

PERFORMANCE OPERATIONS

Grahame Steven traces the development of activity-based costing and shows how it can be applied to inform activity-based management.

Many accounting experts in the eighties and nineties argued that absorption costing, which had been developed at the turn of the 20th century, needed to be replaced by new costing systems that were more appropriate for modern business. The main changes that had necessitated a different approach included the growth in production overheads relative to direct costs; the increase in factories' complexity (ie, they were making a far wider range of goods); the rising level of non-production overheads; and the growth of the service sector.

The key breakthrough in the development of what would become known as activity-based costing (ABC) was the realisation that many production overheads should not be charged to products on a single volume basis – eg, units made – because they weren't driven by these bases. Other factors gave a better explanation of why such costs were incurred. So a more effective way of charging overheads to products was achieved by creating cost pools for each of the main activities and then charging the cost of each pool to products using the cost driver – eg, the inspection of goods – identified for each pool. Activities were often classified under four categories to enable the identification of appropriate drivers: unit level, batch level, product level and facility level.

While it's acknowledged as a big step into modernity, ABC (like many good ideas) has its foundations in the past. The initial focus during the development of standard costing in the late 19th century was on direct costs, but even then it was recognised that overheads needed to be accounted for to determine the profitability of products. Alexander Hamilton Church was the first writer to make this point when he realised that product costs had to include prime costs (wages and materials), indirect shop costs (production) and general and selling expenses. He observed that the production and non-production overhead often "equals and sometimes surpasses in value the item of wages" in some companies. Contrary to the

1a Connoisseur Collection's P&L account				
	Public	Corporate	Retail	Total
Number of cases sold	15,000	9,000	36,000	60,000
Sales (£)	1,050,000	567,000	2,052,000	3,669,000
Cost of sales (£)	576,000	334,800	1,296,000	2,206,800
Gross profit (£)	474,000	232,200	756,000	1,462,200
Operating expenses (£)				
Delivery				254,000
Visits to customers				96,000
Warehouse				192,000
Web site				80,000
Other selling expenses				120,000
Finance and admin				285,000
Net profit (£)				435,200

1b Current product profitability analysis of Connoisseur Collection's three markets			
	Public	Corporate	Retail
Sales price (£)	70.00	63.00	57.00
Wine (£)	38.40	37.20	36.00
Other expenses (£)	17.12	17.12	17.12
Profit per case (£)	14.48	8.68	3.88

2 ABC data for Connoisseur Collection's three markets			
	Public	Corporate	Retail
Average cases sold per customer	1.5	9.0	12.0
Sales orders	10,000	1,000	3,000
Average delivery cost per order	£7	£40	£48
Visits to customers	0	300	180
Cost per visit	£0	£200	£200
Web site hits	130,000	20,000	10,000
ABC drivers Warehouse: number of cases. Web site: number of hits. Other selling expenses: percentage of sales. Finance and admin: number of sales orders.			

views of some modern writers, then, it seems that some factories at the turn of the 20th century were already complex organisations with high levels of overheads. Church also criticised the use of time and percentages to charge overheads to products, since few overheads related to these factors.

While he acknowledged that simple absorption methods wouldn't produce "alarmingly incorrect" costs in a factory with "machines all of a size and kind performing practically identical operations", Church noted that such an approach would not be "trustworthy" in complex factories producing

diverse goods. He believed that product costing systems had to identify “the connection of expenditure of all classes with the items of output on which they are incident” to determine the resources required for each product – which sounds a bit like ABC.

Church also made the following excellent point about the dangers of using simple cost-charging methods: “No one ever argues that, if \$200 has been spent on 20 articles, then the cost of each can be safely considered at \$10, unless indeed the product is absolutely uniform. Such a suggestion would be treated with ridicule, because obviously the only use of detailed costs is to reveal the relative amounts of wages and material that the different orders have absorbed.”

It’s hard to fathom why Church’s advice was ignored at the time in favour of simpler methods of charging overheads. Whatever the reason, his ideas can now be seen as underpinning ABC’s development.

Let’s consider a fictitious firm, Connoisseur Collection, to show how ABC can be used and consider its implications for activity-based management (ABM). The company imports wine for resale in the UK. Although it sold mainly to retail outlets for many years, it has recently developed a business selling directly to the public via the web and has also significantly increased its income from corporate customers by using freelance sales reps. The firm uses a simple analysis of profitability by case of wine sold by each of the three lines: Retail, Corporate and Public. The only direct cost recognised in the current analysis is that of the wine. All other overheads are charged to the three lines on the number of cases sold – ie, total overheads divided by total cases (see tables 1a and 1b, previous page). In this example, it’s $(£254,000 + £96,000 + £192,000 + £80,000 + £120,000 + £285,000) \div 60,000 = £17.12$. The new chief executive is unhappy with this approach. He thinks that ABC should be introduced, since the firm is now selling to diverse markets.

As a result, an investigation is conducted to identify the activities that cause costs. The resulting analysis (see table 2, previous page) reveals that only warehouse costs should be charged on the current basis. Delivery costs should be charged in relation to the average cost of delivering an order. Customer visits

3 ABC analysis of Connoisseur Collection’s three markets			
	Public	Corporate	Retail
Delivery			
Cost per delivery	£7	£40	£48
Average number of cases	1.5	9.0	12.0
Cost per case	£4.67	£4.44	£4.00
Visits to customers			
Number of visits	0	300	180
Cost per visit	£0	£200	£200
Cost of visits	£0	£60,000	£36,000
Number of cases sold	15,000	9,000	36,000
Cost per case	£0	£6.67	£1.00
Warehouse			
Cost	£192,000		
Number of cases	60,000		
Cost per case	£3.20	£3.20	£3.20
Web site			
Cost	£80,000		
Number of hits	160,000		
Cost per hit	£0.50		
Allocation of costs	£65,000	£10,000	£5,000
Number of cases sold	15,000	9,000	36,000
Cost per case	£4.33	£1.11	£0.14
Other selling expenses			
Cost	£120,000		
Sales	£3,669,000		
Percentage of sales	3.27%		
Allocation of costs	£34,342	£18,545	£67,114
Number of cases sold	15,000	9,000	36,000
Cost per case	£2.29	£2.06	£1.86
Finance and admin			
Cost	£285,000		
Sales orders	14,000		
Cost per order	£20.36		
Allocation of costs	£203,571	£20,357	£61,071
Number of cases sold	15,000	9,000	36,000
Cost per case	£13.57	£2.26	£1.70

should be charged only to the Corporate and Retail lines. Members of the public account for nearly all hits recorded by the company’s web site. Percentage of sales is considered to offer a fair reflection of the use of other selling expenses by each of the product lines. And the number of sales orders is seen as the most appropriate basis of charging finance

and administration costs, since most of this work is focused on customer orders.

Table 3 is an ABC analysis that calculates how much of each resource is consumed by each of the different lines. While delivery and customer visits can be readily identified with each line, the figures for the other costs require more calculation. The cost of the

4 Revised product profitability analysis of Connoisseur Collection's three markets

	Public	Corporate	Retail
Sales price (£)	70.00	63.00	57.00
Wine (£)	38.40	37.20	36.00
Delivery (£)	4.67	4.44	4.00
Visits to customers (£)	0	6.67	1.00
Warehouse (£)	3.20	3.20	3.20
Web site (£)	4.33	1.11	0.14
Other selling expenses (£)	2.29	2.06	1.86
Finance and admin (£)	13.57	2.26	1.70
Profit per case (£)	<u>3.54</u>	<u>6.06</u>	<u>9.10</u>

driver is calculated (eg, for sales orders it's £285,000 ÷ 14,000 = £20.36), then total costs are apportioned to each product type. Lastly, a cost per case is calculated from the apportioned cost.

The revised product profitability analysis (see table 4) reveals a different picture, since it provides a better reflection of the resources consumed by the three lines. It reveals that Retail is the most profitable line while Public is the least profitable. This finding is typical for many firms that have introduced ABC. Traditional absorption costing systems tend to overstate the costs of high-volume products and understate those of low-volume products. At Connoisseur Collection the first analysis charged an excessive proportion of finance and administration, customer visits and web site costs to Retail. But don't forget that it's impossible to calculate completely accurate product costs, since all costing systems involve apportionments of shared costs, many of which are fixed or semi-fixed.

The ABC analysis reveals that the company needs to focus its efforts on Public and Corporate, which is where ABM comes in. ABM covers many types of analysis and

action, but in simple terms it's concerned with using the information obtained from ABC to improve performance and profits. The analysis raises the following questions for Connoisseur Collection's managers:

- Why are there relatively more sales visits to Corporate customers than to Retail customers? Is this because the company is using a "spray-gun" approach to developing this market? Should more effort be made to identify customers with worthwhile sales potential?
- Is it possible to reduce the costs of maintaining the web site and/or to convert more hits into sales?
- Could a third party host the web site for a lower cost than £0.50 per hit?
- What can be done to reduce the high cost of finance and administration (£13.57) for Public?
- Is some process re-engineering required – eg, the adoption of an e-commerce system to reduce the high cost of the finance and administration driver (£20.36)?
- Should Connoisseur Collection approach a haulage company that operates bonded warehouses to see whether it could provide a warehouse service at a lower cost than £3.20 per case?
- Is the company undertaking any non-value-adding activities? If so, could these be eliminated or reduced in scale?
- How accurate is the ABC analysis? Has it identified the correct cost drivers? Are sales orders the most appropriate driver for administration costs? (NB: the exam practice question in the panel on the right considers revised ABC data for Connoisseur Collection.)

Exam practice

Try the following question to test your understanding of ABC. The solution will appear in CIMA's student e-magazine, *Velocity* (www.cimaglobal.com/velocity).

The ABC product profitability analysis, presented at Connoisseur Collection's recent executive management meeting, provided much food for thought (see *main text and table 4*). While the managers welcomed the analysis, there was some concern about the basis of some of the calculations. As a result, they asked the ABC team to review its analysis, since they were uneasy about acting upon it until they were confident that it gave an accurate reflection of product profitability.

The ABC team reviewed their analysis and made the following amendments:

- Finance and administration should be split into its constituent parts: £175,000 for finance and £110,000 for administration.
 - Number of cases was identified as the cost driver for admin. (NB: sales orders were still considered to be the appropriate driver for finance.)
 - Purchase orders were determined to be the appropriate cost driver for warehouse, since there was little overlap between the wines sold to each of the company's markets. The number of purchase orders raised for each product line was as follows: 180 for Public, 120 for Corporate and 300 for Retail.
- You are required to prepare a revised ABC analysis and consider it in relation to the initial ABC analysis.

The data obtained from the ABC analysis can also be used to produce a customer profitability analysis for Corporate and Retail. Such analyses can sometimes produce surprising results, since some big customers may not be as profitable as they might seem.

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P1 further reading

H Johnson and R Kaplan, *Relevance Lost*, Harvard Business School Press, 1987.
 R Scarlett, *CIMA Official Learning System – Performance Operations* (2010 edition), CIMA Publishing, 2009.