

CIMA

Subject P2

Advanced Management
Accounting

Study Text



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Contents

		Page
Chapter 1	Activity-Based Costing and Activity-Based Management	1
Chapter 2	The Modern Business Environment	47
Chapter 3	Costing Techniques	85
Chapter 4	Data required for decision-making	117
Chapter 5	The investment decision-making process	139
Chapter 6	Investment appraisal – further aspects	193
Chapter 7	The pricing decision	241
Chapter 8	Responsibility Centres	283
Chapter 9	Alternative measures of performance	329
Chapter 10	Transfer pricing	367
Chapter 11	The treatment of uncertainty and risk in decision making	411
Chapter 12	Risk Management	489
Index		I.1



Introduction

How to use the Materials

These official CIMA learning materials have been carefully designed to make your learning experience as easy as possible and to give you the best chances of success in your objective tests.

The product range contains a number of features to help you in the study process. They include:

- a detailed explanation of all syllabus areas
- extensive 'practical' materials
- generous question practice, together with full solutions.

This Study Text has been designed with the needs of home study and distance learning candidates in mind. Such students require very full coverage of the syllabus topics, and also the facility to undertake extensive question practice. However, the Study Text is also ideal for fully taught courses.

The main body of the text is divided into a number of chapters, each of which is organised on the following pattern:

- **Detailed learning outcomes.** These describe the knowledge expected after your studies of the chapter are complete. You should assimilate these before beginning detailed work on the chapter, so that you can appreciate where your studies are leading.
- **Step-by-step topic coverage.** This is the heart of each chapter, containing detailed explanatory text supported where appropriate by worked examples and exercises. You should work carefully through this section, ensuring that you understand the material being explained and can tackle the examples and exercises successfully. Remember that in many cases knowledge is cumulative: if you fail to digest earlier material thoroughly, you may struggle to understand later chapters.
- **Activities.** Some chapters are illustrated by more practical elements, such as comments and questions designed to stimulate discussion.
- **Question practice.** The text contains three styles of question:
 - Exam-style objective test questions (OTQs).
 - 'Integration' questions – these test your ability to understand topics within a wider context. This is particularly important with calculations where OTQs may focus on just one element but an integration question tackles the full calculation, just as you would be expected to do in the workplace.

- ‘Case’ style questions – these test your ability to analyse and discuss issues in greater depth, particularly focusing on scenarios that are less clear cut than in the objective tests, and thus provide excellent practice for developing the skills needed for success in the Management Level Case Study Examination.
- **Solutions.** Avoid the temptation merely to ‘audit’ the solutions provided. It is an illusion to think that this provides the same benefits as you would gain from a serious attempt of your own. However, if you are struggling to get started on a question you should read the introductory guidance provided at the beginning of the solution, where provided, and then make your own attempt before referring back to the full solution.

If you work conscientiously through this Official CIMA Study Text according to the guidelines above you will be giving yourself an excellent chance of success in your objective tests. Good luck with your studies!

Quality and accuracy are of the utmost importance to us so if you spot an error in any of our products, please send an email to mykaplanreporting@kaplan.com with full details, or follow the link to the feedback form in MyKaplan.

Our Quality Co-ordinator will work with our technical team to verify the error and take action to ensure it is corrected in future editions.

Icon explanations



Definition – These sections explain important areas of knowledge which must be understood and reproduced in an assessment environment.



Key point – Identifies topics which are key to success and are often examined.



Supplementary reading – These sections will help to provide a deeper understanding of core areas. The supplementary reading is **NOT** optional reading. It is vital to provide you with the breadth of knowledge you will need to address the wide range of topics within your syllabus that could feature in an assessment question. **Reference to this text is vital when self-studying.**



Test your understanding – Following key points and definitions are exercises which give the opportunity to assess the understanding of these core areas.



Illustration – To help develop an understanding of particular topics. The illustrative examples are useful in preparing for the Test your understanding exercises.



Exclamation mark – This symbol signifies a topic which can be more difficult to understand. When reviewing these areas, care should be taken.

Study technique

Passing exams is partly a matter of intellectual ability, but however accomplished you are in that respect you can improve your chances significantly by the use of appropriate study and revision techniques. In this section we briefly outline some tips for effective study during the earlier stages of your approach to the objective tests. We also mention some techniques that you will find useful at the revision stage.

Planning

To begin with, formal planning is essential to get the best return from the time you spend studying. Estimate how much time in total you are going to need for each subject you are studying. Remember that you need to allow time for revision as well as for initial study of the material.

With your study material before you, decide which chapters you are going to study in each week, and which weeks you will devote to revision and final question practice.

Prepare a written schedule summarising the above and stick to it!

It is essential to know your syllabus. As your studies progress you will become more familiar with how long it takes to cover topics in sufficient depth. Your timetable may need to be adapted to allocate enough time for the whole syllabus.

Students are advised to refer to the examination blueprints (see page P.13 for further information) and the CIMA website, www.cimaglobal.com, to ensure they are up-to-date.

The amount of space allocated to a topic in the Study Text is not a very good guide as to how long it will take you. The syllabus weighting is the better guide as to how long you should spend on a syllabus topic.

Tips for effective studying

- (1) Aim to find a quiet and undisturbed location for your study, and plan as far as possible to use the same period of time each day. Getting into a routine helps to avoid wasting time. Make sure that you have all the materials you need before you begin so as to minimise interruptions.
- (2) Store all your materials in one place, so that you do not waste time searching for items every time you want to begin studying. If you have to pack everything away after each study period, keep your study materials in a box, or even a suitcase, which will not be disturbed until the next time.
- (3) Limit distractions. To make the most effective use of your study periods you should be able to apply total concentration, so turn off all entertainment equipment, set your phones to message mode, and put up your 'do not disturb' sign.
- (4) Your timetable will tell you which topic to study. However, before diving in and becoming engrossed in the finer points, make sure you have an overall picture of all the areas that need to be covered by the end of that session. After an hour, allow yourself a short break and move away from your Study Text. With experience, you will learn to assess the pace you need to work at. Each study session should focus on component learning outcomes – the basis for all questions.
- (5) Work carefully through a chapter, making notes as you go. When you have covered a suitable amount of material, vary the pattern by attempting a practice question. When you have finished your attempt, make notes of any mistakes you made, or any areas that you failed to cover or covered more briefly. Be aware that all component learning outcomes will be tested in each examination.
- (6) Make notes as you study, and discover the techniques that work best for you. Your notes may be in the form of lists, bullet points, diagrams, summaries, 'mind maps', or the written word, but remember that you will need to refer back to them at a later date, so they must be intelligible. If you are on a taught course, make sure you highlight any issues you would like to follow up with your lecturer.
- (7) Organise your notes. Make sure that all your notes, calculations etc. can be effectively filed and easily retrieved later.

Progression

There are two elements of progression that we can measure: how quickly students move through individual topics within a subject; and how quickly they move from one course to the next. We know that there is an optimum for both, but it can vary from subject to subject and from student to student. However, using data and our experience of student performance over many years, we can make some generalisations.

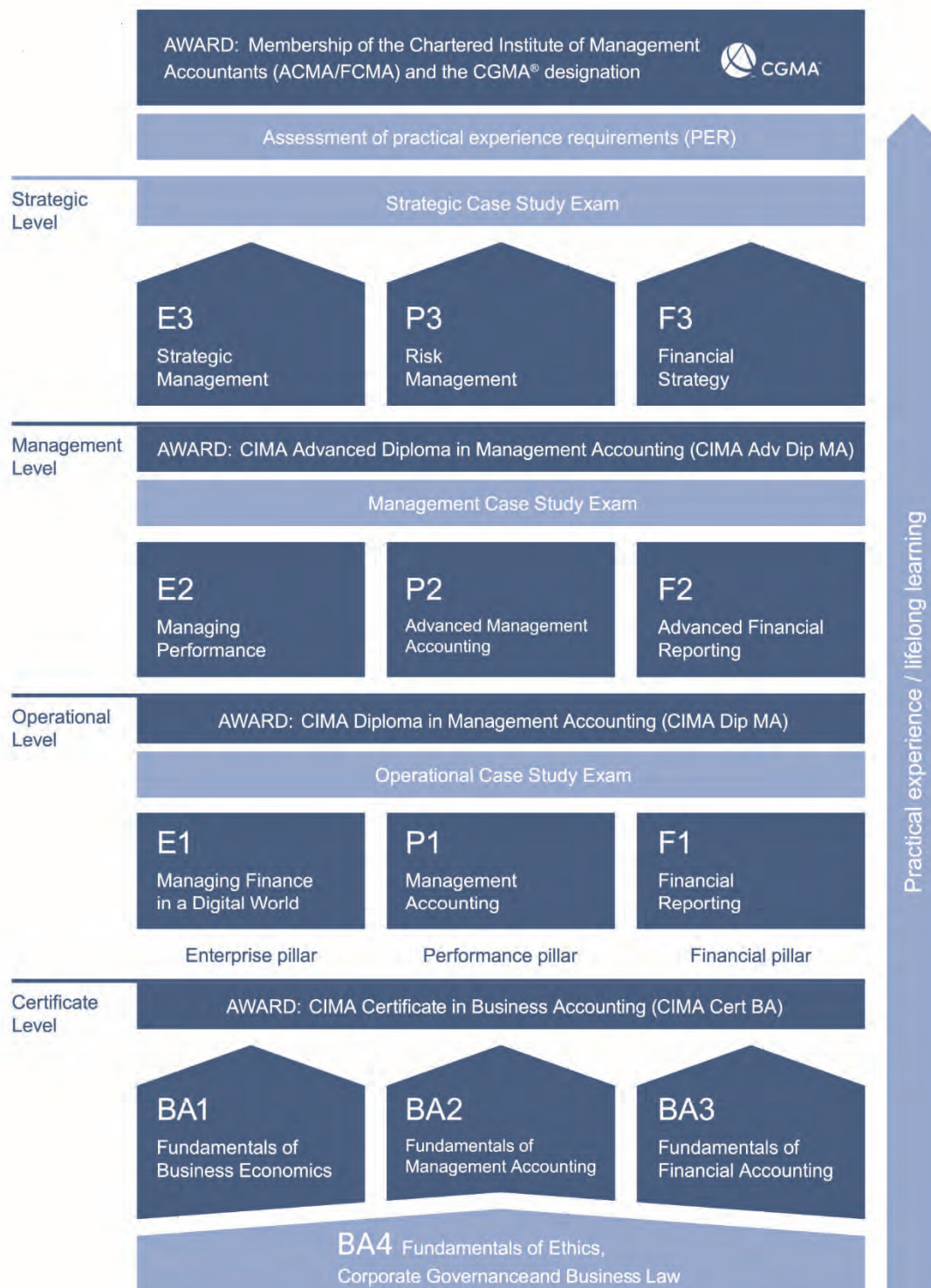
A fixed period of study set out at the start of a course with key milestones is important. This can be within a subject, for example 'I will finish this topic by 30 June', or for overall achievement, such as 'I want to be qualified by the end of next year'.

Your qualification is cumulative, as earlier papers provide a foundation for your subsequent studies, so do not allow there to be too big a gap between one subject and another. For example, P2 *Advanced management accounting* builds on your knowledge of risks, costing and decision making from P1 *Management accounting* and lays the foundations for all strategic level papers.

We know that exams encourage techniques that lead to some degree of short term retention, the result being that you will simply forget much of what you have already learned unless it is refreshed (look up Ebbinghaus Forgetting Curve for more details on this). This makes it more difficult as you move from one subject to another: not only will you have to learn the new subject, you will also have to relearn all the underpinning knowledge as well. This is very inefficient and slows down your overall progression which makes it more likely you may not succeed at all.

In addition, delaying your studies slows your path to qualification which can have negative impacts on your career, postponing the opportunity to apply for higher level positions and therefore higher pay.

You can use the following diagram showing the whole structure of your qualification to help you keep track of your progress. Make sure you carefully review the 2019 CIMA syllabus transition rules and seek appropriate advice if you are unsure about your progression through the qualification.



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Objective test

Objective test questions require you to choose or provide a response to a question whose correct answer is predetermined.

The most common types of objective test question you will see are:

- Multiple choice, where you have to choose the correct answer(s) from a list of possible answers. This could either be numbers or text.
- Multiple choice with more choices and answers, for example, choosing two correct answers from a list of eight possible answers. This could either be numbers or text.
- Single numeric entry, where you give your numeric answer, for example, profit is \$10,000.
- Multiple entry, where you give several numeric answers.
- True/false questions, where you state whether a statement is true or false.
- Matching pairs of text, for example, matching a technical term with the correct definition.
- Other types could be matching text with graphs and labelling graphs/diagrams.

In every chapter of this Study Text we have introduced these types of questions, but obviously we have had to label answers A, B, C etc. rather than using click boxes. For convenience, we have retained quite a few questions where an initial scenario leads to a number of sub-questions. There will be no questions of this type in the objective tests.

Guidance re CIMA on-screen calculator

As part of the CIMA objective test software, candidates are now provided with a calculator. This calculator is on-screen and is available for the duration of the assessment. The calculator is available in each of the objective tests and is accessed by clicking the calculator button in the top left hand corner of the screen at any time during the assessment. Candidates are permitted to utilise personal calculators as long as they are an approved CIMA model. Authorised CIMA models are listed here: <https://www.cimaglobal.com/Studying/study-and-resources/>.

All candidates must complete a 15-minute exam tutorial before the assessment begins and will have the opportunity to familiarise themselves with the calculator and practise using it. The exam tutorial is also available online via the CIMA website.

Candidates may practise using the calculator by accessing the online exam tutorial.

Fundamentals of objective tests

The objective tests are 90-minute assessments comprising 60 compulsory questions, with one or more parts. There will be no choice and all questions should be attempted. All elements of a question must be answered correctly for the question to be marked correctly. All questions are equally weighted.

CIMA syllabus 2019 – Structure of subjects and learning outcomes

Details regarding the content of the new CIMA syllabus can be located within the CIMA 2019 professional syllabus document.

Each subject within the syllabus is divided into a number of broad syllabus topics. The topics contain one or more lead learning outcomes, related component learning outcomes and indicative knowledge content.

A learning outcome has two main purposes:

- (a) To define the skill or ability that a well prepared candidate should be able to exhibit in the examination.
- (b) To demonstrate the approach likely to be taken in examination questions.

The learning outcomes are part of a hierarchy of learning objectives. The verbs used at the beginning of each learning outcome relate to a specific learning objective, e.g.

Calculate the break-even point, profit target, margin of safety and profit/volume ratio for a single product or service.

The verb '**calculate**' indicates a level three learning objective. The following tables list the verbs that appear in the syllabus learning outcomes and examination questions.

The examination blueprints and representative task statements

CIMA have also published examination blueprints giving learners clear expectations regarding what is expected of them.

The blueprint is structured as follows:

- Exam content sections (reflecting the syllabus document)
- Lead and component outcomes (reflecting the syllabus document)
- Representative task statements.

A representative task statement is a plain English description of what a CIMA finance professional should know and be able to do.

The content and skill level determine the language and verbs used in the representative task.

CIMA will test up to the level of the task statement in the objective tests (an objective test question on a particular topic could be set at a lower level than the task statement in the blueprint).

The format of the objective test blueprints follows that of the published syllabus for the 2019 CIMA Professional Qualification.

Weightings for content sections are also included in the individual subject blueprints.

CIMA VERB HIERARCHY

CIMA place great importance on the definition of verbs in structuring objective tests. It is therefore crucial that you understand the verbs in order to appreciate the depth and breadth of a topic and the level of skill required. The objective tests will focus on levels one, two and three of the CIMA hierarchy of verbs. However, they will also test levels four and five, especially at the management and strategic levels.

Skill level	Verbs used	Definition
Level 5 Evaluation How you are expected to use your learning to evaluate, make decisions or recommendations	Advise Assess Evaluate Recommend Review	Counsel, inform or notify Evaluate or estimate the nature, ability or quality of Appraise or assess the value of Propose a course of action Assess and evaluate in order, to change if necessary
Level 4 Analysis How you are expected to analyse the detail of what you have learned	Align Analyse Communicate Compare and contrast Develop Discuss Examine Interpret Monitor Prioritise Produce	Arrange in an orderly way Examine in detail the structure of Share or exchange information Show the similarities and/or differences between Grow and expand a concept Examine in detail by argument Inspect thoroughly Translate into intelligible or familiar terms Observe and check the progress of Place in order of priority or sequence for action Create or bring into existence
Level 3 Application How you are expected to apply your knowledge	Apply Calculate Conduct Demonstrate Prepare Reconcile	Put to practical use Ascertain or reckon mathematically Organise and carry out Prove with certainty or exhibit by practical means Make or get ready for use Make or prove consistent/compatible

Skill level	Verbs used	Definition
Level 2 Comprehension What you are expected to understand	Describe Distinguish Explain Identify Illustrate	Communicate the key features of Highlight the differences between Make clear or intelligible/state the meaning or purpose of Recognise, establish or select after consideration Use an example to describe or explain something
Level 1 Knowledge What you are expected to know	List State Define Outline	Make a list of Express, fully or clearly, the details/facts of Give the exact meaning of Give a summary of

Information concerning formulae and tables will be provided via the CIMA website, www.cimaglobal.com.

SYLLABUS GRIDS

P2: Advanced Management Accounting

Making medium-term decisions and managing costs and performance

Content weighting

Content area		Weighting
A	Managing the costs of creating value	20%
B	Capital investment decision-making	35%
C	Managing and controlling the performance of organisational units	30%
D	Risk and control	15%
		100%

P2A: Managing the costs of creating value

Cost management and transformation are priorities for organisations facing intense competition. This section examines how to use cost management, quality and process management, and value management to transform the cost structures and drivers to provide organisations with cost advantage.

Lead outcome	Component outcome	Topics to be covered	Explanatory notes
1. Apply cost management and cost transformation methodology to manage costs and improve profitability.	Apply the following to manage costs and improve profitability: a. Activity based management (ABM) methodology b. Cost transformation techniques	<ul style="list-style-type: none"> • Engendering a cost-conscious culture • Logic of ABC as the foundation or managing costs • ABM to transform efficiency of repetitive overhead activities • ABM to analyse and improve customer profitability • ABM to analyse and improve channel performance 	One of the reasons for calculating costs is to enable organisations to manage and possibly transform their costs. ABM is a key technique that is used to achieve this objective because of its link to ABC. This revolves around the logic of ABC that links costs to resource consumption and levels of activity and is related to the business model framework. Customer and channel analysis have become very important in the digital world – particularly as customers shift from products and services to experience. How profitable are the segments and channels they use?
2. Compare and contrast quality management methodologies.	Compare and contrast: a. Just-in-time (JIT) b. Quality management c. Kaizen d. Process re-engineering	<ul style="list-style-type: none"> • Impact of JIT and quality management on efficiency, inventory and costs • Benefits of JIT and TQM • Kaizen, continuous improvement and cost of quality reporting • Elimination of non-value adding activities and the reduction of costs using process re-engineering 	Quality management is an important part of managing and transforming costs. What are the key methodologies? How do they affect the costs of products, services and the channels that are used to deliver them?
3. Apply value management techniques to manage costs and improve value creation.	Apply the following to manage costs and value creation: a. Target costing b. Value chain analysis c. Life cycle costing	<ul style="list-style-type: none"> • Determination of target costs from target prices • Components of the value chain • Profitability along the value chain • Life cycle costing and its implication for market strategies 	Cost transformation must always be linked to the value that organisations create. This part provides the link between costs and value.

P2B: Capital investment decision-making

Organisations have to allocate resources and key strategic initiatives to ensure that their strategies are properly implemented. Capital investment decision-making is the primary means by which such resources are allocated between competing needs. This section covers the criteria, process and techniques that are used to decide which projects to undertake. Of particular interest is the financial appraisal of digital transformation projects.

Lead outcome	Component outcome	Topics to be covered	Explanatory notes
1. Apply the data required for decision-making.	Apply the following for decision-making: a. Relevant cash flows b. Non-financial information	<ul style="list-style-type: none"> Incremental cash flows Tax, inflation and other factors Perpetuities Qualitative issues Sources and integrity of data Role of business intelligence systems 	The quality of decisions depends on the quality and type of data that is available to decision-makers. What type of data do decision-makers need for medium-term decisions? Where do they get this data? In a digital world this would come from data lakes through to data warehouses and business intelligence systems.
2. Explain the steps and pertinent issues in the decision-making process.	Explain: a. Investment decision-making process b. Discounting c. Capital investments as real options	<ul style="list-style-type: none"> Origination of proposals, creation of capital budgets, go/no go decisions Time value of money Comparing annuities Profitability index for capital rationing Decision to make follow-on investment, abandon or wait (capex as real options) 	What are the steps in the investment decision-making process for simple as well as complex decisions? What key concepts underpin the techniques that are used? What are the criteria for accepting projects? How is uncertainty dealt with?
3. Apply investment appraisal techniques to evaluate different projects.	Apply the following to evaluate projects: a. Payback b. Accounting rate of return c. IRR d. NPV	<ul style="list-style-type: none"> Process and calculation Strengths and weaknesses Appropriate usage Use in prioritisation of mutually exclusive projects 	This part covers a straight forward application of the techniques used to appraise projects. These should be extended to deal with the evaluation of digital transformation projects that do not have the same profile as other capital projects.
4. Discuss pricing strategies.	Discuss: a. Pricing decisions b. Pricing strategies	<ul style="list-style-type: none"> Pricing decisions for maximising profit in imperfect markets Types of pricing strategies Financial consequences of pricing strategies 	What pricing strategies are open to organisations operating in imperfect markets? How do these affect the capital investment decision process?

P2C: Managing and controlling the performance of organisational units

The structure and strategies of organisations should align with each other to ensure effective strategy implementation. Responsibility centres are the organisational units that are allocated resources and charged with implementing organisational strategy. This section shows how to manage the performance of these organisational units to ensure that they achieve the strategic and other organisational objectives. Key concepts, techniques and issues are explored and examined.

Lead outcome	Component outcome	Topics to be covered	Explanatory notes
1. Analyse the performance of responsibility centres and prepare reports.	a. Analyse performance of cost centres, revenue centres, profit centres, and investment centres. b. Prepare reports for decision-making.	<ul style="list-style-type: none"> Objectives of each responsibility centre Controllable and uncontrollable costs and revenue Costs variability, attributable costs and revenue and identification of appropriate measures of performance Use of data analytics in performance management of responsibility centres 	What are responsibility centres and how should they be matched to the strategy of organisations? What are the KPIs of each type of responsibility centre? How is their performance evaluated and why? What types of reports are prepared for responsibility centre managers? How do they use analytics, visualisation and self-service technologies to enhance the performance management of responsibility centres?
2. Discuss various approaches to the performance and control of organisations.	a. Discuss budgets and performance evaluation. b. Discuss other approaches to performance evaluation.	<ul style="list-style-type: none"> Key performance indicators (e.g., profitability, liquidity, asset turnover, return on investment and economic value) Benchmarking (internal and external) Non-financial performance indicators Balanced scorecard 	How are budgets used to evaluate the performance of responsibility centres? What is best practice in this area? How are other methodologies like the balanced scorecard useful in managing performance?
3. Explain the behavioural and transfer pricing issues related to the management of responsibility centres.	Explain: a. Behavioural issues b. Use and ethics of transfer pricing	<ul style="list-style-type: none"> Internal competition Internal trading Transfer pricing for intermediate goods where markets exist and where no markets exist Types of transfer prices and when to use them Effect of transfer pricing on autonomy, and motivation of managers of responsibility centre Effect of transfer pricing on responsibility centre and group profitability 	What are the behavioural issues in responsibility centre performance management – in particular as they affect controllable and non-controllable costs and revenue? How should they be managed so that responsibility centres work effectively with each other to maximise performance of the whole organisation rather than each responsibility centre? What role can transfer pricing play in this area?

P2D: Risk and control

Risk is inherent in the operations of all organisations. This section analyses risks and uncertainties that organisations face in the medium term. The risks are mainly operational in nature.

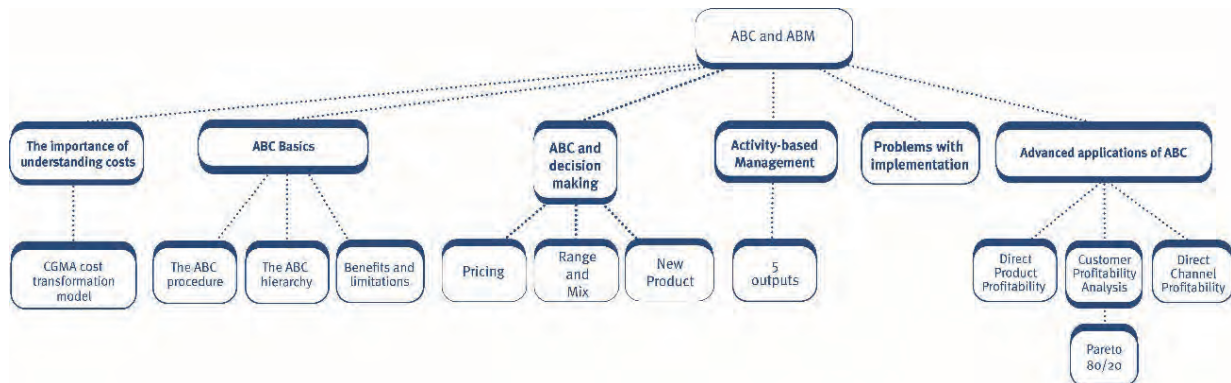
Lead outcome	Component outcome	Topics to be covered	Explanatory notes
1. Analyse risk and uncertainty associated with medium-term decision-making.	Conduct a. Sensitivity analysis b. Analysis of risk	<ul style="list-style-type: none"> Quantification of risk Use of probabilistic models to interpret distribution of project outcomes Stress-testing of projects Decision trees Decision-making under uncertainty 	What risks do organisations face in relation to capital investment decision-making and the implementation of those decisions? How are those risks incorporated in the decision-making process and managed in the implementation of the decisions?
2. Analyse types of risk in the medium term.	a. Analyse types of risk b. Manage risk	<ul style="list-style-type: none"> Upside and downside risks TARA framework – transfer, avoid, reduce, accept Business risks Use of information systems and data in managing risks 	

Activity-Based Costing and Activity-Based Management

Chapter learning objectives

Lead	Component
A1: Managing the costs of creating value	Apply cost management and cost transformation methodology to manage costs and improve profitability (a) Activity Based Management (ABM) methodology (b) Cost transformation techniques

1 Chapter summary



2 Knowledge brought forward

You will already have covered Activity-Based-Costing in previous CIMA papers. It is an important technique. In this chapter, we will explore ABC approaches such as Activity-Based Management, Direct Product Profitability, Direct Customer Profitability and Distribution Channel Profitability.

3 The importance of understanding costs

The understanding of costs is fundamental to your accounting studies.

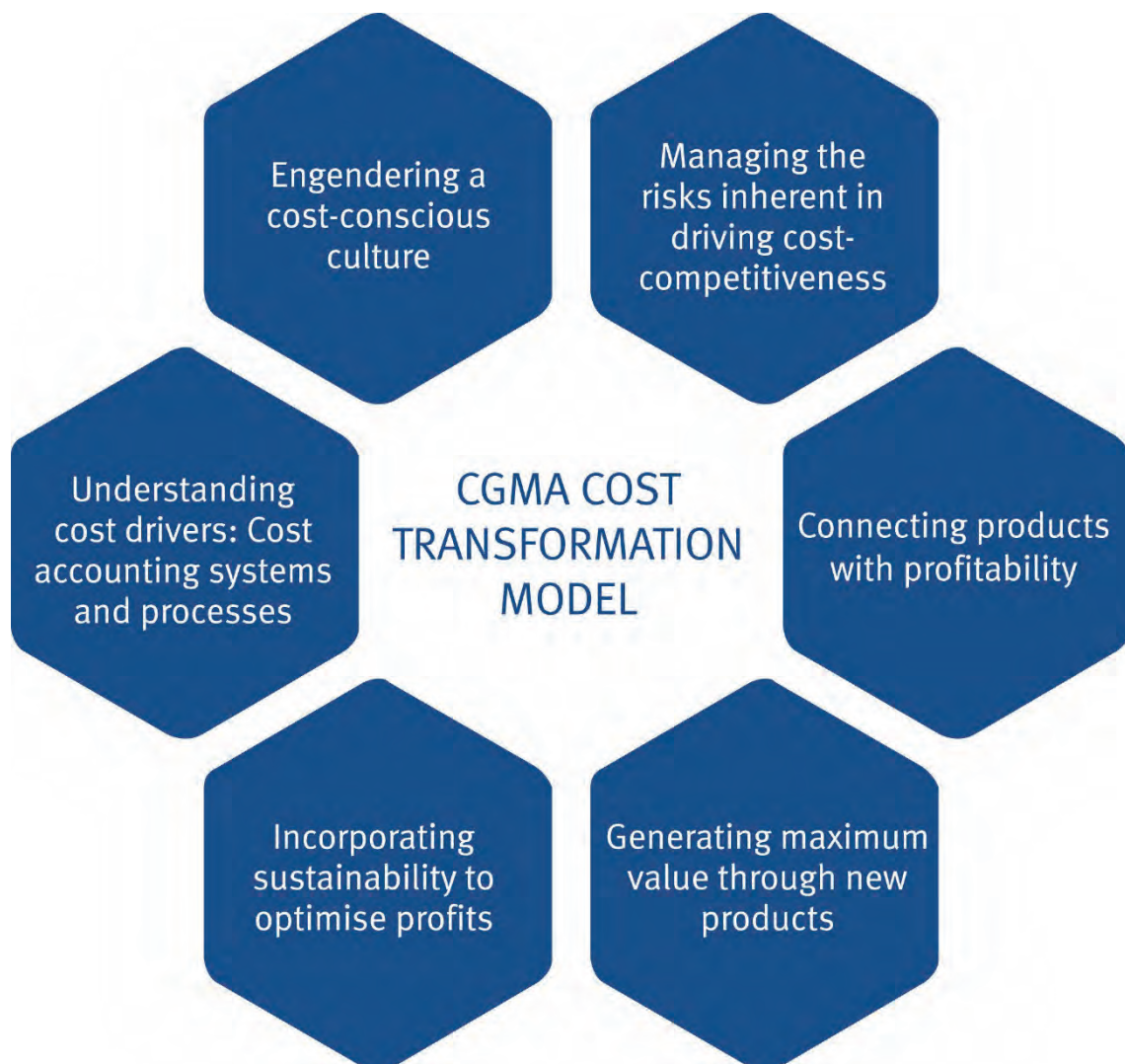
In financial accounting all costs must be recorded so that profit can be calculated and the true and fair value of assets can be presented in the financial statements.

In management accounting an understanding of costs is required in order to carry out the three main functions of planning, control and decision making. If we understand and calculate costs, we can use this information in a number of ways such as:

- Determining the cost to manufacture a product or provide a service can be used to record costs in the financial statements as well as to inform decisions on our products or services.
- The cost per unit can be used to value inventory in the statement of financial position (balance sheet).
- Product and service costs can be used to determine the selling price we should charge for our products or services. For example, if the cost per unit is \$0.30, the business may decide to price the product at \$0.50 per unit in order to make the required profit of \$0.20 per unit.
- Knowing the profit (or, as we will see in a later chapter, the contribution of a product) can help determine the products and services we should supply and in what quantity.
- The cost can also act as a benchmark for future performance. Differences from the expected (or standard) cost can be calculated (known as variances) and evaluated.

The CGMA Cost transformation model

The CGMA cost transformation model is designed to help businesses to achieve and maintain cost competitiveness:



The model has 6 suggested changes for organisations that come together to achieve this objective. These changes are:

- Engendering a cost conscious culture – the organisation should aim to be a cost leader so that its costs are lower than rivals and set a competitive benchmark. Everyone in the organisation should be motivated and enabled to reduce costs in whatever way possible. Technology can play a key role in reducing costs.
- Managing the risks that come from a cost conscious culture – for example, reducing cost may result in reducing quality and customer satisfaction. The organisation should have a clear risk management process in place to identify, assess and manage such risks.

- Connecting products with profitability – it will be important that every product or service makes a positive contribution to overall organisational profits. This will involve understanding what drives costs for each individual product and allocating shared costs to products as accurately as possible.
- Generating maximum value through new products – the potential profitability of new products should be assessed before production begins. Also, as part of product design, the product or service should be made to be as flexible as possible so that it appeals or can adapt to as many customer segments as possible.
- Incorporating sustainability to optimise profits: Consider the environmental impact of products – negative impacts (such as creating unnecessary waste) can add costs as well as damaging reputation and sales.
- Understanding cost drivers – this involves investigating costs to determine why they change and how different variables impact on the cost. Plans should be put in place to reduce the drivers of costs as well as the costs themselves.

The model suggests a number of tools and models which can be used in order to achieve these changes. Many of these tools will be employed across your CIMA studies, some of them in this paper, such as Activity Based Costing which considers cost drivers and how these can be used to allocate shared costs to products.

4 Activity-Based Costing: Basics revisited

In traditional absorption costing, overheads are charged to products using a predetermined overhead recovery rate. This overhead absorption rate (OAR) is based upon the volume of activity. A full unit cost is computed in order to satisfy financial accounting requirements.

However, it is always stressed that full product costs, using financial accounting principles, are not suitable for decision-making purposes. Instead, decisions should be based on a decision-relevant approach incorporating relevant/incremental cash flows.

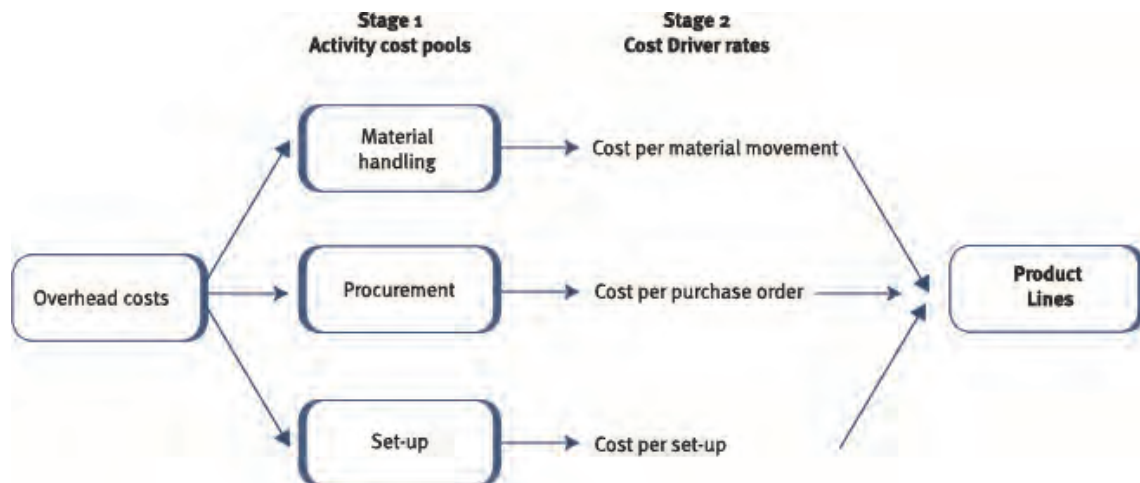
With this approach, decisions such as introducing new products and special pricing decisions should be based on a study of only those incremental revenues and expenses that will vary with respect to the particular decision.

This approach requires that special studies be undertaken when the need arises. However, studies have shown that the majority of companies base their decision making upon full product cost.

In the late 1980s Cooper and Kaplan developed a more refined approach for assigning overheads to products and computing product cost. This new approach is called activity based costing (ABC). It is claimed that ABC provides product-cost information that is useful for decision-making purposes.

Activity-Based Costing is 'an approach to the costing and monitoring of activities which involves tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilise cost drivers to attach activity costs to outputs'.

CIMA Official Terminology



Traditional systems accurately measure volume-related resources that are consumed in proportion to the number of units produced of the individual products. Such resources include direct labour, materials, energy and machine-related costs.

However, many organisational resources exist for activities that are unrelated to physical volume. Non-volume related activities consist of support activities e.g.:

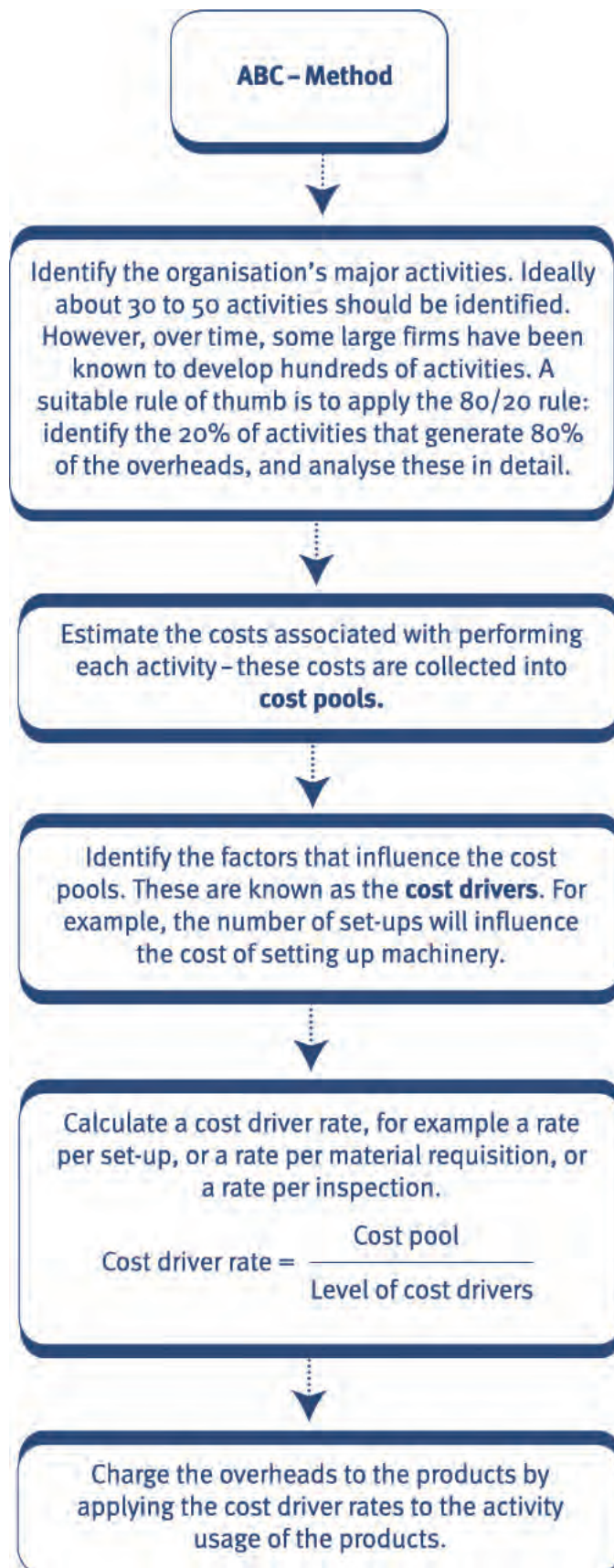
- materials handling
- material procurement
- set-ups
- production scheduling
- first-item inspection activities.

Traditional product-cost systems, which assume that products consume all activities in proportion to their production volumes, thus report distorted product costs.

5 The ABC procedure

Cooper and Kaplan stated that it was the support activities that were the cause of many overheads: material handling, quality inspection, setting up machinery, material acquisition, etc. Thus a simple three-step philosophy was developed:

- support activities cause cost
- the products consume these activities
- cost should, therefore, be charged on the basis of consumption of the activities.





Example 1: Manufacturing Business

A manufacturing business makes a product in two models, model M1 and model M2. Details of the two products are as follows.

	Model M1	Model M2
Annual sales	8,000 units	8,000 units
Number of sales orders	60	250
Sales price per unit	\$54	\$73
Direct material cost per unit	\$11	\$21
Direct labour hours per unit	2.0 hours	2.5 hours
Direct labour rate per hour	\$8	\$8
Special parts per unit	2	8
Production batch size	2,000 units	100 units
Setups per batch	1	3
	\$	Cost driver
Setup costs	97,600	Number of setups
Material handling costs	42,000	Number of batches
Special part handling costs	50,000	Number of special parts
Invoicing	31,000	Number of sales orders
Other overheads	108,000	Direct labour hours
Total overheads	<u>328,600</u>	

A customer has indicated an interest in placing an order for either model M1 or M2, and the sales manager wished to try to sell the higher-priced model M2.

Required:

- Calculate the profit per unit for each model, using ABC.
- Using the information above identify which product the sales manager should try to sell on the basis of the information provided by your ABC analysis.



Favourable conditions for ABC

The purpose of moving from a traditional costing system to an activity-based system should be based on the premise that the new information provided will lead to action that will increase the overall profitability of the business.

This is most likely to occur when the analysis provided under the ABC system differs significantly from that which was provided under the traditional system, which is most likely to occur under the following conditions:

- when production overheads are high relative to direct costs, particularly direct labour
- where there is great diversity in the product range
- where there is considerable diversity of overhead resource input to products
- when consumption of overhead resources is not driven primarily by volume.

6 The activity-based cost hierarchy

Cooper and Kaplan (1991) propose a cost hierarchy framework that maintains that costs are driven by, and are variable with respect to, activities that occur at four levels:



Unit-level activities are performed each time a unit of product is produced. They are consumed in direct proportion to the number of units produced. Expenses in this category include:

- direct labour
- direct materials
- energy costs
- machine maintenance.

Batch-related activities are performed each time a batch is produced. The cost of batch-related activities varies with the number of batches made, but is common (or fixed) for all the units within the batch.

For example, set-up resources are consumed when a machine is changed from one product to another. As more batches are produced, more set-up resources are consumed. It costs the same to set-up a machine for a run of 10 or 5,000 units.

Similarly, purchasing resources are consumed each time a purchasing order is processed, but the resources consumed are independent of the number of units included in the purchase order.

Product-sustaining activities are performed to support different products in the product line. They are performed to enable different products to be produced and sold, but the resources consumed are independent of how many units or batches are being produced.

Cooper and Kaplan (1991) identify engineering resources devoted to maintaining accurate bills of materials and routing each product as an example of product-sustaining activities. Product design costs and advertising costs of the specific product would also be counted as product-sustaining costs. The expenses of product-sustaining activities will tend to increase as the number of products manufactured increases.

Facility-sustaining activities. Some costs cannot be related to a particular product line, instead they are related to maintaining buildings and the facilities. Examples include:

- maintenance of the building
- plant security
- business rates.

7 ABC: Benefits and limitations

Benefits

- 1 Provides more accurate product-line costings particularly where non-volume-related overheads are significant and a diverse product line is manufactured.
- 2 Is flexible enough to analyse costs by cost objects other than products such as processes, areas of managerial responsibility and customers.
- 3 Provides a reliable indication of long-run variable product cost which is particularly relevant to managerial decision making at a strategic level.
- 4 Provides meaningful financial (periodic cost driver rates) and nonfinancial (periodic cost driver volumes) measures which are relevant for cost management and performance assessment at an operational level.
- 5 Aids identification and understanding of cost behaviour and thus has the potential to improve cost estimation.
- 6 Provides a more logical, acceptable and comprehensible basis for costing work.

Limitations

- 1 Little evidence to date that ABC improves corporate profitability.
- 2 ABC information is historical and internally orientated and therefore lacks direct relevance for future strategic decisions.
- 3 Practical problems such as cost driver selection.
- 4 Its novelty is questionable. It may be viewed as simply a rigorous application of conventional costing procedures.

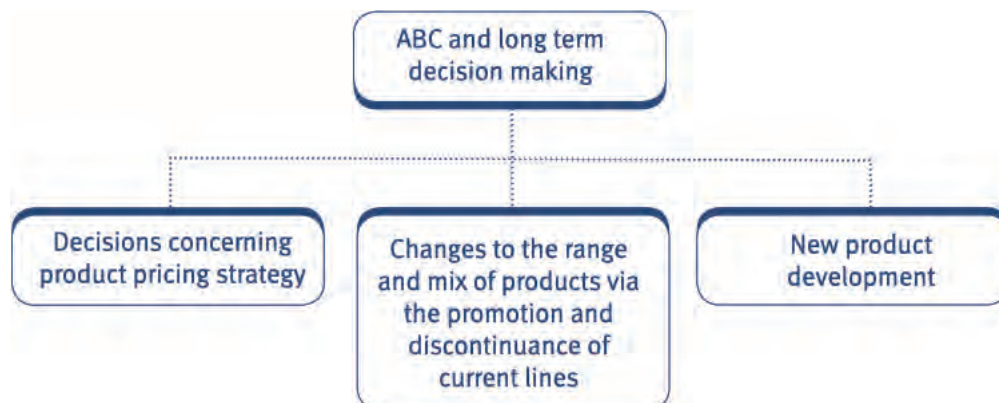
8 ABC and decision making

Activity-Based Costing has a role in longer-term decision-making.

ABC systems are primarily designed to furnish management with cost information relating to an organisation's products.

However, the production of this information is not an end in itself. Indeed it is the use to which such activity-based information is put that represents its real purpose, and its value should be assessed against this end-result.

An ABC system produces historical information relating to its products or service provision, which is of much assistance to management in analysing and explaining an organisation's profitability. However, many commentators including Robert Kaplan and Robin Cooper have viewed ABC as supporting major areas of strategic decision making with organisations, these being:



When ABC information is used in the above ways, then it will underpin policy decisions of senior management, and will therefore have a significant influence upon the longer term prosperity of an organisation.

Advocates of the use of ABC for strategic decision making maintain that its values lies in **greater accuracy attaching to product costing**, which in turn **increases the degree of reliability of cost information** used for the above purposes.

They further maintain that the use of ABC may give an indication for the **long-term variable cost of products**, which arguably is the most relevant cost information for use in decisions of the above type. Given the inherent uncertainty involved in strategic decision making, management may use ABC information in decision-modelling and sensitivity analysis to assist in the making of such decisions.

The end product of an ABC system is an estimate of the historical cost of each of an organisation's products. However, strategic decision making involves future time periods and thus it is future outlay costs that need to be taken into consideration, as opposed to historical costs.

Therefore, it is arguable that the results obtained from an ABC system should be aimed at assisting in the making of longer-term decisions. This is especially the case if ABC based product costs are viewed as estimates of longer term product costs as 'nothing is forever' and historical costs are susceptible to substantial change, since all factors of production become variable in the longer term.

Any cost information which has been produced based on past activities must be used with caution with regard to longer term decisions. Even so, ABC information may provide a sound starting point for the preparation of cost information to be used in strategic decision making. It has been argued that a significant advantage of ABC over conventional costing systems lies in its suitability for strategic decision making. Kaplan has argued that for decisions of a strategic nature, a long-term perspective is usual and maintains that an ABC system gives product cost information which matches this requirement particularly well.

This is evidenced by his assertion that **'conventional notions of fixed and variable costs are ignored because, for the purpose of product cost analysis, the time period is long enough to warrant treatment of virtually all costs as variable.'**



Implementing ABC: Do's and Don'ts (From the 'CGMA Cost Transformation model')

Actions to take/Do's

- Get buy-in from the rest of the business. ABC provides business managers, as well as the finance function, with the information needed to make value-based decisions.
- Use ABC for pricing and product prioritisation decisions.
- ABC should be implemented by management accountants as they are best placed to manage the process and to ensure benefits of its realisation.

Actions to avoid/Don'ts

- Do not get caught up in too much attention to detail and control. It can obscure the bigger picture or make the firm lose sight of strategic objectives in a quest for small savings.
- It is important not to fall into the trap of thinking ABC costs are relevant for all decisions. Not all costs will disappear if a product is discontinued, an example being building occupancy costs.

9 Activity-Based Management

One of the reasons for calculating costs is to enable organisations to manage and possibly transform their costs. Activity-Based Management (ABM) is a key technique that is used to achieve this objective, because of its link to ABC.

ABM is a **'System of management which uses activity-based cost information for a variety of purposes including cost reduction, cost modelling and customer profitability analysis.'**

CIMA Official Terminology

ABM is simply using the information derived from an ABC analysis for cost management. ABM seeks to classify each activity within a process as a value-added or non-value-added activity:

Non-value-added activities are unnecessary and represent waste. The aim should be to eliminate them. For example, time spent dealing with customer complaints is wasted time, but cannot be reduced until the customers have nothing to complain about!

ABM focuses on activities within a process, decision making and planning relative to those activities and the need for continuous improvement of all organisational activity. Management and staff must determine which activities are critical to success and decide how these are to be clearly defined across all functions.

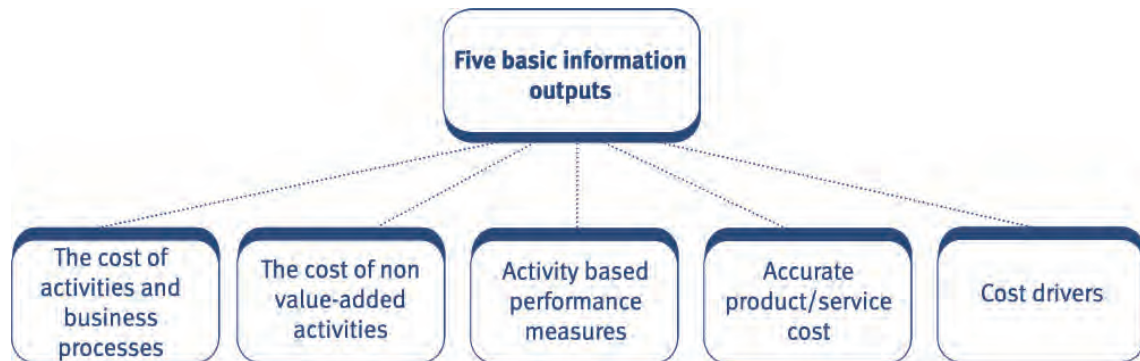
Everyone must co-operate in defining:

- cost pools
- cost drivers
- key performance indicators.

They must be trained and empowered to act; all must be fairly treated and success recognised.

10 Outputs from the ABM Information System

Organisations that are designing and implementing ABM will find there are five basic information outputs:



- 1 **The cost of activities and business processes.** Since activities form the very core of what a business does, the basic output of the ABM system must be to provide relevant cost information about what a business does. Instead of reporting what money is spent for and by whom, costs are assigned to activities.
- 2 **The cost of non value-added activities.** Identification of these wasteful activities is invaluable to management as it provides a crucial focal point for management.
- 3 **Activity based performance measures.** Knowing the total cost of an activity is insufficient to measure activity performance. Activity measures of quality, cycle time, productivity and customer service may also be required to judge performance. Measuring the performance of activities provides a scorecard to report how well improvement efforts are working and is an integral part of continuous improvement.
- 4 **Accurate product/service cost.** Products and services are provided to markets and customers through various distribution channels or contractual relationships. Because products and services consume resources at different rates and require different levels of support, costs must be accurately determined.
- 5 **Cost drivers.** The final output from the ABM system is cost driver information. With this information it is possible to understand and manage these activity levels.
 - whether to continue with a particular activity
 - how cost structures measure up to those of competitors
 - how changes in activities and components affect the suppliers and value chain.

Clearly ABM and employee empowerment takes a critical step forward beyond ABC by recognising the contribution that people make as the key resource in any organisation's success.

- It nurtures good communication and team work.
- It develops quality decision making.
- It leads to quality control and continuous improvement.

ABM will not reduce costs, it will only help the manager understand costs better.

Strategic activity management recognises that individual activities are part of a wider process. Activities are grouped to form a total process or service.

For example, serving a particular customer involves a number of discrete activities that form the total service. Strategic activity management attempts to classify each activity within the whole as a value-added or non-value added activity. Non-value-added activities are unnecessary and should be eliminated.

Bellis-Jones (1992) noted that typically prior to the introduction of ABM, 35% of staff time was spent on diversionary (non-value-added) activities. After the introduction of ABM, total staff time declined and the percentage of time spent on diversionary activities fell to 20% of the reduced time.

Non-value-added activities are often caused by inadequacies within the existing processes and cannot be eliminated unless the inadequacy is addressed.

For example, dealing with customer complaints is a diversionary activity, but it cannot be eliminated unless the source of the complaints is eliminated. Another example is machine set-up time. Better product design so that fewer components or more standard components are used will reduce the set-up time between component runs. So management must concentrate on eliminating non-value-added activities.

But strategic activity management is more than just eliminating non-value added activities, important though this is.

By identifying the cost and value drivers for each activity, the firm can develop both the activities and the linkages between them, and so better differentiate the firm from its competitors. In addition, by understanding the factors which influence the costs of each activity, the firm can take action to minimize those costs in the medium term.

ABC information can be used in an ABM system to assist strategic decisions, such as:

- 1 Whether to continue with a particular activity.
- 2 The effect on cost structure of a change in strategy, e.g. from mass production to smaller production runs.
- 3 How changes in activities and components affect the suppliers and the value chain.

The value chain is simply a large activity map for the organisation and its position in the industry chain. It is covered in a later chapter of this Text.

11 Problems with implementing ABC/ABM

Research has focused on the problems of implementing the ABC system. Friedman and Lyne (1999) provide some clues as to why ABC has not been taken up with more enthusiasm from case study research they carried out. Some reasons they draw attention to are:

- 1 Where it was devised for a single project that was not taken up the system got dropped as well. As communication between business units in a large organisation is often not very good, the work was not developed further by other units.
- 2 Finance department opposed its implementation. Often finance staff appear less than dynamic and unable to perceive the needs of the production staff.
- 3 General ledger information too poor to provide reliable ABC information. The resulting figures would have been no better than traditional absorption methods.

Of course, if organisations do not have reliable ABC information then they also forgo the cost management advantages of an ABM system. Since ABC provides the basic building blocks of activities, without ABC there can be no ABM.



Illustration – ABC and ABM

Tool of the trade (extract)

Financial Management; London; Nov 2001; Stephanie Gourdie;

A company in New Zealand is one of the few to have implemented activity-based management successfully but it needed careful planning and a radical rethink of company culture.

Since professors Robert Cooper and Robert Kaplan codified and developed activity-based costing, many organisations have implemented it, but few are using it for cost management. The original emphasis of ABC was on developing more accurate product costs. It was based on the principle that resource-consuming activities caused costs, not volume of products, as assumed by traditional cost-allocation methods. Overhead costs were allocated and traced back to activities that consumed resources, such as purchasing, set-ups and material handling.

A cost driver was then selected for each activity centre. The choice of driver was based on two things: it had to measure the resources a product used for a particular set of activities; and it had to be linked to the changes of costs in the activity centre (cause-effect relationship).

Cost drivers can include the number of purchase orders, material movements or setup hours. The overhead rate for each activity was worked out by dividing the activity cost by the capacity of the cost driver. The costs of products were determined by multiplying the number of the cost driver of the activity used by the product, by the overhead rate for that activity, for all activities used by that product.

ABC systems could then be applied to cost management. This was labelled activity based management (ABM), defined by Don Hansen and Maryanne Mowen as "a system-wide, integrated approach that focuses management's attention on activities with the objective of improving customer value and the profit achieved by providing this value".

The progression to ABM involved a shift in focus from the original ABC system – producing information on activity-based product costs to producing information to improve management of processes. The idea is to analyse the activities that make up a company's processes and the cost drivers of those activities, then question why the activities are being carried out and how well they are being performed. ABM provides the activity information and the costs of inefficient activities, and quantifies the benefits of continuous improvements.

Companies can then improve operations by re-engineering (complete redesign of processes), redesigning plant layouts, using common parts, outsourcing or strengthening supplier and customer relationships and developing alternative product designs.

[...]

TIPS FOR ABM

- Get the support of senior management
- Recognise that ABM requires a major investment in time and resources
- Know what ABM can achieve and what information you want from the system
- Decide which model to use
- Choose the model approach that emphasises the operational understanding of all activities in the business
- Involve people in the field
- Transfer ownership of cost management from the accounts department to the departments and processes where costs are incurred
- Don't underestimate the need to manage the change process
- Link ABM to corporate objectives in the form of increased product profitability and added value for customers.

12 Direct Product Profitability (DPP)

As traditional absorption costing, which normally uses labour hours as a basis for absorption, is rarely suitable for service and retail organisations other methods had to be devised. One relatively new way of spreading overheads in retail organisations, which is used in the grocery trade in particular, is direct product profitability (DPP).

Direct Product Profitability is **'used primarily within the retail sector...DPP involves the attribution of both the purchase price and other indirect costs (for example distribution, warehousing and retailing) to each product line. Thus a net profit, as opposed to a gross profit, can be identified for each product. The cost attribution process utilises a variety of measures (for example warehousing space and transport time) to reflect the resource consumption of individual products'**.

CIMA Official Terminology

DPP started in the USA in the 1960s at General Electric, and was then taken up and used by Proctor and Gamble in the 1980s. In 1985 the Food Marketing Institute in the USA laid down a standard approach to the system and two years later DPP was taken up by the Institute of Grocery Distribution in the UK. The system described below was introduced in the late 1980s and has since undergone transformation as activity-based costing has developed.

Retail organisations traditionally deducted the bought-in cost of the good from the selling price to give a gross margin. The gross margin is a useless measure for controlling the costs of the organisation itself or making decisions about the profitability of the different products. This is because none of the costs generated by the retail organisation itself are included in its calculation. For example, it does not include the storage costs of the different goods and these costs vary considerably from one good to another. A method was needed which related the indirect costs to the goods according to the way the goods used or created these costs.

The table below shows the DPP for Product A. Directly-attributable costs have been grouped into three categories and are deducted from the gross margin to determine the product's DPP.

Direct product profit for Product A

	\$	\$
Selling price		1.50
Less: bought-in price		(0.80)
		<hr/>
Gross margin		0.70
Less: Direct product costs:		
Warehouse costs	0.16	
Transport costs	0.18	
Store costs	0.22	
		<hr/>
Direct product profit		0.14

Warehouse and store costs will include items such as labour, space and insurance costs, while transport costs will include labour, fuel and vehicle maintenance costs. The usual way to spread these costs across the different goods sold is in relation to volume or area occupied, as most costs increase in direct proportion to the volume of the product or the space it occupies.

However, there are some exceptions to this; for example, insurance costs may be better spread on value or on a risk index. Risk is greater with refrigerated or perishable goods. Refrigeration costs must only be related to those products that need to be stored in the refrigerator. Handling costs can also be treated in a different manner as they tend to vary with the number of pallets handled rather than the volume of the good itself. The labour involved in shelf-stacking may also need to be spread on a different basis.

The benefits of DPP may be summarised as:

- Better cost analysis
- Better pricing decisions
- Better management of store and warehouse space
- The rationalisation of product ranges
- Better merchandising decisions.



Example 2: DPP

A supermarket wholesaler sells over 40,000 product lines to retailers who visit the store. It has 45,000 m³ of general storage including 100 m³ of cold storage. General overheads are \$90,000 and additional cold storage costs are \$5,000. Two of the products sold are single frozen desserts (FD) and trays of 48 cans of soft drink (SD). Only frozen desserts are kept in cooled storage.

The wholesaler pays \$0.4 for a FD, which is 0.03 m³ and sells for \$4. The trays of SD are 0.3 m³ and are bought for \$5 and sold for \$30.

Calculated to two decimal places, the net profit per FD is:

\$

and per crate of SD is

\$



More On DPP

In recent years DPP has developed considerably in parallel with activity-based costing. DPP has become much more sophisticated and is now very similar to activity-based costing. One of the reasons for its development during the 1990s has been the development of EPOS and EFTPOS (electronic point of sale and electronic funds transfer point of sale) systems that have enabled access to the detailed data needed for direct product cost and profitability calculations.

Indirect costs may be analysed into basic cost categories as follows. These are very similar to those discussed later for activity-based costing.

- Overhead cost. This is incurred through an activity that is not directly linked to a particular product.
- Volume-related cost. Products incur this cost in relation to the space they occupy. This is the cost described previously and includes storage and transport costs.
- Product batch cost. This is often a time-based cost. If product items (i.e. a number of identical products which are handled together as a batch) are stacked on shelves, a labour time cost is incurred. If shipping documents have to be prepared for an order or batch, this again is a labour time cost.
- Inventory financing costs. This is the cost of tying up money in inventory and is the cost of the product multiplied by the company's cost of capital per day or per week.
- Each of the categories above will contain a number of individual activities, such as:
 - 1 Checking incoming goods
 - 2 Repacking or packing out for storing
 - 3 Inspecting products
 - 4 Refilling store shelf.

DPP software systems can be purchased to model costs. They require a number of key variables to analyse different situations. The variables are:

- (a) **Buying and selling prices.** The retailer has the option to adjust the selling price. A price increase from a supplier can always be used to increase the gross margin, but the higher the selling price relative to other retailers the slower inventory movement is likely to be.
- (b) **Rate of sale.** This is critical and needs to be as fast as possible in order to minimise space costs at the warehouse and the store, and to avoid loss of interest on money tied up in inventory.

- (c) **Inventory-holding size.** The aim is to hold as little inventory as possible in keeping with JIT principles without running out of inventory.
- (d) **Product size.** This is the cubic area that the product occupies and is important because space costs per item will be incurred according to size.
- (e) **Pallet configuration.** The larger the number of cases on the pallet the cheaper handling costs per unit will be.
- (f) **Ordering costs.** Obviously fewer orders will be cheaper but fewer orders will mean holding more inventory.
- (g) **Distribution routes.** Are the goods transported direct to the store or is a central warehouse used? Transporting goods direct to the store is a high cost activity for the supplier and it is usually better to use a central warehouse, even for goods with a short shelf life.

13 Customer Profitability Analysis

In many organisations, it is just as important to cost customers as it is to cost products. Different customers or groups of customers differ in their profitability. This is a relatively new technique that ABC makes possible because it creates cost pools for activities. Customers use some activities but not all, and different groups of customers have different 'activity profiles'.

Customer Profitability Analysis is **'the analysis of revenue streams and service costs associated with specific customers or customer groups'**.

CIMA Official Terminology

Service organisations such as a bank or a hotel in particular need to cost customers. A bank's activities for a customer will include the following types of activities:

- Withdrawal of cash
- Unauthorised overdraft
- Request for a statement
- Stopping a cheque
- Returning a cheque because of insufficient funds.

Different customers or categories of customers will each use different amounts of these activities and so customer profitability profiles can be built up, and customers can be charged according to the cost to serve them.



Examples of CPA in a hotel

A hotel may have activities that are provided for specific types of customers, such as:

- well-laid-out gardens
- a swimming pool
- a bar.

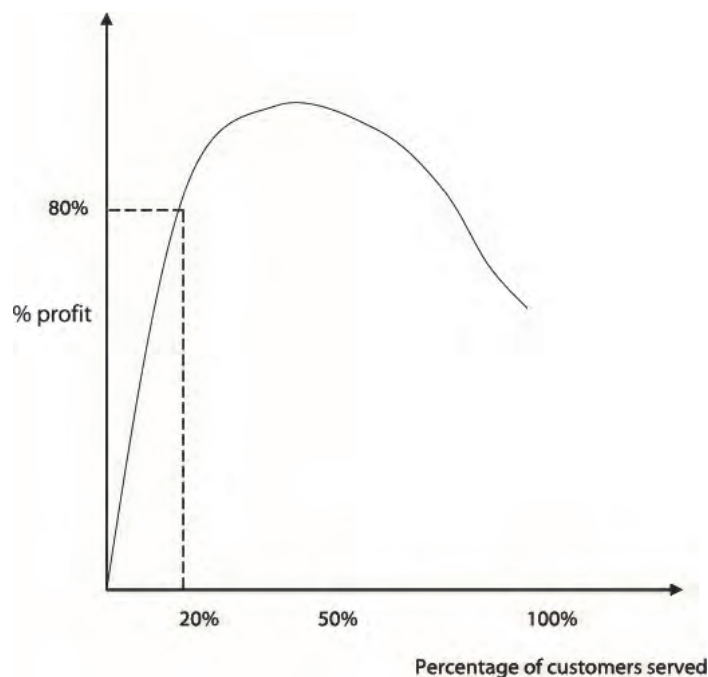
Older guests may appreciate and use the garden, families the swimming pool and business guests the bar.

If the activities are charged to the relevant guests a correct cost per bed occupied can be calculated for this type of category. This will show the relative profitability and lead to strategies for encouraging the more profitable guests.

14 Customer profitability curve

Even a manufacturing organisation can benefit from costing its customers. Not all customers cost the same to serve even if they require the same products. Some customers may be located a long way from the factory and transport may cost more. Other customers may be disruptive and place rush orders that interrupt production scheduling and require immediate, special transport. Some customers need after sales service and help with technical matters, etc.

When an organisation analyses the profitability of its customers it is not unusual to find that a Pareto curve exists. That is 20 per cent of customers provide 80 per cent of the profit. This may be illustrated by a **customer profitability curve**. For example:



The diagram above shows that the last 80% of customers do not all generate profit. The last 50% actually reduce the total profit. There is no point in serving these customers as the situation stands but it may be foolish just to refuse to serve them. Instead it may be better to turn them into profitable customers if this is possible. A multifunctional team should be set up to find ways of making these customers profitable.

Usually it is the small volume/order customers who are unprofitable because of high production batch costs and order processing, etc. One organisation introduced a third party wholesaler into the supply chain and significantly reduced the cost of serving the small order customers. At the same time the organisation found that the product range and service to the small customers improved, and so the company saved costs and the customer received an improved service.



Illustration – CPA

XY provides accountancy services and has three different categories of client:

- limited companies
- self-employed individuals
- employed individuals requiring taxation advice.

XY currently charges its clients a fee by adding a 20% mark-up to total costs. Currently, the costs are attributed to each client based on the hours spent on preparing accounts and providing advice. XY is considering changing to an activity based costing system. The annual costs and the causes of these costs have been analysed as follows:

Accounts preparation and advice	\$580,000
Requesting missing information	\$30,000
Issuing fee payment reminders	\$15,000
Holding client meetings	\$60,000
Travelling to clients	\$40,000

The following details relate to three of XY's clients and to XY as a whole:

	Client			XY
	A	B	C	
Hours spent on preparing accounts and providing advice	1,000	250	340	18,000
Requests for missing information	4	10	6	250
Payment reminders sent	2	8	10	400
Client meetings held	4	1	2	250
Miles travelled to clients	150	600	0	10,000

Required:

Prepare calculations to show the effect on fees charged to each of these three clients of changing to the new costing system.

Solution

Cost driver rates:

Accounts preparation and advice	$\$580,000/18,000 \text{ hours} = \32.222 per hour
Requesting missing information	$\$30,000/250 \text{ times} = \120 per request
Issuing fee payment reminders	$\$15,000/400 \text{ times} = \37.50 per reminder
Holding client meetings	$\$60,000/250 \text{ meetings} = \240 per meeting
Travelling to clients	$\$40,000/10,000 \text{ miles} = \4 per mile

Client costs:

	Client		
	A	B	C
Accounts preparation and advice	\$32,222	\$8,055	\$10,955
Requesting missing information	\$480	\$1,200	\$720
Issuing fee payment reminders	\$75	\$300	\$375
Holding client meetings	\$960	\$240	\$480
Travelling to clients	\$600	\$2,400	\$0
	<hr/>	<hr/>	<hr/>
Total costs	\$34,337	\$12,195	\$12,530
Total costs on original basis (*)	\$40,280	\$10,070	\$13,695
Client fees – new basis (W1)	\$41,204	\$14,634	\$15,036
Client fees – original basis	\$48,336	\$12,084	\$16,434
Increase/(Decrease)	\$(7,132)	\$2,550	\$(1,398)

(*) $\$725,000 / 18,000 \text{ hours} = \40.28 per hour

(W1) Client fees calculations, new basis

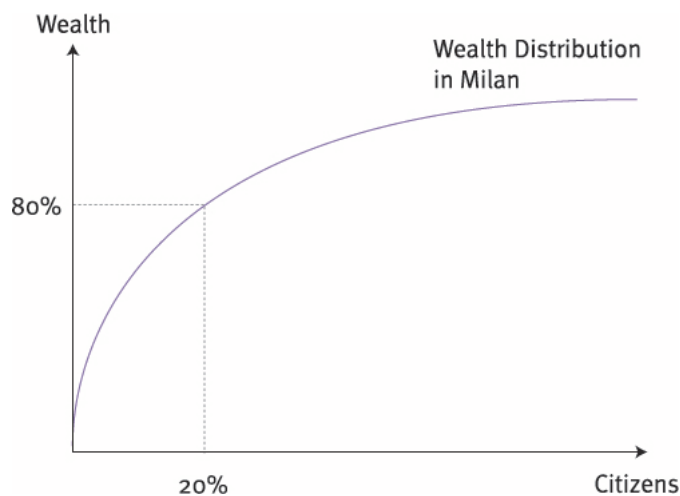
Client A: Total costs $\$34,337 \times (1 + 20\% \text{ mark-up on costs}) = \$41,204$

Client B: Total costs $\$12,195 \times (1 + 20\% \text{ mark-up on costs}) = \$14,634$

Client C: Total costs $\$12,530 \times (1 + 20\% \text{ mark-up on costs}) = \$15,036$

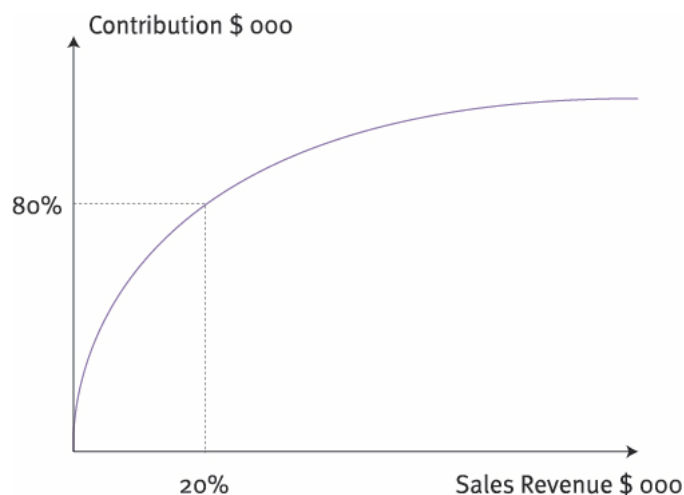
15 Pareto analysis

Pareto analysis is based on the 80:20 rule that was a phenomenon first observed by Vilfredo Pareto, a nineteenth century Italian economist. He noticed that 80 per cent of the wealth of Milan was owned by 20 per cent of its citizens:



This phenomenon, or some kind of approximation of it (70:30, etc.), can be observed in many different business situations. The management accountant can use it in a number of different circumstances to help direct management's attention to the key control mechanisms or planning aspects.

The Pareto phenomenon often shows itself in relation to profitability. Often around 80 per cent of an organisation's contribution is generated by 20 per cent of the revenue. A situation similar to this can be seen in the figure below, where the contributions of five products are plotted on a cumulative basis. Twenty per cent of the sales revenue generates 80 per cent of the contribution:

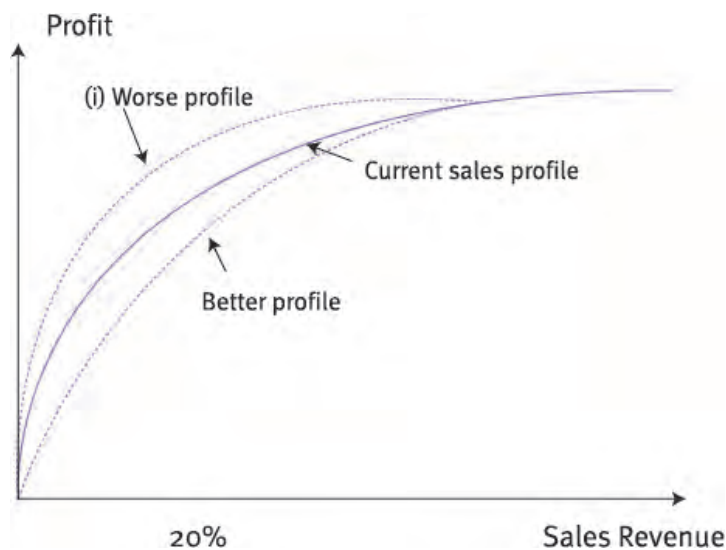


It is not always advisable to delete products from the range if they are not very profitable or their price cannot be increased, without carrying out careful analysis. The poor performers may be new products establishing themselves in the market and they may have a profitable future. However, the products that generate the largest proportion of the contribution need to be looked after. One reason for their profitability may be a high degree of branding which increases the contribution margin per unit. The company must continue to spend money promoting the brand so as to keep it in front of the public.

Pareto analysis has a number of different uses in business:

- Instead of analysing products, customers can be analysed for their relative profitability to the organisation. Again, it is often found that approximately 20 per cent of customers generate 80 per cent of the profit. There will always be some customers who are less profitable than others, just as some products are less profitable than others.

- The key with customers is to make sure that the overall profile does not degenerate and the aim should be to **improve the profile**. This can be seen in the figure below, where the solid line represents the present position and the two dotted lines represent a change in performance for the better and worse. The 'better profile' dotted line shows improved performance in the sense that customers are contributing more evenly to the profit, thus stabilising the position of the organisation. With the 'worse profile', the loss of, say, two of the best customers might seriously jeopardise the organisation's future:



Another use for Pareto analysis is in inventory control where it may be found that only a few of the goods in inventory make up most of the value. A typical analysis of inventory may reveal the situation shown as follows:

Product	Value	% of	% of volume	Action
A	High value	70%	10	Control carefully
B	Medium value	20%	20	Medium control
C	Little value	10%	70	No control

The outcome of this type of analysis may be to increase control and safeguards on the 10 per cent of the inventory that is of a particularly high value and to remove or reduce the controls on the inventory that is of little value.

Alternatively it may be found that a few items take up most of the storage space and therefore storage costs are unduly high for these items. It may be possible to move towards a just-in-time system for these items only, thus saving money and space.

Another study might relate to activity-based costing and overheads. **It may show that 20 per cent of an organisation's cost drivers are responsible for 80 per cent of the total cost.** By analysing, monitoring and controlling those cost drivers that cause most cost, a better control and understanding of overheads will be obtained.

Procedure

- 1 Rank the data in descending order.
- 2 Find each figure as a percentage of the total.
- 3 Turn this into a cumulative percentage.
- 4 It is possible to draw a diagram to illustrate the principle, e.g. a component bar chart or a cumulative frequency graph.

**Pareto analysis and charts**

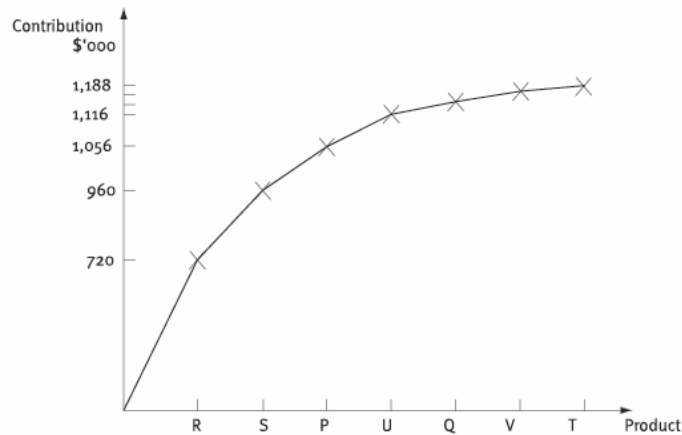
ABC Limited manufactures and sells seven products. The following data relates to the latest period:

Product	Contribution in \$000
P	96
Q	36
R	720
S	240
T	12
U	60
V	24
	1,188

To prepare a Pareto chart of product contribution and comment on the results, the first step is to rearrange the products in descending order of contribution and calculate the cumulative contribution:

Product	Contribution in \$	Cumulative Contribution in \$000	Cumulative %
R	720	720	61
S	240	960	81
P	96	1,056	89
U	60	1,116	94
Q	36	1,152	97
V	24	1,176	99
T	12	1,188	100
	1,188		

The cumulative data can now be used to produce the required Pareto chart showing product contribution:



The analysis shows that more than 80 per cent of the total contribution is earned by two products: R and S. The position of these products needs protecting, perhaps through careful attention to branding and promotion. The other products require investigation to see whether their contribution can be improved through increased prices, reduced costs or increased volumes.

16 Distribution channel profitability

Distribution channels are in simple terms the means of transacting with customers. The channel is the point of purchase. It is not necessarily the point of communication, payment, delivery and after sales support. Companies may transact with their customers through direct channels e.g. sales teams, telephone, shops, Internet, or through indirect channels e.g. retailers, wholesalers, resellers, agents.

Regardless of whether a company's channels are direct or indirect, they should always consider the ultimate needs of the customer and therefore use the channels to ensure that those needs are satisfied. Customers will look for ease of access to the supplier, reciprocal communication, products and services which satisfy their needs, prompt delivery, after sales support to name but a few.

The channel a company selects is therefore a critical driver to business profitability. A company should not only aim to satisfy the needs of the customer but must also ensure that the products and services that they are providing are profitable. The method of channel distribution chosen can account for a significant proportion of total cost and choosing the wrong channel can result in significant losses for that particular product or service.



Example 3: Distribution channel profitability

Crale & Co manufactures replacement batteries for smartphones. The battery retails for \$40 and costs \$10 to make. Crale & Co currently sells 1 million batteries every year through its e-commerce website, and 1 million batteries a year via its network of retail distributors across the country.

Overheads incurred to recruit and retain website administrators amount to \$800,000 yearly, and other employee costs amount to \$310,000 for the e-commerce channel.

Via its retail distribution network, the company must also offer a \$1.50 discount per unit to distributors; also, the administrative cost of processing retail orders amounts to \$620,000.

Required:

(a) **Which of the two channels is more profitable for Crale & Co?**

Further analysis of Crale & Co's financial data reveals that:

- 2% of the batteries sold via the website go unpaid every year, due to payment fraud;
- Packaging and distribution costs linked to the website operation have been calculated at \$0.80 per battery.
- Furthermore, 50% of the batteries ordered on the website qualify for free shipping due to web promotional vouchers. Batteries which qualify for this free shipping incur an additional cost of \$1.20 per battery to process the vouchers and ship to customers (not including the \$0.80 packaging and distribution costs mentioned above).
- The cost of shipping inventory in bulk to distributors is \$1 per unit.

(b) **In light of this further analysis, which of the two channels is now more profitable?**

Key aspects that the company needs to consider in relation to their distribution channels include; access to the customer base, brand awareness, competitiveness, achieving sales and market targets, speed of payment, customer retention rates and most importantly of all profitability.



Distribution Channel Profitability and digital techniques

The world of retailing has changed dramatically in the past decade. The advent of the online channel and new additional digital channels such as mobile channels and social media have changed retail business models, the execution of the retail mix, and shopper behaviour.

Unilever

Customer and channel information in Unilever is gathered in standardised 'People Data Centres' (PDCs) to look at all their "people data". People data come from traditional 'Customer Relationship Management' (CRM) systems, 'social media harvesting' (a way to collect data from social media platforms unobtrusively and automatically), contact with customer service, any information from marketing initiatives or consumer research.

Unilever wanted to create one IT structure and one focal point for the business, so everyone knows where the data sits and how to make use of it. The 'People Data Centres' (PDCs) are actual physical spaces. The social listening aspect is heavily fuelled by Twitter data.

Employees (including cost accountants) can create their own specific queries and requirements to identify precise insights and ultimately control costs better.

Ben & Jerry's Ice Cream

It has been observed that about 80% of all Ben and Jerry's gets sold on a Saturday. Week after week, a constant sales spike is noted on Saturdays. However, it had also been observed that most of the conversations on social media happen on Thursdays and Fridays, not on Saturday. Now, for the ice cream category, this is rather intriguing, because ice-cream is typically a 'point of purchase' sale (the decision to purchase is made in the store, not before). That is the preconceived notion on which brands and advertising usually works. But Ben and Jerry's appears to be a little different. People actually think about their Ben and Jerry's purchase a couple of days ahead on a Thursday, which means consumers are open to digital influence on that day. Therefore, why run ads on a Monday or Tuesday, when probably 99% of impressions are wasted? But on Thursdays and Fridays, the value of impressions may go up 5% or 10%. That is a dramatic difference on the same level of advertising spend.

Source: 'Digital leadership', Cap Gemini Consulting

Costing channels

In companies, it is just as important to cost channels as it is to cost products and customers. Different channels will differ in profitability.

Activity based costing information makes this possible, because it creates cost pools for activities. Channels will use some activities but not all, and different channels will have different 'activity profiles'.

This makes channel profitability analysis possible, and allows companies to build up distribution channel 'profitability profiles'. So, it becomes possible to identify costly distribution channels for low margin products or services supplied through direct channels, which should be supplied through indirect channels instead. This is a typical example of cost transformation: switching channels would result in reduced channel distribution costs, and a better profitability profile for the product or service.

17 Practice Questions



Objective Test Question 1: ABC vs. traditional costing

Company A manufactures three smartphones. Company A currently operates a traditional absorption costing system, but has decided to use an activity based costing (ABC) system on a trial basis for its procurement operation. A time-based cost driver is used to charge the procurement costs to the smartphones under the ABC system. The following unit manufacturing costs have been determined using both traditional absorption costing and activity based costing:

	Traditional absorption	Activity Based Costing
Smartphone Type 1	\$90	\$108
Smartphone Type 2	\$102	\$104
Smartphone Type 3	\$95	\$85

Place each of the following statements in a grey cell, against the product to which it is most likely to relate:

Smartphone Type 1	
Smartphone Type 2	
Smartphone Type 3	

<p>This smartphone uses a lot of parts and materials that are readily available. It does not require any special order: only one supplier is involved, who has been supplying Company A for years. All the components are readily available in the warehouse. Assembling the phone is very straightforward, and does not incur any specific costs.</p>	<p>This smartphone has relatively few components that are generally purchased in bulk. However, the camera components require a special order to a supplier overseas.</p>	<p>This smartphone uses a lot of parts and materials that are difficult to obtain, and so puts the buying department under pressure.</p>
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Objective Test Question 2: Activity Based Management

An engineering company is thinking about implementing activity-based management principles. Which of the following is a correct definition of activity-based management? Select the ONE definition that applies.

- (i) ABM is an approach to the costing and monitoring of activities which involves tracing resources consumption and costing final outputs. Resources are assigned to activities and activities to cost objects based on consumption estimates. The latter utilise cost drivers to attach activities costs to outputs.
- (ii) ABM involves the identification and evaluation of the activity drivers used to trace the cost of activities to cost objects. It may also involve selecting activity drivers with potential to contribute to the cost management function, with particular reference to cost reduction.
- (iii) ABM is a method of budgeting based on an activity framework and utilising cost driver data in the budget setting and variance feedback processes.
- (iv) ABM is a system of management which uses activity-based cost information for a variety of purposes including cost reduction, cost modelling and customer profitability analysis.
- (v) ABM is a grouping of all cost elements associated with an activity.



Objective Test Question 3: Direct Product Profitability

AB plc is a supermarket group which incurs the following costs:

- (i) The bought-in price of the good
- (ii) Inventory financing costs
- (iii) Shelf refilling costs
- (iv) Costs of repacking or 'pack out' prior to storage before sale.

AB plc's calculation of Direct Product Profitability would include:

- A All of the above costs
- B All of the above costs, except (ii)
- C All of the above costs, except (iv)
- D Costs (i) and (ii) only
- E Cost (i) only



Case Study Style question: Casamia

PRE-SEEN MATERIAL

Casamia plc purchases a range of good quality gift and household products from around the world; it then sells these products through 'mail order' or retail outlets. The company receives 'mail orders' by post, telephone and Internet. Retail outlets are either department stores or Casamia plc's own small shops. The company started to set up its own shops after a recession in the early 1990s and regards them as the flagship of its business; sales revenue has gradually built up over the last 10 years. There are now 50 department stores and 10 shops.

The company has made good profits over the last few years but recently trading has been difficult. As a consequence, the management team has decided that a fundamental reappraisal of the business is now necessary if the company is to continue trading.

Meanwhile, the budgeting process for the coming year is proceeding. Casamia uses an activity-based costing (ABC) system and the following estimated cost information for the coming year is available:

Retail outlet costs:

Activity	Cost driver	Rate per cost driver	Per Year	
			Department store	Own shop
Telephone queries and request to Casamia	Calls	\$15	40 calls	350 calls
Sales visits to shops and stores by Casamia sales staff	Visits	\$250	2 visits	4 visits
Shop orders	Orders	\$20	25 orders	150 orders
Packaging	Deliveries	\$100	28 deliveries	150 deliveries
Delivery to shops	Deliveries	\$150	28 deliveries	150 deliveries

Staffing, rental and service costs for each of Casamia plc's own shops cost on average \$300,000 a year.

Mail order costs:

Activity	Cost driver	Rate per cost driver		
		Post	Telephone	Internet
Processing 'mail orders'	Orders	\$5	\$6	\$3
Dealing with 'mail order' queries	Orders	\$4	\$4	\$1
		Number of packages per order		
Packaging and deliveries for 'mail orders' – cost per package \$10	Packages	2	2	1

The total number of orders through the whole 'mail order' business for the coming year is expected to be 80,000. The maintenance of the internet link is estimated to cost \$80,000 for the coming year. The following additional information for the coming year has been prepared:

	<i>Department store</i>	<i>Own shop</i>	<i>Post</i>	<i>Telephone</i>	<i>Internet</i>
Sales revenue per outlet	\$50,000	\$1,000,000			
Sales revenue per order			\$150	\$300	\$100
Gross margin: mark-up on purchase costs	30%	40%	40%	40%	40%
Number of outlets	50	10			
Percentage of 'mail orders'			30%	60%	10%

Expected Head office and warehousing costs for the coming year:

	\$
Warehouse	\$2,750,000
IT	\$550,000
Administration	\$750,000
Personnel	\$300,000
Total	\$4,350,000

Task: Report

You receive the following email from the Financial Controller:

From: Clara Fuchs (Financial Controller)
Sent: 03 June, 10.23 a.m.
To: Senior Management Accountant
Subject: Activity-Based Costing

Please prepare calculations on the expected profitability of the different types of sales outlets for the coming year.

I intend to submit your report to the Board. I would welcome some comments on the results of the figures you have prepared, particularly in the context of the re-appraisal of the business.

Please also advise on how the information you have submitted may be revised or expanded to be of more assistance, and suggest what other information is needed to make a more informed judgement.

Example and OT answers



Example 1: Manufacturing Business

Solution

(a)

Workings	M1	M2	Total
Number of batches	4	80	84
Number of setups	4	240	244
Special parts	16,000	64,000	80,000
Direct labour hours	16,000	20,000	36,000

Activity	Cost		M1	M2
	\$		\$	\$
Setups	97,600	Cost per setup \$400	1,600	96,000
Materials handling	42,000	Cost per batch \$500	2,000	40,000
Special parts handling	50,000	Cost per part \$0.625	10,000	40,000
Invoicing	31,000	Cost per order \$100	6,000	25,000
Other overheads	108,000	Cost per hour \$3	48,000	60,000
	<u>328,600</u>		<u>67,600</u>	<u>261,000</u>

	M1		M2	
	\$	\$	\$	\$
Sales		432,000		584,000
Direct materials	88,000		168,000	
Direct labour	128,000		160,000	
Overheads	67,600		261,000	
	<u>283,600</u>		<u>589,000</u>	
Total costs		283,600		589,000
Profit/(loss)		<u>148,400</u>		<u>(5,000)</u>
Profit/loss per unit		<u>18.55</u>		<u>(0.625)</u>

(b) The figures suggest that model M2 is less profitable than M1. The sales manager should try to persuade the customer to buy model M1. Note that the apparent loss on M2 does not necessarily mean that production should be ceased. To assess this management should consider the incremental relevant cash flows involved – e.g. is the product making positive contribution, how many overheads are avoidable? They could also consider ways to reduce the cost drivers for the product to reduce its share of the overheads and convert the product loss into a profit.

**Example 2: DPP**

The cold storage was included in the space of general storage, and therefore the frozen desserts should be allocated a share of the general costs as well as the cold storage costs.

General storage = $\$90,000/45,000 = \2 m^3

Cold storage = $\$5,000/100 = \50 m^3

Net profit of FD = $\$4 - \$0.4 - 0.03 \text{ m}^3 \times (\$50 + \$2) = \2.04

Net profit of SD = $\$30 - \$5 - (0.3 \text{ m}^3 \times \$2) = \$24.40$

**Example 3: Distribution channel profitability**

(a) The website is without question the more profitable channel, offering an extra \$1.01 in margin per battery.

	Website (e-commerce)	Retail distribution
Retail price	\$40	\$40
Direct costs	(\$10)	(\$10)
Contribution per unit	\$30	\$30
Unit sales	1,000,000	1,000,000
Total contribution	\$30,000,000	\$30,000,000
Website administration overheads	(\$800,000)	
Other employee overheads	(\$310,000)	
Cost of discounts to distributors \$1.50 per battery		(\$1,500,000)
Admin cost of processing retail orders		(\$620,000)
Net profit	\$28,890,000	\$27,880,000
Net profit per unit	\$28.89	\$27.88

(b) When all channel-related costs are taken into account, the retail distribution channel becomes more profitable than the e-commerce channel. The management decisions that will be made as a result of this more thorough analysis will be far different.

	Website (e-commerce)	Retail distribution
Total net profit as in (a)	\$28,890,000	\$27,880,000
Bad debts (Payment fraud) (W1)	(\$800,000)	
Cost of free shipping (W2)	(\$600,000)	
Packaging and distribution costs	(\$800,000)	
Cost of shipping inventory in bulk (W3)		(\$1,000,000)
Net profit	\$26,690,000	\$26,880,000
Net profit per unit	\$26.69	\$26.88

Workings:

(W1) Payment fraud applies to $2\% \times 1,000,000 = 20,000$ batteries

$20,000 \times \$40$ revenue per battery = total non-payment \$800,000

(W2) Free shipping applies to $50\% \times 1,000,000 = 500,000$ batteries

$500,000 \times \$1.20$ cost per battery = \$600,000

(W3) Cost of shipping inventory in bulk applies to all batteries for retail

$1,000,000$ batteries \times \$1 per battery = \$1,000,000 shipping cost.



Objective Test Question 1: ABC vs. traditional costing

Smartphone Type 1	This smartphone uses a lot of parts and materials that are difficult to obtain, and so puts the buying department under pressure.
Smartphone Type 2	This smartphone has relatively few components that are generally purchased in bulk. However, the camera components require a special order to a supplier overseas.
Smartphone Type 3	This smartphone uses a lot of parts and materials that are readily available. It does not require any special order: only one supplier is involved, who has been supplying Company A for years. All the components are readily available in the warehouse. Assembling the phone is very straightforward, and does not incur any specific costs.

Smartphone 1 has a higher cost under ABC, which suggests a more complex item using specific parts and materials.

Smartphone 2 has a marginally higher cost under ABC, which suggests the use of mostly readily available components.

Smartphone 3 has a lower cost under ABC, which suggests a standard product using few, if any, specific or complex components.



Objective Test Question 2: Activity Based Management

The answer is (iv): ABM uses the information provided by an ABC analysis to improve organisational profitability.

Option (i) defines ABC.

Option (ii) defines activity driver analysis.

Option (iii) defines activity based budgeting.

Option (v) defines an activity cost pool.



Objective Test Question 3: Direct Product Profitability

The answer is A: All of the costs described can be identified with specific goods and would be deducted from the selling price to determine the direct product profit.



Data Set Question: Walken Supermarkets

Warehouse cost $\$75,000 \div 10,000 = \7.50 per m^3

Supermarket cost $\$40,000 \div 5,000 = \8.00 per m^3

Transportation cost $\$400 \div 40 = \10 per m^3

	KR \$	TS \$	T \$
Retail price	1.00	0.60	1.75
Less bought-in price	(0.60)	(0.30)	(1.00)
Gross margin	0.40	0.30	0.75
Less overheads:			
Warehouse costs (see workings)	0.0375	0.02	0.0281
Supermarket costs (see workings)	0.08	0.0427	0.02
Transportation costs (see workings)	0.05	0.0133	0.0125
Net profit	0.2325	0.2240	0.6894

Workings:

Number of items per m^3 $10 \times 20 = 200$ $25 \times 30 = 750$ $40 \times 20 = 800$

Warehouse charge:

Kitchen roll $(\$7.50 \div 200) \times 1 \text{ week} = 0.0375$

Tinned spaghetti $(\$7.50 \div 750) \times 2 \text{ weeks} = 0.02$

Toothpaste $(\$7.50 \div 800) \times 3 \text{ weeks} = 0.028125$

Supermarket cost:

Kitchen roll $(\$8.00 \div 200) \times 2 \text{ weeks} = 0.08$

Tinned spaghetti $(\$8.00 \div 750) \times 4 \text{ weeks} = 0.0427$

Toothpaste $(\$8.00 \div 800) \times 2 \text{ weeks} = 0.02$

Transportation costs:

Kitchen roll $\$10 \text{ per } m^3 (\div 20 \text{ cases per } m^3) (\div 10 \text{ items per case}) = 0.05$ per item

Tinned spaghetti $\$10 \text{ per } m^3 (\div 30 \text{ cases per } m^3) (\div 25 \text{ items per case}) = 0.0133$ per item

Toothpaste $\$10 \text{ per } m^3 (\div 20 \text{ cases per } m^3) (\div 40 \text{ items per case}) = 0.0125$ per item



Case Study Style Question: Casamia

REPORT

To: Financial Controller

From: Management Accountant

Date: 03 June

Subject: Profitability of different types of sales outlets

The aim of this report is to determine the expected profitability of the different types of sales outlets for the coming year.

In summary, the calculations in the attached appendices (Appendix 'A' to 'E') show the following:

- Casamia's own shops will make a considerable 'loss'.
- The department store sales will not generate as good a profit as the 'mail order' side.
- The telephone mail order, that is 46% of the business, will generate 104% of the current total profit.
- The Internet business is not particularly profitable in the coming year, but it will presumably grow quite quickly. If this happens, the charge for maintaining the Internet, which is expressed by each order, will presumably decline as it is likely to be a semi-fixed cost.

1 Usefulness of information

The calculations show the profitability of the different types of outlet for the coming year only, which is of some use. For example, it shows that Casamia's own shops make a considerable loss and it would appear, on the surface, that the company would be better off without them, perhaps transferring the business to franchises within department stores. It also indicates that the emphasis of the business should be switched to the mail order side, as it is more profitable and, in particular, to the telephone section.

2 The need for further information

However, the latter shows how dangerous this kind of assumption can be because the telephone section may have peaked and, in future, growth in the Internet section may be at the expense of the telephone section. Therefore, decisions about future strategies cannot be made on predicted short-term costs and revenues. Any attempt to do so could prove disastrous. Growth in the market, competitors' moves, customers' needs and requirements must be the basis for any decisions.

The ABC costs could, however, be used to highlight areas for cost reduction and procedural changes which could assist longer-term profitability. ABC is a method for apportioning costs and it suffers from the same defects as every absorption method. In Casamia's case, the analysis does not look very detailed/accurate and so may be little better than a traditional absorption system.

The head office and warehousing costs need to be examined in detail to determine which type of outlet incurs what part of the cost, as these costs may be caused and used more by some types of outlets than others. If this is so, what would happen to cost if one type of outlet was abandoned and others increased in size?

3 Other information needed to make a more informed judgement is likely to be:

Customers' changing purchasing habits

Same customer purchases across outlet types, that is, do customers buy from shops and order by telephone.

Competitors' moves

New entrants into the market – especially in the Internet business .

Future economic conditions

Exchange rate movements – as some goods are imported.

Increase in disposable income

The image created by the different types of outlet, that is do their own shops create the brand or company name.

Past data to establish trends.

Then, specific information will need to be collected for the fundamental reappraisal of the business. For example, if the decision to close Casamia's own shops was being considered, a detailed study of the interrelationship between outlets should be carried out, as having the products on display in shops might be necessary in order to maintain the high level of telephone orders. For instance, potential customers may visit to see colours, quality, and so on.

Products on display are also a form of advertising for the company and this would be lost if the shops were closed.

Appendix A: Calculation of net margin per type of outlet

	<i>Department store</i>	<i>Own shop</i>	<i>Post</i>	Mail order	
				<i>Telephone</i>	<i>Internet</i>
Sales revenue	50,000	1,000,000	150.00	300.00	100.00
Gross margin ¹ (50,000 + 1.30, etc.)	11,538	285,714	42.86	85.71	28.57
Less: Staffing etc.		300,000			
Telephone queries (\$15 × 40, etc.)	600	5,250			
Sales visits (\$250 × 2, etc.)	500	1,000			
Orders (\$20 × 25, etc.)	500	3,000			
Packaging (\$100 × 28, etc.)	2,800	15,000			
Delivery (\$150 × 28, etc.)	4,200	22,500			
Order cost			5.00	6.00	3.00
Queries			4.00	4.00	1.00
Packing & delivery (\$10 × 2, etc.)			20.00	20.00	10.00
Internet cost ²					10.00
	8,600	346,750	29.00	30.00	24.00
Net margin	2,938	(61,036)	13.86	55.71	4.57
Net margin/sales	5.9%		9.2%	18.6%	4.6%
	4th	5th	2nd	1st	3rd

Appendix B: Calculation of total margin for each type of outlet

	Department Stores	Own shops	Mail order			Total
	\$000	\$000	Post \$000	Telephone \$000	Internet \$000	\$000
Total revenue	2,500	10,000	3,600	14,400	800	31,300
Total net margin	146.90	(610.36)	332.64	2,674.08	36.56	2,579.82

Appendix C: Gross margin calculation for 30% of purchase cost

$$\begin{aligned}
 100 &= 0.3X + X \\
 X &= 76.92\% \\
 0.3 X &= 23.076\% \\
 \$50,000 \times 23.076\% &= \$11,538
 \end{aligned}$$

Appendix D: Mail order

Total number of mail orders = 80,000. So number of Internet orders = $80,000 \times 10\% = 8,000$

Internet link cost per order = $\$80,000/8,000$ orders = \$10

Appendix E: Calculation of total revenues and net margins (\$000)

		Total revenue		Total net margin
Department Stores 50 outlets	(× \$50,000)	\$2,500	(× 2,938)	146.9
Own shops 10 outlets	(× \$1,000,000)	10,000	(× \$61,036)	(610.36)
Mail order – post				
80,000 × 30% = 24,000 orders	(× \$150)	3,600	(× \$13.86)	332.64
Mail order – telephone				
80,000 × 60% = 48,000 orders	(× \$300)	14,400	(× \$55.71)	2,674.08
Mail order – Internet				
80,000 × 10% = 8,000 orders	(× \$100)	800	(× \$4.57)	\$36.56