

THE ROLE OF ACTIVITY BASED COSTING ON ORGANIZATION PRICING SYSTEM - A CASE STUDY OF TEETOO FOAM & MATTRESS INDUSTRY, LIBERIA

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Abstract

This study explains the costing technique of a reputable foam and mattress manufacturing company in Liberia with a view to cross check the relevance and importance of activity based costing technique on its costing operation. The researcher obtains the organization manufacturing cost data for two sizes (6 and 10 inches) of the company's product between July 2008 and June 2009. It was observed that the organization is using the traditional costing system which is volume related technique. Subjecting the cost obtained to ABC system, there is a cumulative cost savings on the company's operation. The hypothesis generated for the study was subjected to t-test analysis and the result shows that activity based costing system allows an organization to have a realistic and effective costing procedure that can enhance organization manufacturing activities.

Keywords: Costing, pricing, activity-based, volume

Introduction

Organization exists because of a specific reason. For instance, business organization's primary objective is to maximize profit. In the process of arriving at profit, the cost incurred for the period must be deducted from its revenue. Effective calculation of its cost goes a long way in arriving at actual profit realized for the period. Before the 80's, traditional costing method was being used to allocate overheads to products or services. Due to changes in business environmental factors characterized by high level of competition across the world where different kinds of new products are being introduced to the market using new manufacturing techniques and technology, it becomes imperative to re-examine the costing techniques used to arrive at the product manufacturing cost. The new manufacturing techniques have introduced high overhead costs as against direct cost, product complexity, service increase, etc. According to Hilton (1998), all these factors

have expanded product distribution channels and customer profitability. As a result of this expansion and volatility in the global business environment, it is expected that manufacturing companies across the globe should change from the conventional costing system and come to terms with activity based costing in the allocation of overheads to the products and services being produced for their customers.

Experience has shown that manufacturing companies in Liberia have not adopted this new costing concept. They are still making use of the traditional method that is described by Sethuramon (2002) as a method where resulting volume related rates are used to apply non-volume related cost of activities to products.

Many writers have criticized the traditional costing system as highly irrelevant and unrealistic to today's business operation. In the words of Drury (2002), using conventional

costing system in the assignment of manufacturing overheads which are not based on production volume is very unhealthy. They submitted that conventional costing method only measures quantity of resources utilized in relation to the quantity of unit produced of each product, hence this approach does not accumulate or report costs of activities.

In their own view, Horngreen et al (2004) believed that due to improvement experienced in the area of technology as it relates to the manufacturing activities as well as the growth in the manufacturing indirect cost, using traditional costing system in manufacturing activities will result in unrealistic product cost as well as unrealistic product price and hence organization may incur losses in its operation. To avoid this situation, activity based costing has been advocated. This costing system is designed to provide a realistic cost of manufacturing activities with a view to assist organizations in formulating effective pricing policies that will ensure realistic returns to the organization, (Armstrong, 1997). Buttressing the point of Armstrong (1997), Horngreen et al (2004) were of the view that activity based costing is the right approach in the face of keen global business competition that have led to astronomical increase in the cost of manufacturing overheads. ABC system offers a more realistic and accurate manufacturing cost of activities upon which effective decisions can be based to enhance organization activities as it goes beyond obtain cost based on production but also process.

Literature review

Business practices around the world have dramatically changed over the years. According to Plower (2002), any organization that intends to survive in the present day business world must conduct its business in accordance with the changes that characterize the modern day business practices. Simon

(2006) was of the view that the global effect on the modern day business practices has totally made all organizations across the world to change the way and manner in which they conduct their activities, accounting activities with no exception. The principles that characterize the conduct of cost accounting were brought to limelight in the early 18th century where production cost was solely based on firm's direct costs component. During this period, allocation of firm's indirect cost was done on the basis of the amount of direct labour consumed to produce a product. Horngreen et al, (2004) were of the view that due to the belief that indirect cost followed labour on a relative basis, firms found it very easy to accumulate indirect cost to its product on direct labour basis. But today, due to complexity in the conduct of businesses, all these practices have changed. Allocation of costs in the old system will not reflect these business changes, hence unrealistic product cost. The old practices otherwise known as traditional costing system only give product costs based on the quantity of resources utilized in relation to the units produced of firms' product.

This according to Drury (2000) does not give a firm realistic cost of activities but only a system that measures volume related resources that are consumed in accordance to the number of units produced of the individual products.

It can be noticed nowadays that there are so many organization resources that are involved indirectly in the production processes which cannot be traced or related to the quantity of units produced. To obtain a realistic cost of products produced, it is necessary that the cost of these non volume related activities should be included. Many writers were of the view that when related costs of activities consumed to produce a product are used as the only basis to obtain organization production cost, the cost of production that is arrived at will not be real.

Drury (2000) observed that the practice of traditional costing system is only ideal and relevant to manufacturing activities with very small number of product ranges and insignificant overheads.

Ibadin & Imoisili (2007) observed that technological advancement in the area of manufacturing process which resulted in indirect cost increase has made a costing system based on volume related resources unnecessarily burdensome. This is because such costing system does not fit the present day business realities as it distorts total production cost because the costing system treats indirect cost as homogeneous lumps” to be allocated to product lives on a single volume related based. Firm’s that are experiencing this according to Horngreen, et al (2004) will find themselves reporting low total production cost for products that consume high level of resources and reporting high total production cost for products that consume low level of resources. Having this situation can make firms to be spending money on products that are actually bringing real losses to them and also stop itself in the production and marketing of products that have profitability potentials, hence the need for activity based costing (ABC).

ABC is a costing system involving two stage allocation processes like traditional costing system but assigns overhead to each major activity as against traditional costing system that assigns costs to departments. ABC systems allow many activity based cost centres to be established (Drury (2001).

Drury (2001) defined activities to consist of the aggregation of many different tasks and are described by verbs associated with objects. These activities according to Horngren (2004) include both production and service activities. Though the components of production and service activities are identical under traditional

costing system and ABC system, the latter normally have a greater number of cost centres.

In the process of allocating costs from cost centre to products, ABC makes use of the term “cost driver” as against traditional costing system that trace overheads to products using a small number of second stage allocation bases, which vary directly with the volume produced. Using the cost driver as the basis of obtaining manufacturing cost, firms are provided with a detailed cost accumulation processes as well as realistic profits obtained from selling a wide range of its products to customers. Hilton (1998) concludes that the adoption and use of ABC costing system will make firms to only change both direct and indirect costs that are exclusively meant for a specific product and do away with those that are not specifically meant for the products, hence, ability to obtain a true and realistic profit/loss on each firm’s product.

Corroborating Hilton (1998), Kaplan (2000) believes that ABC is a unique costing system due to its variability and causality throughout the organization. He maintains that such cause and effect relationship is important for effective and accurate product costing and, by extension, product pricing.

Objective of the study

The main objective of this study is to determine the role that activity based costing can play in an organization effort to have a realistic and effective product pricing. The specific areas of interest are:

1. To find out the nature of ABC system as it differs from the traditional costing system.
2. To determine the relevance of ABC system in the modern day activities of manufacturing organizations.

3. To examine the benefits that can be obtained by manufacturing organizations especially those with huge manufacturing overheads through the use of ABC system.
4. To determine the conditions under which ABC system can be relevant to the activities of manufacturing organizations.

To establish the importance of this study, one hypothesis will be generated and tested.

Null Hypothesis - Activity based costing system does not allow an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

Alternative Hypothesis - Activity based costing system allows an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

Hypothesis formulation:

Calculating overhead rate per activity:

$$\text{Overhead rate per activity (OPA)} = \frac{(\text{Total cost of activity} \times \text{number of activities})}{\text{Quantity of activity} \times \text{Number of activities}}$$

$$\text{i.e. ORA} = \frac{(\text{TCOA}) (\text{NA})}{(\text{QA}) (\text{NA})}$$

$$\begin{aligned} \text{Where, TCOA} &= \text{Total cost of activities} \\ \text{NA} &= \text{Number of activities} \\ \text{QA} &= \text{quantity of activities} \end{aligned}$$

The above equation shows the procedure through which overhead rate per activity using ABC system can be determined. Overhead rate per activity (ORA) is obtained by dividing the total cost of each cost pool by the total quantity of activities associated with each period. As noted above that this can be based either by the use of historical or budgeted cost information. Using historical cost information means that the activity level cost information as well as quantities for the period before are used. ABC system development based on budgeted cost information make use of cost information estimated for the future activities.

Calculation of total cost of each product:

Here, we wish to borrow from the submission of Ibadin & Imoisili (2007) where it was submitted that adopting ABC cost model, total cost of each product can be obtained by multiplying the (ORA) (NA) as depicted above with the activity quantities associated with each product. This can be shown mathematically as below:

$$(\text{TCP})\text{Pn} = \text{DC} + \sum[(\text{ORA})(\text{NA})] [\text{QnPN}]$$

Where

$$\begin{aligned} \text{TCP} &= \text{Total cost of production} \\ \text{Pn} &= \text{Units of products} \\ \text{PN} &= \text{Number of products} \\ \text{DC} &= \text{Direct cost} \end{aligned}$$

QnPn	=	Quantity of activity consumer by products
(ORA)(NA)	=	Overhead rate per activity for a given number of activities
N	=	Number of activities

Calculation of each product unit cost:

This can be easily determined by dividing the total cost for the given product by the number of units of such product produced. This can be shown mathematically as follows:

$$P_n = \frac{(TcP)n}{PN}$$

Where P_n = Unit cost of product
 $(TcP)n$ = Total cost of a given product
 PN = Number of products

Methodology

In line with the objective of this study, the research design that will be used is case study design. This method is used because of the nature of the study. The cost data of a selected foam mattresses organization in Liberia specializing in the production of six different types of foam mattresses are used. It was discovered that the organization is still using the traditional costing system and the researcher tries to compare the cost data obtained for this organization using traditional costing system with the one obtained using activity based costing. Non probability judgmental sampling technique was used to select this organization due to its importance to the economic growth of Liberia.

Both primary and secondary instruments are used to generate data with more emphasis on secondary instrument. Secondary instruments include the cost data obtained from the selected organization. This cost data prepared for only two (2) out of the six products being produced by the organization will be adjusted using activity based costing approach. The primary instrument which will be used will serve as a follow up to secondary instrument.

The primary instrument that will be used is a structured questionnaire. A list of prepared questions will be orally administered to some selected heads of units in charge of cost account preparation.

These selected people will include the cost accountant, head of finance, deputy general – manager (finance) and general manager. These people will be interviewed on the reasons for adopting the traditional costing system and the effect of the system on the organization product pricing. The cost data obtained will be analyzed and reapportioned using cost apportionment method being used under activity based costing system on the overheads that have initially be allocated based on volume related utilized under traditional costing system. The cost apportionment that will be used by the researcher is based on cause and effect relationship proposed under activity based costing system. This will be applied on the cost of overheads supplied by the selected organization after which the results obtained will be compared with those supplied by the company that were prepared on the basis of traditional costing system. Decisions on the hypothesis will be based on

the comparison made on the results obtained from the two systems.

The methodology in the determination of appropriate cost apportionment method in ABC system relies on cause and effect relationship between the costs of relevant or value added activities and activity drivers. The cost apportionment methods were derived by expressing the cost of activity upon the cost drivers. The resulting rates were then applied on the overheads on the basis of each product's consumption of activity resources.

Data analysis

The t-test statistics was used to test the only hypothesis generated for this study. The result of the test is shown below:

Ho - Activity based costing system does not allow an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

HA - Activity based costing system allows an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

$$t^* = t - \text{critical two tailed} = 2.776$$

$$t = t \text{ calculated} = 3.213 \quad t > t^*$$

We can see from the t-test result above, t-critical at two tailed of 2.776 is less than the t-calculated of 3.213. This means that the alternative hypothesis should be accepted. Hence, it is concluded that activity based costing system allows an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

Discussion of findings

In table I, the researcher applied activity based costing system and traditional costing system on the cost data obtained for a particular

period on the activities of "TEETOO" Manufacturing Coy. that specializes in the production of foams and mattresses in Liberia. From the table we can see that using ABC system to compute its cost as well as traditional system, there is gross cost savings of \$214,860 and even after allocating indirect or administrative overheads as shown in table II, there is a net cumulative savings of \$90,480 for the period. This amount is highly significant as it can cover almost three months overheads of the company which is computed to be \$30,089 per month. We can now lend voice to the submission of various writers and researchers among whom is Hilton (1998) on their argument about applying ABC system in cost computation of organization activities. This argument was based on their belief that with proper explanation of organization cost drivers, organization stands a chance to enjoy substantial cost savings, improved product cost or even cost reduction, and so on.

This situation is expected to improve the organization climate as the management has been complaining of low profitability on the company's activities. Between 2003 and 2006, the highest profit realized was \$23,047.76 which represents less than 8% return on turnover. This fell short of at least 20% expected as return on turnover for the period between 2003 and 2007. This situation has brought about discouragement on the part of the owners of the company who perceived that the growth plan for the organization might be jeopardized. It is part of the company's plan to plough back the profits realized for the first seven years of operation to increase the product offerings to the market. Using ABC system, the company will be able to improve its profitability and stand the chance of meeting up with its target and pursue its growth plan.

The process through which product costs are arrived at for the year involved allocating

expenses of the company based on the quantity of six inches and ten inches mattresses produced for the year i.e. adopting traditional costing technique which is based on volume related approach. This approach does not lead to product cost distortion alone but also makes pricing system unrealistic. If we examine the cost analysis for six and ten inches mattresses for various months for the period as contained in table I, it would be seen that six inches and ten inches mattresses cost \$10.65 and \$17.13 for the month of July 2008 respectively.

The above product cost includes the overheads of administrative expenses charged on the basis of volume of output. The total of such amount is \$0.39 being the administrative expense for the two sizes of mattress for the month of July 2008. But adopting ABC system, it is believed that such cost allocation procedure is irrelevant due to inability to establish cause and effect relationship between the administrative charge and the production of the products (mattresses).

Using ABC system, the direct charges of the organization were re-apportioned and indirect charges that constitute administrative expenses were ignore so that we can get a realistic product cost for the period under review. This approach reveals that there are some months when traditional costing approach put a lot of unnecessary cost pressure on the products of the organization. For instance, at the month of October 2008, using ABC system made the organization to enjoy a net saving of \$27,250.00.

An important point to note here is that looking at the product costs arrived at using both traditional costing system and ABC system, we can see that ABC system produced less cost compared to the traditional system. Examining the product costs for the months under study, the costs arrived at using ABC system are less in all the months. This is

attributed to the homogeneity of the products as the same raw materials and assembly line with little adjustment, is used to produce the two products.

In addition, it is also observed that it is only in the first month i.e. July 2008 that the organization experienced negative cost savings for both products under study and this month is the only month under study where the organization has negative cost saving in “ten” inches mattresses. But for “six” inches, the organization has negative cost savings in seventh month. We can therefore attribute this to product homogeneity and product quantity variance.

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Appendix I

Hypothesis i:

The extent to which activity based costing can allow an organization to have a realistic and effective costing procedure that can enhance its manufacturing activities.

HYPOTHESIS		
T-test: Paired Two samples for mean		
	Variable 1	Variable 2
Mean	57	11.4
Variance	755.5	38.3
Observation	5	5
Pearson C	-0.6260845	
Hypothesized mean difference	0	
DF	4	
T. statistic	3.21349953	
P (T<=t) one tail	0.0162403	
t critical one tail	2.13184649	
P(t<=t) two tail	0.0324806	
t critical two tail	2.776450856	
Microsoft excel package		

Source: Data collected through questionnaire administered (2000)