

Activity based costing

(Relevant to AAT Examination Paper 3: Management Accounting)

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Introduction

With the increasingly high level of automation in world class manufacturing, overheads are today the main component of cost. Absorption costing has led to the incorrect allocation of overheads and is a poor basis for decision making. A more accurate allocation of overheads is becoming necessary in the modern manufacturing environment where cost information is being used for decision making purposes, such as pricing and make-or-buy decisions. This has led to the introduction of activity based costing (ABC), under which it is easier to trace overheads to individual products and which provides a better allocation of overheads and thus better product cost information.

Absorption costing assigns direct costs and all or part of overheads to cost units using one or more overhead absorption rates. Activity based costing (ABC) 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.

Use of cost drivers and activities for cost accumulation

In absorption costing, overheads are absorbed solely on volume-based cost drivers (activities are performed each time a unit of the product is produced), such as units of output, machine hours and direct labour hours.

Under ABC, overheads are absorbed using both volume-based and non-volume based (activities are not performed each time a unit of the product is produced) cost drivers, such as number in the production set-up, number of material requisitions and number of purchase orders.

Cost drivers are activities that cause costs. Cost pools are areas for which all of the costs associated with a cost driver are grouped. When the costs for each cost driver have been accumulated in a cost pool, then a cost per cost driver (cost driver rate) can be determined. The cost driver rate can be used to apportion overheads to products in accordance with the use of each activity for each of the products.

The key feature of the choice of cost drivers for any particular activity is that there is a causal relationship between the level of overhead and the volume of the cost driver. That is, an increase in the volume of a particular cost driver will cause an increase in overheads.

Examples of activities and costs drivers include:

Activities

Cost drivers

Purchase of materials	Number of purchase orders
Machining	Number of machine hours
Production set-up	Number of set-ups
Assembly	Number of labour hours
Material handling	Number of material requisitions

Example 1 (AAT Paper 3 Management Accounting, Pilot June 2009, Modified)

Jupiter Silverware Products Limited is a leading manufacturer of silver picture frames. The company uses a traditional costing system to allocate production overheads to products using machine hours.

The newly appointed financial controller believes that activity based costing can provide a better allocation of production overheads to products than the current system does. The following total production overheads for the last period were recorded by the cost accounting system:

	\$
Utility costs related to machine hours	189,000
Production set-up costs	120,000
Cost of ordering materials	18,000
Cost of handling materials	33,000

Details of the three product models and relevant information for the last period are as follows:

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Number of production runs	17	25	18
Number of material orders	20	30	40
Number of material requisitions	30	100	70
Units produced	1,000	2,000	2,500
Machine hours per unit	1	1.5	2
Direct labour hours per unit (\$60 per hour)	0.5 hour	1 hour	2 hours
Direct materials per unit	\$10	\$12	\$15

Required:

- (a) Calculate the unit production cost of each of the three products using: (i) the traditional absorption costing, and (ii) the activity based costing approach.
- (b) Comment on your calculations in part (a) above and explain why the activity based costing approach is superior to traditional absorption costing.

(a) **Using traditional absorption costing:**

Total machinery hours in the period:

	Hours
Model 1 (1,000 × 1)	1,000
Model 2 (2,000 × 1.5)	3,000
Model 3 (2,500 × 2)	<u>5,000</u>
	<u>9,000</u>

Production overhead absorption rate:

$$(\$189,000 + 120,000 + 18,000 + 33,000) \div 9,000 = \$40 \text{ per machine hour}$$

Cost summary

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Per unit:	\$	\$	\$
Direct materials	10	12	15
Direct labour	<u>30</u>	<u>60</u>	<u>120</u>
Prime costs	40	72	135
Production overheads (\$40 per machine hour)	<u>40</u>	<u>60</u>	<u>80</u>
Unit production costs	<u>80</u>	<u>132</u>	<u>215</u>
Units produced	1,000	2,000	2,500
Total production overheads absorbed	<u>40,000</u>	<u>120,000</u>	<u>200,000</u>

Using activity based costing:

Calculation of cost driver rates:

	\$
Utility costs per machine hour (\$189,000 ÷ 9,000)	21
Set-up cost per production run (\$120,000 ÷ 60)	2,000
Cost of ordering per order (\$18,000 ÷ 90)	200
Cost of material handling per requisition (\$33,000 ÷ 200)	165

Cost summary

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
	\$	\$	\$
Production overheads:			
Utility costs (\$21 per machine hour)	21,000	63,000	105,000
Set-up cost (\$2,000 per production run)	34,000	50,000	36,000
Cost of ordering (\$200 per order)	4,000	6,000	8,000
Cost of material handling (\$165 per requisition)	<u>4,950</u>	<u>16,500</u>	<u>11,550</u>
	<u>63,950</u>	<u>135,500</u>	<u>160,550</u>
Units produced	<u>1,000</u>	<u>2,000</u>	<u>2,500</u>
Per unit:	\$	\$	\$
Production overheads	63.95	67.75	64.22
Prime costs	<u>40.00</u>	<u>72.00</u>	<u>135.00</u>
Production costs	<u>103.95</u>	<u>139.75</u>	<u>199.22</u>

- (b) Activity based costing (ABC) charges more overheads to lower volume production (Model 1) and charges relatively less to higher volume production (Model 3). The traditional absorption costing approach penalizes high volume products (volume based overhead allocation method). In fact some factory activities are not associated with production volume.

The traditional absorption costing approach is used when there is a narrow range of products and overhead costs account for a relatively small proportion of total costs. The nature of some overhead costs has changed in recent years due to higher levels of automation. Production overheads now take up a relatively larger proportion of total costs. ABC recognizes that costs may be analyzed by activities rather than production volume. ABC provides a better allocation of overhead costs in a more precise manner based on a cause-and-effect relationship.

References:

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