Chapter 1

Activity-based costing and activity-based management

Chapter learning objectives:

<table>
<thead>
<tr>
<th>Lead</th>
<th>Component</th>
<th>Indicative syllabus content</th>
</tr>
</thead>
</table>
| A.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 | • 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 |
1. The importance of understanding costs

- In management accounting an understanding of costs is required in order to carry out the three main functions of planning, control and decision making.

The CGMA Cost transformation model

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

- **Engendering a cost conscious culture** – the organisation should aim to be a cost leader.

- **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** – understanding what drives costs for each individual product and allocating shared costs to products as accurately as possible.

- Generating maximum value through new products

- Incorporating sustainability to optimise profits

- **Understanding cost drivers** – this involves investigating costs to determine why they change and how different variables impact on the cost.
2. Activity-based costing

- In the late 1980s, Cooper and Kaplan developed a new approach (activity-based costing) that assigns overheads to products to determine the product cost.
- They 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 Terminology)*

A look at traditional systems

- Traditional systems accurately measure volume-related resources that are consumed in proportion to the number of units produced of the individual product.
- Such resources include material, direct labour, energy and machine-related resources.
- But many organisational resources exist for activities that are not related to physical volume. Non-volume-related activities include supporting activities:
  - Material handling
o Material procurement  
o Set-ups  
o Production scheduling  
o First-time inspection activities

Traditional product cost systems that assume that the products consume all activities in proportion to their production volumes thus reported distorted product costs.

- In contrast to traditional cost-accounting systems, ABC systems first accumulate overhead costs for each organisational activity and then assign the costs of the activities to the products, services or customers (cost objects) causing that activity.

- The most critical aspect of ABC is activity analysis. This is the process of identifying appropriate output measures for activities and resources (cost drivers) and their effects on the costs of making a product or providing a service.

- Activity analysis provides a foundation for remedying the distortions inherent in traditional cost-accounting systems.

3. **The ABC process**

Cooper and Kaplan developed a simple three-step process on the basis that it is the supporting activities that cause many overheads.

- Support activities cause costs.  
- Products consume cost activities.  
- Costs should be charged to products on the basis of consumption of activities.

**ABC method**

- Identify the organisation’s major activities.  
- Estimate the cost associated with performing each activity. These costs are collected in the cost pool.  
- Identify the cost drivers that affect the cost pool – the number of set-ups will affect the cost of setting up the machinery.  
- Calculate the cost driver rate, for example:  
  - A rate per set-up  
  - Rate per material requisition  
  - Rate per inspection

\[
\text{Formula} = \frac{\text{Cost pool}}{\text{Level of Cost Drivers}}
\]
• Charge the overheads to the products by applying the rates of the cost drivers to the activity usage of the product.

4. **Activity-based cost hierarchy**

• In 1991, Cooper and Kaplan proposed a cost hierarchy framework that maintains that costs are driven by and variable with respect to activities that occur at four levels.

---

**Activity-based cost hierarchy**

- **Unit-level activities**
  - Performed each time a unit is produced.
  - Consumed in direct proportion to the number of units produced.
  - These include:
    - Direct material
    - Direct labour
    - Energy costs
    - Machine maintenance

- **Batch-related activities**
  - Performed each time a batch is produced.
  - Cost of batch-related activities varies with the number of batches made.
  - But cost is common or fixed for all of the units in the batch.

- **Product-sustaining activities**
  - Performed to support different products in the product line.
  - Performed to enable different products to be produced and sold.

---
• Resources consumed are independent of how many units and batches are being produced.

**Facility-sustaining activities**

• Costs that cannot be associated with a particular product line.
• Related to maintaining the building and the facilities, including:
  o Maintenance of the building
  o Plant security
  o Business rates

ABC has predominantly been used to support strategic decisions such as pricing, outsourcing, and identification and measurement of process improvement initiatives because:

• It helps to identify inefficient products, departments and activities.
• It helps to allocate more resources to profitable products, departments and activities.
• It helps to control the costs at an individual level and on a departmental level.
• It helps to find unnecessary costs.
• It helps to fix the price of a product or service scientifically.

5. **Benefits and limitations of ABC**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides more accurate product line costing in the instance of significant non-volume-related overheads and a diverse product line</td>
<td>A lack of evidence to date that ABC improves corporate profitability</td>
</tr>
<tr>
<td>Flexible enough to analyse costs by cost objects other than products</td>
<td>Deals with historic information that is internally oriented, and hence lacks direct relevance to future strategic decisions</td>
</tr>
<tr>
<td>Provides a reliable indication of long-run variable product cost that is particularly relevant to managerial decision-making at the strategic level</td>
<td>Lacks practicality and gives rise to problems such as cost driver selection</td>
</tr>
<tr>
<td>Provides meaningful financial and non-financial measures relevant to cost management and performance assessment at the operational level</td>
<td>Could be viewed as simply a rigorous application of</td>
</tr>
<tr>
<td>Aids identification and understanding of cost behaviour and thus has the potential to improve cost estimation</td>
<td></td>
</tr>
</tbody>
</table>
Test Your Understanding 1 – ABC

Sledge Company manufactures three types of tablets and operates a traditional absorption costing system. The company is now considering opting for using Activity-Based Costing (ABC) on a trial basis for its procurement operation. A time-based cost driver is used to charge the procurement costs to the tablets under the ABC system. The following unit manufacturing costs have been determined using traditional absorption costing and activity-based costing.

<table>
<thead>
<tr>
<th>Product</th>
<th>Traditional Absorption Costing</th>
<th>Activity-Based Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet – Star</td>
<td>$80</td>
<td>$108</td>
</tr>
<tr>
<td>Tablet – Air</td>
<td>$101</td>
<td>$103</td>
</tr>
<tr>
<td>Tablet – Galaxy</td>
<td>$92</td>
<td>$84</td>
</tr>
</tbody>
</table>

Place each of the following statements in the grey cell beside the product to which it relates.

| Tablet – Star |  |
| Tablet – Air  |  |
| Tablet – Galaxy|  |

<table>
<thead>
<tr>
<th>Statement 1</th>
<th>Statement 2</th>
<th>Statement 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>This tablet uses a lot of parts and materials that are readily available.</td>
<td>This tablet has relatively few components, and these are generally purchased in bulk.</td>
<td>This tablet uses a lot of parts and materials that are difficult to obtain and so places the buying department under pressure.</td>
</tr>
</tbody>
</table>

6. Activity-based management (ABM)

Activity-based management 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 terminology)

- ABM simply uses the information derived from ABC analysis for cost management.
- It classifies each activity within a process as a value-added or non-value-added activity.
- Non-value-added activities are unnecessary and present waste. The aim should be to eliminate non-value-added activities.
ABM focuses on the activities within a process, decision making and planning relative to those activities, and the need for continuous improvement of all organisational activities.

Everyone in the management should cooperate in identifying:

- Cost pools
- Cost drivers
- Key performance indicators

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

7. Output from the ABM information system

There are five basic information outputs from ABM.

Cost of activities and business processes
- Activities form the very core of what a business does.
- The basic output of an ABM system must be relevant cost information about what a business does.

Cost of non-value-added activities
- Identification of these wasteful activities is invaluable as it provides a crucial focal point for the management.

Activity-based performance measures
- Determining 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 reporting how well improvement efforts are working and is an integral part of continuous improvement.
Accurate product/service costs

- Products and services are provided to the market and customers through various distribution channels or contractual relationships.
- Since products and services consume resources at different rates and need different support levels, costs must be accurately determined.

Cost drivers

- The final output from ABM is cost driver information.
- With this information, it is possible to understand and manage activity levels.

STRATEGIC DECISION-MAKING AND ABM

- Whether to continue with a particular activity.
- How cost structures measure up to those of competitors.
- How changes in activity and components affect suppliers and the value chain.

BENEFITS OF ABM

- Nurture good communication and teamwork.
- Develops quality decision-making.
- Leads to quality control and continuous improvement.
- Will not reduce costs but does help managers understand costs better.

8. Direct product profitability (DPP)

Direct product profitability is used primarily within the retail sector....DPP involves 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 Terminology)*
## Illustration 1

Direct product profit for product A

<table>
<thead>
<tr>
<th></th>
<th>$</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Less: Bought-in price</td>
<td>(0.6)</td>
<td></td>
</tr>
<tr>
<td>Gross margin</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Less: Direct product costs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouse costs</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Transport costs</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Store costs</td>
<td>0.20</td>
<td>(0.53)</td>
</tr>
<tr>
<td>Direct product profit</td>
<td></td>
<td>0.67</td>
</tr>
</tbody>
</table>

**Note:**

Warehouse costs:
- Labour
- Space
- Insurance costs

Transport costs:
- Labour
- Fuel
- Vehicle maintenance costs

## Benefits of DPP

- Better cost analysis
- Better pricing decisions
- Better management of store and warehouse space
- Rationalisation of product ranges
- Better merchandising decisions
DPP software system

A DPP software system can be purchased to model the costs. Software that assesses direct product profitability requires a number of key variables to analyse different situations, including:

- Buying and selling prices
- Rate of sale
- Inventory-holding size
- Product size
- Pallet configuration
- Ordering costs
- Distribution routes

Test Your Understanding 2 – DPP

“All In One” is a supermarket group that incurs the following costs:

i. Bought-in price of the product
ii. Shelf refilling cost
iii. Inventory financing cost
iv. Cost of pack-out prior to storage before sale

All In One’s calculation of direct product profitability will include:

A. Cost (i) only
B. Costs (i) & (ii) only
C. All of the above costs except (ii)
D. All of the above costs except (iv)
E. All of the above costs

9. Customer profitability analysis

Customer profitability analysis is the analysis of the revenue streams and service costs associated with specific customers or customer groups. *(CIMA terminology)*

We should understand that service organisations, particularly those such as banks and hotels, need to cost customers.
Illustration 2

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

Illustration 3

Customer profitability analysis for 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 enjoy and appreciate the gardens, whereas families may enjoy the swimming pool, and businesspeople may enjoy the bar.

If the activities are charged to the relevant guests, a correct cost per bed occupied may be determined for each category. This will show relative profitability and enable the formulation of strategies for encouraging more profitable guests.

10. Customer profitability curve

- Different customers bear a different cost for the company (e.g. far from the company, placing badly thought-through orders).
- The company will mostly use the Pareto curve (20% of the customers provide 80% of the profit).
- Revenues and service costs attributable to specific customer types are analysed to identify the customers’ level of profitability.
• The curve shows that the last 50% of customers actually reduces the profit, so why are they served?

• It is worthwhile considering customer profitability and the customer lifecycle:

• Customers may start off loss-making. It costs money to acquire their business, and promotional offers may be necessary. They may develop into long-term profitable revenue streams.

Test Your Understanding 3 – Customer profitability

The following information relates to an entity:

<table>
<thead>
<tr>
<th>Products</th>
<th>Contribution in $000</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>25</td>
</tr>
<tr>
<td>D</td>
<td>50</td>
</tr>
<tr>
<td>E</td>
<td>12</td>
</tr>
<tr>
<td>F</td>
<td>440</td>
</tr>
<tr>
<td>G</td>
<td>900</td>
</tr>
</tbody>
</table>
On the basis of Pareto analysis, which of the following pairs of products earn more than 80% of the total contribution?

A. A & D  
B. G & F  
C. B & C  
D. A & F

11. Pareto analysis

- Pareto analysis is based on the 80:20 rule, a phenomenon first observed by Vilfredo Pareto.
- He observed that 80% of the wealth of Milan was owned by 20% of its citizens.

- Management accountants can use this relationship in a number of different situations to help direct management’s attention to key control mechanisms or planning aspects.
Procedure

1. Rank the data in descending order
2. Find each figure as a percentage of the total
3. Turn this into the cumulative percentage
4. The results can be plotted in a diagram.

Test Your Understanding 4 – Pareto analysis

ABC Ltd manufactures and sells seven products. The following data relates to the most recent period.

<table>
<thead>
<tr>
<th>Product</th>
<th>Contribution in $000</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>95</td>
</tr>
<tr>
<td>B</td>
<td>35</td>
</tr>
<tr>
<td>C</td>
<td>750</td>
</tr>
<tr>
<td>D</td>
<td>240</td>
</tr>
<tr>
<td>E</td>
<td>60</td>
</tr>
<tr>
<td>F</td>
<td>12</td>
</tr>
<tr>
<td>G</td>
<td>25</td>
</tr>
</tbody>
</table>

Draw a Pareto diagram for the above data.
13. Distribution channel profitability

- ABC information can also be used to determine the profitability of different distribution channels.
- The distribution channel is the point of purchase for a customer. These can be direct (shops, sales teams, the internet) or indirect (retailers, wholesalers, etc.)
- Different channels will use some activities but not all. ABC information allows an understanding of the profitability of different channels by creating cost pools for activities.
- Each channel offered can be analysed in terms of its true cost, and so the relative profitability of each channel can be obtained.
- The channel a company chooses can be a critical driver of business profitability.
- Decisions on future selling methods and product pricing can reflect these findings.

14. Solutions to Test Your Understanding questions

**Test Your Understanding 1 – ABC**

| Tablet – Star | This tablet uses a lot of parts and material that are difficult to obtain and so places the buying department under pressure. |
| Tablet – Air  | This tablet has relatively few components, and these are generally purchased in bulk. |
| Tablet – Galaxy | This tablet uses a lot of parts and materials that are readily available. |

**Explanation:**

- **Tablet – Star** has a higher cost under ABC, which suggests a more complex item using specific parts and material.
- **Tablet – Air** has a marginally higher cost under ABC, which suggests the use of mostly readily available components.
- **Tablet – Galaxy** has a lower cost under ABC, which suggests a standard product using few, if any, specific or complex components.

**Test Your Understanding 2 – DPP**

Correct option: E

All of the costs described can be identified with specific goods and would be deducted from the selling price to determine the direct product profitability.
Test Your Understanding 3 – Customer profitability

Correct option: B

<table>
<thead>
<tr>
<th>Products</th>
<th>Contribution in $000</th>
<th>Cumulative Contribution in $000</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>900</td>
<td>900</td>
<td>58%</td>
</tr>
<tr>
<td>F</td>
<td>440</td>
<td>1340</td>
<td>87%</td>
</tr>
<tr>
<td>A</td>
<td>100</td>
<td>1440</td>
<td>93%</td>
</tr>
<tr>
<td>D</td>
<td>50</td>
<td>1490</td>
<td>96%</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>1510</td>
<td>98%</td>
</tr>
<tr>
<td>C</td>
<td>25</td>
<td>1535</td>
<td>99%</td>
</tr>
<tr>
<td>E</td>
<td>12</td>
<td>1547</td>
<td>100%</td>
</tr>
</tbody>
</table>

---

![Graph showing contributions and cumulative contributions for each product.](chart.png)
Test Your Understanding 4 – Pareto analysis

<table>
<thead>
<tr>
<th>Products</th>
<th>Contribution in $000</th>
<th>Cumulative Contribution in $000</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>750</td>
<td>750</td>
<td>62%</td>
</tr>
<tr>
<td>D</td>
<td>240</td>
<td>990</td>
<td>81%</td>
</tr>
<tr>
<td>A</td>
<td>95</td>
<td>1085</td>
<td>89%</td>
</tr>
<tr>
<td>E</td>
<td>60</td>
<td>1145</td>
<td>94%</td>
</tr>
<tr>
<td>B</td>
<td>35</td>
<td>1180</td>
<td>97%</td>
</tr>
<tr>
<td>G</td>
<td>25</td>
<td>1205</td>
<td>99%</td>
</tr>
<tr>
<td>F</td>
<td>12</td>
<td>1217</td>
<td>100%</td>
</tr>
</tbody>
</table>

Analysis

This analysis shows that more than 80% of the total is earned by products C & D. The position of these two products needs to be protected 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.
15. Chapter summary