

Activity Based Costing - Worked example -Solution

(from Hopper et al. 2007, Issues in Management Accounting, Chapter 8, p.162-164)

Table 8.2 Full costs using traditional cost accounting

Cost	Product X	Product Y
Direct material costs	£150,000 ⁽¹⁾	£10,000 ⁽²⁾
Direct labour costs	£300,000 ⁽³⁾	£15,000 ⁽⁴⁾
Manufacturing overhead costs	£129,000 ⁽⁵⁾	£6,450 ⁽⁶⁾
Total manufacturing costs	£579,000	£31,450
Product cost per unit	£38.60	£62.90

Notes:

(1) £10 × 15,000 units

(2) £20 × 500 units

(3) £20 × 15,000 units

(4) £30 × 500 units

(5) [£135,450 / (£300,000 + £15,000)] × £300,000

(6) [£135,450 / (£300,000 + £15,000)] × £15,000

Table 8.5 Activity cost driver rates

Activity cost driver	Activity cost a	Cost driver volume b	Cost driver rate c = a / b
Materials handling	£15,050	2000 parts	£7.525 per part
Set-up	£21,000	400 hours*	£52.5 per hour
Machining	£49,600	1550 hours	£32 per hour
Assembly	£30,000	1500 hours	£20 per hour
Inspection	£19,800	6000 hours	£3.3 per hour

*Product X consumes 75 hours of set-up time, as each production run requires 5 hours of set-up and there are 15 production runs (15,000 units / 1000 units = 15 production runs; 15 production runs × 5 hours = 75 hours set-up).

Product Y consumes 325 hours of set-up time, as each production run requires 6.5 hours of set-up and there are 50 production runs (500 units / 10 units = 50 production runs; 50 production runs × 6.5 hours = 325 hours set-up).

Total set-up time for products X and Y is, therefore, 400 hours (75 hours + 325 hours).

to subsidise a low volume product like Y. ABC seeks to overcome this problem of cost distortion by capturing the 'real' consumption of overhead resources, attributing costs to products based on the activities they require.

Table 8.6 Activity cost assignment

Activity cost driver	Cost driver rate	Product X	Product Y
Materials handling	£7.525 per part	£13,545 ⁽¹⁾	£1,505 ⁽²⁾
Set-up	£52.5 per hour	£3,937.5 ⁽³⁾	£17,062.5 ⁽⁴⁾
Machining	£32 per hour	£32,000 ⁽⁵⁾	£17,600 ⁽⁶⁾
Assembly	£20 per hour	£24,000 ⁽⁷⁾	£6,000 ⁽⁸⁾
Inspection	£3.3 per hour	£14,850 ⁽⁹⁾	£4,950 ⁽¹⁰⁾
Total		£88,332.5	£47,117.5

Notes:⁽¹⁾ £7.525 × 1800 parts⁽²⁾ £7.525 × 200 parts⁽³⁾ £52.5 × 75 hours⁽⁴⁾ £52.5 × 325 hours⁽⁵⁾ £32 × 1000 hours⁽⁶⁾ £32 × 550 hours⁽⁷⁾ £20 × 1200 hours⁽⁸⁾ £20 × 300 hours⁽⁹⁾ £3.3 × 4500 hours⁽¹⁰⁾ £3.3 × 1500 hours

Table 8.7 Full unit cost by ABC

Cost	Product X	Product Y
Direct material costs	£150,000	£10,000
Direct labour costs	£300,000	£15,000
Manufacturing overhead costs	£88,332.5	£47,117.5
Total manufacturing costs	£538,332.5	£72,117.5
Product cost per unit	£35.89	£144.24

After calculating cost driver rates by dividing activity costs by cost driver volumes, overheads were assigned to products X and Y. The activity costs assigned to each product were calculated by multiplying the cost driver rates by the cost driver volumes for each product. These are shown in Table 8.6, and unit product costs under ABC are computed in Table 8.7.

This example shows that there was cross-subsidisation between products X and Y under traditional costing; product X was over-costed and Product Y was under-costed. This is because traditional cost accounting did not consider the differing complexities of products X and Y – it allocated production overheads using only a volume-based allocation (labour costs). Thus, a high volume product like X tends