and expenditure didn't have to be watched. Now with more expensive treatments and an aging population, financial budgets have become much more important.

7.4 Responsibility accounting

A system of accounting that separates revenues and costs into areas of separate responsibility, which can then be assigned to specific managers. This can improve performance provided there is no doubt about who is in charge of achieving results and provided that person can influence the results.

7.5 Management by objectives

A system of management incorporating clearly established objectives at every level of the organisation. Here there is less emphasis on monetary budgets and more emphasis on taking action which helps the business to achieve its objectives.

Employees are given objectives then it is substantially left up to them to decide how to achieve those objectives. It can be very motivating because employees are given the responsibility to choose how best to meet their objectives.

8. Budgeting in not-for-profit organisations

Issues that tend to arise in budgeting that are specific to not-for-profit organizations include the following:

- There might be little control over revenue. For example, it might arise from an allocation of government money.
- There might be no revenue because goods and services are provided free. Therefore, how is success to be identified?
- The organisation may be prevented from borrowing funds or from budgeting for a deficit.
- The organisation may not be allowed to transfer funds from one budget head to another.
- The budgeting tends to be just for one financial year (i.e. short-term rather than long-term) incremental budgeting is the method most widely used

9. Beyond budgeting

There has been much recent criticism of the annual budgeting process for many reasons, including the following:

- Time consuming and costly to put together
- Constrains responsiveness and flexibility and is a barrier to change
- Rarely strategically focused (many budgets are for one year only)
- Add little value
- Concentrate on cost reduction, not value creation
- Strengthen vertical control and command (many are top-down)
- Encourage 'gaming' and perverse behavior just to meet the budget.
- Developed and updated too infrequently
- Based on unsupported assumptions, estimates and guesses
- Reinforce departmental barriers rather than sharing and cooperation
- Make people feel undervalued: the budgets is seen as a strict control mechanism and employees have to stick to the budget no matter what.

Several companies are adopting a 'beyond budgeting' approach whereby instead of preparing budgets and measuring the performance of managers by reference to the budget, managers are measured by comparison with other similar companies or by comparison with other similar divisions of the same company.

"The annual budgeting process is a trap. Pressured by fixed targets and performance incentives, managers focus on making the numbers instead of making a difference, meeting set goals instead of maximizing potential. With their compensation at stake, managers often resort to deceitful - even unethical-behaviour. In the end, everybody loses-the employee, the company, and ultimately the customer. The Beyond Budgeting model argues that companies must abandon traditional budgeting in favour of a new model that links performance measurement to evolving competitive benchmarks-and shifts the firm's focus from controlling employee behaviour to delivering customer value."

10. Principles of beyond budgeting

- Creation of a performance management climate that measures success against the competition and not against an internally focused budget. The motivation and reward process is based on the success of the team compared to the competition.
- The target setting process is based on the agreement of external benchmarks.
- Motivation through challenges and delegating responsibility to operational managers, who can make decisions themselves.
- Empowerment of operational managers by giving them the means to act independently (access to resources). The resource utilization process is based on direct local access to resources (within agreed parameters). The coordination process coordinates the use of resources on the basis of internal markets

Organization based on customer-oriented teams, who are responsible for satisfied and profitable customers. Strategy and action planning is delegated to operational managers and takes place continuously

Creation of a single "truth" in the organization with open and transparent information systems. The measurement and controlling process provides quick and open performance information for multilevel control.

The two fundamental elements of the Beyond Budgeting model are:

- New leadership principles based on the principle of the empowerment of managers and employees, and
- New more adaptive management processes.

The new leadership principles (devolution) should unlock the full potential of managers and employees in order to enable the organization to react in an appropriate way and as quickly as possible to new chances and risks in the market environment.

Adaptive management processes are not based on fixed targets and resource plans like under the budgeting model. Instead, they enable an organization for a high degree of flexibility.

Chapter 4

LEARNING CURVES

1. Introduction

You have been examined on learning curves previously. Although they are a little less likely in this examination, they are still relevant and this chapter is included as revision – there is nothing new to learn.

2. Learning

In most budgeting techniques we assume that the total variable cost is reasonably linear – that the variable cost per unit is fixed.

In the case of labour, this is very often not the case in the early stages of a new product. If we were intending to start production of a new product, then the obvious thing to do would be to produce a prototype in order to assess how long it would take to produce each unit. However, this would be dangerous because as we were to produce more and more units it is likely that the time taken for each unit would reduce as the workers gained experience. This reduction in time per unit is known as the learning effect.

2.1 Conditions

The theory of learning curves will only hold if the following conditions apply:

(3) There is a significant manual element in the task being considered.

(4) The task must be repetitive and complex.

(5) Production must be at an early stage so that there is room for improvement.

(6) There must be consistency in the workforce.

(7) There must not be extensive breaks in production, or workers will 'forget' the skill.

(8) Workforce is motivated.

2.2 Theory

As cumulative output doubles, the cumulative average time per unit falls to a given percentage of the previous average time per unit.

Example 1

The time taken to produce the first unit is 100 hours. There is a learning rate of 75%.

How long will it take to produce an additional 7 units?

2.3 Steady State

Eventually, the time per unit will reach a steady state where no further improvement can be made.

2.4 Cessation of learning effect

(1) When machine efficiency restricts any further improvement

(2) The workforce reach their physical limits

(3) If there is a 'go-slow' agreement among the workforce

(4) Physical processes (e.g. drying)

(5) Employee turnover

2.5 Formula

$y = ax^b$

where y = cumulative average time per unit

x = cumulative output

a = time taken for 1st

b = a learning factor which is given by the formula $\frac{\log r}{\log 2}$

r = learning rate expressed as a %.

Example 2

Flogel Ltd has just produced the first full batch of a new product taking 200 hours. Flogel has a learning curve effect of 85%.

(a) How long will it take to produce the next 15 batches?

(b) Flogel expects that after the 30th batch has been produced, the learning effect will cease.

From the 31st batch onwards, each batch will take the same time as the 30th batch. What time per batch should be budgeted?

Chapter 5

BUSINESS STRUCTURE, MANAGEMENT ACCOUNTING AND CHANGE

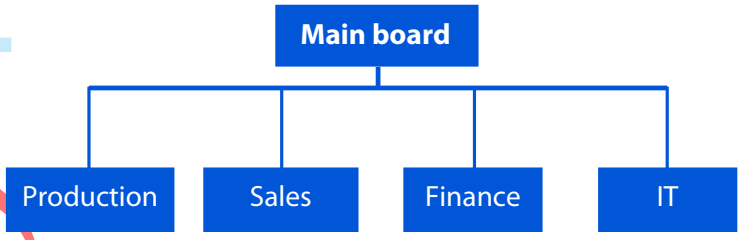
1. Introduction

This chapter looks at the different types of business structure, and the effect the structure has on the information needed. It also looks at the types of changes that business might implement to improve their performance.

2. The information needs of different business structures

2.1 Functional structure

One of the common structures found in medium-sized organisations is the functional structure. This means that people within an organisation are organised by function. So, for example, there is a finance department, a manufacturing department, a sales department, and so on.



The advantages of such a structure are:

- The organisation gains economies of scale
- Each of these department is likely to be large enough to be headed by a well-qualified manager
- Staff within each department are dealing with like-minded individuals with similar skills and motivation.

The disadvantages of such a structure are:

- As the organisation grows, each of the functional departments can become very powerful and can begin to concentrate on their own interests rather than those of the organisation as a whole. This is sometime known as a silo mentality in which departments do not wish to share information others in the same company. This type of mentality will reduce efficiency, morale and company performance.
- It is not easy to identify where profits and losses are made eg are production costs too high sales too low or has not enough been spent on research and development.

Information needs of functional structures:

Because top management in functional organisations is centralised, data from each department needs to be aggregated before top management can review and give feedback on it.

The aggregation can introduce delays in responding to the information. In addition, top management needs the skills to deal with many departments, markets and issues.

2.2 Divisional structure

As organisations grow they will often develop a divisional structure, where each division has its own functional departments and where the divisional manager has a degree of autonomy.

Divisions can be on the basis of:

- Products.
- Geography.
- Type of customer.

The advantages of such a structure are:

- Divisional managers are more motivated as they are provided with performance targets that are easier to define, measure and evaluate.
- Decisions are made 'closer to the action' so that faster decisions can be made.
- Divisions can specialize. For example, the N American division can concentrate making goods to suit that market, pricing them competitively and countering the competition there.
- Junior managers have more responsibility and get training for more senior positions in the future

The disadvantages of such a structure are:

- Head office management may need to restrict the autonomy of divisional managers, which can reduce motivation and cause dissatisfaction
- Divisional managers are concerned about their own division's performance rather than that of the organisation as a whole, which can lead to a loss of goal congruence.
- Poorer coordination.
- There can be transfer pricing issues.
- There can be some duplication of service departments eg to finance departments.

Information needs of divisional structures:

Each divisional manager needs information about the performance of his division – aggregating the data from each department within the division. This aggregated information is then passed upwards to head office.

Head office does however need to aggregate the information received from each division in order to assess the overall performance of the organisation.

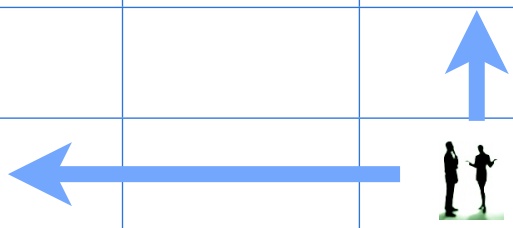
2.3 Network (or matrix) structure

An example of this may be found in firms of accountants, where there may be managers responsible for each individual office within a country, but at the same time there may be managers responsible for different activities in all offices throughout the country.

As a result, an employee working in the tax department of an office in one town will be reporting both to the manager of that office, and to the nationwide tax manager.

Another example is that of employees being assigned to a project.

	Engineering	Finance	Quality control	Purchasing
Project A				
Project B				
Project C				



These employees are responsible to both the project leader of project B and to the quality control manager.

The advantages of such a structure are:

- Communication is encouraged between various departments and activities
- Employees are encouraged to be more concerned for the organisation as a whole instead of simply there geographical division

The disadvantages of such a structure are:

- There can be conflicting pressures brought to bear on employees by the different managers to whom they report (but that might happen even in a conventional structure.
- There can be confusion over which boss has the ultimate say.

Information needs of network structures:

Data needs to be aggregated in two ways – both for the manager of the division and for the manager of the activity.

As with a divisional structure, the aggregated information is passed upwards to head office, and head office need to be able to aggregate it in order to assess the performance of the organisation as a whole.

3. Business change

3.1 Types of change

Changes can be categorized as:

- Automation
- Rationalisation
- Business process engineering

Increasing degree of change

3.1 Automation

Doing by machine what had previously been done manually. Examples include:

- Wage and salary calculations
- Receivables processing
- Supermarket stock ordering

These changes should improve performance through saving labour costs, increased processing speed (so fewer delays), greater accuracy and improved management information. For example, the receivables ledger has been computerized it is possible to easily obtain management reports such as aged analysis and sales analyses.

3.2 Rationalisation

Improving performance by carrying out a process in a more logical way to reduce bottle-necks and increase efficiency. For example, asking airline passengers to check-in on-line, and to print (or have sent to a smart phone) their boarding cards. Airlines are experimenting with self-printing of luggage tags at the airport and also with labelling luggage in a completely different way, such as each piece having an electronic identifier tag.

3.3 Business Process Reengineering

Business process reengineering involves re-thinking and radically re-designing of the way an organisations processes operate.

It is not simply attempting to improve the existing way of doing things, but starting almost with a blank piece of paper and designing how best to operate the business. The starting point it to determine what the desired outcome is of the organisation and then to design how best to achieve it.

It focuses on maximising customer value and removing non-value adding work.

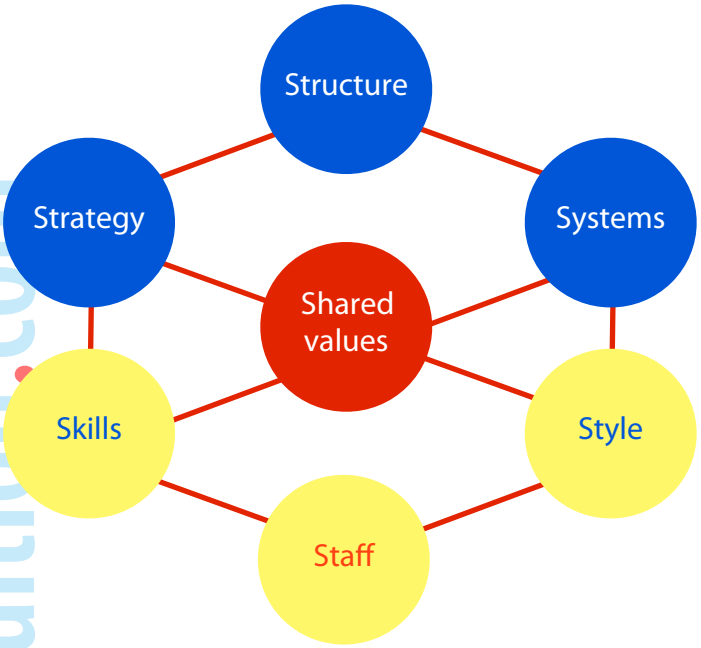
A leading advocate of business process reengineering – Michael Hammer – claimed that most of the work being done does not add any value for customers, and that this work should be removed, rather than simply speeded up, using technology. Information technology in particular has been used primarily for automating existing processes whereas us should be used as a way of making non-value added work obsolete.

Business process reengineering opportunities can be identified by the following approaches:

- Zero-based: if you were starting the business now, how would you choose to organize it?
- Simplification – eliminate duplication and redundant steps
- Value-added analysis – remove non-value adding activities
- Gaps and disconnects – check flows between departments

2.5 McKinsey's 7S model

This model represents organizations using the following inter-related elements. To carry out a strategy successfully, consideration has to be given to getting each element correct:



Strategy

Plans on how to reach identified goals and for dealing with the environment, competition, customers, new technology and so on

Structure

The way the organization's units relate to each other: centralized, functional divisions, divisionalisation, tall/narrow or wide/flat, decentralized (the trend in larger organizations); matrix etc.

Systems

The procedures, processes and routines define how work is to be done: financial systems, quality control systems, recruitment, promotion and performance appraisal systems, information systems, safety procedures.

Skills

Distinctive competences of personnel or of the organization as a whole.

Staff

Numbers and types of personnel within the organization.

Style

Cultural style of the organization and how key managers behave in achieving the organization's goals. For example an organisation could adopt a role culture or a task culture.

Shared Values

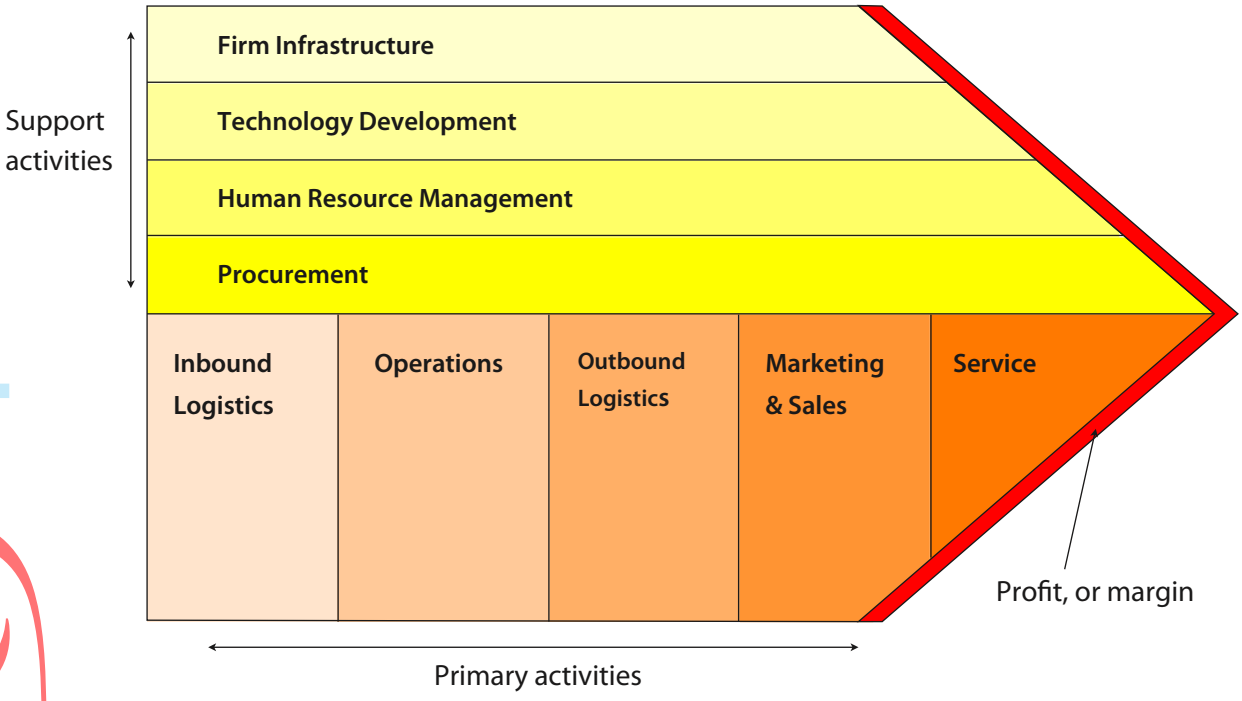
What the organization stands for and what it believes in. Central beliefs and attitudes.

The upper three elements on the dark background are the 'hard Ss' , meaning that they are relatively easy to describe and define. Many organization focus too much on these because they are easy to define and describe.

The lower three on the white background and the central element are the 'soft Ss' and are less easy to describe and define. Therefore, these tend to be ignored.

Additionally, all the elements are all inter-dependant so that changing one will affect others. For example, the introduction of a new production system will probably affect skills structure, style and staff. It could even have an impact on strategy if it allowed, for example, more flexible production.

2.6 The value chain



This model represents organizations by setting out the activities they carry out.

Firm infrastructure, technology development, human resources and procurement are known as support activities (mostly indirect-costs). The other activities are primary activities.

By carrying out these activities organization can manage to make profits. However, it is essential for the organization to know what gives the right (or ability) to make profits.

Why do customers pay enough to allow a profit to be made? It might be because:

- The organization possesses knowhow that customers pay for
- The organization offers flexibility
- The organization offers economies of scale
- The organization take on risks

Whatever it is that customers value is the key to an organisation's success and its performance there needs to be carefully managed. The organisation also has to be careful about changing or removing activities or performance that customers value. If an organisation is left carrying out tasks that are not valued by customers, how will the organisation survive? Short term performance improvements in one area might lead to long-term performance decreases in another.

Chapter 6

EFFECT OF INFORMATION TECHNOLOGY ON STRATEGIC MANAGEMENT ACCOUNTING

1. Introduction

This chapter considers the impact of IT on management accounting. There is a lot of terminology, which may or may not be already familiar to you. You are unlikely to be tested on specific terminology, but you should be aware of the various items listed in this chapter.

2. Information needs of traditional manufacturing businesses

Manufacturing businesses need information areas:

- Costs: material, labour overheads
- Efficiency
- Orders
- Inventory (raw material, work-in-progress, finished goods)
- Quality
- Major customers and their buying habits
- Sales by product, customer, season, country.
- Time for the manufacturing process to allow scheduling
- Resources
- Competitors' products and prices
- Innovation: new products being developed

3. Service oriented businesses

The nature of what is provided by service orientated businesses is often different to what manufacturing businesses provide in the following respects:

Heterogeneity: manufacturing often produces many identical units; service industries often produce tailored products eg an audit. Costing information and efficiency measurement will be quite different. Pricing will be very different as customer (or clients) will find it more difficult to judge prices.

Perishability: many services are perishable ie they lose their value after a certain time. An example is airline seats: once the aircraft departs the seats have no value. Again, this presents interesting pricing challenges. Performance will be improved by attracting each extra passenger at the maximum marginal price, but if everyone knows that prices will fall near the departure date, passengers will be encouraged to postpone booking until prices reduce.

Intangibility: it is difficult to show potential customer what they will get for their money. Auditing firms cannot show clients an audit or audit file so how can potential clients judge value for money?

Simultaneity: in manufacturing, production and sale can be separated. This allows products to be quality checked before dispatch and allow flexibility in timing. For example, production can be carried out steadily throughout the year and inventory can be stored until busy sales periods. Services cannot be stored and are often instantly delivered. This places additional demands on scheduling, pricing and quality control information

No transfer of ownership. Often services or the use of a service provider is for a limited period of time. Pricing and demand information has to reflect this. For example, the pricing of hotel rooms will vary from week-days to weekends. In addition because a service is being provided for a limited period only, consumers are likely to be very demanding during that period.

The information needed to perform well when providing a service will often be more related to qualitative than quantitative aspects. For example, reputation, customer satisfaction, availability of the service when required,

4. Instant access to data

IT has made it possible to access data and information **instantly**. This should mean that delays between events, processing the results of those events and feedback to alter future events should be much shorter. With manual accounting systems it took significant time to collect and process results, prepare reports and for those reports to be distributed to managers. Now is common for managers to have daily update on events (for example sales of many different products in supermarkets) and to take action to improve performance much more quickly. Indeed this can often be in **real time**. For example, as a particular airline flight receives bookings, air fares can be changed many times per day to try to maximize the marginal revenue that can be earned.

You should be aware of the following terminology:

Databases:	large amounts of data are held in a way that allows many diverse users to access the data and to update it. Every will see the data in the same state ie it is consistent. Controls are needed to ensure that the data is held securely and confidentially.
Data warehouse:	a vast amount of data. For example, supermarkets recording every loyalty card owner's purchases.
Data mining:	searching through a data warehouse in the hope of finding information of use – particularly unexpected useful information.
Groupware:	allows users to collaborate. An example is Lotus Notes.
Internet:	gives access to websites. Searches can be made on keywords (eg using Google) to find sites that might be of use.
Intranets:	an internal internet. Very useful for distributing information within an organisation
Extranets:	an organisation's intranet given access to another's intranet.
ERP	(Enterprise resource planning). A system that integrates internal and external management information across an entire organization, including: finance/accounting, manufacturing, sales and service, customer relationship management, etc. ERP systems automate these activities with an integrated software application and they facilitate the flow of information between all business functions of the organization.
MIS:	(Management information systems). Used for structured decision- making ie where there is a correct answer.

DSS: (Decision support system).
Helps managers to cope with unstructured decisions such as what should next year's budget show. Spreadsheets are a good example.

EIS: (Executive information systems).
Used by top management. Flexible with the ability to 'drill down' to more and more detailed information. Access to external information is essential at this level.

ES: (Expert systems).
These can make decisions that replicate the decisions an expert would make. They rely on extracting knowledge from the expert and storing this in a knowledge base. Situations can then be presented to the system which uses the knowledge base to come to a conclusion or recommendation.The type of data needed depends on the management level:

Management level	*Characteristics of the information*
Strategic	Highly summarised Often using estimates about the future Often non-routine High need for external information
Tactical	A mix of the characteristics of strategic and operational
Operational	Very detailed Usually historical Routine Mostly internal

5. Remote input of data

Traditionally, data was input into the computer systems using a keyboard. This takes time, and inevitably results in input errors.

IT has enabled more and more data to be input remotely and/or automatically. You should be aware of the uses of the following:

- Laptop/notebook computers often with WiFi or 3G (or 4FG) connectabiity allow sales personnel to contact head office to check on inventory and to enter new orders.
- Handheld devices (including smartphones and iPads) can be used to input inventory counts and update production statistics
- Barcodes (standard super-market technology)
- RFID tags (radio frequency identification tags). RFID tags are tracking consumer products worldwide. Many manufacturers use the tags to track the location of each product they make from the time it's made until it's pulled off the shelf and tossed in a shopping cart.

6. The need for continual development

However well a management accounting system has been designed, it is vitally important that it is continually re-appraised, refined and developed if a business is to maintain or improve its performance.

The marketplace is increasingly competitive and increasingly global, creating different information needs for management.

1. Big Data

There are many definition the term 'big data' but most suggest something like the following:

"Extremely large collections of data (data sets) that may be analysed to reveal patterns, trends, and associations, especially relating to human behaviour and interactions."

In addition, many definitions also state that the data sets are so large that conventional methods of storing and processing the data will not work.

In 2001 Doug Laney, an analyst with Gartner (a large US IT consultancy company) stated that big data has the following characteristics, known as the 3Vs:

- Volume
- Variety
- Velocity

These characteristics, and sometimes additional ones, have been generally adopted as essential qualities of big data.

Variety:
disparate non-uniform data of different sizes, sources, shape, arriving irregularly, some from internal sources and some from external sources, some structured, but much of it is unstructured

Velocity:
data arrives continually and often has to be processed very quickly to yield useful results

Volume:
a very large amount of data. More than can be easily handled by a single computer, spreadsheet or conventional database system

The commonest fourth 'V' that is sometimes added is veracity: Is the data true? Can its accuracy be relied upon?

Volume

The volume of big data held by large companies such as Walmart (supermarkets), Apple and EBay is measured in multiple petabytes. What's a petabyte? It's 1015 bytes (characters) of information. A typical disc on a personal computer (PC) holds 109 bytes (a gigabyte), so the big data depositories of these companies hold at least the data that could typically be held on 1 million PCs, perhaps even 10 to 20 million PCs.

These numbers probably mean little even when converted into equivalent PCs. It is more instructive to list some of the types of data that large companies will typically store.

- **Retailers**

  Via loyalty cards being swiped at checkouts: details of all purchases you make, when, where, how you pay, use of coupons.

  Via websites: every product you have every looked at, every page you have visited, every product you have ever bought. (To paraphrase a Sting song "Every click you make I'll be watching you".)

- **Social media (such as Facebook and Twitter)**

  Friends and contacts, postings made, your location when postings are made, photographs (that can be scanned for identification), any other data you might choose to reveal to the universe.

- **Mobile phone companies**

  Numbers you ring, texts you send (which can be automatically scanned for key words), every location your phone has ever been whilst switched on (to an accuracy of a few metres), your browsing habits. Voice mails.

  Internet providers and browser providers

  Every site and every page you visit. Information about all downloads and all emails (again these are routinely scanned to provide insights into your interests). Search terms you enter.

- **Banking systems**

Every receipt, payment, credit card payment information (amount, date, retailer, location), location of ATM machines used.

Variety

Some of the variety of information can be seen from the examples listed above. In particular, the following types of information are held:

- Browsing activities: sites, pages visited, membership of sites, downloads, searches
- Financial transactions
- Interests
- Buying habits
- Reaction to ads on the internet or to advertising emails
- Geographical information
- Information about social and business contacts
- Text
- Numerical information
- Graphical information (such as photographs)
- Oral information (such as voice mails)
- Technical information, such as jet engine vibration and temperature analysis

This data can be both structured and unstructured:

- **Structured data:** this data is stored within defined fields (numerical, text, date etc) often with defined lengths, within a defined record, in a file of similar records. Structured data requires a model of the types and format of business data that will be recorded and how the data will be stored, processed and accessed. This is called a data model. Designing the model defines and limits the data that can be collected and stored, and the processing that can be performed on it.

  An example of structured data is found in banking systems, which record the receipts and payments from your current account: date, amount, receipt/payment, short explanations such as payee or source of the money.

  Structured data is easily accessible by well-established database structured query languages.

- **Unstructured data:** refers to information that does not have a pre-defined data-model. It comes in all shapes and sizes and this variety and irregularities make it difficult to store it in a way that will allow it to be analysed, searched or otherwise used. An often quoted statistic is that 80% of business data is unstructured, residing it in word processor documents, spreadsheets, PowerPoint files, audio, video, social media interactions and map data.

Velocity

Information must be provided quickly enough to be of use in decision making. For example, in the above store scenario, there would be little use in obtaining the price-comparison information and texting customers once they had left the store. If facial recognition is going to be used by shops and hotels, it has to be more-or less instant so that guests can be welcomed by name.

You will understand that the volume and variety conspire against the third, velocity. Methods have to be found to process huge quantities of non-uniform, awkward data in real-time.

Software for big data

Without getting too technical on this issue, a library of software known as Apache Hadoop is specifically designed to allow for the distributed processing of large data sets (ie big data) across clusters of computers using simple programming models. (Clusters of computers are needed to hold the vast volume of information.) Hadoop is designed to scale up from single servers to thousands of machines, each offering local computation and storage.

The processing of big data is generally known as big data analytics and includes:

- Data mining: analysing data to identify patterns and establish relationships such as associations (where several events are connected), sequences (where one event leads to another) and correlations.
- Predictive analytics: a type of data mining which aims to predict future events. For example, the chance of someone being persuaded to upgrade a flight.
- Text analytics: scanning text such as emails and word processing documents to extract useful information. It could simply be looking for key-words that indicate an interest in a product or place.
- Voice analytics: as above with audio.
- Statistical analytics: used to identify trends, correlations and changes in behaviour.

Google provides web-site owners with Google Analytics that will track many features of web-site traffic. For example, Google analytics on the OpenTuition.com reports statistics such as the following:

Geographical distribution of users:

Country	Sessions	% of Total
	626,439	626,439
1. United Kingdc	150,403	24.01%
2. Malaysia	41,189	6.58%
3. Pakistan	29,862	4.77%
4. India	27,587	4.40%
5. United States	24,181	3.86%
6. Nigeria	21,210	3.39%
7. Mauritius	18,572	2.96%
8. Ireland	18,335	2.93%
9. Kenya	16,132	2.58%
10. Singapore	14,772	2.36%

Type of browser used

		626,439 % of Total: 100.00% (626,439)
1.	Chrome	300,165 (47.92%)
2.	Safari	96,107 (15.34%)
3.	Internet Explorer	82,165 (13.12%)
4.	Firefox	70,411 (11.24%)
5.	Android Browser	21,429 (3.42%)
6.	Opera Mini	19,095 (3.05%)

Age of user

Age	Sessions	
		363,970 % of Total: 58.10% (626,439)
1.	25-34	170,225 (46.77%)
2.	18-24	102,618 (28.19%)
3.	35-44	56,652 (15.57%)
4.	45-54	22,648 (6.22%)
5.	55-64	8,318 (2.29%)
6.	65+	3,509 (0.96%)

The final table is instructive. OpenTuition.com does not ask for users' ages, so this data has been pieced together from other information available to Google; it has been able to do this for only about 58% of users.

The analytical findings can lead to:

- Better marketing
- Better customer service and relationship management
- Increased customer loyalty
- Increased competitive strength
- Increased operational efficiency
- The discovery of new sources of revenue.

Dangers of big data

Despite the examples of the use of big data in commerce, particularly for marketing and customer relationship management, there are some potential dangers and drawbacks.

- **Cost:** It is expensive to establish the hardware and analytical software needed, though these costs are continually falling.
- **Regulation:** Some countries and cultures worry about the amount of information that is being collected and have passed laws governing its collection, storage and use. Breaking a law can have serious reputational and punitive consequences.
- **Loss and theft of data:** Apart from the consequences arising from regulatory breaches as mentioned above, companies might find themselves open to civil legal action if data were stolen and individuals suffered as a consequence.
- **Incorrect data (veracity):** If the data held is incorrect or out of date incorrect conclusions are likely. Even if the data is correct, some correlations might be spurious leading to false positive results.
- **Employee monitoring:** data collection methods allow employees to be monitored in detail every second of the day. Some companies place sensors in name badges so that employee movements and interactions at work can be monitored. The badged monitor to whom each employee talks and in what tone of voice. Stress levels can be measured from voice analysis also. Obviously, this information could be used to reduce stress levels and to facilitate better interactions but you will easily see how it could easily be used to put employees under severe pressure.

Chapter 7

EXTERNAL INFLUENCES ON ORGANISATIONAL PERFORMANCE

1. Introduction

The business environment has been changing rapidly in recent years due to factors such as:

- Increased competition
- Globalisation
- Privatisation
- Technology in general; information technology; the Internet
- Rapid changes in customer requirements
- New approaches to manufacturing e.g. just-in-time; dedicated cells.

2. Government influences

Government policies and decisions can affect organizations in the following ways:

- Environmental protection
- The level of public expenditure
- Incentive schemes (eg to set up businesses in certain areas)
- Exchange rates
- Interest rates
- Tax rates
- Consumer and employee protection legislation
- Legislation on restrictive practices (eg industries protecting themselves)
- Monopolies and merger legislation.

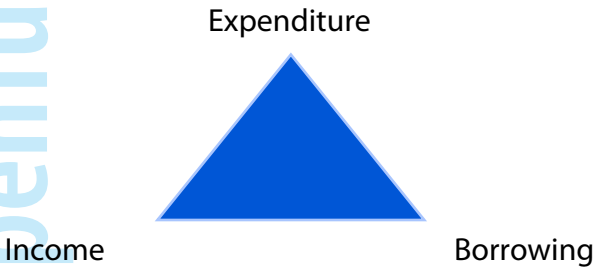
Michael Porter has identifies seven ways in which a government can affect the structure of an industry:

- Capacity expansion eg encouraging new businesses
- Demand eg more government spending can increase demand
- Divestment and exit from industries
- Control of emerging industries
- Entry barriers to products (quotas and tariffs)
- Competition policy
- New product adoption eg how approval is given.

3. Fiscal and monetary policy

These are the two economic tools that governments use to regulate the economy

3.1 Fiscal policy



The government balances income, expenditure and borrowing. Income arrises mainly from taxation. If the government wants to spend more it either has to increase its income from taxes or it must borrow more.

The financial crisis has shown that many governments had created very high borrowings and to reduce these, particularly in Europe, austerity measures had to be introduced and governments were forced to reduce their expenditure.

In most Western countries, government expenditure is about 40 - 50% of all expenditure, so governments policies and spending decisions have a very powerful effect on organizations

3.2 Monetary policy

This approach to economic control attempts to manage the supply of money. This can be done through:

- Interest rates.
- Money supply (eg governments 'printing' money).
- Reserve requirements (what proportion of money deposited by customers may banks lend to other customers).
- Credit controls (eg if a person is buying an item on credit, what is the minimim deposit they must give)

4. The limitations of traditional management accounting techniques

You have studied traditional management accounting techniques, such as variance analysis, for earlier examinations.

It has however been argued that in today's environment they are less than adequate. Listed below are some examples of areas where traditional management accounting is criticised.

- **Absorption of overheads**

  Traditional product costing tends to be absorption costing, absorbing the overheads on a labour hour basis. In a modern environment, with more automation and a higher proportion of fixed costs, an activity based costing approach is more appropriate.

- **Process costing**

  The traditional approach to cost accounting in a manufacturing business involves accounting for costs process by process as raw materials are transformed into finished goods.

  In the modern environment with just-in-time systems there is very little work-in-progress and the conventional process costing approach involves a great deal of work but gains little. A backflush costing approach would be more appropriate.

- **Designing costs out of production**

  The focus of traditional management accounting tends to be on reducing costs at the production stage, whereas most costs tend to be determined at the design stage. Therefore a product lifetime costing approach is needed.

- **Over-focusing on production costs**

  Many costs are driven by customers (such as service delivery costs and discounts), but traditional management accounting tends to focus on production costs. It may not therefore be realised that the company is trading with some customers at a loss. A customer profitability analysis approach would be more appropriate.

- **Variance analysis**

  Traditional variance analysis tends to focus on direct costs rather than on overheads, whereas in most businesses overheads are more controllable than direct costs.

- **Labour costs**

  Often more like fixed costs than their conventional treatment as variable

5. Customer profitability analysis (CPA)

CPA is an application of Activity Based Costing techniques to customers.

Traditionally, ABC is applied to products but in a modern business environment in which it is vital that organisations respond promptly to the demands of customers, analysis on the basis of customers can provide vital management information.

The approach is exactly the same as the 'normal' activity based approach, except that we attempt to identify the profitability of each type of customer.

We can then identify unprofitable types of customer and attempt to persuade them to alter their buying behaviour so they become profitable customers.

This approach also identifies where we should focus our cost reduction efforts.

Example 1

Vilnius Ltd manufactures components for the heavy goods vehicle industry.

The following annual information regarding three of its key customers is available.

	X	*Y*	*Z*
Gross margin	US$897,000	US$1,070,000	US$1,056,000
Orders placed	200	320	700
Sales visits	80	100	140
Invoices raised	200	320	700

The company uses an activity based costing system and the analysis of customer-related costs is as follows.

Sales visits	$420 per visit
Order processing	$190 per order placed
Despatch costs	$350 per order placed
Billing and collections	$97 per invoice raised

Using customer profitability analysis, how would the customers be ranked?

5.1 Customer profitability statement

There is no set format for the statement, but it would normally be similar to the one below.

	$'000	*$'000*
Revenue at list prices		100
Less: discounts given		8
Net revenue		92
Less: cost of goods sold		50
Gross margin		42
Less: customer specific costs	28	
financing costs:		
credit period	3	
customer specific inventory	2	
		33
Net margin from customer		9

Example 2

Frodo Ltd supplies shoes to Sam Ltd and Gollum Ltd. Each pair of shoes has a list price of $50 and costs Frodo Ltd $25. As Gollum buys in bulk it receives a 10% trade discount for every order for 100 pairs of shoes or more. Sam receives a 15% discount irrespective of order size, because that company collects the shoes, thereby saving Frodo Ltd any distribution costs. The cost of administering each order is $50 and the distribution cost is $1,000 per order. Sam makes 10 orders in the year, totalling 420 pairs of shoes, and Gollum places 5 orders of 100 pairs each.

Which customer is the most profitable for Frodo Ltd?

6. Activity-based costing and activity-based management

Traditional accounting for production overheads lumps them together and then usually absorbs them on a labour hour or machine hour basis. This is a very crude approach.

Modern manufacturing techniques are much more automated than previously and this increases the proportion of manufacturing costs that are fixed (whereas there is lower proportion of costs from direct labour). It is therefore that fixed costs are accounted for as accurately as possible.

Activity based costing tries to identify what activities causes costs (the cost drivers) then accounts for the fixed costs on the appropriate bases.

Example 3

	Product A	*Product B*
Demand (units)	1,000	200
Unit cost card	$	$
Marginal cost	50	80
Fixed cost	30	60
Total absorption cost	80	140
Mark-up (50%)	40	70
Selling price	120	210

Investigation shows that 1/3 of fixed costs relate to batch set-up costs and 2/3 relate to time in the factory. Each unit of B takes twice as long to make as a unit of A. Product A is made in batches of 500 units; Product B in batches of 100 units.

Recalculate the data using an activity based costing approach.

Activity-based management (ABM) is a method of identifying and evaluating activities that a business performs using activity-based costing to carry out a value chain analysis or a re-engineering initiative to improve strategic and operational decisions in an organization. Activity-based costing establishes relationships between overhead costs and activities so that overhead costs can be more precisely allocated to products, services, or customer segments. Activity-based management focuses on managing activities to reduce costs and improve customer value.

Operational ABM is about "doing things right", using ABC information to improve efficiency. Those activities which add value to the product can be identified and improved. Activities that don't add value are the ones that need to be reduced to cut costs without reducing product value.

Strategic ABM is about "doing the right things", using ABC information to decide which products to develop and which activities to use. This can also be used for customer profitability analysis, identifying which customers are the most profitable and focusing on them more.

7. Value analysis

Value analysis is the examination and assessment by an organization of a product's features to ensure that its cost is no greater than is necessary to carry out its functions.

The product's functions are again determined by customers and the company must examine the factors affecting the cost of a product or service in order to attempt to reduce costs whilst still delivering the required standard of quality and reliability.

Note that some costs are associated with a product's functional and some with its esteem value. Luxury and cheap products might carry out the same function but the styling or quality of the luxury product might be essential in the eyes of consumers. It is important for the manufacturer damages neither function nor esteem value when trying to reduce costs.

A **value added activity** is one which adds value to the customer's perception of a product or service, whereas a **non-value added activity** is one that does not add value in the eyes of the customer.

Costs that do not add value to the product should be targeted for elimination. However, this is not always the case – the removal of some non-value added activities (such as quality control) could add further costs.

A further classification is the breakdown of activities between **core** (such as time spent with potential customers), **support** (such as travelling time to customers), and **discretionary** (such as correcting accounting errors).

Effective cost management is about reducing or eliminating costs spent on non-core activities.

8. Dedicated cells

Many production lines involve many separate processes – for example, cutting, painting, drilling. The traditional approach is often to have teams of people for each separate process. The material is cut in one process by one team of people, then moves to the next process where it is painted by another team of people, and so on.

This 'production line' approach does mean that each team becomes very skilled at their particular task, which can lead to efficiency savings.

However, a downside of this approach is that employees lose motivation and lose concern for quality, because they do not feel any responsibility for the final product (and in fact often will not even see the finished product).

A potential remedy for this is the 'dedicated cell' approach. Here the workforce is split into small teams comprising workers skilled at each of the various functions. For example one team might comprise one cutter, one painter, and one driller.

Each team is therefore responsible for all aspects of the production up to the finished product. Each member of the team feels more responsibility to other members of their team, and for the overall quality of the finished product.

9. Contingency Theory

The contingency approach to management accounting is based on the idea that there is no universally appropriate accounting system applicable to all organisations in all circumstances. Efficient systems depend on the awareness of the system designer of the specific environmental factors which influence their creation.

The following is a very simplified illustration of the idea:

Petras makes three different products: X, Y and Z. He has never had any competitors, and every month the managing director receives a report in the following form:

	$
Sales	10,000
Production costs	5,000
Gross profit	5,000
Administrative costs	1,000
Net profit	4,000

Another company, Quixas, has entered the market for products X and Y, undercutting the prices charged by Petras, and has started to win some of Petras's customers.

The managing director asks the management accountant for information about the profitability of X and Y. Sales information is easy to analyse, but to analyse cost information requires a new system of coding to be introduced. Eventually the management accountant comes up with the following report:

	X	Y	Z	Total
Sales	3,000	3,000	4,000	10,000
Production costs	500	500	4,000	5,000
Gross profit	2,500	2,500	–	5,000
Administrative costs				1,000
Net profit				4,000

As a result of receiving this information, the managing director reduces the prices of X and Y, and also divides the production function into two divisions, one of which will concentrate exclusively on reducing the costs of product Z while maintaining quality.

This is a simple illustration of contingency theory in that the original design of the accounting system was determined by the fact that Petras faced a highly predictable environment, and was a highly centralised organisation.

The design of the new system is the result of a new set of **contingent variables** – the entry of Quixas into two of Petras's markets requires the system to adopt a different reporting structure for X and Y, and more detailed analysis of costs in the case of Z. This is matched by a change in the structure of the organisation as a whole.

To recap, the aim of contingency theory is to identify specific features of an organisation's context that affect the design of particular features of that organisation's accounting system.

10. Institutional theory

You might have heard a phrase such as "He/she has become institutionalised". It is often used in the context of someone who has spent a long time in hospital, care or prison. When we say that they have become institutionalised we mean that they have been conditioned to act in a particular way and they would find it hard to change if given the opportunity.

Procedures and people in commercial organisations become institutionalised. For example, management accounting systems are influenced by legal requirements, culture and the copying of successful firms. This can mean that it is difficult for accounting systems to 'break free' from what is accepted as normal and this could hinder organisations' progress.

Burns and Scapens (2000) sought to provide a framework describing the process of institutionalisation. The main concern of their framework was to understand the processes through which management accounting rules and routines become taken-for-granted assumptions and so become institutionalised within the organisation.

As such, management accounting systems, for example the budgeting system, carry the values of rationality and financial orientation, which if taken-for-granted can become institutionalised.

However, Burns and Scapens also note that not all newly introduced accounting rules and routines will necessarily become institutionalised. In particular, if new management accounting systems and practices challenge the prevailing institutions (ie the currently accepted way of doing things) in the organisation, they may not be widely adopted and may fail to become an institutionalised basis for behaviour. This framework has been used by various researchers to study management accounting change – or lack of it.

Chapter 8

RISK AND UNCERTAINTY

1. Introduction

Risk and uncertainty is a topic on which you have been examined previously, but is deemed knowledge and it therefore repeated here as revision.

Decision making involves making decisions now which will affect future outcomes which are unlikely to be known with certainty.

Risk exists where a decision maker has knowledge that several possible outcomes are possible – usually due to past experience. This past experience enables the decision maker to estimate the probability or the likely occurrence of each potential future outcome.

Uncertainty exists where the future is unknown and where the decision maker has no past experience on which to base predictions.

Whatever the reasons for the uncertainty, the fact that it exists means that there is no ‚rule' as to how to make decisions. For the examination you are expected to be aware of, and to apply, several different approaches that might be useful.

2. Risk preference

As will be illustrated by an example, the approach taken to make the decision will depend on the decision-makers attitude to risk.

A risk seeker will be interested in the best possible outcome, no matter how small the change that they may occur.

Someone who is risk neutral will be concerned with the most likely or 'average' outcome.

A risk avoider makes decisions on the basis of the worst possible outcomes that may occur.

Example 1

John has a factory capacity of 1,200 units per month.

Units cost him $6 each to make and his normal selling price is $11 each. However, the demand per month is uncertain and is as follows:

Demand	*Probability*
400	0.2
500	0.3
700	0.4
900	0.1

He has been approached by a customer who is prepared to contract to a fixed quantity per month at a price of $9 per unit. The customer is prepared to sign a contract to purchase 300, 500, 700 or 800 units per month.

The company can vary production levels during the month up to the maximum capacity, but cannot carry forward any unsold units in stock.

(c) Calculate all possible profits that could result

(d) Determine for what quantity John should sign the contract, under each of the following criteria:

(i) expected value
(ii) maximin
(iii) maximax
(iv) minimax regret

(e) What is the most that John would be prepared to pay for perfect knowledge as to the level of normal demand?

6. The limitations of expected values.

Although we say that someone who is risk neutral would take an expected value approach to decision making, there three two serious limitations of this approach:

- The expected value is not usually 'expected'.
- The expected value gives no indication of the risk.
- The estimation of the probabilities is very unreliable

Example: mutually exclusive projects ($'000)

Project cost = 3,800

State of the world	*P*	*Project A income*	*Project B income*	*P x Project A*	*P x Project B*
I	0.6	2,000	4,000	1,200	2,400
II	0.4	10,000	6,500	4,000	2,600
			Expected values	5,200	5,000

The expected value of the income from both projects is greater than the cost of 3,800 so both appear worthwhile and Project A seems to be preferable as it has a higher expected value.

However neither of the expected values of 5,200 or 5,000 is expected to occur: the only possible results seem to be 2,000, 4,000, 6,500 and 10,000. If Project A were chosen, there is a greater than evens chance that only 2,000 will be earned, creating a loss of 1,800 (ie 2,000 – 3,800). Project B is never expected to produce a loss. Perhaps Project B is preferable?

Chapter 9

SOURCES OF MANAGEMENT INFORMATION

1. Introduction

This chapters considers the information needs of an organisation, particularly in respect of control systems to ensure that the organisation maintains performance.

2. Information needs for different levels of decision making

The different levels of decision making were discussed in the previous chapter. The information needs of the decision makers will be different and depend on the type of decision.

2.1 Strategic planning

The information needed at this level is likely to be more external information and is likely to be more forecasts of the future.

2.2 Management control / Tactical planning

At this level there will be a need for both external and internal information. The focus is also more likely to be on current information.

2.3 Operational control

Here the information needs will almost exclusively be internal, and will be past and current information.

3. Sources of information

3.1 Internal sources of information

Source	*Information*
Sales ledger system	Number and value of invoices Volume of sales Value of sales, analysed by customer Value of sales, analysed by product
Purchase ledger system	Number and value of invoices Value of purchases, analysed by supplier
Payroll system	Number of employees Hours worked Output achieved Wages earned Tax deducted
Fixed asset system	Date of purchase Initial cost Location Depreciation method and rate Service history Production capacity

In addition the following internal, non-accounting sources may be used

Source	*Information*
Production	Machine breakdown times Output achieved Number of rejected units
Sales and marketing	Types of customer Market research results Demand patterns, seasonal variations etc

3.2 External courses of information

There is much information to be obtained from external sources as illustrated below:

Source	*Information*
Suppliers	Product prices Product specifications
Newspapers, journals	Share price Information on competitors Technological developments National and Market surveys
Government	Industry statistics Taxation policy Inflation rates Demographic statistics Forecasts for economic growth
Customers	Product requirements Price sensitivity
Employees	Wage demands Working conditions
Banks	Information on potential customers Information on national markets
Business enquiry agents	Information on competitors Information on customers
Internet	Almost everything via databases (public and private), discussion groups and mailing lists.

4. Attributes of good information

In order to be useful to management, information should possess the following attributes: [ACCURATE]

Accurate:	Sufficient for its purpose. Note that at higher managerial levels information does not normally need to be as accurate as at lower levels
Complete:	Obviously, incomplete information is likely to mislead
Cost-beneficial:	Benefits should exceed costs
User-targeted:	It should provide the information by needed by the user to make the decision/perform the job
Relevant:	Irrelevant information distracts and wastes people's time.
Authoritative:	Well, you know how unreliable some web-site data is: sometimes deliberately misleading, sometimes sloppy, sometimes out-of-date.
Timely:	Information should be received quickly enough to enable better decisions. There is no need for all information to be 'instantly' available and speed often has a cost.
Easy to use:	Well-set out and annotated.

Another mnemonic is **PAIL.** This can be used to assess the quality of reports:

Purpose	What is the purpose of the information or report. What should it highlight? What is the important information it has to get convey?
Audience	Care has to be taken to assess the appropriate level of detail, layout and terminology used in reports so that users will properly understand the information that is provided.
Information.	The information provided must match the purpose of the performance report. In particular, non-financial performance is a very important determinant of the long term success of any enterprise.
Layout.	Layout must help users to understand the information presented and to see quickly the important amounts, trends, results and explanations.

One of the most common criticisms of reports is that they present too much information and are much too cluttered. There might be valuable information there but it is almost impossible to find and interpret it. There is always the suspicion that large volumes of information have been deliberately provided to obfuscate the facts and to blunt the message.

Although graphical information can be presented in a misleading way, graphical displays can be used to greatly enhance the impact and understanding of information.

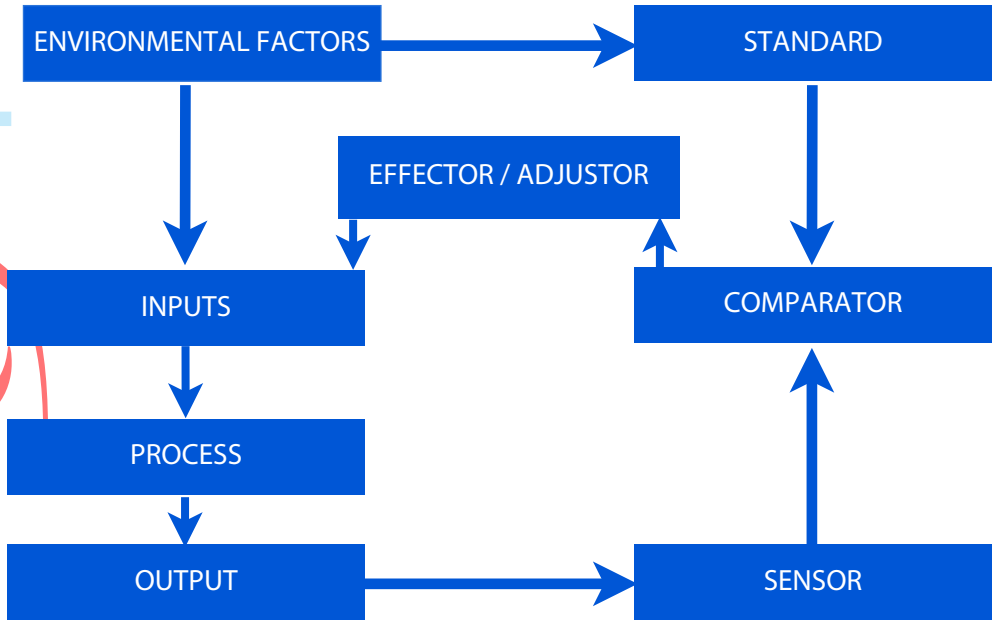
5. Control systems

Control systems are necessary throughout an organisation in order to monitor performance so that corrective action may be taken where appropriate.

An example is a budgetary control system, where costs might be compared against budget and action taken to attempt to correct any over-spends.

Another example is a quality control system, where production is compared against pre-defined standards, and again appropriate action is taken when the quality deviates from the standard.

All control systems operate in the same basic way, and you should be aware of the diagram below and the terminology.



6. Feedback / feedforward control

Feedback control is where the outputs of a process are measured and information is then provided regarding corrective action, after the outputs have been produced.

Variance analysis is an example of this. At the end of (say) each month, variances are calculated. If there is an overspend in January, then attempts will be made to correct the problem for the future. It is however too late to do anything about January!

Feed forward control is where a problem is identified in advance and corrective action taken - before the problem occurs.

An example of this is one use of the budgeting process. If a budget is prepared for the coming year and forecasts an unacceptably low profit, then ways will be looked for of changing plans in order to increase the profit. For example, increasing selling prices or cutting costs.

7. Negative / positive feedback

These terms refer to the way that feedback results in control.

Negative feedback is where the control mechanism reduces the problem, and is what we would desire to achieve. For example if actual costs are above budgeted costs, negative feedback would be applied

Positive feedback however, is where the departure from the plan is to be encouraged. For example, if sales are ahead of budget the organisation would try to encourage that behaviour.

8. Integrated reporting

8.1 Definition

Integrated reporting:

- Is a concise communication of an organisation's strategy, governance and performance.
- Demonstrates the links between its financial performance and its wider social, environmental and economic context.
- Shows how organisations create value over the short, medium and long term.

Its aim is to:

- Enable more effective decision making at board level.
- Improve the information available to investors.
- Encourage more integrated thinking and business practices.

It is encouraged by the International Integrated Reporting Council.

8.2 Guiding principles

The following Guiding Principles underpin the preparation of an integrated report, informing the content of the report and how information is presented:

- **Strategic focus and future orientation**

  An integrated report should provide insight into the organisation's strategy, and how it relates to the organisation's ability to create value in the short, medium and long term, and to its use of and effects on the capitals

- **Connectivity of information**

  An integrated report should show a holistic picture of the combination, interrelatedness and dependencies between the factors that affect the organisation's ability to create value over time

- **Stakeholder relationships**

  An integrated report should provide insight into the nature and quality of the organisation's relationships with its key stakeholders, including how and to what extent the organisation understands, takes into account and responds to their legitimate needs and interests

- **Materiality**

  An integrated report should disclose information about matters that substantively affect the organisation's ability to create value over the short, medium and long term

- **Conciseness**

  An integrated report should be concise.

- **Reliability and completeness**

  An integrated report should include all material matters, both positive and negative, in a balanced way and without material error

- **Consistency and comparability**

  The information in an integrated report should be presented:

  (a) on a basis that is consistent over time; and

  (b) in a way that enables comparison with other organisations to the extent it is material to the organisation's own ability to create value over time.

8.3 Content elements

An integrated report includes eight Content Elements that are fundamentally linked to each other and are not mutually exclusive:

- **Organisational overview and external environment**

  What does the organisation do and what are the circumstances under which it operates?

- **Governance**

  How does the organisation's governance structure support its ability to create value in the short, medium and long term?

- **Business model**

  What is the organisation's business model?

- **Risks and opportunities**

  What are the specific risks and opportunities that affect the organisation's ability to create value over the short, medium and long term, and how is the organisation dealing with them?

- **Strategy and resource allocation**

  Where does the organisation want to go and how does it intend to get there?

- **Performance**

  To what extent has the organisation achieved its strategic objectives for the period and what are its outcomes in terms of effects on the capitals?

- **Outlook**

  What challenges and uncertainties is the organisation likely to encounter in pursuing its strategy,and what are the potential implications for its business model and future performance?

- **Basis of presentation**

  How does the organisation determine what matters to include in the integrated report and how are such matters quantified or evaluated?

Chapter 10

FINANCIAL PERFORMANCE MEASUREMENT

1. Introduction

It is very common in the examination to be given information about a company and to be asked to comment on the performance. It is clearly important in practice to have measures in order to determine whether or not the company is performing well.

It is important to measure both financial and non-financial performance, but in this chapter we will consider only financial performance. You will be given extracts from the company's accounts for several years and be expected to analyse and interpret this information.

2. Approach

Although you must be aware of several key measures of financial performance, it is important that you do not fall into the trap of simply calculating every ratio imaginable for every year available. What the examiner is after is much more of an over-view and being able to determine the key measures and to comment adequately.

The following points should be considered:

2.1 What is it that you are being asked to comment on?

For example, if you are looking at the information from the shareholders' perspective, then growth (or otherwise) in the share price will be of great interest.

However, if you are looking at how well the managers are performing, the growth (or otherwise) in the profit (to the extent to which they control it) is perhaps of more importance.

2.2 Growth:

Always make some comment as to the level of growth. The amount of detail required depends on the information available and the number of marks allocated, but growth in turnover, in profit, and in share price are all potentially relevant.

Look at the overall level of growth and look for any trends, do not waste time doing detailed year- by-year analysis.

2.3 Areas for analysis:

Subject again to exactly what you are being asked to comment on, the following areas are likely to be worthy of consideration:

Profitability – how well a company performs, given its asset base

Liquidity – the short term financial position of the company

Gearing – the long-term financial position of the company

Investors' ratios – how well investors will appraise the company

2.4 Bases for comparison:

Most measures mean little on their own, and are only really useful when compared with something. Depending on the information given in the question, any comparison is likely to be with one of the following:

- Previous years for the same company
- Other similar companies
- Industry averages

3. Common ratios

The following is a list of the most common ratios that may be appropriate. However, do not simply calculate every ratio for every question – think about what you are trying to consider and choose the most appropriate ratios. If relevant by all means calculate additional ratios – there is no one set of ratios.

3.1 Profitability ratios

(a) Return on capital employed (ROCE) $= \dfrac{\text{Profit before interest and tax (PBIT)}}{\text{Capital employed}} \%$

(b) Net profit margin $= \dfrac{\text{PBIT}}{\text{Turnover}} \%$

(c) Gross profit margin $= \dfrac{\text{Gross profit}}{\text{Turnover}} \%$

(d) Asset turnover $= \dfrac{\text{Turnover}}{\text{Capital employed}} \%$

Note: Capital employed = shareholders funds plus 'creditors amounts falling due after more than one year' plus long term provisions for liabilities and charges.

Net profit margin × asset turnover = ROCE

$$\frac{\text{PBIT}}{\text{Turnover}} \times \frac{\text{Turnover}}{\text{Capital employed}} = \frac{\text{PBIT}}{\text{Capital employed}}$$

3.2 Liquidity ratios

(a) Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$

(b) Acid test (quick ratio) = $\frac{\text{Current assets less stock}}{\text{Current liabilities}}$

(c) Debtors payment period = $\frac{\text{Average debtors}}{\text{Credit sales}} \times 365$

(d) Stock days = $\frac{\text{Average stock}}{\text{Cost of sales}} \times 365$

(d) Creditors payment period = $\frac{\text{Average creditors}}{\text{Purchases}} \times 365$

3.3 Gearing ratios

(a) Gearing ratio = $\frac{\text{Prior charge capital (long term debt)}}{\text{Long term debt + equity (shareholders funds)}}$

(b) Interest cover = $\frac{\text{PBIT}}{\text{Interest}}$

(c) Operating gearing = $\frac{\text{Contribution}}{\text{PBIT}}$

3.4 Investor ratios

(a) P/E ratio = $\frac{\text{Market price (pence)}}{\text{EPS (pence)}}$

(b) Earnings per share (EPS) = $\frac{\text{Earnings available for distribution to equity}}{\text{Number of shares in issue and ranking for dividend}}$

(c) Dividend yield = $\frac{\text{Dividend per share (pence)}}{\text{Market price (pence)}}$

4. EBITDA

EBITDA is a financial performance measure that has appeared relatively recently. It stands for

'earnings before interest, taxes, depreciation and amortisation' and is particularly popular with high-tech startup businesses.

Consideration of earnings before interest and tax has long been common – before interest in order to measure the overall profitability before any distributions to providers and capital, and before tax on the basis that this is not under direct control of management.

The reason that EBITDA additionally considers the profit before depreciation and amortisation is in order to approximate to cash flow, on the basis that depreciation and amortisation are non-cash expenses.

A major criticism, however, of EBITDA is that it fails to consider the amounts required for fixed asset replacement.

Example 1

Summary financial information for Repse plc is given below, covering performance over the last four years.

$ thousands	*Year 1*	*Year 2*	*Year 3*	*Year 4*
Turnover	43,800	48,000	56,400	59,000
Cost of sales	16,600	18,200	22,600	22,900
Salaries and Wages	12,600	12,900	11,900	11,400
Other costs	5,900	7,400	12,200	13,400
Profit before interest and tax	8,700	9,500	9,700	11,300
Interest	1,200	1,000	200	150
Tax	2,400	2,800	3,200	3,600
Profit after interest and tax	5,100	5,700	6,300	7,550
Dividends payable	2,000	2,200	2,550	3,600
Average debtors	8,800	10,000	11,100	11,400
Average creditors	3,100	3,800	5,000	5,200
Average total net assets	33,900	35,000	47,500	50,300
Shareholders' funds	22,600	26,000	44,800	48,400
Long term debt	11,300	9,000	2,700	1,900
Number of shares in issue ('000)	9,000	9,000	12,000	12,000
P/E ratio (average for year)				
Repse plc	17.0	18.0	18.4	19.0
Industry	18.0	18.2	18.0	18.2

The increase in share capital was as a result of a rights issue.

Review Repse's performance in light of its objective being to maximise shareholder wealth.

Chapter 11

DIVISIONAL PERFORMANCE MEASUREMENT

1. Introduction

In this chapter we will consider the situation where an organisation is divisonalised (or decentralised) and the importance of proper performance measurement in this situation.

We will also consider the possible problems that can result from the use of certain standard performance measures.

2. The meaning of divisionalisation

As mentioned earlier, divisionalisation is the situation where managers of business areas are given a degree of autonomy over decision making i.e. they are given the authority to make decision without reference to senior management. In effect they are allowed to run their part of the business almost as though it were their own company.

2.1 Advantages of divisionalisation:

- Specialism in product/country/customer
- Greater motivation for managers
- Allows divisions to be profit centres (motivating and promotes efficiency)
- Allows performances between divisions to be compared
- Clearer objectives for managers (concentrate on one area of the business only)
- Usually accompanied by decentralization, so potentially better decisions.

2.2 Problems with divisionalisation:

- Coordination difficulties
- Requires transfer prices to be established
- Lack of goal congruence/dysfunctional decision-making
- Difficulties in 'fair' comparison of divisions.
- Potential duplication of some services

3. The use of performance measures to control divisional managers

If managers are to be given autonomy in their decision making, it becomes impossible for senior management to 'watch over' them on a day-to-day basis – this would remove the whole benefit of having divisionalised!

The way to control their performance is to establish in advance a set of measures that will be used to evaluate their performance at (normally) the end of each year. These measures provide a way of determining whether or not they are managing their division well, and also communicate to the managers how they are expected to perform.

It is of critical importance that the performance measures are designed well.

For example, suppose a manager was simply given one performance measure – to increase profits. This may seem sensible, in that in any normal situation the company will want the division to become more profitable. However, if the manager expects to be rewarded on the basis of how well he achieves the measure, all his actions will be focussed on increasing profit to the exclusion of everything else. This would not however be beneficial to the company if the manager were to achieve it by taking actions that reduced the quality of the output from the division. (In the long- term it may not be beneficial for the manager either, but managers tend to focus more on the short-term achievement of their performance measures.)

It is therefore necessary to have a series of performance measures for each division manager.

Maybe one measure will relate to profitability, but at the same time have another measure relating to quality. The manager will be assessed on the basis of how well he has achieved all of his measures.

We wish the performance measures to be goal congruent, that is to encourage the manager to make decisions that are not only good for him but end up being good for the company as a whole also.

In this chapter we will consider only financial performance. However, non-financial performance is just as important and we will consider that in the next chapter.

4. Controllable profits

The most important financial performance measure is profitability.

However, if the measure is to be used to assess the performance of the divisional manager it is important that any costs outside his control should be excluded.

For example, it might be decided that pay increases in all division should be fixed centrally by human resources staff at Head Office. In this case it would be unfair to penalise (or reward) the manager for any effect on the division's profits in respect of this cost. For these purposes therefore a profit and loss account would be prepared ignoring wages and it would be on the resulting controllable profit that the manager would be assessed.

5. Investment centres and the problem with measuring profitability.

As stated earlier, divisionalisation implies that the divisional manager has some degree of autonomy.

In the case of an investment centre, the manager is given decision-making authority not only over costs and revenues, but additionally over capital investment decision.

In this situation it is important that any measure of profitability is related to the level of capital expenditure. Simply to assess on the absolute level of profits would be dangerous – the manager might increase profits by $10,000 and be rewarded for it, but this would hardly be beneficial to the company if it had required capital investment of $1,000,000 to achieve!!

The most common way of relating profitability to capital investment is to use Return on Investment as a measure. However, as we will see, this can lead to a loss of goal congruence and a measure known as Residual Income is theoretically better.

6. Return on Investment (ROI)

ROI is defined as: Controllable division profit as a percentage of divisional investment

It is equivalent to Return on Capital Employed and this is one of the reasons that it is very popular in practice as a divisional performance measure.

Example 1

Arcania plc has divisions throughout the Baltic States.

The Ventspils division is currently making a profit of $82,000 p.a. on investment of $500,000. Arcania has a target return of 15%

The manager of Ventspils is considering a new investment which will require additional investment of $100,000 and will generate additional profit of $17,000 each year/

(a) Calculate whether or not the new investment is attractive to the company as a whole.

(b) Calculate the ROI of the division, with and without the new investment and hence determine whether or not the manager would decide to accept the new investment.

In the above example, the manager is motivated to accept an investment that is attractive to the company as a whole. He has been motivated to make a goal congruent decision.

Note that in this illustration we have used the opening book value for capital invested. In practice it may be more likely that we would use closing book value (which would be lower because of depreciation). There is no rule about this – in practice we could do whichever we thought more suitable. However, in examinations always **use opening book value** unless, of course, you are told to do differently.

However, there can be problems with a ROI approach as is illustrated by the following example:

Example 2

The circumstances are the same as in example 1, except that this time the manager of the Ventspils division is considering an investment that has a cost of $100, 000 and will give additional profit of $16,000 p.a.

(a) Calculate whether or not the new investment is attractive to the company as a whole.

(b) Calculate the ROI of the division, with and without the new investment and hence determine whether or not the manager would decide to accept the new investment.

In this example the manager is not motivated to make a goal congruent decision. For this reason, a better approach is to assess the manager's performance on Residual Income.

3. Residual Income (RI)

Instead of using a percentage measure, as with ROI, the Residual Income approach assesses the manager on absolute profit. However, in order to take account of the capital investment, notional (or imputed, or 'pretend') interest is deducted from the Income Statement profit figure. The balance remaining is known as the Residual Income.

(Note that the interest charge is only notional, and is only made for performance measurement purposed).

Example 3

Repeat examples 1 and 2, but in each case assume that the manager is assessed on his Residual Income, and that therefore it is this that determines how he makes decisions.

Note that in both cases the manager is motivated to make goal congruent decisions.

4. ROI vs RI

Note that both RI and ROI will favour divisions with older assets because those divisions will:

(1) Probably have bought the assets more cheaply than new divisions which buy at inflated prices.

(2) The assets are more heavily depreciated so that the capital employed figures is less in the division with older assets – and this affects both the denominator in ROI and the notional interest charge in RI

(3) Both methods can also suffer distortions because of assets leased on operating leases and also if head office accounts for some 'divisional' assets (for example HO holding all receivables).

In practice, ROI is more popular than RI, despite the fact that RI is technically superior in terms of encouraging managers to make the correct investment decisions.

Pros and cons of ROI:

It seems familiar – most managers will know about return on capital calculations.

- Easy: compare ROI with a company target.
- Encourages maximization of ROI which might be how congruent with shareholders judge the company.
- Good for comparing divisions of different sizes

BUT

- Decisions will not necessarily maximize shareholder wealth.

Pros and cons of RI:

- RI maximization tends to be congruent with decisions that maximise shareholder wealth
- Different notional interest rates can be set for investment of different risk.

BUT

- A less familiar calculation and concept
- Not good at comparing divisions of different sizes. (Larger RIs might simply be a function of bigger divisions).

5. Annuity Depreciation

Despite the points made above, even if we use a Residual Income approach there is a danger of non-goal congruent decisions being made because divisional managers tend to think short-term. (The same problem applies to ROI approaches also). This is because in early years the book value of any new investment is high and this depresses both the ROI and RI.

A solution to this problem is to use annuity depreciation.

We will illustrate the nature of the problem, and the solution of annuity depreciation by means of an example.

Example 4

Grip plc has a cost of capital of 10% p.a..

One of its divisions has the possibility of undertaking the following project:

Investment	US$250,000
Project life	5 years
Net cash inflow	$72.500 p.a.
Scrap value	Nil

(a) Calculate the Net Present Value of the project and assess therefore whether or not the company as a whole wishes to invest in the project

(b) Calculate the additional Residual Income generated by the project for each of the 5 years, and comment as to whether or not the manager is likely to accept the project (assume that the division depreciates on a straight line basis).

(c) Recalculate the Residual Income each year using annuity depreciation, and comment as to whether or not the manager is likely to accept the project.

4. Economic Value Added

Economic value added (EVA) is a performance metric that is very similar in approach to Residual Income, and is defined as being:

EVA = Net operating profit after tax – WACC x book value of capital employed

EVA is a trade-marked technique, developed by consultants called Stern Stewart and Co.

The principle behind it is that a business is only really creating value if its profit is in excess of the required minimum rate of return that shareholders and debt holders could get by investing in other securities of comparable risk.

The capital employed is the **opening** capital employed, adjusted fro the items set out below.

EVA allows all management decisions to be modelled, monitored, communicated, and compensated in a single and consistent way – always in terms of the value added to shareholder investment.

However, EVA makes certain adjustments because certain types of expenditure which appear in the statements of profit and loss under ISAs and IFRSs are NOT regarded as expenses when using EVA and cash accounting is regarded as more reliable than accruals accounting).

The major adjustments are:

Add back to profits:

- Expenditure on building for the future (e.g. research expenditure, marketing expenditure and staff training):
- Non-cash expenses
- Provisions
- Goodwill written off
- Depreciation: add back book depreciation and deduct economic depreciation. If economic depreciation is not given, assume it is the same as book depreciation and that there is no net adjustment.
- Interest on debt capital

  Add back to net profit after adjusting for any tax relief.

  Treat the debt as part of capital employed

Adjustment to statement of financial position

- Non capitalized leases
- Research etc now capitalised
- Goodwill written off
- Provisions

Example 5

Extracts from the accounts of Value Co are as follows:

Income Statements:

	2014 $m	2013 $m
Revenue	608	520
Pre-tax accounting profit (note 1)	134	108
Taxation	(46)	(37)
Profit after tax	88	71
Dividends	(29)	(24)
Retained earnings	59	47

Balance Sheets:

	2014 $m	2013 $m
Non-current assets	250	192
Net current assets	256	208
	506	400
Financed by: Shareholders' funds	380	312
Medium and long-term bank loans	126	88
	506	400

Note: After deduction of the economic depreciation of the company's non-current assets. This is also the depreciation used for tax purposes. Other information is as follows:

1. Capital employed at the end of 2012 amounted to $350m.
2. Value Co had non-capitalised leases valued at $16m in each of the years 2012 to 2014. The leases are not subject to amortisation.
3. Value Co's pre-tax cost of debt was estimated to be 9% in 2013 and 10% in 2014.
4. Value Co's cost of equity was estimated to be 15% in 2013 and 17% in 2014.
5. The target capital structure is 70% equity and 30% debt.
6. The rate of taxation is 30% in both 2013 and 2014.
7. Economic depreciation amounted to $64m in 2013 and $72m in 2014. These amounts were equal to the depreciation used for tax purposes and the depreciation charged in the income statements.
8. Interest payable amounted to $6m in 2013 and $8m in 2014.
9. Other non-cash expenses amounted to $20m in 2013 and $15m in 2014.
10. Research and development expenditure on a new project started in 2013 and written off was $10 million in 2013 and $11 million in 2014

Calculate the Economic Value Added in each of 2014 and 2013.

5. Potential problems of EVA

- It is difficult to use EVA to compare firms or divisions because it is an absolute measure and takes no account of the relative size of the business.
- Because EVA is a year-to-year measure, it could be improved in the short term but to the detriment of the business in the long term.
- Economic depreciation is difficult to calculate and conflicts with generally accepted accounting principles.
- Other factors that could be important but are not included in the accounts are ignored.
- EVA is a short-term measure whereas performance measures should focus on the longer- term forecasts. Ideally economic income would be used (by discounting estimated future cash flows) but even ignoring the complexity of this, the person responsible for estimating it would very often be the person being measured, which could lead to bias.

Chapter 12

NON-FINANCIAL PERFORMANCE MEASUREMENT

1. Introduction

In the previous two chapters we were looking at measures of financial performance. However, as we stated, it is important to have a range of performance measures considering non-financial as well as financial matters.

In general, financial performance is easy to measure (earning per share, profit, dividends, EVA etc) but these measurements do **not** tell managers why financial performance has improved. For example, sales might have increased either because prices have been lowered or the company has spent money developing a new, innovative product. In this chapter we will consider the various areas where performance measures are likely to be needed.

Note that although we might all like to think that, for example, customer service is a foundation for company success, it is not necessarily so. Some low-cost airlines have been very successful despite giving poor customer service. Good customer service, and the other non-financial qualities which are mentioned about below are not ends in themselves. They become important in profit seeking organisations only if the enable financial success.

In not-for-profit organisations, non-financial measures can be ends in themselves. For example, in a hospital patient service is likely to be a fundamental part of its mission.

Various authors have summarised the areas in different ways and the main approaches are summarised in this chapter.

2. Fitzgerald and Moon building blocks

Fitzgerald and Moon focussed on performance measurement in service businesses. They said that organisations need:

Measures: dimensions of performance that should be measured

Standards: KPIs need to be capable of ownership (ie the person responsible feels able to influence the measure), should be achievable and should be fair.

Rewards: should be clear, provide motivation and controllable ie managers can influence their rewards by their behaviour.

They suggested that the following dimensions need measures of performance:

Performance area	*Possible measures*
Financial performance	• Profitability • Sales growth • ROI • Cash flow/liquidity • EVA
Competitive performance	• Sales growth • Proportion of contracts won • Customer assessment/feedback • Market share
Quality	• Rejects/reworks • Customer complaints/feedback • Claims for compensation • Peer review assessments
Flexibility	• Spare capacity • Time order to delivery • Set-up time • % of work declined
Resource utilization	• Idle time • Non-chargeable time • Machine utilization • Wastage
Innovation	• New products brought to market • Patents files • R&D spend

3. Kaplan and Norton's Balanced Scorecard

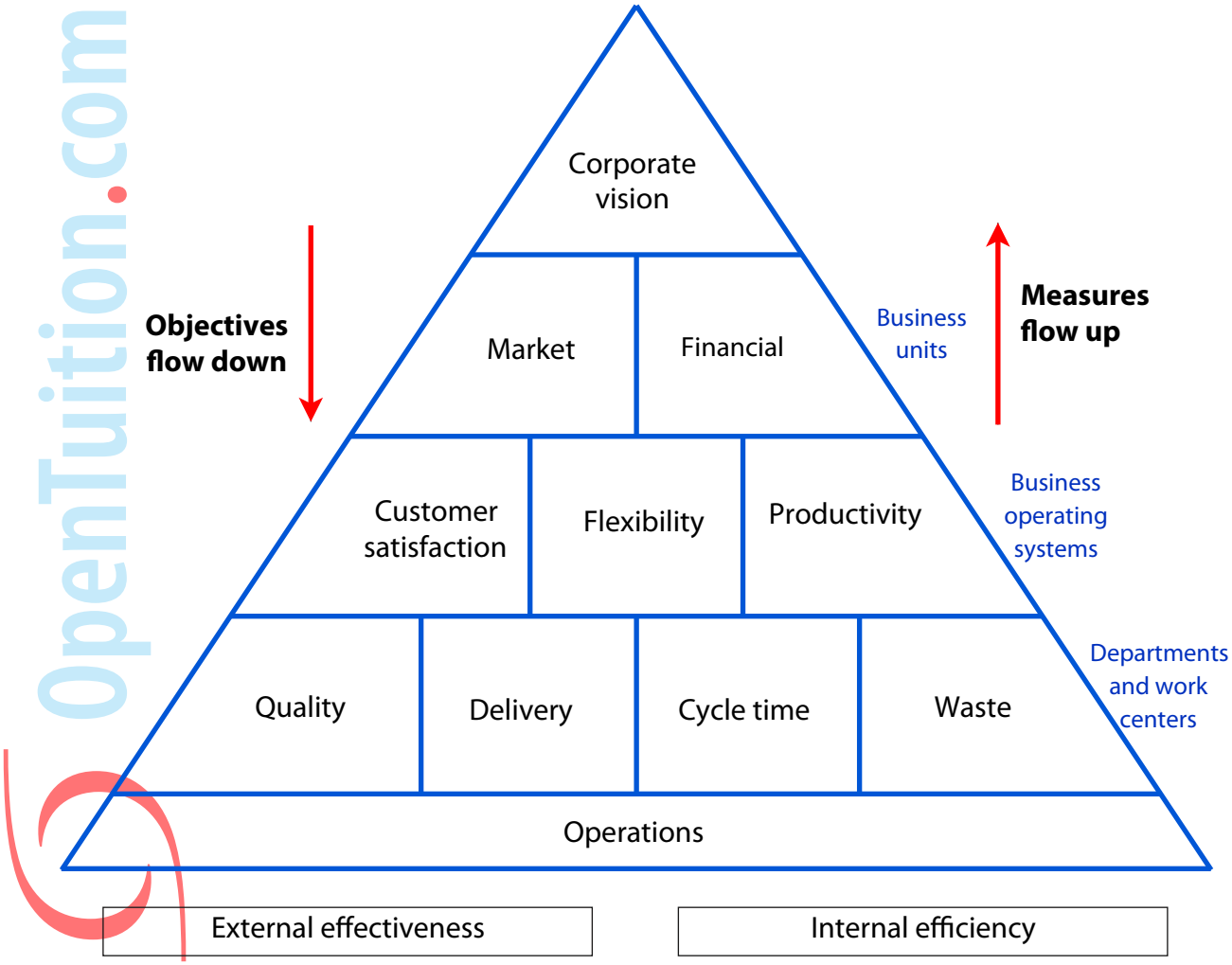
The balanced scorecard (developed by Kaplan and Norton 1992) views the business from four perspectives and aims to establish goals for each together with measures which can be used to evaluate whether these goals have been achieved. These should be viewed as a hierarchy with good financial performance depending on 'happy' customers, who are 'happy' if we do what we say we will do. Continued success demands that organisations never stop trying to improve through learning and innovation.

Perspective	*Question*	*Possible Measures*
Financial Perspective	How do we create value for our shareholders?	• Profitability • Sales growth • ROI • Cash flow/liquidity
Customer Perspective	What do existing and potential customers value from us?	• % Sales from new customers • % On time deliveries • % Orders from enquiries • Customers survey analysis
Internal Business Perspective	What process must we excel at to achieve our customer and financial objectives?	• Unit cost analysis • Process/cycle time • Value analysis • Efficiency
Innovation and Learning Perspective	How can we continue to improve and create future value?	• Number of new products introduced • Time to market for new products

4. The Performance Pyramid

Lynch and Cross viewed business as a performance pyramid.

The pyramid views a range of objectives for both external effectiveness and internal efficiency. The objectives can be achieved through measures at various levels as shown in the pyramid below. These measures are seen to interact with each other both horizontally at each level and vertically across levels in the pyramid.



Operations carried on in departments and work centres: quality, delivery, cycle time and waste. These operations support the layers further up the pyramid.

Companies must achieve customer satisfaction, productivity and flexibility – the ability to adapt to different customer requirements and methods of production. Customer satisfaction arises from quality and delivery. Productivity arises from system time and waste; flexibility arises from delivery and cycle time.

A strong performance in the market depends on customer satisfaction and flexibility towards different environments. Financial performance depends on productivity and flexibility.

Chapter 13

PERFORMANCE IN THE NOT-FOR-PROFIT SECTOR

1. Introduction

Non-profit seeking organisations are those whose prime goal cannot be assessed by economic means. Examples would include charities and state bodies such as the police and the health service.

For this sort of organisation, it is not possible or desirable to use standard profit measures. Instead (in for example the case of the health service) the objective is to ensure that the best service is provided at the best cost.

In this chapter we will consider the problems of performance measures and suggestions as to how to approach it.

2. Problems with performance measurement

- **Multiple objectives**

  Even if all objectives can be clearly identified, it may be impossible to identify an over-riding objective or to choose between competing objectives

- **The difficulty of measuring outputs**

  An objective of the health service is obviously to make ill people better. However, how can we in practice measure how much better they are?

- **Financial constraints**

  Public sector organisations have limited control over the level of funding that they receive and the objectives that they can achieve.

- **Political, social and legal considerations**

  The public have higher expectations from public sector organisations than from commercial ones, and such organisations are subject to greater scrutiny and more onerous legal requirements.

- **Little market competition and no profit motive.**

3. Value for money

Non-profit organisations, such as the health service, are expected to provide value for money. This can be defined as providing a service in a way which is economical, efficient and effective. Performance should be assessed under each of these '3 E's '

Effectiveness

Determining how well the organisation has achieved its desired objectives.

Efficiency

Maximising the output for a given input (or, for a given output achieving the minimum input).

Economy

Attaining the appropriate quantity and quality of inputs at the lowest cost

4. The use of league tables

In the UK, the government insists that schools, police forces, hospitals and other public bodies publish league tables relating to their performance. For example, schools publish their exam grades. The government instigated league table reporting to provide the public with information that might be useful to make more informed choices and to put pressure on under-performing public-funded institutions. Managers in the institutions are themselves sensitive to this public reporting of performance. Generally, they dislike it, but the hope is that the transparency offered by league tables about performance encourages improvements in performance.

Potential problems:

- What should be measured? Not-for-profit organisations usually have complex sets of stakeholders and objectives. There is no single, agreed measure of what, say, a good school is, so league tables might over-simplify a complex appraisal. Of course, separate tables could be produced using several measures for each organisation – but that approach is likely to become complex and confusing to use. If the measures are summarised into one score, details are lost and the weightings given to each component might be arbitrary.
- Is the data 'fair'? For example a school in a poor area of town, where there is less parental support, might find it hard to achieve the exam grades of a school in a prosperous area. Similarly the health problems and outcomes of people in a hospital's catchment area will vary greatly depending on whether that area is affluent or poor.
- Manipulation of data. A police force can flatter its success at solving crimes by simply not recording some crimes. Doctors might not attempt risky, but necessary, procedures in case their success rate or that of the hospital's declined.
- Magnification of differences. Three organisations achieving scores of 75, 74.5 and 74 will be labelled 1, 2, 3 which could mask the fact that there is really no material difference in performance.

Chapter 14

TRANSFER PRICING

1. Introduction

Transfer prices were examined in a previous examination. It is, however deemed knowledge for this paper and can be asked again. It is therefore repeated here for revision.

2. What is a transfer price?

The transfer price is the price that one division charges another division of the same company for goods or services supplied from one to the other. It is an internal charge – the 'sale' of one division is the 'purchase' of the other. Although it will be reflected in the results for each division individually, there is no effect in the accounts of the company as a whole.

Ideally transfer prices should:

Be perceived as fair to both divisions and therefore good for performance measurement and management

- Provide profits for both divisions because profits are motivating
- Promote goal congruence so that divisions volunteer to do what is good for the group
- Promote autonomy ie minimise head office interference

Example 1

Division A produces goods and transfers them to Division B which packs and sells them to outside customers. Division A has costs of $10 per unit, and Division B has additional costs of $4 p.u.. Division B sells the goods to external customers at a price of $20 p.u.

Assuming a transfer price between the divisions of $12 p.u., calculate:

(a) the total profit p.u. made by the company overall

(b) the profit p.u. made by each division

3. Why have a transfer price?

The reason for having a transfer price is to be able to make each division profit accountable. If, in the previous example, there was no transfer price and goods were transferred 'free of charge' between the division, then the overall profit for the company would be unchanged. However, Division A would only be reporting costs, and Division B would be reporting an enormous profit. The problem would be compounded if Division A was selling the same product externally as well as transferring to Division B.

4. Cost-plus transfer pricing

A very common way in practice of determining a transfer price is for the company to have a policy that all goods are transferred at the cost to the supplying division plus a fixed percentage.

Example 2

Division A has costs of $15 p.u., and transfer goods to Division B which has additional costs of $5 p.u.. Division B sells externally at $30 p.u.

The company has a policy of setting transfer prices at cost + 20%.

Calculate:
(a) the transfer price
(b) the profit made by the company overall
(c) the profit reported by each division separately

5. Other practical approaches

- Market prices: perceived as fair to both parties and places them in a position as though they were independent and trading on their own rather than part of a group.
- Marginal cost: condemns selling divisions to making losses because fixed costs are not covered. However, promotes goal congruent decisions
- Marginal cost plus lump sum: during the year marginal costs are used (goal congruence). At the end of the an additional lump sum is transferred between transferee and transferror to account for profits.
- Dual prices: transferee transfers at a markup (so makes a profit); transferee buys in at marginal cost (so can make correct decisions for goal congruence)

6. Goal congruence

If we are properly divisionalised, then each divisional manager will have autonomy over decision making. It will be therefore the decision of each manager which products are worth producing in their division (for these purposes we assume that each division has many products and therefore stopping production of one product will not be a problem).

A cost-plus approach, which easy to apply can lead to problems with goal congruence in that in some situations a manager may be motivated not to produce a product which is in fact to the benefit of the company as a whole.

Example 3

Division A has costs of $20 p.u., and transfer goods to Division B which has additional costs of $8 p.u.. Division B sells externally at $30 p.u.

The company has a policy of setting transfer prices at cost + 20%.

Calculate:
(a) the transfer price
(b) the profit made by the company overall
(c) the profit reported by each division separately

Determine the decisions that will be made by the managers and comment on whether or not goal congruent decisions will be made.

7. "Sensible" transfer pricing to achieve goal congruence.

The previous example illustrates that unless care is taken to set the transfer price sensibly, decisions may be made that are not goal congruent.

In the examination you can be asked to suggest sensible transfer prices. (As we will illustrate, you will normally be asked to state a range rather than one specific price.)

There is a 'rule' that may be applied. However, it is dangerous to simply learn a rule without fully understanding the logic. We will therefore build up the rule using a series of small examples, and then state the rule at the end.

Example 4

Division A has costs of $20 p.u., and transfer goods to Division B which has additional costs of $8 p.u.. Division B sells externally at $30 p.u.

Determine a sensible range for the transfer price in order to achieve goal congruence.

Example 5

Division A has costs of $15 p.u., and transfers goods to Division B which has additional costs of $10 p.u.. Division B sells externally at $35 p.u.

A can sell part-finished units externally for $20 p.u.. There is limited demand externally from A, and A has unlimited production capacity.

Determine a sensible range for the transfer price in order to achieve goal congruence.

Example 6

Division A has costs of $15 p.u., and transfers goods to Division B which has additional costs of $10 p.u.. Division B sells externally at $35 p.u.

A can sell part-finished units externally for $20 p.u.. There is unlimited external demand from A, and A has limited production capacity.

Determine a sensible range for the transfer price in order to achieve goal congruence.

Example 7

Division A has costs of $8 p.u., and transfers goods to Division B which has additional costs of $4 p.u.. Division B sells externally at $20 p.u.

Determine a sensible range for the transfer price in order to achieve goal congruence, if Divison B can buy part-finished goods externally for:

(a) $14 p.u.

(b) $18 p.u.

8. The 'rule' for sensible transfer pricing

The following rule summarises the results from the previous examples:

8.1 Minimum transfer price:

(Determined by the transferor, or seller): MC + lost contribution from transferring internally

8.2 Maximum transfer price:

(Determined by the transferee, or buyer): Lower of nMR and external buy-in price.

(Note: we always assume that both divisions are manufacturing many products and that discontinuing one product will have no effect on the fixed costs. It is therefore only the marginal costs that we are interested in when applying the above rules.)

9. Capacity limitations

In one of the previous examples there was a limit on production in one of the divisions. This problem can be made a little more interesting, although the same rule as summarised in Section 7 still applies.

Example 8

A is capable of making two products, X and Y. A can sell both products externally as follows:

	X	*Y*
External selling price	80	100
Variable costs	60	70
Contribution p.u.	20	30

A has limited labour available. The labour hours required for each product are X: 5 hours p.u., Y: 10 hours p.u.

A has unlimited external demand for both products. Division B requires product Y from Division A.

Calculate the minimum transfer price that should be charged by A for supply of Product Y to Division B.

10. Multinational Transfer Pricing

Globalisation, the rise of multinational companies, and the fact that more than 60% of world trade takes place within multinational organisations means that international transfer pricing is very important.

When transfers occur between different countries, then there are additional factors to take into account. These include the following:

Taxation in the different countries

Import tariffs

Exchange controls

Anti-dumping legislation Competitive pressures Repatriation of funds

In practice, most countries tax laws will include rules about transfer pricing.

Usually they encourage a transfer price at market value to ensure that both countries receive a fair share of the profits. However, it is not always easy to establish what is a fair market value.

A transfer price at full cost is usually acceptable to tax authorities, but transfer prices at variable cost are unlikely to be acceptable.

Chapter 15

PREDICTING AND PREVENTING CORPORATE FAILURE

1. Introduction

This chapter considers the reasons for companies failing, and various suggestions as to how corporate failure might be predicted.

Finally we look at possible ways in which failure might be prevented.

2. Corporate failure models

There are two types of corporate failure models: quantitative models, which are based largely on published financial information; and qualitative models, which are based on an internal assessment of the company concerned.

3. Quantitative models

3.1 Beaver

Beaver looked at various financial ratios and concluded that the best predictor was the ratio of cash flow to total debt.

The approach is simple, but suffers as a result because in reality many factors are likely to result in failure – not just one factor (a univariate approach).

3.2 Altman's Z score

Altman took a multivariate approach by considering a combination of ratios and combining them to produce a single score – the Z score – with a low score indicating poor financial health.

$Z = 1.2\ X1 + 1.4\ X2 + 3.3\ X3 + 0.6\ X4 + 0.999\ X5$

Where:

X1 = working capital / total assets

X2 = retained earnings / total assets

X3 = profit before interest and tax / total assets

X4 = market value of equity / book value of debt

X5 = sales / total assets

A Z-score of less than 1.8 indicates strong potential for failure; between 1.8 and 2.99 is the 'grey' (or warning) zone; above 2.99 is the 'safe' zone.

The model was devised many years ago specifically for the finance industry. Economic changes will mean that the coefficients are almost certainly out of date. The examiner will provide an equation for you to use. There have been several refinements of the Z-score equation, but all have the same basic idea of combining ratios.

4. Qualitative models

4.1 Argenti's A-score

Argenti developed a model that looked at non-accounting variables. He produced a list of possible defects, mistakes, and symptoms of failure with a mark against each.

If the defect etc. exists, then it scores the full mark. If it does not exist then it scores zero. There is a pass mark for each section of the list, and an overall, total, pass mark.

Defects:

Chief Executive is an autocrat	8 marks
Chief Executive is also the chairman	4 marks
Passive board of directors	2 marks
Lack of skills balance in the board	2 marks
Lack of management depth	1 mark
No budgets or budgetary controls	3 marks
No cash flow plans	3 marks
No costing system	3 marks
Poor response to change	15 marks

The pass mark for this section is 10 marks (i.e. a mark of less than 10 is satisfactory)

Mistakes:

High gearing	15 marks
Overtrading	15 marks
Too much reliance on one big project	15 marks

The pass mark for this section is 15 marks

Symptoms:

Financial signs (such as the Z score)	5 marks
Creative Accounting	4 marks
Non-financial signs (e.g. low morale)	3 marks
Terminal signs	1 mark

There is no separate pass mark for this section.

The overall total pass mark is 25, and it is suggested that a score in excess of this is cause for concern, as is a score above the pass mark in the first two individual sections.

5. Avoiding failure

Ross and Kami listed 'Ten Commandments' that should be followed by a company to avoid failure:

- You must have a strategy
- You must have controls
- The Board must participate
- You must avoid one-man rule
- There must be management in depth
- Keep informed of, and react to, change
- The customer is king
- Do not misuse computers
- Do not manipulate your accounts
- Organise to meet employees needs

Chapter 16

DISCOUNTED CASH FLOW TECHNIQUES

1. Introduction

You have studied investment appraisal previously so most of this chapter will be revision for you. Of the few new items in this chapter, the most important is Modified Internal Rate of Return and you should make sure that you learn the technique involved.

2. Net present value calculations

Here is a list of the main points to remember when performing a net present value calculation. After we will look at a full example containing all the points.

- Remember it is cash flows that you are considering, and only cash flows. Non-cash items (such as depreciation) are irrelevant.
- It is only future cash flows that you are interested in. Any amounts already spent (such as market research already done) are sunk costs and are irrelevant.
- There is very likely to be inflation in the question, in which case the cash flows should be adjusted in your schedule in order to calculate the actual expected cash flows. The actual cash flows should be discounted at the actual cost of capital (the money, or nominal rate). (Note: alternatively, it is possible to discount the cash flows ignoring inflation at the cost of capital ignoring inflation (the real rate). We will remind you of this later in this chapter, but it is much less likely to be relevant in the examination.)
- There is also very likely to be taxation in the question. Tax is a cash flow and needs bringing into your schedule. It is usually easier to deal with tax in two stages – to calculate the tax payable on the operating cash flows (ignoring capital allowances) and then to calculate separately the tax saving on the capital allowances.
- You are often told that cash is needed to finance additional working capital necessary for the project. These are cash flows in your schedule, but they have no tax effects and, unless told otherwise, you assume that the total cash paid out is received back at the end of the project.

Example 1

Rome plc is considering buying a new machine in order to produce a new product.

The machine will cost $1,800,000 and is expected to last for 5 years at which time it will have an estimated scrap value of $1,000,000.

They expect to produce 100,000 units p.a. of the new product, which will be sold for $20 per unit in the first year.

Production costs p.u. (at current prices) are as follows:

Materials $8

Labour $7

Materials are expected to inflate at 8% p.a. and labour is expected to inflate at 5% p.a..

Fixed overheads of the company currently amount to $1,000,000. The management accountant has decided that 20% of these should be absorbed into the new product.

The company expects to be able to increase the selling price of the product by 7% p.a.. An additional $200,000 of working capital will be required at the start of the project. Capital allowances: 25% reducing balance

Tax: 25%, payable immediately

Cost of capital: 10%

Calculate the NPV of the project and advise whether or not it should be accepted.

3. Internal rate of return

One problem with decision making using the Net Present Value is that the Cost of Capital is at best only an estimate and if it turns out to be different that the rate actually used in the calculation, then the NPV will be different. Provided that the NPV remains positive then the project will still be worthwhile, but if the NPV were to become negative that the wrong decision will have been made.

The Internal Rate of Return (IRR) is that rate of interest at which the NPV of the project is zero (i.e. breakeven).

In order to estimate the IRR we calculate the NPV at two different rates of interest, and then approximate between the two assuming linearity. (In fact, the relationship is not linear and so any estimate will only be approximate)

Example 2

For the project in example 1, calculate the Internal Rate of Return.

4. Problems with the use of the internal rate of return

Although the IRR is the 'breakeven' rate of interest for the project, and as such can be useful when we are not certain of the Cost of Capital for the company, it does have many drawbacks.

It is only a relative measure of wealth creation, it can have multiple solutions, it is difficult to calculate, and it does effectively assume that the cash flows produced by the project are re-invested at the IRR.

A possible better measure is the **Modified Internal Rate of Return (MIRR).**

5. Modified internal rate of return

The MIRR is quicker to calculate than the IRR and effectively assumes that the cash flows are re- invested at the Cost of Capital.

There are several ways of calculating it, but the method suggested here is to calculate the Present Value of the 'investment phase' (the flows in the years when the company is investing in the project) and to calculate the Terminal Value of the 'return phase' (the flows in the years when the project is generating returns) ie what the returns would have generated by the end of the project if invested as soon as received. This reduces the problem to two flows only: an outflow at time 0 and an inflow at the termination of the project. The IRR of these two flows can then be calculated.

Example 3

A project has the following cash flows:

Time	*US$0*
0	(1,000)
1	600
2	700
3	(200)

The cost of capital and the rate at which cash can be invested is 10%

Calculate the MIRR

The MIRR is usually lower than the IRR, because it assumes that the proceeds are re-invested at the Cost of Capital. However in practice the proceeds are often re-invested elsewhere within the firm. It does however have the advantage of being much quicker to calculate than the IRR.

Chapter 17

BEHAVIOURAL ASPECTS OF PERFORMANCE MANAGEMENT

1. Introduction

This relates to the 'management' part of performance management. If one knows that one's performance is being measured (and very often one's rewards are tied into the performance measure) then it is human nature to concentrate on those aspects of the work that are being measured. Indeed many would claim that 'what you measure you change' with the implication that what you do no measure will not change.

It is important therefore that the performance measures encourage goal congruence (i.e. encourage working for the overall good of the company) and that they encourage long-term as opposed to short-term thinking.

2. Recap of earlier chapters

We have already discussed in earlier chapters the use of Return on Investment, Residual Income, and Economic Value Added, NPV and IRR as ways of measuring financial performance, and the effect of these on long-term and short-term thinking.

We have also discussed in earlier chapters the importance of having a range of performance measures, looking at non-financial as well as financial performance.

3. Potential benefits of reward schemes

Management encourage employees to achieve goals by having rewards linked to their success of failure in achieving desired levels of performance.

Potential benefits of implementing a reward scheme include:

- Rewards and incentives shape the behaviour of employees – a well-designed scheme will be consistent with the organisational objectives
- A reward scheme provides an incentive to achieve good performance.
- Key incentives can be emphasised in the reward scheme – it is a way of communicating the goals of the company to the employee.
- An effective scheme will create an environment in which all employees are focussed on continuous improvement.
- Schemes that incorporate share ownership can encourage behaviour that in the longer-term increases the market value of the business.

4. Specific behavioural problems

In one of his articles for Student Accountant, the previous examiner highlighted the following specific problems that can occur with performance measurement schemes:

- **Tunnel vision**

  Undue focus on performance measures to the detriment of other areas ('What you measure you change')

- **Sub-optimisation**

  Ceasing effort when acceptable performance is achieved (eg when budgeted sales have been achieved), even though better performance might be achievable.

- **Myopia**

  Focussing on the short-term resulting in the ignoring of the long-term

- **Measure fixation**

  Behaviour and activities in order to achieve specific performance measure that may not be effective. For example, measuring behavior or results that are not important

- **Misrepresentation**

  Using creative reporting to suggest that performance measures have been achieved

- **Gaming**

  Behaviour designed to achieve some strategic advantage. For example, not passing on sales leads to a colleague so that your sales are comparatively higher.

- **Ossification**

  The unwillingness to change a performance measure scheme once it has been set up.

5. Suggested ways of addressing the problems

- Involve staff at all levels in the development and implementation of the scheme
- Be flexible in the use of performance measures
- Keep the performance measurement system under constant review

Chapter 18

CURRENT DEVELOPMENTS IN MANAGEMENT ACCOUNTING

1. Introduction

In this chapter we will look at a few modern ideas in management accounting. Some of them you will have seen before in your studies for Paper F5, but others are here for the first time.

2. The changing role of the management accountant

The traditional role of the management accountant has been to exercise control, and for this reason they have been largely independent of the operational managers.

More recently management accounting has focussed more on business support. According to Burns and Scapens, there are three main reasons for the change in the management accountants role:

- Changes in technology

  the changes in information technology have improved the amount of information available and broadened the availability of it.

- Changes in management structure

  the responsibility for budgeting has moved from the centre to individual managers leaving the management account to focus more on strategies for improvement.

- Changes in the level of competition

  Increase in competition has lead to a more commercial orientation and more long-term focus as opposed to short-termism.

In addition, the following will have influenced the role of the management accountant:

- Increasing internationalisation and globalisation
- Deregulation and privatisation of industries
- New business processes eg just in time
- A need for more rapid responses
- The increasing importance of non-financial indicators

3. Quality management

3.1 Definitions

Quality can be defined as:

- "Fitness for use" (Juran)

Or

- " …the totality of characteristics…ability to satisfy customers' stated or implied needs.." (ISO9000 handbook)

Quality control refers to the processes (such as sampling and testing) that an organisation employs to check on quality.

Quality assurance is the sum of the management allow an organisation to dependably achieve a stated level of quality

Quality management is the overseeing of all the activities needed to achieve and maintain the required quality. It includes establishing the required quality level, setting quality control procedures and also considering quality improvement

3.2 Costs associated with quality

Costs of conformance (i.e. of improving quality)

- Prevention costs
- Appraisal costs

Costs of non-conformance (i.e. of allowing poor quality)

- Internal failure costs
- External failure costs

Moving effort towards the top of this list should save costs. Hence the claim that 'quality is free'

3.3 Total Quality Management (TQM)

TQM is defined as "the continuous improvement in quality, productivity and effectiveness obtained by establishing management responsibility for processes as well as outputs. In this, every process has an identified process owner and every person in an entity operates within a process and contributes to its improvement".

Any manufacturing company will want to deliver goods to the customer that are of sufficiently high quality to avoid goods being returned. In order to check this, the company will have some form of quality control checks on goods leaving the factory. However, even though good quality control will result in poor quality goods being rejected, and therefore not reaching the customer, there remain the costs associated with waste and poor quality work.

It is therefore important that all possible steps are taken not only to check quality at each stage, but to design processes and educate the workforce to facilitate good quality

production. If everything is done right first time, there will be no quality control problems and no waste of materials or time.

TQM does not apply only to the manufacturing system. It will also apply to phone answering, provision of information, the organisation's web-site, order processing, invoicing, recruitment and training.

The implementation of TQM is never really complete and there is a culture within the organization of continually achieving improvements. Often these are small, but nevertheless will add up to be significant. The process of a continuous series of small improvements is known as 'Kaizen'.

3.4 Six sigma

Six sigma is an approach to quality control that was originally devised by Motorola, a high tech electronics company that manufactures, amongst other products, microprocessor chips. The aim of the company was to achieve very low rejection rates, < 3.4 defects/million, though that specific objective is not as important as their methodology, known as DMAIC: define, measure, analyse, improve, control.

Define:	define what is meant by quality. For example, reliability, style, fast response, helpful service.
Measure	Ways of measuring the quality factors have to be devised. For example, failure rate for reliability, customer surveys for style. Measure both current performance and use the measurement methods to better define what is meant by quality i.e. set targets.
Analyze	Investigate why current performance falls short of required performance.
Improve	Attempt to improve performance.

Repeat the D, M, A, I cycle until the required standards have been achieved.

Control	Control is continuously applied to ensure, for example, that definitions are still relevant, that costs are within budget and that progress is being made.

DMAIC fits in with Kaizen ie a continuous series of improvements

4. Life-cycle costing

When seeking to make a profit on a product it is essential that the total revenue arising from the product exceeds total costs, whether these costs are incurred during the phases of design, manufacture, operation, end-of-life:

Phase	Examples of types of cost
Design	Research, development, design, tooling
Manufacture	Material, labour, overheads, machine set up, inventory, training, production machine maintenance, depreciation, and environmental costs
Operation	Distribution, advertising, warranty claims
End of life	Environmental clean-up, disposal, de-commissioning,

There are four principal lessons to be learned from life-cycle costing:

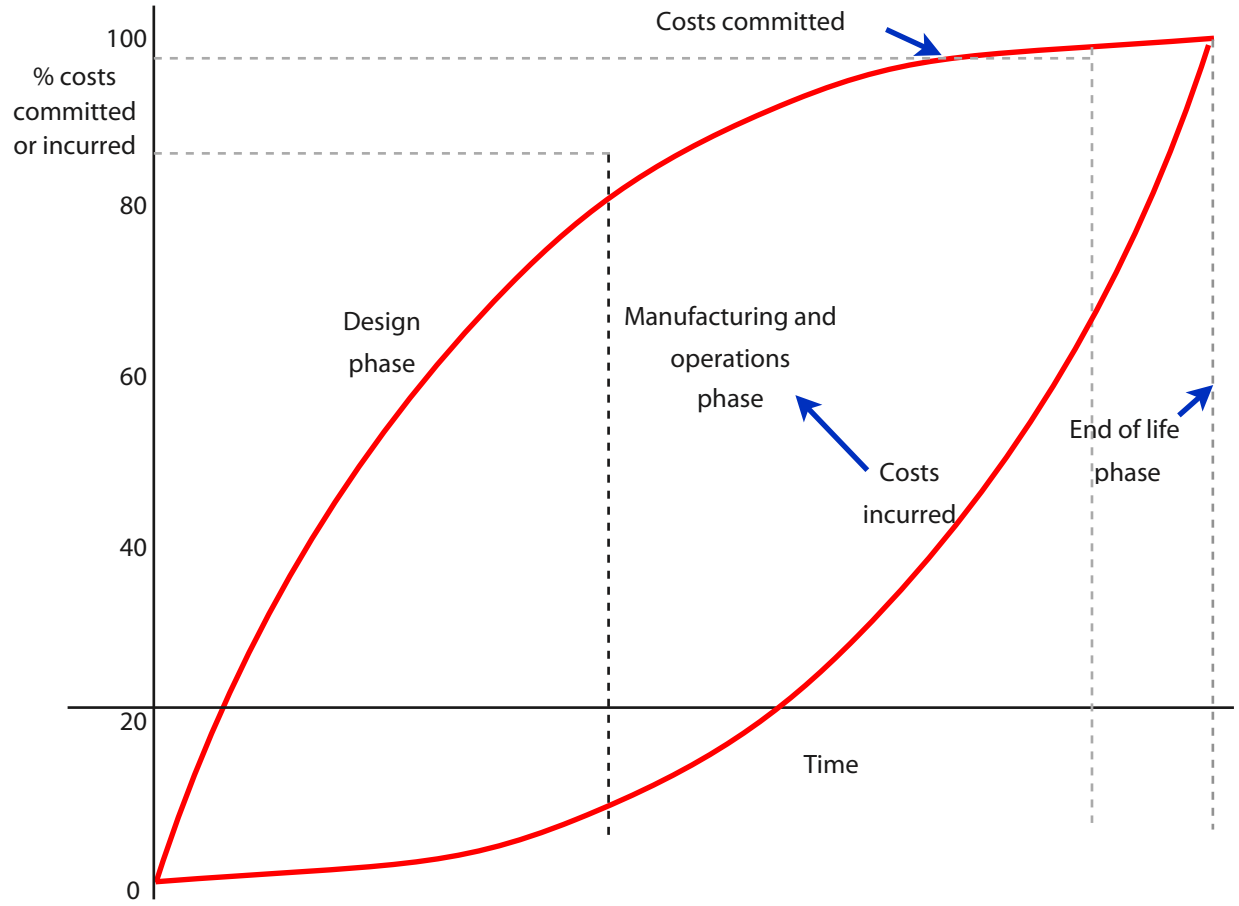
(1) All costs should be taken into account when working out the cost of a unit and its profitability.

(2) Attention to all costs will help to reduce the cost per unit and will help an organization achieve its target cost.

(3) Many costs will be linked. For example, more attention to design can reduce manufacturing and warranty costs. More attention to training can reduce machine maintenance costs. More attention to waste disposal during manufacturing can reduce end-of life costs.

(4) Costs are committed and incurred at very different times. A committed cost is a cost that will be incurred in the future because of decisions that have already been made. Costs are incurred only when a resource is used.

Typically the following pattern of costs committed and costs incurred is observed:



The diagram shows that by the end of the design phase approximately 80% of costs are committed.

For example, the design will largely dictate material, labour and machine and environmental costs. The company can try to haggle with suppliers over the cost of components but if, for example, the design specifies ten units of a certain component, negotiating with suppliers is likely to have only a small overall effect on costs. A bigger cost decrease would be obtained if the design had specified only eight units of the component. The design phase locks the company in to most future costs and it this phase which gives the company its greatest opportunities to reduce those costs.

Conventional costing records costs only as they are incurred, but recording those costs is different to controlling those costs and performance management depends on cost control, not cost measurement. Many costs in the manufacturing phase can only be controlled by what happened in the design phase.

5. Just-in-time (JIT)

Traditionally, most manufacturing companies have considered it necessary to have a certain level of stock of raw materials, work-in-progress, and finished goods.

However, not only may this be costly in terms of physically holding the stock and in terms of the possibility of damage and obsolescence, but also the requirement to hold stock may be symptomatic of inefficiencies within the company.

For example, the level of work-in-progress is determined by the length of time of the manufacturing process. If the process can be streamlined and production time reduced, then the level of work- in-progress will be reduced but the company will make additional gains as a result of greater efficiency.

With a just-in-time approach, the focus is on allowing the demand to determine the production ('demand-pull' production). This results in greater customer satisfaction, savings resulting from greater efficiency, and savings resulting from the need to have lower stock levels.

5.1 Conventional reasons for keeping stocks:

Raw materials

- To deal with production needs
- To safeguard supplies
- To take advantage of low prices
- Some materials produced seasonally, so has to be purchased when available
- To obtain bulk discounts

Work-in-progress

- To have some partially made inventory that will allow fast completion
- Technical reasons (eg production maturing, chemical processes that take time to complete).

Finished goods

- To deal with variable demand
- To enable instant supply (might be required by customers)
- To hold goods at different locations to reduce delivery times

5.2 Main features of a just-in-time approach:

- Very little (or no) inventory held.
- A pull approach: inventory is 'pulled in' in response to orders received.
- A very high degree of coordination is needed internally and with suppliers and customers. The management information system has to be very good
- Reliable suppliers and transportation
- Flexible suppliers
- Supplies of high quality
- Supplies available quickly (often implies that manufacturers have to be close to both their suppliers and customers).

Note that any disruption of the supply of raw materials and components quickly causes serious problems: no raw materials implies no production, implies an idle work-force and unhappy customers.

6. Target costing

Traditionally it has been the cost of producing an item that has driven the selling price – the first step was to estimate the production cost and then to decide on a selling price. However, this approach ignored the effect of the selling price on the demand for the product, and also gave no direct incentive to reduce costs. Target costing is a market driven approach and consists of the following steps:

- From research of the market determine a selling price at which the company expects to achieve the desired market share – the target selling price.
- Decide on the profit required (e.g. a required profit margin, or a required return on investment)
- Calculate the maximum cost per unit in order to achieve the required profit – this is the target cost
- Estimate the actual cost of production and compare with the target cost.

Example 1

Packard plc are considering whether or not to launch a new product. The sales department have determined that a realistic selling price will be $20 per unit.

Packard have a requirement that all products generate a gross profit of 40% of selling price.

Calculate the target cost.

Example 2

Hewlett plc ia about to launch a new product on which it requires a pre-tax ROI of 30% p.a.. Buildings and equipment needed for production will cost $5,000,000.

The expected sales are 40,000 units p.a. at a selling price of $67.50 p.u..

Calculate the target cost.

6.1 The use of the target cost

Once the target cost has been determined, it will be compared with the estimated actual cost of production. Any excess of the actual cost over the target cost is known as the target cost gap and the company will then be looking for ways of closing this gap.

Possible 'solutions' to the target cost gap:

- Cheaper materials
- Fewer features
- Outsource to a cheaper producer
- More efficient production eg longer production runs

7. Kaizen costing

Is the process of cost reduction during the manufacturing phase of an existing product. The Japanese word kaizen refers to continual and gradual improvement through small betterment activities, rather than large or radical improvement made through innovation or large investments in technology. Kaizen costing is most consistent with the saying "slow and steady wins the race."

Whereas target costing is used during the design phase of a new product, Kaizen costing is used during the manufacturing phase and involves team work by employees continually looking for ways of reducing costs and improving quality

8. Environmental management accounting

Businesses have become increasingly aware of the environmental implications of their operations. Poor environmental behaviour has an adverse impact on the business due to the possibility of fines, loss of sales etc.. As a consequence, environmental issues need to be measured and managed.

Techniques that are useful for managing environmental costs include:

- **input / output analysis**

  record material flows in order to discover what happens to the material input – what proportion of it ends up in the final product, what proportion ends up as waste, etc..

- **flow cost accounting**

  concentrates more on where material losses are occurring within the business, with the aim of reducing the quantities of materials used.

- **environmental activity based costing**

  ABC distinguishing between environment –related costs (e.g. direct waste disposal costs) and environment –driven costs (more general overheads e.g. higher staff costs)

- **life cycle costing**

  e.g. Xerox developed new packing for photocopiers that could be used both for the delivery of new machines and the return by customers of old machines – the packaging was re-usable.

Chapter 19

COMMON MISTAKES AND MISCONCEPTIONS IN THE USE OF NUMERICAL DATA USED FOR PERFORMANCE MEASUREMENT

1. Introduction

The September 2016 P5 syllabus contains the learning outcome:

'Advise on the common mistakes and misconceptions in the use of numerical data used for performance measurement'.

The mistakes and misconceptions can be divided into two causes:

- The quality of the data: what measures have been chosen and how have data been collected?
- How have the data been processed and presented to allow valid conclusions to be drawn?

Inevitably, these two causes overlap because the nature of the data collected will influence both processing and presentation.

2. The collection and choice of data

2.1 What to measure?

What to measure is the first decision and the first place where wrong conclusions can be either innocently or deliberately generated. For example:

- A company boasts about impressive revenue increases but downplays or ignores disappointing profits.
- A manager wishing to promote one of two mutually exclusive projects might concentrate on its impressive IRR whilst glossing over which project has the higher NPV.
- A production manager measures the quantity of units produced but not their quality.
- An investment company with 20 different funds advertises only the five most successful ones.

Not only might inappropriate amounts be measured, but they might be deliberately undefined. For example, a marketing manager in a consumer products company might claim that the company's new toothbrush is reported by users to be 20% better.

But what's meant by that statement? What is 'better'? Even if that quality could be defined, is the toothbrush 20% better than: using nothing, competitors' products, the company's previous products, or better than using a tree twig?

Another potential way to confuse readers is to report relative rather than absolute changes. For example, you will occasionally read reports claiming that eating a particular type of food will double your risk of getting a disease. Doubling sounds serious but what if you were told that consumption would change your risk from 1 in 10m to 1 in 5m? For most people doubling the risk does not look quite so serious now. The event is still rare and the risk remains very low.

Similarly, if you were told that using a new material would halve the number of units rejected by quality control, you might be tempted to switch to using it. But if the rate of rejections is falling from 1 in 10,000 to 1 in 20,000, the switch does not look so convincing – though it would depend on the consequences of failure.

2.2 Sampling

Many statistical results depend on sampling. The characteristics of a sample of the population are measured and, based on those measurements, conclusions are drawn about the characteristics of the population.

There are two potential problems:

(1) For the conclusions to be valid, the sample must be representative of the population. This means that **random** sampling must to be used so that every member of the population has an equal chance of being selected for the sample. Other sorts of sampling are liable to introduce **bias** so that some elements of the population are over or under represented and false conclusions are likely to be drawn. For example, a marketing manager could sample customer satisfaction only at outlets known to be successful.

(2) Complete certainty can only be obtained by looking at the whole population and there are dangers in relying on samples which are too small. It is possible to quantify these dangers and, in particular, you need to know information like "to a 95% confidence level, average salaries are $20,000 ± 2,300". This means that, based on the sample, you are 95% confident (**the confidence level**) that the population mean salary is between $17,700 and $22,300 (**the confidence interval**). Of course, there is a 5% chance that the true mean salary lies outside this range. Conclusions based on samples are meaningless if confidence intervals and confidence levels are not supplied.

The larger the sample the greater the reliance that can be placed on conclusions drawn. In general, the confidence interval is inversely proportional to the square size of the sample. So, to halve the confidence interval the sample size has to be increased four times – often a requiring a significant amount of work and expense.

2.3 More on small samples

Consider a company that has launched a new advert on television. The company knows that before the advert 50% of the population recognises its brand name. The marketing director is keen to show to the board that the ad has been effective in raising brand recognition to at least 60%. To support this contention a small survey has been quickly conducted by stopping 20 people at 'random' in the street and their brand recognition was tested. (Note that this methodology can introduce bias: which members of the population are out and about during the survey period? Which street was used? What are the views of people who refuse to be questioned?)

Even if the ad were completely ineffective and only 50% of the population recognises the brand it can be shown that there is a 25% chance that at least 12 out of the 20 selected will recognise the brand. So, if the director didn't get a favourable answer in the first sample of 20, another small sample could be quickly organised. There is a good chance that by the time about four surveys have been carried out one of the results will show the improved recognition that the marketing director wants. (Note: these results make use of the binomial distribution, which you do not need to be able to use.)

It's rather like flipping a coin 20 times – you intuitively know that there is a good chance of getting an 8:12 split in the results.

If instead of just 20 people being surveyed, 100 were asked, then the chance of getting a recognition rate of at least 60% would be only 1.8%.

In general, small samples:

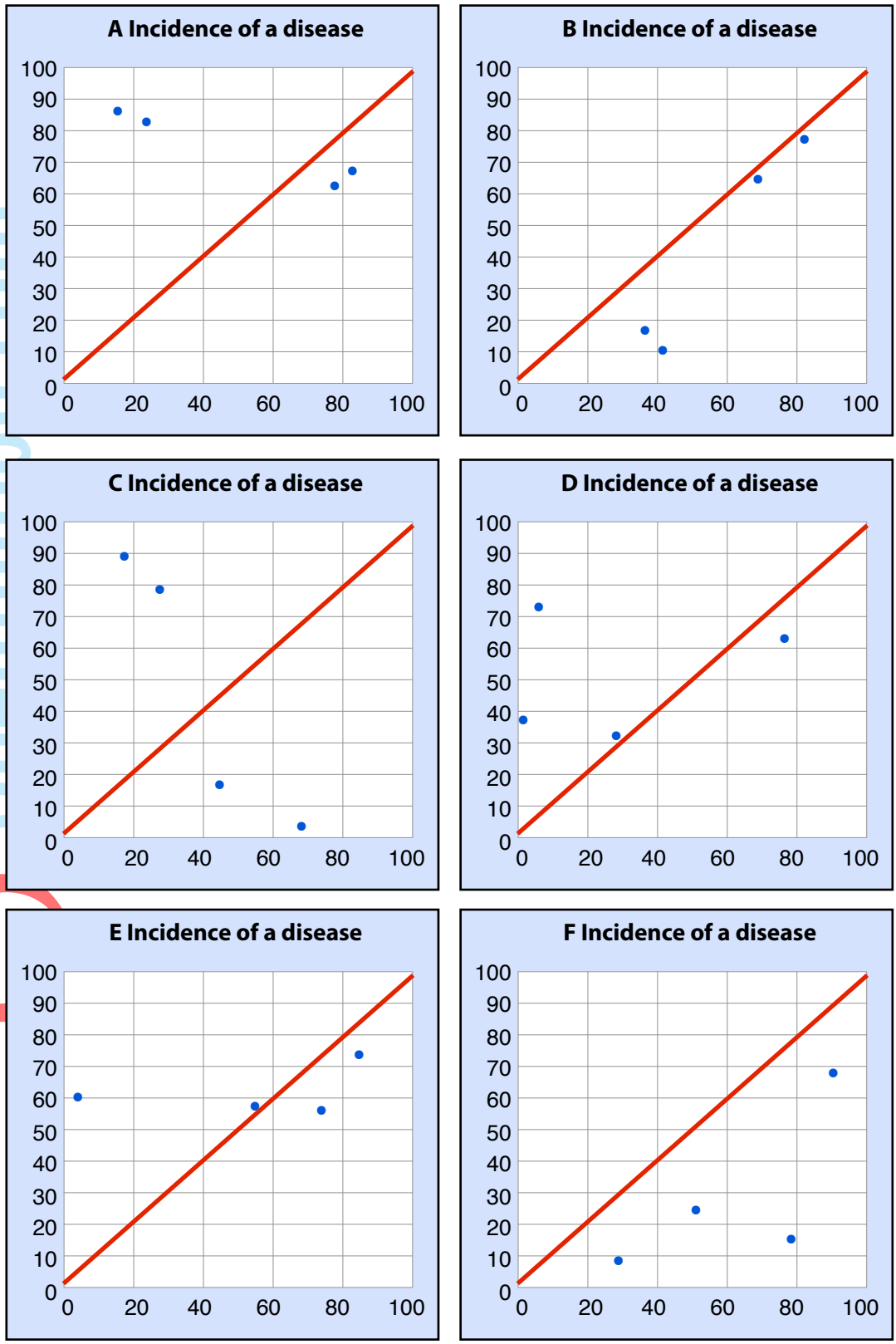
- Increase the chance that results are false positives.
- Increase chance that important effects will be missed.

Always be suspicious of survey results that do not tell you how many items were in the sample.

Another example of a danger arising from small samples is that of seeing a pattern where there is none of any significance.

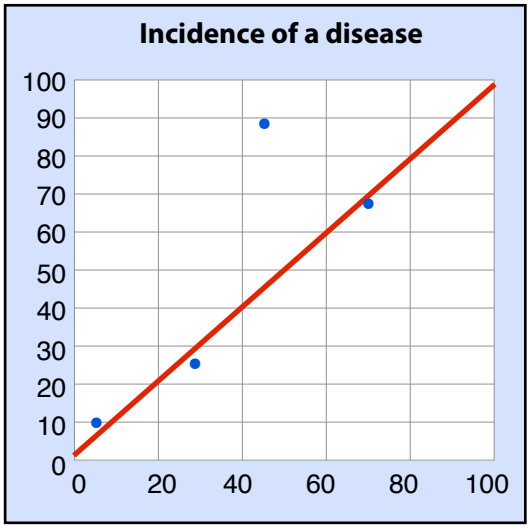
Imagine a small country of 100 km x 100 km. The population is evenly distributed and that four people will suffer from a specific disease. In the graphs below, the locations of the sufferers have been generated randomly using Excel and plotted on the 100 x 100 grid. These are actual results from six consecutive recalculations on the spreadsheet data and represent the six possible scenarios

Now imagine you are a researcher who believes that the disease might be caused high-speed trains. The dark diagonal line represents the railway track going through the country.



Have a look at the position of the dots (sick people) compared to the rail-tracks. If you wanted to see a clustering of disease close to the railway tracks you could probably do so in several of the charts. Yet the data has been generated randomly.

I didn't have to do many more recalculations before the following pattern emerged:



For people predisposed to believing what they want to believe, this graph is presenting them with a pattern they will interpret as conclusive evidence of the effect.

The problem is that if you are dealing with only four pieces of data then there is a good chance that they will often cluster around any given shape. The negative results such as seen in Graph C are easily dismissed and researchers concentrate on the patterns they want to see.

Now think about the following business propositions:

- A business receives very few complaints about its level of service, but in one year all relate to one branch. Does that indicate that the branch is performing poorly or is it just an artefact of chance?
- In a year a business tenders for 1000 contracts but only three are won – all by the same sales team. Does that really mean that that sales team is fantastic or is it again simply the result of chance?

3. The processing and presentation of data

3.1 Averages

Almost certainly when you use the term 'average' you are referring to the arithmetic mean. This is calculated by adding up all results and dividing by the number of results. So, for example:

Person	*Height (cm)*
A	175
B	179
C	185
D	179
E	176
Total	**894**

So the arithmetic mean of these 5 people is 894/5 = 178.8 and this feels as though it is a natural way to describe an important measurement about the data. However, as we will see below, it can lead you astray.

The arithmetic mean is one measure of the data's **location.** The other common measures are:

Mode: the most commonly occurring value. In the table above, the mode is 179. This measure would be more useful to you than the mean if you were a mobile phone manufacturer and needed to know customer preferences for phones of 8, 16, 32 or 64 GB. You need to know the most popular.

Median: this is the value of the middle ranking item. So, for the data above arrange it in ascending order of height and find the height of the person at the mid-point

Person	*Height (cm)*
A	175
E	176
B	179
D	179
C	185

So, the height of the mid-ranking person is 179 and this is the median

Unless the distribution of the data is completely symmetrical, the mean, mode and median will generally not have the same values. In particular, the arithmetic mean can be distorted by extreme values that give rise to its misinterpretation.

To demonstrate this we will initially set up a theoretical symmetrical distribution of the annual income of a population:

Number of people (000)	10	20	30	40	50	40	30	20	10
Annual income $000	15	25	35	45	55	65	75	85	95

The mean, median and mode are all $55,000. If you earned that you would feel that you were on 'average' pay with as many people earning more than you as less than you.

Now let's say that into this population comes the founder of a hi-tech internet company called Mark Gutenberg who invented a social medium service called U-Twit-Face. Mr Gutenberg has a very high income - $10m/year. The salary distribution now looks like:

Number of people (000)	10	20	30	40	50	40	30	20	10	M Gutenberg	1
Annual income $000	15	25	35	45	55	65	75	85	95		10000

The arithmetic mean of this distribution is $55,400, so now earning only $55,000 you feel that you are earning less than average. In fact over 50% of the population is earning less than 'average' – something that at first glance would seem impossible.

This distortion could allow a government to claim that people are now better off because average earnings are higher. In fact, even if all the salary bands were reduced by 5%, the arithmetic mean including Gutenberg would be around $55,380. So the government could claim that on average the population is better off when, in fact, almost everyone is worse off.

In situations where the data is not symmetrical, the median value will often provide a more useful measure. The inclusion of Gutenberg does not change the median value and if everyone's income fell by 5%, so would the median.

3.2 False positives and false negatives: Bayes' theorem

This will first be demonstrated using a medical example, then it will be applied to a more business-related area.

Assume there is a serious medical condition called 'lurgy' suffered by 5% of the population. There is a diagnostic test available, but this is not perfect. If the test result is positive there is a 90% chance that it is correct, and a 10% chance that it is wrong (false positive). If the test is negative, there is an 80% chance that the result is correct, but a 20% chance that the disease was missed (false negative).

You are tested and the result is positive, so what is the probability that you have lurgy? You might assume the answer is 90%, but that is far from the truth.

The easiest way to solve this is to construct a table, based (say) on 10,000 people.

	Suffers from lurgy	*Does not suffer from lurgy*	*Total*
Positive test result			
Negative test result			
Total	500	9,500	10,000

First, put in the true number of the 10,000 who suffer from the disease: 5% and 95% of 10,000.

So, of the 500 who have the disease, the test will report correctly on 90% of them and incorrectly on 10%. In numbers this will be 90% x 500 = 450 who have the disease and who are correctly reported on, and 10% x 500 = 50 who have the disease but are not reported on.

Similarly, of the 9,500 non-sufferers, the test will correctly report on 80% of them. The numbers are 80% x 9,500 = 7,600. The remainder will be reported as having the disease, 20% x 9,500 = 1,900

The table can now be shown as:

	Suffers from lurgy	*Does not suffer from lurgy*	*Total*
Positive test result	450	1,900	2,350
Negative test result	50	7,600	7,650
Total	500	9,500	10,000

So, you go to your doctor for your test results and find they are positive. You are obviously in the top line of this table (where the positive results are). From the population of 10,000 there are 2,350 positive results, but only 450 are true positives. Therefore your chance of actually having the disease is 450/2,350 = 19% - a far cry from the 90% you might have thought at the start.

Now let's look at a business-orientated example.

Maxter Software Co creates software and web-sites for clients. They prefer to recruit employees with no programming experience and train them. It is believed that 1% of the population has the aptitude to become a programmer. The company asks each applicant to undergo an aptitude test. If someone has the proper aptitude the test will identify them correctly on 80% of occasions, but 20% are missed. If a recruit does not have aptitude there is a 5% chance that they will pass the test.

If someone is identified as having aptitude, what is the chance that they actually do?

	Has aptitude	*Does not have aptitude*	*Total*
Passes test	80	475	555
Does not pass test	20	9,525	9,545
Total	100	9,900	10,000

So the chance that a person who passes the test actually has aptitude is 80/555 = 14.4: not a great way to recruit successful staff.

3.3 Correlation

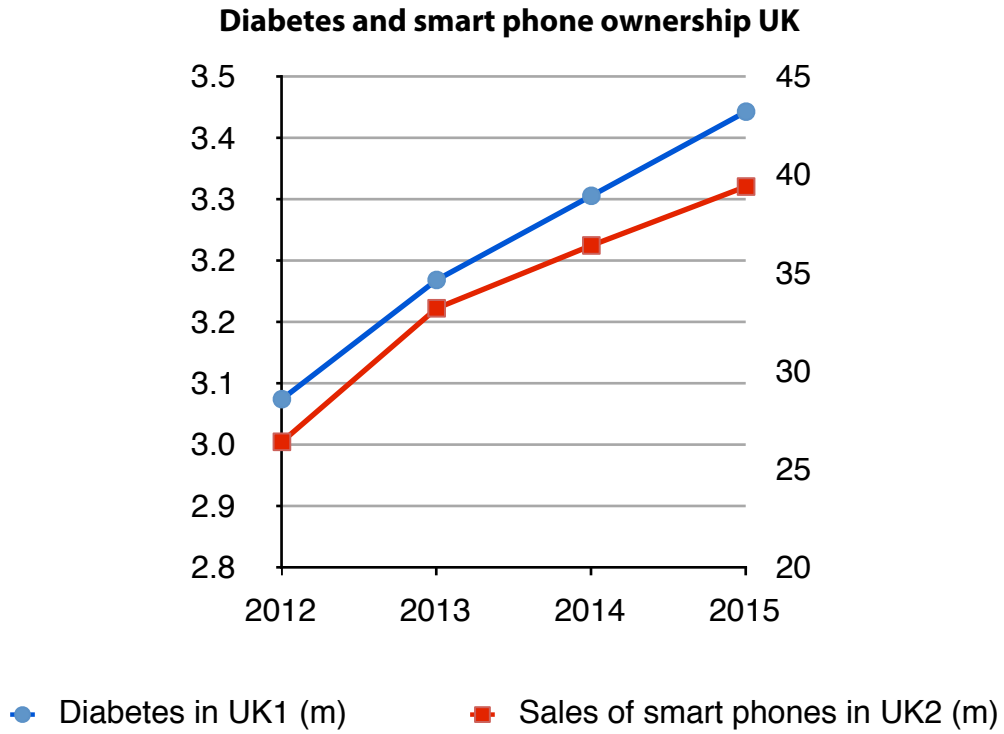
One of the commonest misuses of data is to assume that good correlation between two sets of data (ie they move closely together) implies causation (that one causes the other). This is an immensely seductive fallacy and one that needs to be constantly fought against.

For example, consider this data set:

	Diabetes in UK1 (m)	*Sales of smart phones in UK2 (m)*
2012	3.04	26.4
2013	3.21	33.2
2014	3.33	36.4
2015	3.45	39.4

1 Diabetes UK
2 Statista/eMarketer

On a graph the data looks like:



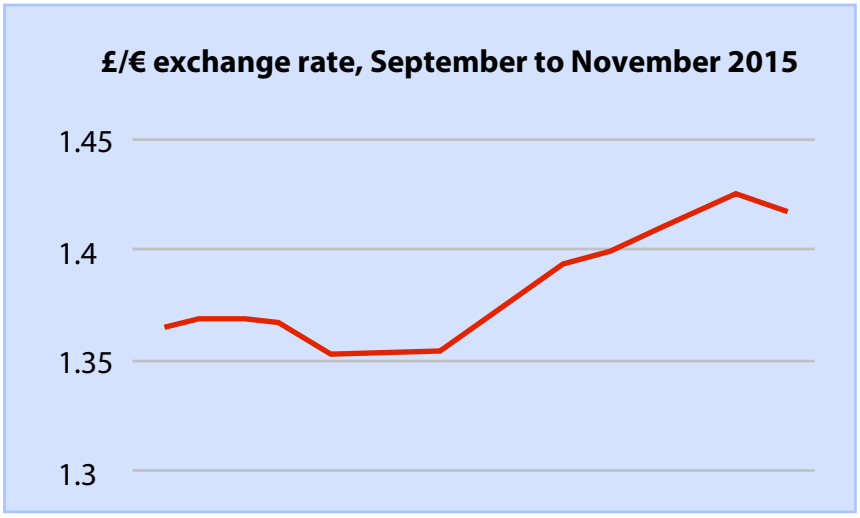
The two sets of data follow one another closely and indeed the coefficient of correlation between the variables is 0.99, meaning very close association.

It is unlikely that any of you believe that owning a smart phone causes diabetes or vice versa and you will easily prefer to believe that the high correlation is spurious. However, with other sets of data showing with high correlation it is easier to assume that there is causation. For example:

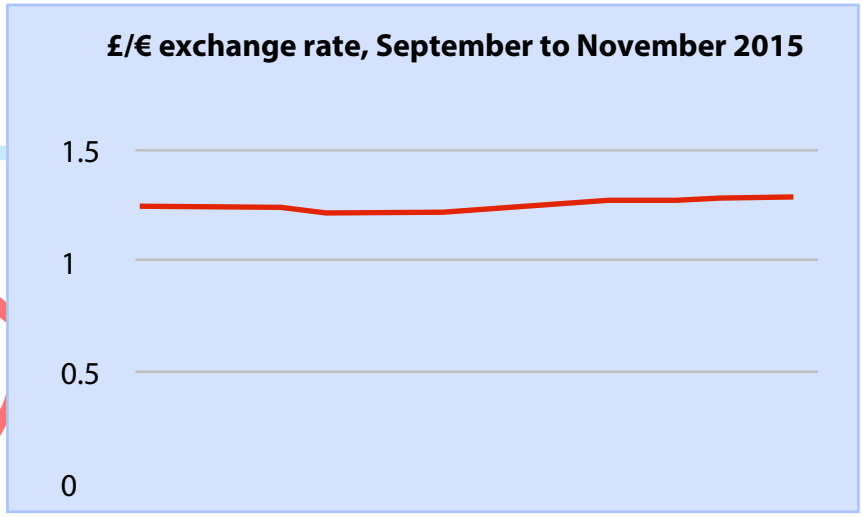
- Use of MMR vaccines and incidence of autism. Almost no doctors now accept there is any causal connection. In addition the whole study was later discredited and the doctor responsible was struck off the UK medical register.
- Cigarette smoking and lung cancer. A causal effect is well-established, but it took more than correlation to do so.
- Concentration of CO_2 in the atmosphere and average global temperatures. Not universally accepted (but increasingly accepted).

3.4 Graphs and pictograms

Here's a graph of the £/€ exchange rate for September to October 2015. It seems to be quite a rollercoaster:



However, the effect has been magnified because the y axis starts at 1.3, not 0. The whole graph only stretches from 1.3 to 1.44. If the graph is redrawn starting the y axis at 0, then the graph will look a follows:



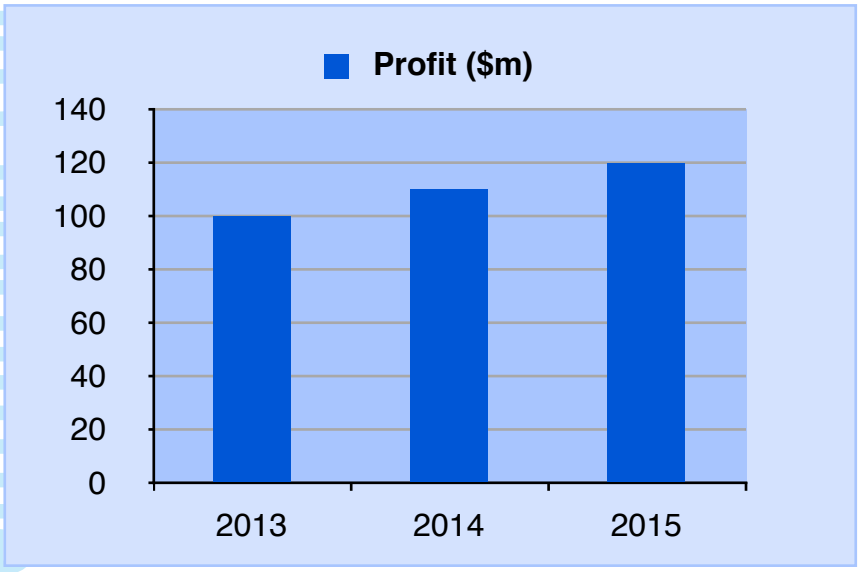
Not nearly so dramatic.

Note that a board of directors that wants to accentuate profit changes could easily make small increases look dramatic, simply by starting the y axis at a high value.

Pictograms are often used to make numerical results more striking and interesting. Look at the following set of results:

Year	*Profit ($m)*
2013	100
2014	110
2015	120

The increase has been a relatively modest 10% per year and on a bar chart would appear as:



A pictogram could show this as:

Look at the first and last bag of money and think about how much you could fit into each. I would suggest the capacity of the third one looks at least 50% greater than the first one. That's because the linear dimensions have increased by 20%, but that means that the capacity has increased by $1.2^3 = 1.73$, flattering the results.

ANSWERS TO EXAMPLES

Chapter 1

No examples

Chapter 2

No examples

Chapter 3

Example 1

	Fixed Budget	*Flexed Budget*	*Actual*	*Variances*	
Sales	100,000	120,000	122,000	2,000	(F)
Materials	50,000	60,000	60,000	--	
Labour	25,000	30,000	28,500	1,500	(F)
Variable o/h	12,500	15,000	15,000	-	
Fixed o/h	10,000	10,000	11,000	1,000	(A)
	97,500	115,000	114,500	500	(F)
Profit	$2,500	$5,000	$7,500	2,500	(F)

Original budgeted profit	2,500	
Sales volume variance	2,500	(F)
Flexed budget profit	5,000	
Sales price variance	2,000	(F)
Labour variance	1,500	(F)
Fixed overhead variance	1,000	(A)
Actual profit	$7,500	

Chapter 4

Example 1

units	*Average time*	*Total time*
1	100	100
2	75	150
4	56.25	225
8	42.1875	337.5

	Hours
Time for 8	337.5
Time for first	100.0
Time for additional 7	237.5hours

Example 1

(a) $b = \frac{\log 0.85}{\log 2} = -0.2345$

$y = ax^b$

for 16 batches $y = 200 \times 16^{-02345} = 104.3912$

Total time for 16 = 16 × 104.4	=	1,670 hours
Time for first	=	200 hours
Time for next 15	=	1,470 hours

(b) Average time for 30 = $200 \times 30^{-0.2345} = 90.08$
Total time for 30 = 30 ×90.08 = 2,703 hours

Average time for 29 = $200 \times 29^{-0.2345} = 90.80$
Total time for 29 = 29 × 90.80 = 2,633 hours

Time for 30^{th} = 2,703 – 2,633 = 70 hours

Chapter 5

No examples

Chapter 6

No examples

Chapter 7

Example 1

	X	Y	Z
	$'000	$'000	$'000
Gross margin	897	1,070.00	1,056.00
Less: Customer specific costs			
Sales visits (80/100/140 × $420)	(33.60)	(42.00)	(58.80)
Order processing (200/320/700 × $190)	(38.00)	(60.80)	(133.00)
Despatch costs (200/320/700 × $350)	(70.00)	(112.00)	(245.00)
Billing and collections (200/320/700 × $97)	(19.40)	(31.04)	(67.90)
Profit	736.00	824.16	551.30
Ranking	2	1	3

Example 2

	Gollum	Sam
	$	$
Revenue	25,000	21,000
Less: discount	2,500	3,150
Net revenue	22,500	17,850
Less: cost of shoes	(12,500)	(10,500)
customer transport cost	(5,000)	–
customer administration cost	(250)	(500)
Net gain	4,750	6,850
The difference on a unit basis is considerable.		
Number of pair of shoes sold	500	420
Net gain per pair of shoes sold	$9.50	$16.31

Example 3

Total fixed costs must have been budgeted as: $30 x 1,000 + $60 x 200 = $42,000.

These are now split as 1/3 = $14,000 for set-up costs and the rest, $28,000 for other costs

The cost driver/causer for set-up costs will be the activity of setting-up. There are 1,000/500 200/100 = 4 set-ups in the period, so the cost per set=up = $14,000/4 = $3,500.

For one set up, 500 units of A are made, so the cost per unit = $3,500/500 = $7.
For one set up, 100 units of B are made, so the cost per unit = $3,500/100 = $35.

$	*Product A*	*Product B*
Marginal cost	50	80
Set-up costs	7	35
Other fixed costs $28,000/(1000 + 2 x 200) = $20 for A, $40 for B	20	40
Total absorption cost	77	155
50% mark-up	38.5	77.7
Selling price	115.5	232.5

It can now be more clearly seen that set-up costs are a major component of Product B. These could be reduced if it were possible to have longer production runs.

Chapter 8

(a)

		Demand			
	Contract size	*400u*	*500u*	*700u*	*900u*
	300u	2,900	3,400	4,400	5,400
	500u	3,500	4,000	5,000	5,000
	700u	4,100	4,600	4,600	4,600
	800u	4,400	4,400	4,400	4,400

(b) (i) Expected value if contract size =

300 units = (0.2×2,900) + (0.3 × 3,400) + (0.4 × 4,400) + (0.1 × 5,400) = **$3,900**

500 units = (0.2 × 3,500) + (0.3 × 4,000) + (0.5 × 5,000) = **$4,400**

700 units = (0.2 × 4,100) + (0.8 × 4,600) = **$4,500**

900 units = $4,400

Sign contract for 700 units

(ii) Maximin

Worst outcome from:

300 units = $2,900

500 units = $3,500

700 units = $4,100

800 units = $4,400

Sign contract for 800 units

(iii) Best outcome from

300 units = $5,400

500 units = $5,000

700 units = $4,600

800 units = $4,400

Sign contract for 300 units

(iii) Regret table

	Demand			
Contract size	*400u*	*500u*	*700u*	*900u*
300u	1,500	1,200	600	0
500u	900	600	0	400
700u	300	0	400	800
800u	0	200	600	1,000

Worst regret for

300 units = $1,500

500 units = $900

700 units = $800

800 units = $1,000

Sign contract for 700 units

Chapter 9

No examples

Chapter10

Example 1

Begin with a review of the summary information - notable points

- Growth in turnover
- Growth in PBIT
- Growth in PAT
- Growth in total assets, debtors approx. in line with turnover, creditors at a higher rate.
- Reduction of gearing (result of rights issue?) and reduced interest charge
- Dividend growth
- P/E ratio has overtaken industry average.

Profitability	Year 1	Year 2	Year3	Year 4
ROCE	26%	27%	20%	22%
Profit Margin	19.9%	19.8%	17.2%	19.2%
Asset Turnover	1.3	1.4	1.2	1.2
Gearing				
Gearing (book values)	50%	34.6%	6%	3.9%
Interest cover (times)	7.25	9.5	48.5	75.3
Liquidity				
Debtor days	73	76	71	70
Creditor days	68	76	81	83
Investor ratios				
Share Price* $	9.63	11.40	9.66	11.95
Market Capitalisation $m	86.67	102.60	115.92	143.4
Divi per share (p)	22.2	24.4	21.65	30.0
Divi yield	2.3%	2%	2.2%	2.5%

* EPS = 5,100,000/9,000,000 = $0.5666; P/e = 17. Therefore price = 17 x 0.5666 = $9.63

Chapter 11

Example 1

Return from new project = $\frac{17,000}{100,000}$ = 17%

(a) For company:
17% > 15% (target)
Therefore company wants to accept

(b) For division

ROI (without project) $\frac{82,000}{500,000}$ = 16.4%

ROI (with project) $\frac{82,000 + 17,000}{500,000 + 100,000}$ = 16.5%

ROI of division increases therefore divisional manager motivated to accept.Example 2

Return from new project = $\frac{16,000}{100,000}$ = 16%

(a) For company: 16% > 15%
Company wants to accept

(b) For division:

ROI (without project) =16.4%

ROI (with project) $\frac{82,000 + 16,000}{500,000 + 100,000}$ = 16.3%

Example 3

(1) RI (without project)

Profit	82,000
Less: Interest	
15% × 500,000	(75,000)
	US$7,000

RI (with project)

Profit	99,000
Less: Interest	
15% × 600,000	90,000
	US$9,000

$9,000 > $7,000 manager motivated to accept

(2) RI (without project) US$7,000

ROI (with project)	
Profit	98,000
Less: Interest	
15% × 600,000	90,000
	US$8,000

$8,000 > $7,000 manager motivated to accept

In both cases the decisions are goal congruent

Example 4

(a)

		d.f. at 10%	*P.V.*
0	(250,000)	1	(250,000)
1 – 5	72,500	3.791	274,847
			24,847

NPV positive: company accepts

(b)

	1	*2*	*3*	*4*	*5*
Bal sheet value	250,000	200,000	150,000	100,000	50,000
Net cash flow	72,500	72,500	72,500	72,500	72,500
Less: Depreciation	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)
Profit	22,500	22,500	22,500	22,500	22,500
Less: Interest at 10%	(25,000)	(20,000)	(15,000)	(10,000)	(5,000)
Residual value	(2,500)	2,500	7,500	12,500	17,500

If manager thinks short-term, may reject project

(c) Annual depreciation + interest $\frac{250,000}{3.791}$ **= $65,946**

	1	*2*	*3*	*4*	*5*
Bal sheet value	250,000	209,054	164,013	114,468	59,969
Net cash flow	72,500	72,500	72,500	72,500	72,500
Less: Depreciation	(40,946)	(45,041)	(49,545)	(54,499)	(59,949)
Profit	31,554	27,459	22,955	18,001	12,551
Less: Interest at 10%	(25,000)	(20,905)	(16,401)	(11,447)	(5,997)
Residual value	6,554	6,554	6,554	6,554	6,554

Even if manager thinks short-term, he is motivated to accept.

Example 5

	2014	2013
	$m	$m
Profit after tax	88	71
Non-cash expenses	15	20
Research and development	11	10
After tax interest (0.7 × 8); (0.7 × 6)	5.6	4.2
Adjusted profit	US$119.6	US$105.2

Adjusted Capital Employed

	2014	2013
Capital employed at start of the year	400	350
Non cash expenses	20	
Research and development	10	
Non-capital leases	16	16
	US$446	$366

Weighted average Cost of Capital:

2013: (15% × 0.7) + (9% × 0.7 × 0.3) = 12.39%
2014: (17% × 0.7) + (10% × 0.7 × 0.3) = 14.00%

EVA 2013 = 105.2 – (366 × 0.1239) = $59.85m

EVA 2014 = 119.6 – (446 × 0.14) = $57.16m

Chapter 12

No examples

Chapter 13

No examples

Chapter 14

Example 1

(a)	Selling price			20
	Costs:	A	10	
		B	4	14
	Profit			US$

(b)

	A		*B*	
Selling price	12	Selling price		20
		Transfer in price	12	
Costs	10	Costs	4	16
Profit	$2	Profit		US

Example 2

(a) Transfer price = 15 × 1.2 = $18 p.u.

(b)	Selling price			30
	Costs:	A	15	
		B	5	20
	Profit			$10

(c)

	A		*B*	
Total Profit	18	Selling price		30
Cost	15	Transfer in price	18	
Profit	$3	Costs	5	23
		Profit		$7

Example 3

(a) Transfer price = 20 × 1.2 = $24 p.u.

(b)	Selling price			30
	Costs:	A	20	
		B	8	28
	Profit			$2

(c)

	A		*B*	
Total Profit	24	Selling price		30
Cost	20	Transfer in price	24	
Profit	$4	Costs	8	32
		Loss		$(2)

Example 4

For A: T.P. > 20
For B: T.P. < 30 - 8
< 22
Sensible T.P. between $20 and $22 p.u.

Example 5

For A: T.P. > 15
For B: T.P. < 35 - 10
< 25
Sensible range between $15 and $25 p.u.

Example 6

For A: T.P. > 20
For B: T.P. < 25 (as in previous example)
< 22
Sensible range. between $20 and $22 p.u.

Example 7

(a) For A: T.P. > 8

For B: T.P. < 14

Sensible range between $8 and $14 p.u.

(b) For A: T.P. > 8

For B: T.P. < 20 – 4

< 16

Sensible range between $8 and $16 p.u.

Example 8

	X	Y
Contribution	$20	$30
Hours	5	10
Contribution per hour	$4	$3

Therefore, if no transfers to B then A would sell exactly and generate $4 per hour contribution.
To make transfers of Y worthwhile, A need to charge at least 70 + (10 × 4) = **$110 p.u.**

Chapter 15

No examples

Chapter 16

Example 1

	0	1	2	3	4	5
Sales		2,000	2,140	2,290	2,450	2,622
Materials		(864)	(933)	(1,008)	(1,088)	(1,175)
Labour		(735)	(772)	(810)	(851)	(893)
Net operating flow		401	435	472	511	554
Tax on operating flow		(100)	(109)	(118)	(128)	(139)
Cost	(1,800)					
Scrap						1,000
Tax on saving on capital allowed		113	84	63	47	(107)
Working Capital	(200)					200
Net cash flow	(2,000)	414	410	417	430	1,508
d.f. @ 10%	1	.909	0.826	0.751	0.683	0.621
P.V.	(2,000)	376	339	313	294	936

NPV = $258

The NPV is positive and so the project should be accepted.

	0	1	2	3	4	5
Net cash flow	(3,000)	401	510	494	1,700	(167)
d.f. @ 5%	1	.952	0.907	0.864	0.823	0.784
P.V.	(3,000)	382	463	427	1,399	(131)

NPV = $258

Example 2

	0	1	2	3	4	5
Net cash flow	(2,000)	414	410	417	430	1,508
d.f. @ 15%	1	.870	0.756	0.658	0.572	0.497
P.V.	(2,000)	360	310	274	246	749

NPV = $ (61) at 15%

NPV @ 10% = $258 (from example 1)

IRR = 10% + [258/(258 +61)] x [15 - 10] = 14%

Example 3

	0	1	2	3
Net cash flow	-1,000	600	700	-200
Discount outflows to time 0 at 10%@ 10%	1			0.751
P.V.	-1,000			-150
PV outflows	-1,150			
Invest inflows at 10% until time 3		x 1.1 x 1.1	x 1.1	
Terminal value of inflows	1,496	726	770	

At IRR NPV = 0, so $1,150 = 1,496/(1 + r)^3$

$(1 + r)^3 = 1,496/1,150 = 1.3$
$1 + r = \sqrt[3]{1.3} = 1.09$; $r = 0.09$ or 9%

Chapter 17

No examples

Chapter 18

Example 1

Selling price = $20 p.u.
Target return = 40% of selling price
Target Cost = **$12 p.u.**

Example 2

Target return = 30% × 5M = $1.5M p.u.
Expected revenue = 40,000 × $67.50 = $2.7M

Target cost = (2.7m - 1.5m)/40,000 = $30 pu

Paper P5

PRACTICE QUESTIONS

1. Mission Statement

(a) Explain the role and content of a Mission Statement.
(b) Explain how a Mission Statement could contribute towards the planning and performance measurement process.
(c) Identify the potential problems arising from using a Mission Statement to manage performance.

2. The Rubber Group

The Rubber Group (TRG) manufactures and sells a number of rubber-based products. Its strategic focus is channelled through profit centres which sell products transferred from production divisions that are operated as cost centres. The profit centres are the primary value-adding part of the business, where commercial profit centre managers are responsible for the generation of a contribution margin sufficient to earn the target return of TRG. The target return is calculated after allowing for the sum of the agreed budgeted cost of production at production divisions, plus the cost of marketing, selling and distribution costs and central services costs.

The Bettamould Division is part of TRG and manufactures moulded products that it transfers to profit centres at an agreed cost per tonne. The agreed cost per tonne is set following discussion between management of the Bettamould Division and senior management of TRG.

The following information relates to the agreed budget for the Bettamould Division for the year ending 30 June 2009:

(1) The budgeted output of moulded products to be transferred to profit centres is 100,000 tonnes. The budgeted transfer cost has been agreed on a two-part basis as follows:
  (i) A standard variable cost of $200 per tonne of moulded products;
  (ii) A lump sum annual charge of $50,000,000 in respect of fixed costs, which is charged to profit centres, at $500 per tonne of moulded products.

(2) Budgeted standard variable costs (as quoted in 1 above) have been set after incorporating each of the following:
  (i) A provision in respect of processing losses amounting to 15% of material inputs. Materials are sourced on a JIT basis from chosen suppliers who have been used for some years. It is felt that the 15% level of losses is necessary because the ageing of the machinery will lead to a reduction in the efficiency of output levels.
  (ii) A provision in respect of machine idle time amounting to 5%. This is incorporated into variable machine costs. The idle time allowance is held at the 5% level partly through elements of 'real-time' maintenance undertaken by the machine operating teams as part of their job specification.

(3) Quality checks are carried out on a daily basis on 25% of throughput tonnes of moulded products.

(4) All employees and management have contracts based on fixed annual salary agreements. In addition, a bonus of 5% of salary is payable as long as the budgeted output of 100,000 tonnes has been achieved;

(5) Additional information relating to the points in (2) above (but NOT included in the budget for the year ending 30 June 2009) is as follows:

(i) There is evidence that materials of an equivalent specification could be sourced for 40% of the annual requirement at the Bettamould Division, from another division within TRG which has spare capacity.

(ii) There is evidence that a move to machine maintenance being outsourced from a specialist company could help reduce machine idle time and hence allow the possibility of annual output in excess of 100,000 tonnes of moulded products.

(iii) It is thought that the current level of quality checks (25% of throughput on a daily basis) is vital, although current evidence shows that some competitor companies are able to achieve consistent acceptable quality with a quality check level of only 10% of throughput on a daily basis.

The directors of TRG have decided to investigate claims relating to the use of budgeting within organisations which have featured in recent literature. A summary of relevant points from the literature is contained in the following statement:

'The use of budgets as part of a 'performance contract' between an organisation and its managers may be seen as a practice that causes management action which might lead to the following problems:

(a) Meeting only the lowest targets

(b) Using more resources than necessary

(c) Making the bonus whatever it takes

(d) Competing against other divisions, business units and departments

(e) Ensuring that what is in the budget is spent

(f) Providing inaccurate forecasts

(g) Meeting the target, but not beating it

(h) Avoiding risks.'

(a) Explain the nature of any SIX of the eight problems listed above relating to the use of budgeting;

(b) Illustrate EACH of the six problems chosen in (a) using the data from the Bettamould division/TRG scenario; and

(c) Suggest ways in which each of the six problems chosen in (a) above may be overcome.

3. Dental Health Partnership

The Dental Health Partnership was established in 1992 and provides dentistry and other related services to the population of Blaintopia, a country in which the public health service is partially funded by the Government.

Additional information relating to the Dental Health Partnership for the year ended 31 May 2005 is as follows:

(1) The partnership was open for five days per week during 48 weeks of the year.

(2) Each dentist treated 20 patients per day. The maximum number of patients that could have been treated by a dentist on any working day was 24 patients.

(3) (i) The partnership received a payment from the government each time any patient was consulted as shown in the following table:

Category of treatment	Payments from Government ($'s)
No treatment required	12
Minor treatment	50
Major treatment	100

(ii) In addition, adult patients paid a fee for each consultation which was equal to the amount of the payment shown per category of treatment in the above table. Children and Senior Citizens were not required to pay a fee for any dental consultations.

(4) The partnership received an annual fee of $20,800 from a well-known manufacturer of dental products under a fixed-term contract of three years' duration. The contract commenced on 1 June 2004 and relates to the promotion of the products of the manufacturer.

(5) The total of material and consumable costs (which are 100% variable) during the year ended 31 May 2005 amounted to $446,400.

(6) Staff costs were paid as follows:

Category of Employee	*Salary per annum, per employee ($'s)*
Dentist	60,000
Dental Assistant	20,000
Administrator	16,000

Note: A fixed bonus payment amounting to 4% of their basic salary was paid to each Dental Assistant and Administrator.

(7) Establishment costs and other operating costs amounted to $85,000 and $75,775 respectively for the year ended 31 May 2005.

(8) All costs other than materials and consumables costs incurred by the Dental Health Partnership are subject to contracts and are therefore to be treated as fixed costs.

(9) A table of non-financial information relating to the Dental Health Partnership for the year ended 31 May 2005 is as follows:

Number of Dentists:	6
Dental Assistants	7

Administrators	2
Patient 'Mix':	
Adults	50%
Children	40%
Senior Citizens	10%
Mix of patient appointments (%):	
No treatment required	70%
Minor treatment	20%
Major treatment	10%

(a) Prepare a summary Profit and Loss Account of the Dental Health Partnership for the year ended 31 May 2005 and calculate the percentage of maximum capacity that was required to be utilised in order to break even in the year ended 31 May 2005.

(b) Discuss FOUR factors that distinguish service from manufacturing organisations and explain how each of these factors relates to the services provided by the Dental Health Partnership.

(c) Excluding the number of complaints by patients, identify and briefly explain THREE quantitative non-financial performance measures that could be used to assess the 'quality of service' provided by the Dental Health Partnership.

4. Dench

Dench manufacturing has received a special order from Sands Ltd to produce 225 components to be incorporated into Sand's product. The components have a high cost, due to the expertise required for their manufacture. Dench produces the components in batches of 15, and as the ones required are to be custom-made to Sands' specifications, a "prototype" batch was manufactured with the following costs:

	$
Materials	
4 kg of A, $7.50/kg	30
2 kg of B, $15/kg	30
Labour	
20 hrs skilled, $15/hr	300
5 hrs semi-skilled, $8/hr	40
Variable Overhead	
25 labour hours, $4/hr	100
	500

Additional information with respect to the workforce is noted below:

Skilled	virtually a permanent workforce that has been employed by Dench for a long period of time. These workers have a great deal of experience in manufacturing components similar to those required by Sands, and turnover is virtually non-existent.
Semi-Skilled	hired by Dench on an "as needed" basis. These workers would have had some prior experience, but Dench management believe the level to be relatively insignificant. Past experience shows turnover rate to be quite high, even for short employment periods.

Dench's plans are to exclude the prototype batch from Sands' order. Management believes a 80% learning rate effect is experienced in this manufacturing process, and would like a cost estimate for the 225 components prepared on that basis.

(a) Prepare the cost estimate, assuming an 80% learning rate is experienced, and

(b) Briefly discuss some of the factors that can limit the use of learning curve theory in practice.

5. Spa

Spa Health Centre specialises in the provision of sports/exercise and medical/dietary advice to clients. The service is provided on a residential basis and clients stay for whatever number of days suits their needs.

Budgeted estimates for the year ending 30 June 2001 are as follows:

(i) The maximum capacity of the centre is 50 clients per day for 350 days in the year.

(ii) Clients will be invoiced at a fee per day. The budgeted occupancy level will vary with the client fee level per day and is estimated at different percentages of maximum capacity as follows:

Client fee per day	*Occupancy level*	*Occupancy as percentage of maximum capacity*
US$180	High	90%
US$200	Medium	75%
US$220	Low	60%

(iii) Variable costs are also estimated at one of three levels per client day. The high, most likely and low levels per client day are $95, $85 and $70 respectively.

The range of cost levels reflects only the possible effect of the purchase prices of goods and services.

Required:

(a) Prepare a summary which shows the budgeted contribution earned by Spa Health Centre for the year ended 30 June 2001 for each of nine possible outcomes.

(b) State the client fee strategy for the year to 30 June 2001 which will result from the use of each of the following decision rules: (i) maximax; (ii) maximin; (iii) minimax regret. Your answer should explain the basis of operation of each rule. Use the information from your answer to (a) as relevant and show any additional working calculations as necessary.

(c) The probabilities of variable cost levels occurring at the high, most likely and low levels provided in the question are estimated as 0·1, 0·6 and 0·3 respectively.

Using the information available, determine the client fee strategy which will be chosen where maximisation of expected value of contribution is used as the decision basis.

6. UKCOM

UKCOM is a large US owned company that was formed in 1997 and operates only within the UK. The company has grown rapidly via acquisition and concentrates its activities in the rapidly growing and highly competitive mobile phone market. The acquired companies have substantial infrastructure assets with only 10% of the available network capacity being utilised in the provision of services to customers. 35% of the assets are categorised as intangible and are composed of goodwill and license acquisition expenditures.
The Board has announced that it will not acquire any further companies and will maintain the same level of debt for the next decade. The Board of Directors based in the US take all the strategic decisions concerned with financing and acquisition policy but leave the operating activities to the UK based Chief Operating Executives

Financial Highlights ($millions)

	1998	*1999*	*2000*	*2001*
Turnover	173	491	747	1591
Costs				
Operating	76	301	376	813
Selling	87	169	293	566
Depreciation	40	153	273	791
Interest	–	203	336	689
Profit/ (loss)	(30)	(335)	(531)	(1,268)
Average Net Assets (NBV)	463	2,347	6,318	12,261
Average Long Term debt	–	1,529	4,214	8,997
Year End Share Price	$5	$34	$76	$110

Management have provided the following estimates of projected cash flows*:

Year	*2002*	*2003*	*2004*	*2005*	*2006*
Cash Outflows	2500	2600	2700	2800	2900
Cash Inflows	4100	4700	6100	7500	9000

These cash flows are based on the current level of competition and the current state of governmental legislation.

*Received and paid at the end of each year

The cash outflows can be estimated with a high degree of certainty owing to the fixed nature of the costs. On the other hand, the cash inflow estimates are subject to considerable uncertainty because of the alternative outcomes that may arise. There are three possible market scenarios that are likely to impact on the inflows:

1) Intensified competition – there is a 40% probability of this occurring and the consequence will be a reduction of 10% on the estimate of cash inflows.
2) Government price regulation – there is a 20% probability of this occurring and it will reduce the estimated inflows by 20%.

3) Less competition – this would result in cash inflows increasing by 5%. There is a 40% probability of this scenario developing.

The company's cost of capital is set at 4% above the average weighted cost of debt interest in the year prior to the first year of the forecast period (rounded up to the nearest percentage point).

Required:

(a) Provide a report on the financial performance of UKCOM from 1998 to 2001 from the perspective of the parent company. (8 marks)

(b) The UK based Chief Operating Executive maintains that his/her team's financial performance has continued to improve throughout the period.
Explain how this claim might be substantiated. Your answer should include a relevant indicator for each of the years 1998 - 2001 which the COE could use. (6 marks)

(c) (i) Calculate the NPV of the future cash flows for the period 2002 – 2006.
Your answer should show all relevant working notes and explain the basis of your calculation (a decision tree type analysis is not required). **(4 marks)**

(ii) Comment on the relevance of your answer in the evaluation of future performance. **(2 marks)**

(20 marks)

7. Nation

The owners of The Nation Restaurant have diversified business interests and operate in a wide range of commercial areas. Since buying the restaurant in 2006 they have carefully recorded the data below.

Recorded Data for The Nation Restaurant (2007 - 2010)

	2007	*2008*	*2009*	*2010*
Total meals served	3,750	5,100	6,200	6,700
Regular customers attending weekly	5	11	15	26
Number of items on offer per day	4	4	7	9
Reported cases of food poisoning	4	5	7	7
Special theme evenings introduced	0	3	9	13
Annual operating hours with no customers	380	307	187	126
Proposals submitted to cater for special events	10	17	29	38
Contracts won to cater for special events	2	5	15	25
Complimentary letters from satisfied customers	0	4	3	6
Average number of customers at peak times	18	23	37	39
Average service delay at peak times (mins)	32	47	15	35
Maximum seating capacity	25	25	40	40
Weekly opening hours	36	36	40	36
Written complaints received	8	12	14	14
Idle time	570	540	465	187
New meals introduced during the year	16	8	27	11
Financial Data	***$***	***$***	***$***	***$***
Average customer spend on wine	3	4	4	7
Total Turnover	83,000	124,500	137,000	185,000
Turnover from special events	2,000	13,000	25,000	55,000
Profit	11,600	21,400	43,700	57,200
Value of food wasted in preparation	1,700	1,900	3,600	1,450
Total turnover of all restaurants in locality	895,000	1,234,000	980,000	1,056,000

Required:

(a) Assess the overall performance of the business and submit your comments to the owners. They wish to compare the performance of the restaurant with their other business interests and require your comments to be grouped into the key areas of performance such as those described by Fitzgerald and Moon.

(b) Identify any additional information that you would consider of assistance in assessing the performance of The Nation Restaurant in comparison with another restaurant. Give reasons for your selection and explain how they would relate to the key performance area categories used in (a).

8. HFG

The Health and Fitness Group (HFG), which is privately owned, operates three centres in the country of Mayland. Each centre offers dietary plans and fitness programmes to clients under the supervision of dieticians and fitness trainers. Residential accommodation is also available at each centre. The centres are located in the towns of Ayetown, Beetown and Ceetown.

The following information is available:

(1) Summary financial data for HFG in respect of the year ended 31 May 2008.

	Ayetown $000	*Beetown $000*	*Ceetown $000*	*Total $000*
Revenue:				
Fees received	1,800	2,100	4,500	8,400
Variable costs	(468)	(567)	(1,395)	(2,430)
Contribution	1,332	1,533	3,105	5,970
Fixed costs	(936)	(1,092)	(2,402)	(4,430)
Operating profit	396	441	703	1,540
Interest costs on long-term debt at 10%				(180)
Profit before tax				1,360
Income tax expense				(408)
Profit for the year				952
Average book values for 2008: Assets				
Non-current assets	1,000	2,500	3,300	6,800
Current assets	800	900	1,000	2,700
Total assets	1,800	3,400	4,300	9,500
Equity and liabilities:				
Share capital				2,500
Retained earnings				4,400
Total equity				6,900
Non-current liabilities				
Long-term borrowings				1,800
Total non-current liabilities				1,800
Current liabilities	80	240	480	800
Total current liabilities	80	240	480	800
Total liabilities				2,600
Total equity and liabilities				9,500

(2) HFG defines Residual Income (RI) for each centre as operating profit minus a required rate of return of 12% of the total assets of each centre.

(3) At present HFG does not allocate the long-term borrowings of the group to the three separate centres.

(4) Each centre faces similar risks.

(5) Tax is payable at a rate of 30%.

(6) The market value of the equity capital of HFG is $9 million. The cost of equity of HFG is 15%.

(7) The market value of the long-term borrowings of HFG is equal to the book value.

(8) The directors are concerned about the return on investment (ROI) generated by the Beetown centre and they are considering using sensitivity analysis in order to show how a target ROI of 20% might be achieved.

(9) The marketing director stated at a recent board meeting that 'The Group's success depends on the quality of service provided to our clients. In my opinion, we need only to concern ourselves with the number of complaints received from clients during each period as this is the most important performance measure for our business. The number of complaints received from clients is a perfect performance measure. As long as the number of complaints received from clients is not increasing from period to period, then we can be confident about our future prospects'.

(a) The directors of HFG have asked you, as management accountant, to prepare a report providing them with explanations as to the following:

(i) Which of the three centres is the most 'successful'? Your report should include a commentary on return on investment (ROI), residual income (RI), and economic value added (EVA) as measures of financial performance. Detailed calculations regarding each of these three measures must be included as part of your report;

(ii) The percentage change in revenue, total costs and net assets during the year ended 31 May 2008 that would have been required in order to have achieved a target ROI of 20% by the Beetown centre. Your answer should consider each of these three variables in isolation. State any assumptions that you make.

(iii) Whether or not you agree with the statement of the marketing director in note (9) above.

(b) The Superior Fitness Co (SFC), which is well established in Mayland, operates nine centres. Each of SFC's centres is similar in size to those of HFG. SFC also provides dietary plans and fitness programmes to its clients. The directors of HFG have decided that they wish to benchmark the performance of HFG with that of SFC.

Discuss the problems that the directors of HFG might experience in their wish to benchmark the performance of HFG with the performance of SFC, and recommend how such problems might be successfully addressed.

9. Jim and Jam

(a) The transfer pricing system operated by a divisional company has the potential to make a significant contribution towards the achievement of corporate financial objectives.

Explain the potential benefits of operating a transfer pricing system within a divisionalised company.

(6 marks)

(b) A company operates two divisions, Jim and Jam. Jim manufactures two products, X and Y. Product X is sold to external customers for $42 per unit. The only outlet for product Y is Jam.

Jam supplies an external market and can obtain its semi finished supplies (product Y) from either Jim or an external source. Jam currently has the opportunity to purchase product Y from an external supplier for $38 per unit. The capacity of division Jim is measured in units of output, irrespective of whether product X, Y or a combination of both are being manufactured. The associated product costs are as follows:

	X	Y
Variable costs per unit	32	35
Fixed overheads per unit	5	5
Total unit costs	37	40

Using the above information, provide advice on the determination of an appropriate transfer price for the sale of product Y from division Jim to division Jam under the following conditions:

(i) When division Jim has spare capacity and limited external demand for product X; (3 marks)

(ii) When division Jim is operating at full capacity with unsatisfied external demand for product X. (4 marks)

(c) The design of an information system to support transfer pricing decision making necessitates the inclusion of specific data.

Identify the data that needs to be collected and how you would expect it to be used. (7 marks)

(20 marks)

10. CTC

The Childrens Toy Company (CTC) manufactures electrically-operated toy versions of animals. The activities of CTC are confined to the country of Stableland, which has a zero-inflation economy. The government of Stableland has granted tax-exempt status to CTC since it provides goods or services exclusively for children. However, no tax allowances are available on investments made by CTC.

CTC has a total production capacity of 400,000 units which cannot be exceeded. The products to be manufactured together with forecast sales volumes are as follows:

Product	*Forecast sales units ('000)*			
	2008	*2009*	*2010*	*2011*
Bruno the Bear	180	120	100	60
Kong the Ape	150	48	24	0
Leo the Lion	60	72	76	30

Other relevant information relating to the products is as follows:

1. Selling prices per unit and contribution to sales ratios (%) for 2008 and 2009:

Product:	*Selling price per unit ($)*	*Contribution to sales ratio (%)*
Bruno	40	70
Kong	50	65
Leo	60	60

2. Product-specific fixed overheads:

Year	*2008*	*2009*
	$000	*$000*
Bruno	3,800	2,400
Kong	2,400	1,340
Leo	2,040	2,100

3. The company's other fixed overheads are estimated at $1·65 million per annum.

Required:

(a) (i) Prepare a statement of product profitability for each of years 2008 and 2009 which also shows the net profit or loss of CTC. (4 marks)

(ii) Comment on the figures in the statement prepared in (a)(i) above. (4 marks)

(b) The marketing director of CTC has suggested the introduction of a new toy 'Nellie the Elephant' for which the following estimated information is available:

1. Sales volumes and selling prices per unit

Year ending, 31 May	*2009*	*2010*	*2011*
Sales units (000)	80	180	100
Selling price per unit ($)	50	50	50

2. Nellie will generate a contribution to sales ratio of 50% throughout the three year period.
3. Product specific fixed overheads during the year ending 31 May 2009 are estimated to be $1·6 million. It is anticipated that these fixed overheads would decrease by 10% per annum during each of the years ending 31 May 2010 and 31 May 2011.

4. Capital investment amounting to $3·9 million would be required in June 2008. The investment would have no residual value at 31 May 2011.
5. Additional working capital of $500,000 would be required in June 2008. A further $200,000 would be required on 31 May 2009. These amounts would be recovered in full at the end of the three year period.
6. The cost of capital is expected to be 12% per annum.

Assume all cash flows (other than where stated) arise at the end of the year.

Required:

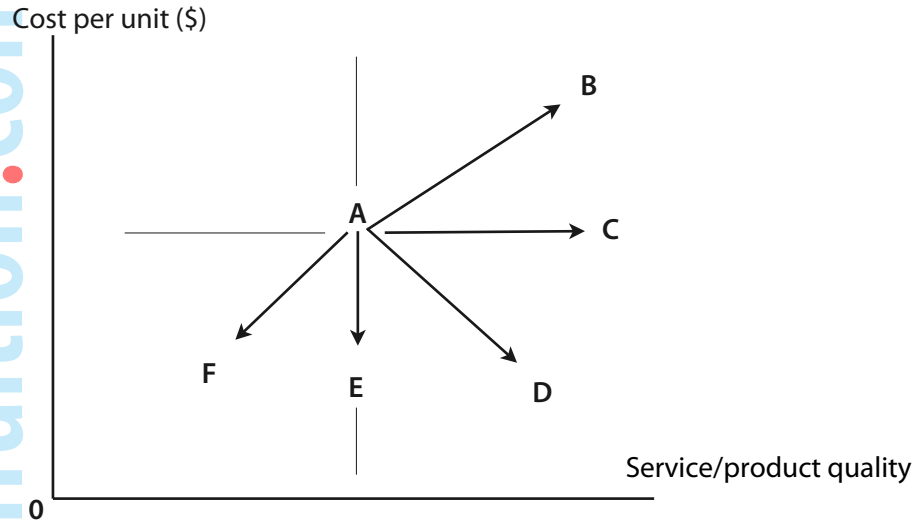
(i) Determine whether the new product is viable purely on financial grounds.(4 marks)
(ii) Calculate the minimum target contribution to sales ratio (%) at which 'Nellie the Elephant' will be financially viable, assuming that all other data remain unchanged. (4 marks)
(iii) Identify and discuss an alternative strategy that may assist in improving the performance of CTC with effect from 1 May 2009 (where only the products in (a) and (b) above are available for manufacture). (4 marks)

(20 marks)

11. Costs And Quality

'Performance through Quality' has been a theme adopted by many successful organisations that operate in highly competitive business environments. The diagram below entitled Costs and Quality illustrates the alternative paths (as depicted by the arrows) that a business can take from a starting point A.

Costs and Quality



(a) Briefly explain the probable business consequences of pursuing the alternative paths available and arriving at points B to F. Identify the path that is most likely to bring business success.

Traditional management accounting activities have had their original scope broadened by the development of a variety of techniques that incorporate a growing recognition of the cost and quality issue in the management decision making process.

(b) Explain how contemporary management accounting/management techniques such as Total Quality Management, Just In Time, Value Analysis, Activity Based Costing and The Balanced Scorecard could contribute towards the analysis of the relationship between costs and quality.

12. Marge Ltd

Marge Ltd makes a butter substitute using sunflower seeds and a variety of synthetic ingredients. Butter substitute is sold to wholesalers for $0.40 per 500g pack, while variable costs excluding those described below amount to 65% of sales income. Thirty per cent of the sunflower seed input is converted to butter substitute, the remainder being accounted for by losses in process.

The availability of sunflower seeds is difficult to control because of their perishability and because of the variability of world-wide weather conditions. However, some other ingredients, including one called Duralin, are freely available. Two kg of Duralin is used in the process per hundred kg of sunflower seeds.

To avoid some of the uncertainty Marge Ltd wishes to place an advance order for Duralin, but the corresponding level of sunflower seeds available will not be known when the order for Duralin is placed. Management estimate the likelihood of different levels of sunflower seeds being available as follows:

Availability level	Probability	Duralin costs per kg $	Sunflower seeds purchased 000kg
High	0.2	1.50	72,000
Medium	0.6	1.75	65,000
Low	0.2	2.00	54,000

If the wrong decision is made and too small a quantity of Duralin is ordered a discount on the whole quantity actually needed will be allowed by the supplier when the order is changed. If the advance order is too large, however, an extra amount will be payable for changing the order.

Nature of alteration to order size	Discount $	Premium $
Low to medium	0.20	-
Medium to high	0.15	-
Low to high	0.35	-
Medium to low	-	0.35
High to medium	-	0.35
High to low	-	0.55

(a) Calculate the contribution earned by Marge Ltd for each of the possible outcomes.

(b) Advise Marge Ltd what level of Duralin order it should place, according to each of the following decision criteria.

(i) Maximax

(ii) Maximin

(iii) Maximum expected value

(c) What attitude to risk is held by managers who work according to the maximax criterion as opposed to those who prefer maximin?

(d) If it were possible to know in advance what level of seeds would be available, how much should Marge Ltd be prepared to pay for this information?

Paper P5

PRACTICE ANSWERS

1. Mission Statement

(a) A Mission Statement describes the organisation's basic function in society. What is it trying to accomplish? The elements of a Mission Statement might include:

Purpose: Why does it exist? A company exists primarily to create wealth for its shareholders whereas a hospital exists to care for the sick.

Strategy: It may specify the business that the organisation is in, the product and service areas it is going to operate and the necessary competences that need to be present.

Values and Culture: It may state the beliefs, ethical standpoints and principles under which activity is to be carried out.

The statement can range from short snappy sentences ('Absolutely, Positively, Overnight' for a parcel courier service) to a page long description of business intentions (for, example, for public sector organisations). Whatever the length, it should guide all employees at all levels to work collectively towards the achievement of the corporate mission – 'a guiding light'.

It may attempt to incorporate several of the stakeholders (for example, shareholders, customers, employees), and increasingly, the environment.

(b) The Mission Statement can play an important part in the planning process by providing:

- a framework within which the plans must be developed
- a focus on strategies
- a screening device for unacceptable projects, practices and activities
- a communication device to establish a common acceptable corporate culture.

This framework should impact upon both high level strategic plans e.g. what areas of business are acceptable, and on operational planning decisions such as sources of supply and the way customers are dealt with by staff.

In terms of the owners, the statement may incorporate:

(i) a broad intention to enhance shareholder wealth

(ii) this then needs to be converted into specific goals such as to provide a return on investment and/or increase share value

(iii) then measurable targets will be developed, e.g. 20% return on investment annually and/or a share price increase of 5% in excess of the industry average

(iv) and to achieve the required 20% return on investment may necessitate the profit margin on sales to be 43%.

The mission statement will therefore result in the cascading down of increasingly more detailed plans and targets. These targets will be set for the corporate entity, business sub-

units and individuals. They will provide the basis of the performance measurement when they are compared with the outcomes.

Good performance might be concerned with the extent that we are achieving the mission, the organisation never gets there, it is more of a journey that should be pursued. Performance is concerned with assessing the extent that a desire, goal, objective or target has been achieved – a comparative judgement. To what extent have we achieved what was set out to be done?

(c) Potential problem areas:

- the wording of the statement may be rather vague and abstract and therefore provide limited assistance in developing strategies
- the content of the statement may provide the management with non-congruent goals. For example, maximising shareholder wealth may conflict with any ethical statements made in the mission. Trade-offs between quantifiable financial targets and non-quantifiable goals complicate the assessment of managerial performance
- the potential for inconsistent goal setting can occur between departments, differing managerial levels and over time
- the Mission Statement is occasionally regarded by employees as 'political window dressing' and does not in their view reflect actual company strategy and the actions of management – this may result in adverse behavioural consequences
- the statement does not normally stipulate a time horizon for the achievement of the mission
- problems arise in assessing how well the organisation is doing.

2. The Rubber Group

Suggested answer content for each of the eight problems contained within the scenario is as follows:

(a) The nature of each of the problems relating to the use of budgeting is as follows:

Meeting only the lowest targets

infers that once a budget has been negotiated, the budget holder will be satisfied with this level of performance unless there is good reason to achieve a higher standard.

Using more resources than necessary

Once the budget has been agreed the focus will be to ensure that the budgeted utilisation of resources has been adhered to. Indeed the current system does not provide a specific incentive not to exceed the budget level. It may be, however, that failure to achieve budget targets would reflect badly on factors such as future promotion prospects or job security.

Making the bonus – whatever it takes

A bonus system is linked to the budget setting and achievement process might lead to actions by employees and management which they regard as 'fair game'. This is because they view the maximisation of bonuses as the main priority in any aspect of budget setting or work output.

Competing against other divisions, business units and departments

Competition may manifest itself through the attitudes adopted in relation to transfer pricing of goods/services between divisions, lack of willingness to co-operate on sharing information relating to methods, sources of supply, expertise, etc.

Ensuring that what is in the budget is spent

Management may see the budget setting process as a competition for resources. Irrespective of the budgeting method used, there will be a tendency to feel that unless the budget allowance for one year is spent, there will be imposed reductions in the following year. This will be particularly relevant in the case of fixed cost areas where expenditure is viewed as discretionary to some extent.

Providing inaccurate forecasts

This infers that some aspects of budgeting problems such as 'Gaming' and 'misrepresentation' may be employed by the budget holder in order to gain some advantage. Gaming may be seen as a deliberate distortion of the measure in order to secure some strategic advantage. Misrepresentation refers to creative planning in order to suggest that the measure is acceptable.

Meeting the target but not beating it

There may be a view held by those involved in the achievement of the budget target that there is no incentive for them to exceed that level of effectiveness.

Avoiding risks

There may be a prevailing view by those involved in the achievement of the budget target that wherever possible strategies incorporated into the achievement of the budget objective should be left unchanged if they have been shown to be acceptable in the past. Change may be viewed as increasing the level of uncertainty that the proposed budget target will be achievable.

(b) An illustration of each of the problems using the data from the Battamould division/TRG scenario is as follows:

Meeting only the lowest targets

In the scenario, the budgeted variable cost of $200 per tonne has been agreed. There is no specific incentive for the Bettamould division to try to achieve a better level of performance.

Using more resources than necessary

In the scenario, the current budget allows for 5% machine idle time. There is evidence that a move to outsourcing machine maintenance from a specialist company could help reduce idle time levels and permit annual output in excess of 100,000 tonnes.

Making the bonus – whatever it takes

At present, the only sanction/incentive is to achieve 100,000 tonnes of output. There is no mention of any sanction for example, if processing losses (and hence costs) rise to 20% of material inputs.

Competing against other divisions, business units and departments

At present, the Bettamould division sources its materials from chosen suppliers who have been used for some years. There is evidence that materials of equal specification could be sourced for 40% of the annual requirement from another TRG division which has spare capacity. Why has this not been investigated?

Ensuring that what is in the budget is spent

In the Bettamould scenario, there is a fixed cost budget allowance of $50,000,000. We are told in the question that salaries of all employees and management are paid on a fixed salary basis. Bettamould's management will not want a reduction in the fixed budget allowance, since this could lead to the need to reduce the number of employees, which they may see as having a detrimental effect on the ability of the division to meet its annual budget output target of 100,000 tonnes.

Providing inaccurate forecasts

In the scenario there may have been deliberate efforts to increase the agreed budget level of aspects of measures and costs. For example, by putting forward the argument that the budget requirement of 15% processing losses is acceptable because of the likelihood that ageing machinery will be less effective in the coming budget period.

Meeting the target but not beating it

In the scenario the bonus of 5% of salary is payable as long as the 100,000 tonnes of output is achieved. This does not require that actual results will show any other aspects of the budget being improved upon. For example there is no need to consider a reduction in the current level of quality checks (25% of daily throughput) to the 10% level that current evidence suggests is achieved by competitor companies. The current budget agreement allows the Bettamould division to transfer its output to market based profit centres at $200 + $500 = $700 per tonne. There is no specified penalty if costs exceed this target level.

Avoiding risks

Bettamould has not yet incorporated the changes listed in note 4 in the question. For example why has the sourcing of 40% of required materials from another TRC division not been quantified and evaluated. It is possible that the division with spare capacity could supply the material at cost (possibly based on marginal cost) which would be less than currently paid to a supplier external to TRC. It may be that Bettamould have not pursued this possibility because of risk factors relating to the quality of the material transferred or its continued availability where the supplying division had an upturn in the level of more profitable external business.

(c) Ways in which each of the problems might be overcome are as follows:

Meeting only the lowest targets

To overcome the problem there must be some additional incentive. This could be through a change in the basis of bonus payment which currently only provides an incentive to achieve the 100,000 tonnes of output.

Using more resources than necessary

Overcoming the problem may require a change in the bonus system which currently does not provide benefit from any output in excess of 100,000 tonnes. This may not be perceived

as sufficiently focused in order to achieve action. It may be that engendering a culture of continuous improvement would help ensure that employees actively sought ways of reducing idle time levels.

Making the bonus – whatever it takes

It is likely that efforts to change the 'work ethos' at all levels is required, while not necessarily removing the concept of a bonus payable to all employees for achievement of targets. This may require the fostering of a culture for success within the company. Dissemination of information to all staff relating to trends in performance, meeting targets, etc may help to improve focus on continuous improvement.

Competing against other divisions, business units and departments

The problem may need some input from the directors of TRG. For example, could a 'dual-cost' transfer pricing system be explained to management at both the Bettamould division and also the Division with spare capacity in order to overcome resistance to problems on transfer pricing and its impact on divisional budgets and reported results? In this way it may be possible for the Bettamould division to source some of its input materials at a lower cost (particularly from TRG's viewpoint) and yet be acceptable to the management at the supplying division.

Ensuring that what is in the budget is spent

In order to overcome the problem it may be necessary to educate management into acceptance of aspects of budgeting such as the need to consider the committed, engineered and discretionary aspects of costs. For example, it may be possible to reduce the number of salaried staff involved in the current quality checking of 25% of throughput on a daily basis.

Providing inaccurate forecasts

In order to overcome this problem there must be an integrated approach to the budget setting process. This may be achieved to some extent through all aspects of the budget having to be agreed by all functions involved. For example, engineers as well as production line management in reaching the agreed link between percentage process losses and the falling efficiency of machinery due to age. In addition, TRC may insist an independent audit of aspects of budget revisions by group staff.

Meeting the target but not beating it

To overcome the problem may require that the bonus system should be altered to reflect any failure to control costs per tonne at the budget level.

Avoiding risks

In order to overcome such problems, TRC would have to provide some guarantees to Bettamould management that the supply would be available during the budget period at the initially agreed price and that the quality would be maintained at the required level. This would remove the risk element that the management of the Bettamould division may consider currently exists.

3. Dental Health Partnership

Summary Profit and Loss Account for the year ended 31 May 2005

	$
Fees received	1,226,880 (Note 1)
Other Operating Income	20,800
Total Income	1,247,680
Less: variable costs	
Material and consumables	446,400
Less: fixed costs	
Salaries	538,880
Establishment costs	85,000
Other operating costs	75,775
Total costs	1,146,055
Net profit for the period	101,625

Calculation of % of total capacity required to break-even during the year ended 31 May 2005.

Fees received	US$1,226,
Less: variable costs	US$446,4(
Contribution	US$780,4{
Total number of consultations	28,800

Weighted average contribution per patient visit= 780,480/ 28,800

Total fixed costs:	$
Salaries	538,880
Establishment costs	85,000
Other operating costs	75,775
	699,655
Less: fixed income	20,800
Total fixed costs less fixed income	678,855

Divide by weighted average contribution per patient visit

$678,855/$27·10 = 25,050 consultations.

Total capacity for patient visits = 28,800/0·8333 = 34,560 per annum

Therefore percentage of maximum capacity required in order to break-even is 25,050/34,560 = 72·5%

Note 1. Fees received:

Adult fees = Payment plus Government refund Children/Senior Citizens = Government refund

Adjusted patient mix is as follows:

Adults	50% x 2 =	100%
Children		40%
Senior Citizens		10%
Total		150%

The weighted average fee per patient is as follows:

Type of patient treatment:		$
None	0·70 x $12 =	8·40
Minor	0·20 x $50 =	10·00
Major	0·10 x $100 =	10·00
Total		28·40

Therefore fees received during the year ended 31 May 2005 = 28,800 x 1·5 x $28·40 = $1,226,880.

Note 2. Capacity:

Each dentist had a maximum of 24 patients per day but on average treated 20 patients per day which equates to 83·333% of maximum capacity.

(b) The major characteristics of services which distinguish services from manufacturing are as follows:

- Intangibility.

  When a dentist provides a service to a client there are many intangible factors involved such as for example the appearance of the surgery, the personality of the dentist, the manner and efficiency of the dental assistant. The output of the service is 'performance' by the dentist as opposed to tangible goods.
- Simultaneity.

  The service provided by the dentist to the patient is created by the dentist at the same time as the patient consumed it thus preventing any advance verification of quality.
- Heterogeneity.

  Many service organisations face the problem of achieving consistency in the quality of its output. Whilst each of the dentists within the Dental Health Partnership will have similar professional qualifications there will be differences in the manner they provide services to clients.
- Perishability.

  Many services are perishable. The services of a dentist are purchased only for the duration of an appointment.

(c) In order to assess the quality of patient care provided by the Dental Health Partnership the following performance measures might be used:

- The percentage of 'on time' treatment of those patients who arrived prior to their appointment time would provide an indication regarding the effectiveness of the scheduling of appointments by the Dental Health Partnership.
- the percentage of patient appointments which were re-arranged at the request of the Dental Health Partnership. Rearranged appointments represent the provision of a lower level of service provision to clients who may, as a result, switch to an alternative dental practice.
- the percentage of patients who return for treatment after their first appointment would provide an indication that they were satisfied with the service they received.
- the percentage of patients who were able to gain an appointment at their preferred date and time is an indication of the availability of the service to clients.

Note: Candidates were only required to discuss three measures.

4. Dench

(a) Cost estimate for 225 components is based upon the following assumptions:

(1) the first batch of 15 is excluded from the order (and total cost for first batch is likewise excluded); and

(2) the 80% learning rate only applies to the skilled workforce, (and related variable overhead) due to their high level of expertise/low turnover rate.

Cumulative Batches	*Cumulative Units*	*Total Time*	*Cumulative time/batch*
1	15	20 hr	20 hr
2	30	32 hr	16 hr
4	60	51.2hr	12.8hr
8	120	81.92hr	10.24hr
16	240	131.072hr	8.192hr

Total cost for 16 batches (240 components)

		$
Material A:	$30 batch	480
Material B:	$30/batch	480
Labour:	Skilled 131.072 hr @ $15/hr	1,966
	Semi-skilled $40/batch	640
Variable OH:	131.072 hr @ $4/hr	524
	5 hr/batch at $4/hr	320
		4,410
Less: Cost for 1st batch (15 components)		(500)
∴cost for 225 components		3,910

(b) The limited use of learning curve theory is due to several factors:

(a) the learning curve phenomenon is not always present;

(b) it assumes stable conditions at work (eg of the labour force and labour mix) which will enable learning to take place. This is not always practicable (eg because of labour turnover).

(c) it must also assume a certain degree of motivation amongst employees;

(d) extensive breaks between production of items must not be too long, or workers will 'forget' and the learning process would have to begin all over again;

(e) it is difficult to obtain enough accurate data to decide what the learning curve is;

(f) there there will be a cessation to learning eventually, once the job has been repeated often enough.

5. Spa

(a) Budgeted Net Profit/Loss outcomes for year ending 30 June 2001.

Client Days	Fee per Client day	Variable cost per client day	Contribution per client day	Total contribution per year
	$	$	$	$
15,750	180	95	185	1,338,750
15,750	180	85	195	1,496,250
15,750	180	70	110	1,732,500
13,125	200	95	105	1,378,125
13,125	200	85	115	1,509,375
13,125	200	70	130	1,706,250
10,500	220	95	125	1,312,500
10,500	220	85	135	1,417,500
10,500	220	70	150	1,575,000

(b) The maximax rule looks for the largest contribution from all outcomes. In this case the decision maker will choose a client fee of $180 per day where there is a possibility of a contribution of $1,732,500.

The maximin rule looks for the strategy which will maximise the minimum possible contribution. In this case the decision maker will choose client fee of $200 per day where the lowest contribution is $1,378,125. This is better than the worst possible outcome from client fees per day of $180 or $220 which will provide contribution of $1,338,750 and $1,312,500 respectively.

The minimax regret rule requires the choice of the strategy which will minimise the maximum regret from making the wrong decision. Regret in this context is the opportunity lost through making the wrong decision.

Using the calculations from part (a) we may create an opportunity loss table as follows:

	Client fee per day strategy		
State of variable cost	US$180	US$200	US$220
High	39,375	0	65,625
Most likely	13,125	0	91,875
Low	0	26,250	157,500
Maximum regret	39,375	26,250	157,500

Example of the workings: at the low level of variable costs, the best strategy would be a client fee of $180. The opportunity loss from using a fee of $200 or $220 per day would be $26,250 (1,732,500 – $1,706,250) or $157,500 (1,732,500 – 1,575,000) respectively.

The minimum regret strategy (client fee $200 per day) is that which minimises the maximum regret (i.e. $26,250 in the maximum regret row above).

(c) The expected value of variable cost

= $95 × 0·1 + $85 × 0·6 + $70 × 0·3 = $81.50

For each client fee strategy the expected value of budget contribution for the year may be calculated:

- fee of $180 : 15,750 (180 × 81·50) = $1,551,375
- fee of $200 : 13,125 (200 × 81·50) = $1,555,312·50

- fee of $220 : 10,500 (220 × 81·50) = $1,454,250

Hence choose a client fee of $200 per day to give the maximum expected value contribution of $1,555,312·50. Note that there is virtually no difference between this and the contribution where a fee of $180 per day is used.

6. UKCOM

(a) The rapid growth in turnover has been exceeded by an even faster growth in costs and hence the growth in the annual loss sustained. The company's growth has been facilitated by extensive borrowing which has resulted in a substantial interest burden. In terms of key financial indicators we have:

	1998	*1999*	*2000*	*2001*
net loss	(17%)	(68%)	(71%)	(79%)
return on assets	(6·4%)	(14·2%)	(8·4%)	(10·4%)
debt/assets	–	65%	67%	73%

The increasing loss and rising gearing would represent serious cause for concern in a traditional/conventional assessment of financial performance. In contrast, the increasing share price suggests that the shareholders are not taking a pessimistic view. They are aware of the financial results but still have confidence in the company – we need to investigate this apparent dichotomy in viewpoints. Share price is a measure of financial performance alongside sales and profit margins. Suggestions for the paradox:

- the company's financial performance is judged according to how it is performing in relation to a known business plan. The loss was predicted and revenues and costs are on target. The share price may begin to fall if the results do not adhere to the plan. Shareholder confidence and perceived performance is about the management delivering on their promises.
- the shareholders and the market are taking a long term view with the first four year results being regarded as only short to medium term. The long term financial performance is yet to be disclosed
- the company owns substantial tangible assets in addition to intangibles that will provide the basis of future market growth. The licences and goodwill represent the purchase of future cash inflows and may be regarded as market entry costs.

(b) This is concerned with the issue of being able to differentiate the performance of the organisation from the performance of the manager. The COE may argue that they do not determine either the amount of the assets under their control or the interest on the debt – acquisition and financing policy is determined by the board and therefore beyond their control. Instead of using the standard measure of profit as an indicator of performance, the CEO may be judged on Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA). This represents the surplus after excluding to two significant costs associated with the acquisition of the company's capital assets – depreciation (of tangible and intangibles assets) and interest charges.

	1998	1999	2000	2001
Loss (as per accounts)	(30)	(335)	(531)	(1,268)
Interest adjustment	ñ	203	336	689
Depreciation Adjustment	40	153	273	791
EBITDA	10	21	78	212

This shows a significant improvement in performance and therefore could be used to justify the assertion that the team's performance has improved.

(c) The uncertain cash flows require to be adjusted for the alternative potential scenarios.

Calculate the expected values by multiplying the cashflows by the probabilities:

0·4 × ·9 =	0·36
0·4 × 1·05 =	0·42
0·2 × ·8 =	0·16
	0·94

2002	2003	2004
4,100 × 0·94 =3,854	4,700 × 0·94 = 4,418	6,100 × 0·94 = 5,734

2005	2006
7,500 × 0·94 = 7,050	9,000 × 0·94 = 8,460

Year	2002	2003	2004	2005	2006
Cash outflows	(2,500)	(2,600)	(2,700)	(2,800)	(2,900)
EV cash inflows	3,854	4,418	5,734	7,050	8,460
Net cash flow	1,354	1,818	3,034	4,250	5,560
12% PV factor	·893	·797	·712	·636	·567
PV	1,209	1,449	2,160	2,703	3,153

Total NPV = $10.674 billion

Cost of capital = 689/8997 = 7·65% + 4% =11·65 or rounded up to 12%

The cash inflow projections are likely to arise from the company entering into a period of stable capital costs and increasing revenues as the spare capacity in the network becomes utilised (mentioned in question brief).

The $10·7 billion is far in excess of the historic cumulative loss. The rising share price would have probably been influenced by these anticipated cash flows.

7. Nation

(a) The performance can be categorised into the following key areas: Financial, Competitiveness, Resource Utilisation, Quality of Service and Innovation/Flexibility.

Financial:

- Continuous turnover growth with a 123% increase over the period.
- Annual compound growth rate
- An even faster growth in profit – approximate five fold increase
- Profits growing faster than turnover creates an increasing net profit margin from 14% in 1998 to 30·9% in 2010. This may have arisen from improved resource utilisation (see below) resulting in a gradual decrease in the ratio of fixed costs to revenues.

Competitiveness:

Concerned with market share and growing new business areas.

Market share measured by the rate of restaurant turnover to the turnover of all restaurants in the locality. This commences with 9·2% in 2007 and continually increases to 17·5% in 2010. There is also a rapid growth in the proposals submitted for new events (10 to 38), and even more significantly, is the faster growth in contracts won. The success rate increases from 20% in 2007 to 66% in 2010. The restaurant is therefore competing increasingly successfully in this developing business area. The restaurant is becoming increasingly price competitive.

Quality of service

The increasing number of regular customers would suggest that many customers are satisfied with the total package that the restaurant offers. This may be partly due to service quality or other factors such as price competitiveness. The growth in complaints, complimentary letters, reported cases of food poisoning and the service delivery data would suggest rather a mixed situation. It is difficult to provide a definitive comment regarding the quality of service over the period, especially as the number of customers nearly doubled over the period. Even additional calculations, such as those involving key service quality data per 100 customers would not provide the basis for an overall conclusive comment.

Innovation/Flexibility

The restaurant has fared quite well in this respect when we consider:

– increase in the number of dishes on offer

– the introduction of theme evenings

– the development of the catering activities for special events

The restaurant is prepared to try new dishes although the extent of its experimentation varies considerably from year to year.

Also, the fluctuating and somewhat unsatisfactory service delays suggest that they are not managing to flex their resources adequately to meet peak demand levels.

Resource Utilisation

The business activity level continually increased over the period (meals served) with a decline in non-productive time and the hours of operation with no customers. All these

suggest an improvement in resource utilisation. We do not know whether the increase in seating capacity in 2009 arose from extending the floor area available or from the provision of more seating within a constant space. Although this capacity increase permitted more customers to be fed at peak times, it did result in a fluctuation in the annual number of meals served at each seat, 150 (2007), 204 (2008), 155 (2009), 167 (2010). A brief attempt was made in 2009 to extend the opening hours and increase the hourly utilisation of the premises.

(b) Financial:

- the value of assets required to generate the profits – to calculate the ROCE
- details of cost categories e.g. labour, food overheads – to assess comparative financial ratios
- did the increase in capacity in 2009 require additional capital investment – to assess the marginal returns
- the level of business risk inherent in alternative business and the associated expected return

Competitiveness

- national trends in restaurant attendance and revenues provide broader comparisons
- data on/customer surveys of restaurants in targeted customer groups

Quality of Service

- to assess various intangible factors e.g. politeness of staff, atmosphere and décor, responsiveness to customer requests
- food writers or expert ratings

Innovation/Flexibility:

- staff training and the potential for multi-skilling activities to provide greater operational flexibility
- the ability to cope with non-standard requests e.g. special dietary needs and respond to customer needs

Resource Utilisation

- data on employee numbers would facilitate the calculation of business activity per employee
- data on floor area per customer

8. HFG

(a) (i) To: The Directors From: Management Accountant Subject: The performance of our three health centres Date: 6 June 2008

Further to your recent request please find below my detailed responses to the questions you have raised. A Summary of the financial performance of the three centres is shown in the following table:

Heath centre	*Return on investment (%)*	*Residual income ($000)*	*Economic value added ($000)*
Ayetown	23·02	180·00	42·08
Beetown	13·96	33·00	–123·27
Ceetown	18·40	187·00	–30·09

Which of the three centres is the most successful?

This very much depends on the method used to assess the performance of the three health centres. As requested, I have undertaken calculations based on three performance measures namely, return on investment (ROI), residual income (RI) and economic value added (EVA). I have included the workings for each respective calculation in an appendix to this report.

Using ROI as a measure of financial performance indicates that Ayetown is the most successful of the three centres since its ROI was 23·02% compared with the 18·40% achieved by Ceetown and the 13·96% achieved by Beetown. However, you should bear in mind that the use of ROI can be grossly misleading since it is a relative measure and ignores absolute returns. In this respect I wish to draw your attention to the fact that Beetown earned $45,000 (11·4%) more operating profit than Ayetown and Ceetown earned $397,000 (77·5%) more profit than Ayetown.

The use of RI as a measure of financial performance indicates that Ceetown is the best performing centre, generating $187,000 of residual income. It is worth observing that Ayetown was not far behind Ceetown in terms of generating residual income of $180,000. However, Beetown only managed to generate $33,000 of residual income.

EVA™ is a specific type of residual income calculation which has attracted a considerable amount of attention during recent years. Economic Value Added equals after-tax operating profit minus the (after-tax) weighted average cost of capital multiplied by total assets minus current liabilities. EVA™ substitutes the following numbers in residual income calculations:

(a) Income is equal to after-tax profits;

(b) A required rate of return is equal to the after-tax weighted average cost of capital; and

(c) Investment is equal to total assets minus current liabilities.

Ayetown has the highest EVA. Indeed, it is the only centre which has a positive EVA. In common with RI, EVA charges managers for the cost of making investments in long-term assets and working capital. Value will only be created in circumstances where post-tax operating profit exceeds the cost of investing the required capital. In order to improve EVA, managers need to earn more operating profit using the same amount of capital, or invest capital in higher-earning projects. The use of EVA is often preferred to RI because it takes into account tax effects of investment decisions whereas pre-tax residual income measures do not.

(ii) The ROI of Beetown is currently 13·96%. In order to obtain an ROI of 20%, operating profit would need to increase to (20% × $3,160,000) = $632,000, based on the current level of net assets. Three alternative ways in which a target ROI of 20% could be achieved for the Beetown centre are as follows:

(1) Attempts could be made to increase revenue by attracting more clients while keeping invested capital and operating profit per $ of revenue constant. Revenue would have to increase to $2,361,644, assuming that the current level of profitability is maintained and fixed costs remain unchanged. The current rate of contribution to revenue is $2,100,000 – $567,000 = $1,533,000/$2,100,000 = 73%. Operating profit needs to increase by $191,000 in order to achieve an ROI of 20%. Therefore, revenue needs to increase by $191,000/0·73 = $261,644 = 12·46%.

(2) Attempts could be made to decrease the level of operating costs by, for example, increasing the efficiency of maintenance operations. This would have the effect of increasing operating profit per $ of revenue. This would require that revenue and invested capital were kept constant. Total operating costs would need to fall by $191,000 in order to obtain an ROI of 20%. This represents a percentage decrease of 191,000/1,659,000 = 11·5%. If fixed costs were truly fixed, then variable costs would need to fall to a level of $376,000, which represents a decrease of 33·7%.

(3) Attempts could be made to decrease the net asset base of HFG by, for example, reducing debtor balances and/or increasing creditor balances, while keeping turnover and operating profit per $ of revenue constant. Net assets would need to fall to a level of ($441,000/0·2) = $2,205,000, which represents a percentage decrease amounting to $3,160,000 – $2,205,000 = 955,000/3,160,000 = 30·2%.

(iii) The marketing director is certainly correct in recognising that success is dependent on levels of service quality provided by HFG to its clients. However, whilst the number of complaints is an important performance measure, it needs to be used with caution. The nature of a complaint is, very often, far more indicative of the absence, or a lack, of service quality. For example, the fact that 50 clients complained about having to wait for a longer time than they expected to access gymnasium equipment is insignificant when compared to an accident arising from failure to maintain properly a piece of gymnasium equipment. Moreover, the marketing director ought to be aware that the absolute number of complaints may be misleading as much depends on the number of clients serviced during any given period. Thus, in comparing the number of complaints received by the three centres then a relative measure of complaints received per 1,000 client days would be far more useful than the absolute number of complaints received.

The marketing director should also be advised that the number of complaints can give a misleading picture of the quality of service provision since individuals have different levels of willingness to complain in similar situations.

The marketing director seems to accept the current level of complaints but is unwilling to accept any increase above this level. This is not indicative of a quality-oriented organisation which would seek to reduce the number of complaints over time via a programme of 'continuous improvement'.

From the foregoing comments one can conclude that it would be myopic to focus on the number of client complaints as being the only performance measure necessary to measure the quality of service provision. Other performance measures which may indicate the level of service quality provided to clients by HFG are as follows:

Staff responsiveness assumes critical significance in service industries. Hence the time taken to resolve client queries by health centre staff is an important indicator of the level of service quality provided to clients.

- Staff appearance may be viewed as reflecting the image of the centres.
- The comfort of bedrooms and public rooms including facilities such as air-conditioning, tea/coffee-making and cold drinks facilities, and office facilities such as e-mail, facsimile and photocopying.
- The availability of services such as the time taken to gain an appointment with a dietician or fitness consultant.
- The cleanliness of all areas within the centres will enhance the reputation of HFG. Conversely, unclean areas will potentially deter clients from making repeat visits and/or recommendations to friends, colleagues etc.
- The presence of safety measures and the frequency of inspections made regarding gymnasium equipment within the centres and compliance with legislation are of paramount importance in businesses like that of HFG.
- The achievement of target reductions in weight that have been agreed between centre consultants and clients. (Other relevant measures would be acceptable.)

Appendix:

Calculations of ROI:

	(A) Operating profit	*(B) Total assets less current liabilities*	*(A) ÷ (C) Return on Investment (%)*
Ayetown	396	1,720	23·02
Beetown	441	3,160	13·96
Ceetown	703	3,820	18·40

Calculations of RI

RI:	*(A) Operating profit* ($000)	*(B) Required rate return*	*(C) Total assets* ($000)	*(D) = (B) × (C) Required return on investment* ($000)	*(E) = (A) – (D) Residual income* ($000)
Ayetown	396	12%	1,800	216	180
Beetown	441	12%	3,400	408	33
Ceetown	703	12%	4,300	516	187

Calculations of EVA

EVA	*(A) Pre-tax operating profit* ($000)	*(B) = (A) x 70% Post-tax operating profit* ($000)	*(C) WACC*	*(D) Total assets less current liabilities* ($000)	*(E) = (C) x (D) WACC x (ta – cl)* ($000)	*(F) = (B) – (E) EVA* ($000)
Ayetown	396	277·2	13·67%	1,720	235·12	42·08
Beetown	441	308·7	13·67%	3,160	431·97	–123·27
Ceetown	703	492·1	13·67%	3,820	522·19	–30·09

Calculation of weighted average cost of capital (WACC) for use in calculation of EVA is as follows:

	Market value ($000)			
equity	9,000	Ke	0·15	1350
debt	1,800	Kd	0·07	126
	10,800			1,476
	WACC = 1,476/10,800			13·67%

Note that the cost of equity is 15% and the after-tax cost of debt is $\frac{(100 - 30)}{100} \times 10\% = 7\%$

(b) There are a number of potential problems which the directors of HFG need to recognise. These are as follows:

(i) There needs to exist a sufficient incentive for SFO to share their information with HFG as the success of any benchmarking programme is dependent upon obtaining accurate information about the comparator organisation. This is not an easy task to accomplish, as many organisations are reluctant to reveal confidential information to competitors. The directors of HFG must be able to convince the directors of SFO that entering into a benchmarking arrangement is a potential 'win-win situation'.

(ii) The value of the exercise must be sufficient to justify the cost involved. Also, it is inevitable that behavioural issues will need to be addressed in any benchmarking programme. Management should give priority to the need to communicate the reasons for undertaking a programme of benchmarking in order to gain the full co-operation of its personnel whilst reducing the potential level of resistance to change.

(iii) Management need to handle the ethical implications relating to the introduction of benchmarking in a sensitive manner and should endeavour, insofar as possible, to provide reassurance to employees that their status, remuneration and working conditions will not suffer as a consequence of the introduction of any benchmarking initiatives.

9. Jim and Jam

(a) Potential benefits include:

- achieving global/corporate profit optimality
- goal congruence between divisions and group
- fostering divisional autonomy and local decision making
- the measurement of divisional financial performance via the generation of a recognised income figure
- the provision of 'pricing signals' that induce decisions to improve corporate profitability.

(b) (i) When division Jim has spare capacity the incremental cost to the company of producing Y is $35. The cost of the external supply is $38. Therefore it is cheaper for the company if division Jim supplies Y. The transfer price should be fixed at a price above $35, to provide an incentive for Jim to supply and generate a contribution towards the recovery of fixed costs, and below $38 to encourage Jam to buy. The price should be set so that both divisions, acting independently and in their own interests, choose to trade at the set price.

(ii) The situation now requires a consideration of the opportunity cost of diverting resources away from the supply of external customers. For every additional unit of Y produced and supplied to Jam, Jim will have to sacrifice indirectly $10 in lost contribution from external sales ($42 – $32). So the relevant cost of making a unit of Y in these circumstances is $35 plus $10 i.e. $45. $45 represents the 'real' cost of supplying division Jam with one unit of product Y. It is therefore better for the company to purchase product Y from the external supplier for $38. We can ensure this happens by fixing the transfer price of Y above $38, to discourage Jam from buying it from Jim. At a price of $40, Jam would not choose to buy from Jim, and it would not be in the interest of Jim to sell to the other division.

(c) Unit variable costs to identify the incremental costs of producing the different products and services

- sales prices in the external market to assess potential contribution towards overheads and profit
- current and maximum capacity levels to ascertain the opportunity cost of lost sales
- the limiting factors that are constraining the capacity so that the managers can take appropriate action to expand capacity
- the value of the shadow prices so that the managers can evaluate whether it is worthwhile to acquire specific resources
- the availability and prices of obtaining supplies from external suppliers (for make or buy decisions)

10. CTC

(a) (i) Statement of Product Profitability

	2008				2009			
	Bruno	Kong	Leo	Total	Bruno	Kong	Leo	Total
	000	000	000		000	000	000	
Sales units	180	150	60		120	48	72	
Selling price per unit ($)	40	50	60		40	50	60	
Sales revenue	7,200	7,500	3,600	18,300	4,800	2,400	4,320	11,520
Variable cost	2,160	2,625	1,440	6,225	1,440	840	1,728	4,008
Contribution	5,040	4,875	2,160	12,075	3,360	1,560	2,592	7,512
Product fixed overheads	3,800	2,400	2,040	8,240	2,400	1,340	2,100	5,840
Product profit	1,240	2,475	120	3,835	960	220	492	1,672
Company fixed				1,650				1,650
Profit/Loss				2,185				22

(ii) The statement of product profitability shows that CTC is forecast to achieve a profit of $2·185 million in 2008 giving a profit:sales ratio of 11·9%. However, the forecast profit in 2009 is only $22,000 which would give a profit:sales ratio of just 0·19%! Total sales volume in 2008 is 390,000 units which represent 97·5% utilisation of total annual capacity. In stark contrast, the total sales volume in 2009 is forecast to be 240,000 units which represents 60% utilisation of total annual capacity and shows the expected rapid decline in sales volumes of Bruno and Kong products. The rapid decline in the sales of these two products is only offset to a relatively small extent by increased sales volume from the Leo product. It is vital that a new product or products with healthy

contribution to sales ratios are introduced. Management should also undertake cost/benefit analyses in order to assess the potential of extending the life of Bruno and Kong products.

(b) (i)

	01 Jun 2008	31 May 2009	31 May 2010	31 May 2011
Initial investment	–3,900,000			
Working capital	–500,000	–200,000		700,000
Contribution (at 50%)		2,000,000	4,500,000	2,500,000
Fixed overheads		–1,600,000	–1,440,000	–1,296,000
Net cash flow	–4,400,000	200,000	3,060,000	1,904,000
Discount factor at 12%	1·000	0·893	0·797	0·712
DCF	–4,400,000	178,600	2,438,820	1,355,648

The negative net present value indicates that the introduction of Nellie the Elephant is not viable on financial grounds.

(ii) Let X = the change in the contribution to sales ratio (%)

For Nellie the Elephant to become financially viable, an increase in the contribution to sales ratio (%) is required. This can be calculated as follows:

$(4 \times X \times 0{\cdot}893) + (9 \times X \times 0{\cdot}797) + (5 \times X \times 0{\cdot}712) = 0{\cdot}426932$

i.e $3{\cdot}572X + 7{\cdot}173X + 3{\cdot}56X = 0{\cdot}426932$

$\therefore 14{\cdot}305X = 0{\cdot}426932$

$\therefore \quad X = 0{\cdot}02985$

This means that the required contribution to sales ratio (%) = 0·50 + 0·02985 = 0·52985 or 52·985%. This would result in a net present value = 0.

(Alternative solution methods would be accepted.)

(iii) If no new products are available then CTC must look to boost revenues obtained from its existing product portfolio whilst seeking to reduce product specific fixed overheads and the company's other fixed overheads. In order to do this attention should be focused on the marketing activities currently undertaken.

CTC should consider selling all of its products in 'multi product' packages as it might well be the case that the increased contribution achieved from increased sales volumes would outweigh the diminution in contribution arising from reductions in the selling price per unit of each product.

CTC could also apply target costing principles in order to reduce costs and thereby increase the margins on each of its products. Value analysis should be undertaken in order to evaluate the value-added features of each product. For example, the use of non-combustible materials in manufacture would be a valued added feature of such products whereas the use of pins and metal fastenings which are potentially harmful to children would obviously not comprise value added features. CTC should focus on delivering 'value' to the customer and in attempting to do

11. Costs and Quality

(a) The path from A to:

A higher costs and lower quality is the worst possible scenario which will probably result in business failure.

B higher costs and quality, the appropriateness depends on the market situation and how competitors respond.

C higher quality at constant costs, may be successful but depends on market situation and competitors' response.

D improved quality and lower costs is certainly the most desirable path to follow. This will generate long term business success if it can sustained.

E lower costs while maintaining quality, may be successful in the short term but quality improvements amongst competitors may create problems in market retention.

F lower costs and quality, going down market, unlikely to be successful in increasingly affluent societies - may have limited success in specific markets.

Path D is most likely to bring business success.

(b) Total Quality Management (TQM)

TQM is an approach that seeks to ensure that goods and services are delivered at the highest possible standard. The underlying principle is that the costs of preventing deficient quality is less than the costs of correcting poor quality. This denies the idea that improved quality can only be secured with greater expenditure, but adopts the approach that improved quality will reduce costs.

Quality related costs are concerned with both achieving quality and failure to achieve quality. Quality costs can categorised as:

Prevention costs - communicating the concept, training, establishing systems to deliver quality services

Appraisal costs - e.g. inspection and testing

Internal failure costs - wasted materials used in rejects, down time resulting from internal service quality failures, resources devoted to dealing with complaints

External failure costs - loss of goodwill and future business, compensation paid to customers and rectification costs

The TQM view is that by getting it right first time and every time, the prevention and appraisal costs will be outweighed by the savings in failure costs, hence lower costs and improved quality are congruent goals. TQM requires everyone in the organisation to have identified customers, whether external or internal, so that a continuous service quality chain is maintained all the way through the organisation to the final customer.

Just In Time (JIT)

JIT is a manufacturing and supply chain process that is intended to reduce inventory levels and improve customer service by ensuring that customers receive their orders at the right time and in the right quantity. The system should facilitate a smooth workflow throughout the business and reduce waste. Goods are produced to meet customer needs directly, not for stock.

Cost reductions should arise from:

- Lower raw material and finished goods inventory levels, therefore reduced holding costs
- Reduced material handling
- Frequently results in a reduction in the number of suppliers and lower administration and communication costs
- Guaranteed quality of supplies reduces inspection and rectification costs

Quality improvements arising from:

- Fewer or even single sourcing of supplies strengthens the buyer-supplier relationship and is likely to improve the quality.
- The absence of customer stockholding compels the supplier (if they want continued business) to guarantee the quality of the material that they deliver.
- The necessity to work regularly and closer with hauliers strengthens the relationship with them. The deliveries become high priority and more reliable.
- Customers are not faced with the traditional problems of having to wait until their suppliers stocks are replenished. The system is designed to respond to customers' needs rapidly.
- Direct focus on meeting an identified customers' need, production is merely to add to an anonymous stock pile.

Value Analysis

Is concerned with concentrating on activities that add value to the product/service as perceived by the customer. It examines business activities and questions why they are being undertaken and what contribution do they make. Value added activities includes designing products, producing output and developing customer relationships. Non-value added activities include returning goods, inventory holding checking on the quality of supplies received. Wherever possible eliminate the non-value added activities.

Value analysis commences with a focus on the customer - what do they want, what do they regard as significant in the buying decision: function, appearance, longevity or disposal value? This is concerned with identifying what customers regard as quality and then providing it. Do not expend effort on what they regard as unimportant. It is about clarifying what the constituents of quality is on the Costs and Quality diagram. Having decided this there is a need to develop alternative designs, estimate costs and evaluate alternatives.

Activity Based Costing (ABC)

ABC is concerned with attributing/assigning costs to cost units on the basis of the service received from indirect activities e.g. public relations, recruitment, quality assurance general meetings. The organisation needs to identify cost drivers - the specific activities that cause costs to arise e.g. number of orders taken, telephone calls made, number of breakdowns or the number of visitors to an attraction

ABC intends to avoid the arbitrary allocation of overheads to products/services by identifying a causal link between costs, activities and outputs. The increasing significance of overheads in the cost make up of output intensifies the need to improve the apportionment of them. Accountants can contribute towards providing better cost information to the value analysis referred to above. Product managers need to know what they are getting for their money - what is the real cost of quality? What are the cost driving activities that do not

impact on quality? What activities that generate minimal costs have a significantly favourable impact on quality?

The Balanced Scorecard (Kaplan and Norton)

The Balanced Scorecard provides a framework for a business to achieve its strategic objectives include both financial and non-financial objectives. The approach claims that performance has four dimensions of which the Customer Perspective is one - how does the business appear to the customers and the internal perspective is another - what do we need to do to satisfy shareholders and customers, including the monitoring of unit costs. The scorecard is concerned with monitoring and measuring the critical variables that comprise the customer and internal perspective. The choice of variables for inclusion in the scorecard is significant because the scorecard report is a design for action. Inappropriate indicators will trigger damaging responses. For example, the organisation needs to monitor what factors customers regard as contributing to improved quality, not what the business thinks it should provide. Therefore the scorecards would be suitable for inclusion as quantifiable indicators on the axis on the Costs and Quality diagram. The Balanced Scorecard attempts to improve the range and relationship between alternative performance measures, in the case under discussion, costs and quality.

12. Marge LTD

(a) Contribution summary (Ws 2, 4 & 5)

Availability	*High Order*	*Medium*	*Low*
High (0.2)	3,888	3,744	3,672
Medium (0.6)	3,055	3,185	3,120
Low (0.2)	2,322	2,268	2,376

(b)

Expected value	*High Order*	*Medium*	*Low*
High (0.2)	3,075	3,113.4	3,081.6

(i) Maximum

The option offering the highest return is to place an order for 1,440,000 kg of seeds (HIGH).

(ii) Maximin

Minimum contribution from:

High order = $2,322

Medium order = $2,268

Low order = $2,376

Therefore place a low order initially as this is preferable to the other options.

(iii) Expected value

A medium order size offers the highest long run average value.

(c) Maximax implies a management that is risk seeking. Maximin implies a risk averse management.

(d) If the company knows in advance what level of seeds will be available it can then place the most appropriate order for Duralin.

Consultant's advice	*Order*	*Contribution* *$'000*	*Probability*	*$'000*
High	High	3,888	0.2	777.6
Medium	Medium	3,185	0.6	1,911.0
Low	Low	2,376	0.2	475.2
				3,163.8
EV without consultant's advice				3,113.4
Maximum value of consultant's advice				50.4

Workings

1

Sales price per kg =	$0.80
Variable costs 65% =	$0.52
Contribution excluding Duralin	$0.28

2

Availability	*High* *'000kg*	*Medium* *'000kg*	*Low* *'000kg*
Seeds	72,000	65,000	54,000
Output 30%	21,600	19.500	16.200
Contribution ($0.28)	$6.048	$5,460	$4,536
	1,440	1,300	1,080

3 Price paid per kg of Duralin

$ per kg	*High (1.50)*	*Order Medium (1.75)*	*Low (2.00)*
Availability Final order High	1.50	1.60	1.65
Medium	1.85	1.75	1.80
Low	2.05	2.10	2.00

4 Total price paid for Duralin
(kgs purchased times cost in W3)

	High	*Order Medium*	*Low*
Purchase High (1,440kg)	2,160	2,304	2,376
Medium (1,300kg)	2,405	2,275	2,340
Low (1,080kg)	2,214	2,268	2,160

5 Sampling working for contribution

Availability High - contribution before Duralin	6,048
Cost of Duralin if order high	(2,160)
Net contribution	3,888
Cost of Duralin if ordered medium	(2,304)
	3,744

etc.