

ORIGINAL ARTICLE

Activity-Based Costing: Reliable Costing Method in Manufacturing Companies

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ARTICLE HISTORY Received: 30.01.2016 Revised 16.02.2016 Accepted 11.05.2016	ABSTRACT <i>Activity Based Costing (ABC) is a technique for the accurate allocation of resources based on an organization's direct and indirect consumption of the activities carried out. ABC replaces a traditional full absorption or variable costing; it can become a corporate inventory valuation method. The cost of inventories is based on the account of steady flow. This article examines the principles and advantages of a small company of ABC, and renders examples of its applications.</i> Keywords: Activity-Based Costing (ABC), Implementation, Companies
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INTRODUCTION

The present era of global competition, the evolving technology and information systems leading part in the renewed commitment to excellence in manufacturing, factoring increased due to the introduction of new products, quality of products and processes, the level of inventories and improving labor policy has helped the company to become world class. Accurate cost information is vital to every aspect of the business, their pricing policies and evaluates the performance of their designs.

However, most firm still using the traditional cost accounting systems which were developed decades ago (Kaplan and Cooper , 1998 In the last two decades, a new kind of cipher systems, activity- based costing / management) is gaining acceptance in the United States of America (ABC / as well as the Pacific Rim and now in Europe) Keegan and Eiler, 1994). System ABC / M represents a shift from a purely financial point of view ' perspective of the whole system because they include both financial and non-financial data in its reports. And not only the current activity-based costing is a costing system that can be used as a decision support system (DSS) for the management serve.

In fact, ABC is a costing method provides information on the share of each customer's overall profitability managers are offered. It also helps managers to improve performance and implement appropriate strategies to identify profitable. One of the most important abilities ABC explain the overall costs associated with the services requested by clients crucial role in determining the share of each customer's net income. ABC in recent years has had the most influence on product costing. The idea of ABC, is not new and has progressed in step with traditional costing management. (heckret) vocabulary resources, activities, stimulating activities, to discuss how to allocate logistics costs in the writings of the costing was used in 1940. Most applications on ABC in the production environment (for accurate product cost) focus. Although many service industries, including logistics, in most of the cases mentioned in the last few years have started to implement ABC. (Drucker) holds that ABC may be the most effective service industries. He argues that ABC will be instrumental in the future that will require proper management. Banks and lending institutions have a long history of investing in ABC order confirmation ATM machines, which are cheaper than the operators and cashiers and customer satisfaction increases. ABC railway companies to determine the cost of bills processed manually loaded, fax and Internet are used. Law firms to determine the hourly fees could increase the profitability of their services. Health care centers and ABC to calculate interest rate arbitration, eliminating unnecessary costs, and plan for change are using.

ABC is being implemented by a growing number of companies around the world. It has primarily developed on account of the limitation of traditional system of charging overhead. Its main advantages are the followings:

Accurate and reliable-ABC is more accurate and reliable system of ascertaining product costs as it is based on caused and affect relationship in cost incurrence.

- Better pricing decision-It overcomes the problems of under costing and over costing as a result of which management is able to make more judicious selling price decisions based on accurate costs.
- Realistic approach-Distribution of overhead based on activities is an objective and realistic approach. As against this, traditional method of overhead costing uses more arbitrary based of apportionment of overhead and is a subjective approach.
- Control of costs-ABC produces more meaningful information regarding cost behavior and enables management to control many fixed overhead by exercising more control over those activities which cause these fixed overhead.
- Greater cost efficiency ABC helps to identify those activities which are unnecessary and may be weeded out and thus achieving greater cost efficiency.
- Useful cost driver rates ABC helps through its cost driver rates, in the modification of existing products and also in the development of new product

RESEARCH METHODOLOGY

It is a descriptive study. Further research and fact-finding study aimed to describe the current state of affairs is the subject of this study. (Observation, interview - data collected by one or more of the methods). Describe what happens and what can be done about it. It's kind of like a cross, but the emphasis is on discovering what happens, why it happens and what can be done about it. Using a small sample size and data collection devices probe very deeply.

LITERATURE REVIEW

Because people could no longer rely on traditional methods and techniques to meet their current needs, and these organizations were forced to revise their own accounting systems and cost. On the one hand , and the urgent need for the development of new approaches in the field of management accounting, on the other hand , makes changes in the presentation of new methods of calculating the cost was . Thought to provide a link between costs and activities in the late 1960s and early 1970s in the works of authors such Salvmnz (Solomons, 1968), and Astabas (Stubus, 1971) were presented. But according to the scientific and academic institutions about the importance and how it functions in most organizations was introduced in the 1980s (Namazi , 1999-2000). This is mainly due to three factors was the emergence of structural changes first in the world to introduce new technologies, information systems and intelligent novel mechanism of action occurred. The second structural changes, management philosophy major organizations in the 1980s, in addition to profitability, and other factors such as global competition, increasing customer satisfaction and high quality service insisted.

The third factor was the efforts of academic and managerial accounting authors, the new space has been created to describe the extensive and serious roles in various technology and new perspectives of managers began. Meanwhile, Cooper and Kaplan (Cooper & Kaplan) towards others influences reflected in the lack of management accounting systems. The authors believed that the use of traditional systems not only meet the needs of managers, not the cause confusion and lack of information they have is accurate decisions. These inefficiencies and increasing global competition, rapid and timely access to information that it has given great importance, leading to the emergence of a new method of costing called "activity based costing", respectively. Terms of activity -based costing, which later evolved into the ABC system, the first time by Cooper and Kaplan (1988), was used to assign costs to activities and products. These two authors, along with Johnson (1988) and others influences reflected in the failure of financial accounting system providing accurate information about costs and their cost.(Namazi , 1999-2000)

In the accounting literature, different definitions of activity based costing (ABC) is presented: Myhr and Dykyn believe: ((activity-based costing is a costing method, the cost of collecting the goods cost activities that lead to a product are obtained)).

Hilton says: ((activity-based costing method in which the share of costs based on the proportion spent on activities by each product, different products are assigned to the cost of a tank)). Looking at the above concepts and definitions ABC focuses on activities the production or services to be performed activities with respect to the amount of profit per product and the cost of activities to products to be shared.

RESULTS AND DISCUSSION

Activity-Based Costing Method

Implementation of activity-based costing in manufacturing companies:

First, the design committee system: This system costing information needs of different sectors, including finance, process engineering, and therefore should be used with various specialties in the committee.

Second step: determining the activities of the company: Manufacturing activities are divided into three groups:

- 1- Activities that are directly related to the products and doing service
- 2- Activities that are not directly traced to products and services like factory overhead activities such as warehousing, logistics, administration, utilities,

Third step: Assign activity costs to products based on cost drivers

After identifying the activities, each activity based cost allocation principles or stimulating the production cost allocation process. An example of the allocation principles are as follows:

Table 1

Activity	Based allocation
Procurement - Purchasing	Purchase order number
Supervision	Supervision time to time
Electricity costs	Working time machine
Storage	Item out of stock
Cost of sales	Time used for unit sales

Steps mentioned above with a simple numerical example will explain:

Assume the traditional cost accounting Alpha and Beta Gamma three products are as follows:

Table 2

Product	X	Y	Z	Total
Number of Sales	2,000	1,000	500	3,500
The selling price per unit	15	30	20	
Amount of Sale	30,000	30,000	10,000	70,000
Cost:				
Direct material	8,000	6,400	2,400	16,800
Direct labor	2,000	1,300	1,800	5,100

The actual overhead:	Supervision	Supplies	Power	Storage	Total
	3,000	9,000	3,000	3,000	18,000

Absorption of overhead based on direct labor absorption of the product.

Cost of sales 70,000 x 2% = 2% of total sales in 1400

Table 3

Product	X	Y	Z	Total
The cost of a single material	8,000/2,000=4	6,400/1,000=6.4	2,400/500=4.8	15.2
Unit wage costs	2,000/2,000=1	1,300/1,000=1.3	1,800/500=3.6	5.9
A single overhead costs	Total overhead/ total wages =	18,000/5,100=3.53		
	3.53*2,000=7060	3.53*1,300=4586	3.53*1,800=6354	
	Share on	Share on	Share on	
Number of Production	2,000	1,000	500	-
A single overhead	3.53	4.558	12.7	20.81
The selling price of a unit The sum of the cost of a single Margin	15	30	20	-
The selling price of a unit The sum of the cost of a single Margin	(8.53)	(12.28)	(21.1)	-
Cost of sales 2% of sales Profit especially in the traditional way	6.47	17.72	(1.1)	-
Cost of sales 2% of sales Profit especially in the traditional way	(0.3)	(0.6)	(0.4)	-
	6.17	17.12	(1.5)	-

Calculations based on Activity-Based Costing

Cost of materials and direct labor as the method of data transfer is directly overhead, but the cost will be shared as follows:

Operating expenses - general supervision of the production process for a 100 hour supervision is declared

Table 4

Product	X	Y	Z	Total
The number of hours of supervision	45	40	15	100
The cost of one hour of supervision	30	30	30	
$3,000/100=30$				
The total cost of administrative activities	1,350	1,200	450	3000
Share on				
Number of Production	2,000	1,000	500	3,500
The cost of producing one unit of supervision	$2,000/1,350=0.67$	1.2	0.9	

Operating costs - logistics based on the total number of purchase orders that have been 240 orders for the following products

Table 5

Product	X	Y	Z	Total
Purchase order number	100	120	20	240
The cost per order	37.5	37.5	37.5	
$9,000/240=37.5$				
The total cost of the purchase activity	3,750	4,500	750	9,000
Share on				
Number of Production	2,000	1,000	500	
Procurement cost of a unit of product	1.87	4.5	1.5	

Operating costs - Electrical Machinery hour's work over 200 hours into the production process Below is a breakdown product

Table 6

Product	X	Y	Z	Total
Machine operating hours	90	100	10	200
The cost per hour of machine operation	15	15	15	
$3,000/200=15$				
Collection of electrical activity	1,350	1,500	150	3,000
Divided by the number of Production	2,000	1,000	500	
The cost of a unit of electricity	0.67	1.5	0.3	

Operating costs - storage warehouse goods are based on the average share of each product is:

Table 7

Product	X	Y	Z	Total
Item out of stock	50	45	5	100
The cost of maintaining a single	30	30	30	
$3,000/100=30$				
Collect warehousing activities	1,500	1,350	150	3,000
Divided by the number of Production	2,000	1,000	500	
The cost of maintaining a unit	0.75	1.35	0.3	

Operating expenses - sales by sharing sales leads for time spent the time spent for each of the following products have been

Table 8

Product	X	Y	Z	Total
The time taken for Sale (h)	25	10	5	40
The cost of one hour of time spent	75	75	75	
$3,000/40=75$				
Aggregate sales activity.	1,875	750	375	3,000
Divided by the number of Production	2,000	1,000	5,00	
The cost of selling a single product	0.94	0.75	0.75	

Compare the cost of a traditional unit calculated and ABC

Table 9

Description	Traditional				ABC method.		
	X	Y	Z		X	Y	Z
Product							
Cost:							
Direct material	4	6.4	4.8		4	6.4	4.8
Direct labor	1	1.3	3.6		1	1.3	3.6
Overload:							
Absorbed	3.35	4.58	12.7	Supervision	0.67	1.2	0.9
Buy	1.87	4.5	1.5	Supplies	-	-	-
	-	-	-	Power	0.67	1.5	0.3
	-	-	-	Storage	0.75	1.35	0.3
Sum of Cost	8.53	12.28	21.1		8.96	16.25	11.4
Sale	15	30	20		15	30	20
Cost of sales	(8.53)	(12.28)	(21.1)		(8.96)	(16.25)	(11.4)
Profit margin	6.47	17.72	(1.1)		6.04	13.75	8.6
Cost of sales	(0.3)	(0.6)	(0.4)		(0.94)	(0.75)	(0.75)
Profit Special	6.17	17.12	(1.5)		5.1	13	7.85

A Case Study

The total cost allocated to cost centre for machine set up related costs is Rs 5,00,000 and there were 100 set ups during the period. Thus the rate per set up is Rs 5,00,000/100 = Rs 500. If a particular product needs 10 set ups, charge to that product will be Rs 500 *10 = Rs 5,000. If 20 units of the product are produced, cost per unit will be Rs 5,000 /20 unit = Rs 250. In this way, cost of other activities also is charged to product.

Table 10

Products	A	B	C
Output (units)	10,000	20,000	30,000
Direct material	50	40	32
Direct labour per unit	30	40	48
Labour hour per unit	3	4	5
Machine hour per unit	4	4	7
No of purchase requisitions	600	900	1000
No. of machine set ups	120	130	150

Production overhead split by department

Table 11

Rs

Department X	12,00,000
Department Y	15,00,000
Total	27,00,000

Department X is labour intensive and Y is machine intensive.

Total labour hours in dept. X = 2,00,000.

Total machine hour in dept Y = 5,00,000

Production overhead split by activity

Table 12

	Rs
Received and inspection	14,00,000
Production scheduling / set up	13,00,000
Total	27,00,000

No of batch received/inspected- 2,500

No of batch for scheduling/set up- 400

Required- if we calculate the cost statement under traditional absorption costing and activity based costing methods.

Traditional Method-Overhead Absorption Rate:

Department X: Rs 12,00,000 / 2,00,000 labour hours = Rs 6 per labour hour

Department Y: Rs 15,00,000 / 5,00,000 machine hours= Rs 3 per machine hour

Table 13-Statement Cost I

Particulars	Cost per unit		
	A Rs	B Rs	Z Rs
Direct Materials	50	40	32
Direct Wages	30	40	32
Overhead-Dept. X			
A-3 hrs. @ Rs.6	18	-	-
A-4 hrs. @ Rs.6	-	24	-
A-5 hrs. @ Rs.6	-	-	30
Overhead-Dept. Y			
A-4 hrs. @ Rs.3	12	-	-
A-4 hrs. @ Rs.3	-	12	-
A-4 hrs. @ Rs.3	-	-	21
Product Cost	110	116	131

ABC Method

Cost Driver Rates =Overhead Cost of the activity/Cost of Drivers

Receiving and inspection =Rs.14,00,000/2,500 Batches=Rs.560 per batch

Scheduling and set up =Rs.13,00,000/400 batches=Rs.3,250 per set up

Table 14-Statement of Cost II

Particulars	Cost per unit		
	A Rs	B Rs	Z Rs
Direct Materials	50.00	40.00	32.00
Direct Wages	30.00	40.00	48.00
Overhead Receiving	33.60	25.20	18.67
Set up	39.00	21.13	16.25
Product Cost	152.60	126.33	114.92

Receiving Over Head per Unit

Product A = (Rs 560* 600 requisitions)/10,000 units= Rs 33.60

Product B = (Rs 560*900 requisitions)/20,000 units = Rs 25.20

Product C = (Rs 560*1000 requisitions)/30,000 units = Rs 18.67

Machine Set up Overhead per Unit

Product A = (Rs 3,250*120 requisitions)/10,000 units = Rs 39 .00

Product B = (Rs 3,250*130 requisitions)/20,000 units =Rs 21.13

Product C = (Rs 3,250*150 requisitions)/30,000 units =Rs 16.25

COMMENTS

Statement of cost prepared under traditional method and activity based costing produced different results. Under traditional method, product Z appears quite costly as compared to activity based costing. On the contrary, product A shows higher cost under activity based costing than traditional method. As ABC is consider more logical, it may be presumed that results produced by ABC are more accurate. If selling priced are fixed on the basis of cost, product Z would be priced higher on traditional costing and product A would be priced lower. This will result in loss of sales of Z and loss per unit on A, leading to a loss to the company.

CONCLUSION

Given the above example, compare the two methods, we observe that the product of gamma traditional way of allocating inappropriate overhead costs of loss of well production method based costing activity benefits amounted to 8.6 riyals are also corporate profits in the traditional way to 21. 79 and the ABC method is equal to 25.95. In conclusion, the use of activity-based costing in manufacturing and service companies with complex activities are the high overhead costs of the following advantages: to obtain: improving enterprise systems costing, reasonably accurate determination of product price, evaluate performance of executives and cost reduction activities that have a high cost. However, implementation of this method, there are some limitations such as culture in the ABC method, culture directors to the ABC, how to control the company and high administrative costs.

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