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# ACCA Paper F5

## Performance Management

For exams in 2010

**Chapter 1**

# Specialist Cost & Management Accounting Techniques


## KEY KNOWLEDGE
## Activity Based Costing (ABC)

ABC is a method that seeks to group overhead costs according to the activities causing those costs. The activities giving rise to the costs are called "cost drivers". By linking costs to activities (cost drivers), it becomes possible to charge costs to the agents undertaking those activities.

## EXAMPLE

A factory clinic with total annual costs of USD 500,000 serves two Workshops A and B. Workshop A has 200 employees and Workshop B has 300 employees.

A conventional way of apportioning the cost would be on the basis of employees:

Workshop A: (200/500) x 500,000 = 200,000
Workshop B: (300/500) x 500,000 = 300,000
500,000

An ABC approach might look at the number of visits to the clinic by the employees of A and B.

Workshop A: 150 visits p.a.
Workshop B: 70 visits p.a.

In this case, the apportionment could be:

Workshop A: (150/220) x 500,000 = 340,909
Workshop B: ( 70/220) x 500,000 = 159,091
500,000

The different levels of usage may reflect different degrees of occupational hazard present in the two workshops.

ABC advantages: provides a more precise way to determine costs per unit of output, especially since not all overhead costs are driven by production volumes.

EXAMPLE

**A manufacturing illustration**

A company producing vitamin supplements for humans (V1) and animals (V2) calculates the following prime costs per batch:

| ($ per batch) | V1 | V2 |
|---|---|---|
| Direct materials | 10.00 | 7.00 |
| Direct labor (3.50/hr) | 5.25 | 3.50 |

| | | |
|---|---|---|
| **Total** | **15.25** | **10.50** |

The overhead (indirect manufacturing) costs totaling $ 73,500 have yet to be allocated to the two products.

In preparing the (partial) cost card above, the management accountant has instructions to allocate the overheads based on direct labor hours. The company assumes a normal level of activity with production volumes of 5,000 batches of V1 and 10,000 batches of V2.

Complete the cost card.

V1: 1 batch requires 1.5 hours of direct labor x 5,000 batches = 7,500 hours

V2: 1 batch requires 1.0 hour of direct labor x 10,000 batches = 10,000 hours

Total direct hours: 17,500 hours

Total overheads: $ 73,500

Overhead absorption rate (OAR): $ 4.2 per hour

Cost card:

| ($ per batch) | V1 | V2 |
|---|---|---|
| Direct materials | 10.00 | 7.00 |
| Direct labor (3.50/hr) | 5.25 | 3.50 |
| Overhead costs | 6.30 | 4.20 |
| **Total** | **21.55** | **14.70** |
| Production volume (batches) | 5,000 | 10,000 |

An ABC analysis of overhead costs involves the following steps:

**Step 1 – Identification of Activities; Cost breakdown; Cost drivers**

| Activity | Amount | Cost driver |
|---|---|---|
| Production process setups | 20,000 | No. of runs |
| Equipment monitoring | 14,500 | No. of machine hours |
| Materials handling | 17,000 | No. of requisitions |
| Quality/Safety control | 22,000 | No. of tests |
| **Total** | **73,500** | |

**Step 2 – Cost drivers broken down by product**

| | Production runs | Machine hours | Requisitions | Tests |
|---|---|---|---|---|
| V1 | 14 | 500 | 30 | 50 |
| V2 | 8 | 300 | 20 | 35 |
| **Total** | **22** | **800** | **50** | **85** |

**Step 3 – Determine the cost per cost driver of each activity**

| Activity | Amount | Cost driver | Driver units | Cost /Driver unit |
|---|---|---|---|---|
| Prod. process setups | 20,000 | Production runs | 22 | 909 |
| Equipmt monitoring | 14,500 | Machine hours | 800 | 18 |
| Materials handling | 17,000 | Requisitions | 50 | 340 |
| Quality/Safety control | 22,000 | Tests | 85 | 259 |

**Step 4 – Calculate the activity cost per product**

| Cost driver | Cost /Driver unit | Driver units by product | | Cost/product | |
|---|---|---|---|---|---|
| | | V1 | V2 | V1 | V2 |
| Production runs | 909 | 14 | 8 | 12,726 | 7,272 |
| Machine hours | 18 | 500 | 300 | 9,000 | 5,400 |
| Requisitions | 340 | 30 | 20 | 10,200 | 6,800 |
| Tests | 259 | 50 | 35 | 12,950 | 9,065 |

| | | |
|---|---|---|
| **Total** | **44,876** | **28,537** |

**Step 5 – Calculate the overheads by product per batch**

Cost/product

| | V1 | V2 |
|---|---|---|
| Total overheads | 44,929 | 28,571 (= 73,500; rounding diff. included) |
| Production volume (batches) | 5,000 | 10,000 |
| **Overheads per batch** | **8.99** | **2.86** |

**Revised cost card (per batch):**

| ($ per batch) | V1 | V2 |
|---|---|---|
| Direct materials | 10.00 | 7.00 |
| Direct labor (3.50/hr) | 5.25 | 3.50 |
| Overhead costs | 8.98 | 2.86 |
| **Total** | **24.23** | **13.36** |

**Compared with original cost card (overheads allocated by direct labor hours)**

| ($ per batch) | V1 | V2 |
|---|---|---|
| Direct materials | 10.00 | 7.00 |
| Direct labor (3.50/hr) | 5.25 | 3.50 |
| Overhead costs | 6.45 | 4.20 |
| **Total** | **21.70** | **14.70** |

Discuss the implications of the revised cost card calculated in the previous illustration.

Other ABC advantages:

Budgetary planning, pricing decisions and managing performance are all facilitated by ABC.

ABC disadvantages:

It can be complex and costly to implement. It is not a "plug-in-and-go" system! It is therefore imperative that management carefully weigh the costs against the (expected) benefits from ABC before deciding to implement it.

EXAMPLE

How would you go about planning the implementation steps for ABC at your company? Take into consideration the following:

- Pricing issues;
- Sales strategy;
- Performance management; and
- Decision-making

## KEY KNOWLEDGE
## Target costing

This is a market-oriented approach to costing which starts by identifying the likely price that a product can fetch in the market, deducts the profit that the product is expected to earn, and arrives at the maximum (target) cost of manufacturing the product.

Such a method usually requires successive iterations in order to close a "cost gap", i.e. where the costs are above the targeted level. Product re-design, alternative materials and production processes are examined in order to achieve the desired level of costs.

## EXAMPLE

A company reviews its costs and desired mark-up for a product in development:

| | $ |
|---|---|
| • Cost | 15 |
| • Mark-up | 3 |
| • Selling price | 18 |

Consumer research reveals that the market will be more receptive at a price of $16. In order to defend its desired mark-up, the company must therefore revise its anticipated costs:

| | $ |
|---|---|
| • Price | 16 |
| • Less: Margin | (3) |
| • Target cost | 13 |

Define the **cost gap** in the above example and discuss how the company may close it.

## KEY KNOWLEDGE
## Life-cycle costing

A product normally "lives" beyond one accounting period and the costs connected to its development/design, launch and maintenance fall unevenly across time periods. This method takes a comprehensive view of the costs relating to the product throughout its life-cycle.

## EXAMPLE

A company projects the following costs in connection with a product under development:

| *Years* | *0* | *1* | *2* | *3* | *4* |
|---|---|---|---|---|---|
| (Amts $m) | | | | | |
| R&D | **8.0** | | | | |
| **Marketing** | | **4.0** | **3.0** | **2.0** | **1.0** |
| Prod cost/unit | | 1.0 | 1.0 | 0.9 | 0.9 |
| Volume (units m) | | 0.5 | 1.0 | 4.0 | 1.0 |
| **Prod cost** | | **0.5** | **1.0** | **3.6** | **0.9** |
| | | | | | |
| **Total costs (per period)** | | **4.5** | **4.0** | **5.6** | **1.9** |
| **Cost / unit** | | **9.0** | **4.0** | **1.4** | **2.1** |
| | | | | | |
| **Total cum. costs** | **8.0** | **12.5** | **16.5** | **22.1** | **24.0** |
| **Total cum. costs / unit** | | **25.0** | **11.0** | **4.0** | **3.7** |

The company accountant proposes a launch price of 15/unit in order to cover period costs, a portion of the R&D cost and a profit margin of 25%.

Discuss and explore alternative approaches to pricing.

## KEY KNOWLEDGE
## Back-flush Accounting

This is a simplified costing method which can be used in conditions of short operational cycles and low inventories. Companies working on a Just-In-Time (JIT) basis may practice it, as it avoids the detailed tracking of costs during production; instead, it records costs when goods are completed. These costs are then "back-flushed" through the system based on standard costs.

## EXAMPLE

During a production period, a company has purchased raw materials of $30,000 and incurred conversion costs (labor and overheads) of $32,000.

At the end of the period, raw materials with a value of $2,000 were left over, as were semi-finished and finished goods in inventory valued at $5,000.

Back-flush treatment would proceed as follows:

1) Initially, $62,000 went into the COGS account;

Based on period-end values, however,

2) $7,000 is back-flushed out of COGS

## KEY KNOWLEDGE
## Throughput accounting

This method is also consistent with a JIT environment and focuses on the bottlenecks in a production process; by eliminating these bottlenecks, it raises the amount of output that can flow through the process (assuming there is demand for the output – the idea is not to produce for inventory!).

The throughput accounting approach itself considers all costs (including direct labour) as fixed and typically considers only direct materials as being truly variable in the short term. Thus,

Throughput = Sales – Materials costs

## EXAMPLE

| | |
|---|---|
| Sales | 400,000 |
| Variable costs* | (210,000) |
| Contribution | 190,000 |
| Fixed costs | (110,000) |
| Profit | 80,000 |

* incl. material costs of 150,000

The throughput in the above case is:

400,000 – 150,000 = 250,000

Throughput can be considered a short-term profitability yardstick. Its maximization can be subject to constraints, which act as production bottlenecks.

## Bottlenecks

For example, a factory will only be able to produce as fast as its bottlenecks allow. If production is limited by the number of machines available, then this can be lifted by investing in more machines. Once a bottleneck is removed, a new one will typically appear until the last constraint, which may well be external market demand.

If a company is manufacturing at the limit of its productive capacity, then its throughput maximization goal may be defined as

$$\frac{\text{Return generated per factory hour}}{\text{Cost per factory hour}}$$

This is referred to as the throughput accounting ratio (TPAR)

When TPAR > 1, throughput exceeds operating costs;

When TPAR < 1, operating costs exceed throughput

EXAMPLE

A factory's monthly production is limited to 10,000 machine hours. Its throughput is $10/unit and each unit requires 4 machine hours to make. Total operating expenses are $20,000/month.

Calculate the TPAR.

## Multi-product limiting factors

In cases where more than one product is produced, throughput accounting can be applied to solving problems with a limiting factor.

EXAMPLE

A company using throughput accounting has three products (X, Y and Z). The company operates under a bottleneck of 50 machine hours available for production purposes. Based on the information below, determine in what order of priority the products should be produced.

| Per unit data ($) | X | Y | Z |
|---|---|---|---|
| Sales price | 140 | 80 | 110 |
| Materials | 70 | 40 | 50 |
| Direct labor | 20 | 20 | 10 |
| Machine hrs | 10 | 5 | 8 |
| Demand (units) | 8 | 6 | 3 |

Analysis:

| | | | |
|---|---|---|---|
| Throughput per unit | 70 | 40 | 60 |
| Throughput per hr | 7 | 8 | 7.5 |
| Ranking | 3 | 1 | 2 |