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THE PRACTICABILITY OF ACTIVITY-BASED COSTING IN SERVICE FIRMS

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ABSTRACT

The study of Activity-Based Costing (ABC) system is a recent phenomenon in accounting. Modern management requires details of costs and other statistical information which will enable it not only to distinguish efficient departments from inefficient ones and profitable products from unprofitable ones, but to also relate good and bad results to individual managers or those directly responsible for them. The availability of such information in a convenient form enables management to judge the efficiency of past efforts, control current operations, make future plans and above all cut down heavily on its operating costs. ABC is among the latest tools designed to perform such functions. A concept mostly associated with the manufacturing sector, this paper reviews ABC and tests the extent to which it is practicable in service industries. Specifically, the conditions necessary for effective ABC and the reasons for its preferred application was looked into. It is also intended to bring to light the nature and techniques used in its application. To attain this a thorough review was done through conceptual analysis to show the extent to which it is practicable in service firms. It was discovered that ABC can be successfully practice by firms providing services with varying degree of acceptability and positivity. Moreover, its successful application is not only limited to the private sector but includes the public sector as well. This notwithstanding, some service firms shy away from applying ABC while others preferred an alternative system known as activity-based management (ABM).

1. INTRODUCTION

The industrial revolution of the 18th Century led to a drastic change in the process of production. Output of companies not only increased overnight but their expansion grew beyond imagination. This expansion led to serious competition among businesses for higher profit. One way of making more profit is to increase the price hopping that cost remains constant. Nevertheless, in a competitive environment an organization that attempts to increase its price in the face of fixed prices by other firms faces doom. The best alternative therefore, is cutting down cost (Haladu & Sani, 2008). The introduction of Activity-Based Costing (ABC) system in recent years as an effective tool for cutting down overhead costs is a step in the right direction. ABC is the allocation of cost to cost units on a more realistic basis. It includes the charging of overhead to cost units on the basis of benefit received rather than production units (Adeniji, 2004). Specifically, it emphasizes the realistic allocation of cost to reduce the total cost of production. Thus it provides a favorable alternative towards

increasing profit while maintaining cost at the lowest level possible. ABC recognizes the fact that you cannot manage costs, you can only manage what is being done (activity) then cost will change as a result (Emblemsvag, 2000).

Firms today demand lots of operations and activities to satisfy their customers. In services firms there are dangers of over apportionment of overheads and other indirect costs that may threaten profits. There may also be inflation and other economic variables or the market situation that may affect costs as well as profits. No matter how careful or well-planned these factors may be, improper control of cost may spell danger for an organization. We are living witnesses to how large service providers like Leventis, Univer Liver, T. Choitram and Chellagram have been gradually faced out of competition in the Nigerian economy. Though most reasons for this could be attributed to recession, it still remains a fact that outdated accounting technique might have played a part in this. The significance of ABC can therefore not be overestimated.

This paper discusses the concept, significance and practicability of ABC system in the services industry. The aim is to discover the possibility of applying ABC in service firms and the rate of success achieved so far. For simplicity purpose the work has been divided into five parts. The first section is a general review to briefly trace the background and gives an insight of the meaning of ABC concept. The second part reviews in detail the concept of ABC, by tracing the history, its significance and delimitations, and how it is being operated. The research design is discussed in section three under Methodology. In part four analyses of empirical studies on ABC and related systems are made. Finally, the last section gives details of the general conclusion drawn on the possibility, success or otherwise of applying ABC system in services industries.

2. REVIEW OF RELEVANT LITERATURE

2.1 The Development of Activity-Based Costing

Perhaps the latest approach to cost accounting for efficiency in cost control is activity-based costing (ABC) system which was developed in the 1970's and 1980's. ABC is an accounting tool that has established a break-through role in the world of costing – applicable in retail, manufacturing or construction companies from one-man businesses to large corporations (Isa, 2008). Proponents of this technique argue that traditional cost accounting techniques give misleading and inequitable division of cost between low value and high value products. The traditional basis of assigning production overhead to a job is through production volume as measured by machine or labour hours utilized for the job. Under ABC overhead are related to the activity that cause or “drive” them to be incurred in the first place and to change subsequently (Dandago & Tijjani, 2005). ABC assigned production overhead to a job on the basis of the benefit received from a supporting activity e.g. ordering, planning, material handling, etc. (Adeniji, 2004). The benefits received by a job from a supporting activity cost center like inspection can be determined by relating the number of inspections made on all jobs during the period under consideration. Thus if there are 250 inspections made during the period on all jobs and a particular job requires 25 inspection, the job will be regarded as having consumed 10% of the benefits provided by the inspection cost center and will therefore, be charged 10% of the total cost of providing inspection activity.

The major distinction between ABC and the traditional costing system is that (Dandago, 2005) the traditional method operates under the assumption that the production of goods and services is what causes cost to occur. On the other hand ABC is built on the assumption that “activities” causes cost. It assumed that products, services and consumers are the reasons that activities must be performed. While traditional cost accounting is structure oriented, ABC is process oriented (Emblemsvag, 2000). It can therefore, be seen that the major emphasis of ABC is the “activities” undertaken. Costs are no longer seen as untraceable. Thus the era of indirect costs is over. The apportionment or allocation of cost is now just a dream. Under the ABC system, cost can now be traced not only to direct material or direct labor but also to indirect material and indirect labor. “The basic fact is that activities attracts costs, products demand activities and products absorb costs most often proportionately to their level of consumption of the activities. This wise fact would no doubt guide the emergent ABC manager to unwind more values on true production costs and achieve optimum overheads control” (Ya’u, 2007).

2.2 Meaning of Activity-Based Costing (ABC)

ABC is an accounting technique through which overhead costs are charged to cost units on the basis of benefits received from an indirect activity like ordering, planning, material handling, sales, electricity, etc. This technique emphasizes more on showing the relationship between costs and the activity that caused them. The ABC Portal (2002) sees ABC as “a costing model that identifies the cost-pool, or activity centers in an organization and assigns costs to products and services (cost-drivers) based on the number of events or transactions involved in the process of providing a product or service”.

Dandago and Tijjani (2005) defined ABC as an approach that “relates overhead costs (short-term and long-term) to the activities that cause or ‘drive’ them to be incurred in the first place and to change subsequently”. Resources are scarce in relation to their demand therefore; allocating such resources in terms of cost must be worth it. Under ABC such worth is defined in terms of established relationship with the organization’s direct activities which will eventually lead to its relevance to the end product (Ya’u, 2007).

In effect, accounting no longer recognizes traditional ways of apportioning overhead. That is, on the basis of volume, area occupied, number of employees, labor hour, etc. These methods may lead to over or under statement of costs, thus giving misleading result about the cost of the product which may ultimately affect profit. ABC emphasizes more on the activities undertaken to produce a product. The proportion of that particular or specific activity is taken in relation to the total activities in the organization and allocated to the portion of the product being produced. For example, if a cleaner is employed to be cleaning a Departmental store and is directed to clean as follows:

Cosmetics and jewelry	5 times daily
Foods and provisions	4 times daily
Baby wares	3 times daily
Others	2 times daily
Total	14 times daily

Assuming the cleaner is employed on a N10,000 monthly salaries. At the end of the month instead of using the number or the area occupied by these cost centers to apportion the indirect cost of the cleaner to the products, ABC uses the number of activity undertaken by the cleaner to do that. Thus:

Proportion	Amount (N)
Cosmetics and jewelry	3,571
Foods and provisions	2,857
Baby wares	2,143
Others	1,429
Total	10,000

ABC is mainly aimed at the following:

- To ensure that no product is charged more than its fair share of production overhead costs. This is done by charging the overhead costs that reflect the way the different products differ in the use of the organization's supporting activities.
- To draw the attention of the managers, especially those involved with production activities to the areas where the organization's production cost reduction effort can be concentrated, since each cost-driver are measured in physical terms (like number of set-ups, number of production runs, etc.).
- It is easier for the managers to control the use of these physical units as a way of controlling overhead costs.

There are so many reasons why ABC is preferred to traditional cost apportioning methods. As earlier mentioned, the application of ABC in modern business is mostly due to the problems associated with the traditional methods of cost apportionment using direct labour cost and overhead cost. Changes in technology and market conditions are also factors that give rise to ABC. Average direct labour cost has been drastically reduced in recent times. This reduction has made absorption rate that is labour related to be meaningless. On the other hand, overhead cost has been growing due to service support like scheduling, production control, data processing and so on (Adeniji, 2004). This increase has had serious impact on the magnitude of overhead and has changed the nature of most overhead costs.

The production process has drastically changed in recent times, depending heavily on the use of modern technology (computers). This coupled with short product life cycle and higher standards demanded by customers have resulted in increased overhead costs. Finally, there is the need to stay above competitors in the modern market. Traditional methods of apportionment give higher overhead to products. ABC makes a more realistic overhead allocation thus reducing the total product cost.

2.3 Operation and Significance of ABC

The application of ABC involves certain stages. The first stage is the identification of the various activities of the organization where cost can be related. These cost that are related to the various activities are known as "*cost-pools*".

Secondly, the determination of the factors that influence cost in each activity cost center. Such factors are known as “*cost-drivers*”. Cost-drivers occur at several levels which include at unit level, batch level, product level and facility level (Emblemsvag, 2000). In the case of the cleaning activity cost center described earlier, the cost driver is the number of cleaning. A cost-driver for purchasing activities cost center will be the number of purchase orders made during the given period. To determine the cost-driver rate, collect the cost of the activities. These are directly equivalent to conventional cost centers (Adeniji, 2004:142). Then compute a cost-driver rate using this formula:

$$\text{Cost-driver rate} = \frac{\text{activity cost-pool}}{\text{activity cost-driver}}$$

Finally, each job should be charged the cost of activity cost center on the basis of the job usage of the activity carried out by the cost center. That is, apply the activity cost-driver rate to cost unit to get the activity based product. It is given as:

$$\text{Activity-based product} = \text{Cost-driver rate} \times \text{activity}$$

The significance of ABC are enormous. ABC is today a widely accepted method of costing in most businesses because of the advantages it has over the traditional methods of cost apportionment. It has not only helped out in cutting down overhead cost but provides a more realistic product costing method. The proportion of activity applied to a product is what is used to cost the product. ABC recognizes the strong relationship between cost and activity. That, it is activity and not product that causes cost. Products only consume activities (Adeniji, 2004). ABC also gives a meaningful analysis of costs by the use of financial measurements (driver rates) and non-financial measures (transaction volume). This provides a better basis for pricing. Moreover, the causes of increases in cost are more readily identified under ABC than under the traditional method (Dandago & Tijjani, 2005). This makes it possible for proper budgeting control through variance analysis. ABC also recognizes the complexity of modern businesses, thus the use of multiple cost-drivers which are activity based. The ABC method of costing assists in ranking customers in terms of profitability (ABC Portal, 2002). Managers are provided with useful information regarding the overall contribution of each customer to profit.

Updating the ABC model on the basis of events gives a better reflection of current conditions in the organization (Kaplan & Anderson, 2004). In other words, ABC will keep the management abreast about conditions in the organization. Perhaps the biggest advantage of ABC is that it focuses on the consumption of resources by a product or cost center rather than using volume or other basis applicable under traditional methods. There is also the question of flexibility in ABC. This makes it easier for cost to be traced to activities (process, customers, areas, managerial responsibilities and product costs).

It is not everything that can be said to be good about ABC. Although modern, ABC fails to provide answers to some practical problems. There are some activities that are common to all like security after working hours. ABC cannot solve the problem of this common cost because the activity cannot be traced to the individual products. Moreover, ABC is very

complex if not ambiguous. The determination of cost-pool, cost-driver, cost-driver rate and even product cost all of which involves complex means of identification and computation.

The question of whether activity causes cost (a fundamental assumption under ABC) has been seriously challenged. Critics of ABC said it is decision and not activity that causes cost. ABC is also considered to be an expensive venture. The processes involved in identifying, analyzing and interpreting the new information is costly. That is why some argue that ABC should not be introduced unless it can provide management with planning and controlling information (Dandago & Tijjani, 2005). Some overhead costs are neither related to volume nor activity. Therefore, using a single cost-driver to fully explain behavior of all items in the organization is questionable if not unacceptable.

3. METHODOLOGY

Being a new development in accounting, ABC could be said to be hardly practicable in service industries. Materials for this paper were sourced from text books and journal publications. Outcomes of empirical works were analyzed through content analysis. The analysis process involved evaluation of the success or otherwise of ABC to determine the level of application by firms in modern times. A comparative analysis between firms application of ABC was also considered to show their effects. To a lesser extent descriptive statistics was applied in the analysis of the studies covered.

4. RESULTS

4.1 Objectives and Discoveries from Some Empirical Works

Observing the cost involved in activity-based management (ABM) Armstrong (2002) stressed that the machinery of activity-based costing (ABC) depends on staff department as a mass-producer of repeated acts of “routine” activities performed for particular cost objects. Looking at ABC system on the supply chain management Askarany, Yazdifar and Askary (2002), aimed at knowing the significant contribution of ABC to the global supply chain management. A clear distinction between Armstrong (2002) and Askarany, Yazdifar, & Askary (2010), is that while Armstrong (2002) emphasis on the practice of ABC in manufacturing firms. Askarany, Yazdifar, & Askary (2010), work covers service industry. Szychta (2010) explain time-driven ABC in service firms by looking at its principles.

Effective cost management is aimed at providing relevant and timely information to management (Badad & Balachandran, 1993) to support efficient management of resources in service provision. Rather than confronting ABC directly, the paper emphasizes more on activity-based management (ABM) which is an off-shoot of ABC. In their study of the effects of ABC on the adoption of excellent manufacturing practices on plant performances, Banker, Bardhan and Chen (2008); developed a research-mediating model to study this impact instead of looking at its effect directly. Baykasoglu and Kaplanoglu (2008) were concerned with limited work on the real life application of ABC especially as it relates to transportation. They argued that if properly implemented ABC proves helpful in determining transport companies’ cost of operation with much degree of accuracy. Most empirical researches on ABC have concentrated on the private sector. For this reason Brown, Myring, and Gard (1999) decided to explore the public sector’s use of ABM to answer many

questions relating to the implementation, use, cost, and benefits of it. The unique feature of free services provided by governments (Brown, Myring & Gard, 2003), makes it difficult to justify the application of ABC. Cagwin and Bouwman (2000) conducted a study aimed at investigating improvements in financial performance that can be linked with the application of ABC. Cooper and Kaplan (1992) considered the basis and use of the ABC system. The traditional cost allocation system considers volume-driven allocation, but modern cost allocation links the cost not to the volume of units produced but to the efforts (activities) involve in the production. Innes, Mitchell, and Sinclair (2000) reviewed the operations of the ABC system in UK firms for a 5-year period to know the nature, design, uses, success, and importance attached to ABC. For those firms that have not adopted the ABC, the study investigated their reasons for not doing so. Investigating the difference in ABC system among firms at different stages of their development Kallunki and Silvola (2008) tested for the hypothesis that the use of ABC system is more common among firms in maturity and revival phases than among firms in a growth phase. Kaplan and Anderson (2003) looked at time-driven ABC. This can be estimated through only two parameters: the unit cost of capacity supplied and the time within which an activity could be performed. The paper tries to articulate the basics of time-driven ABC with examples of firms that have adopted the approach and enjoy rapid and significant profit improvements. Krishnan (2006) analyzes how ABC system improves operation and better meets the needs of universal customers in a cost effective manner.

It should be noted that the emphasis on routine activities threatened the dumping of departments in which non-routine activities occur Armstrong (2002). ABC is expected to provide accurate, detail and up-to-date information on activities and processes in the organization. This strengthened the argument for a re-examination of activity-based management (ABM). The adoption of ABC in smaller firms needs more attention than large firms (Askarany, Yazdifar and Askary, 2002), irrespective of the industry. Manufacturing firms are however, expected to pay more attention and to implement higher levels of ABC. In their work they discovered that ABC system achieved improved accuracy in the estimation of cost by applying multiple cost-drivers to trace cost activities to products. This lead to the conclusion that a cost-driver is an event related to an activity that results in the utilization of a firm's resources (Badad & Balachandran, 1993). Due to the vastness of firms, operations using distinct cost-drivers for each activity; ABC system may not be cost effective. Thus, it is more cost effective to group cost-drivers into single driver categories. This then leads to the question of how many and which cost-driver to use. Badad and Balachandran (1993) provided an efficient ABC design model based on the use of composite greedy algorithm. The algorithm is based on a priority order according to which, low priorities and relatively insignificant activities will be combined to save costs though without accuracy (Badad & Balachandran, 1993).

In a cross-sectional study of US manufacturing plants, it was discovered that ABC has no significant direct impact on plant performance as tested by costs, time and product quality (Banker, Bardhan, and Chen, 2008). However, an excellent manufacturing practice, which is the mediator, mediates a positive impact on plant performances. Thus, advance-manufacturing capabilities are the missing link in understanding the overall impact of ABC.

Making use of a transport company in Turkey, they concluded that to improve the effectiveness of ABC it should be integrated with business process modelling and analytical hierarchy approach (Baykasoglu and Kaplanoglu, 2008). Thus giving birth to effective costing services in the land transportation business as opposed to traditional costing methods. Brown, Myring, and Gard (1999) concluded that benefits such as awareness, cost creation, and improved decision-making are enjoyed by implementing ABC in the public sector notwithstanding the difficulty of installing it. Care should be taken by management to ensure the cost of implementing ABC does not exceed the benefit. Using factor analysis and SEM their study attempted an investigation of the conditions under which ABC can improve performance. The result shows a direct relationship exists between ABC and improvement in the financial performance here defined as ROI if ABC is combined with other strategic initiatives (Cagwin & Bouwman, 2000). It was concluded that if higher activity is demanded this will raise cost where as if activity for an operation falls below demand then the cost of the activity will fall. Management must therefore take conscious action either to use or reduce spending on human resources by the elimination of unused capacity. This will determine the level of profit demanded. In simple terms, Cooper and Kaplan (1992) opined, “management’s behavior, not cost behavior” determines whether reductions in resource demands become translated into higher reductions. It was discovered that ABC adoption has remain higher among larger UK firms especially those from the financial sector. Proportionately however, ABC users have fallen and those not considering its use have significantly increase (Innes, Mitchell & Sinclair, 2000). Only 17.5% of larger firms used it. This result supports the assertion (Kallunki and Silvola, 2008). ABC system provides accurate cost management by enabling university management to compute the true cost of a product and it is available to all (Krishnan, 2006). It helps trace costs, their drivers and show which costs adds less value to production in the system. It also aids in cost planning prediction, estimation and the elimination of low value-added cost. Using literature studies of previous researches the authors expressed their opinion on both the conventional and modern ABC systems by highlighting the strength and weaknesses of time-driven ABC. Many useful cases of successful time-driven ABC (TDABC) implementation have been reported (Kaplan & Anderson, 2003). Time is used as primary cost-driver and for the allocation of resource costs. Time-driver is the most suitable for service industries because they are measured through labour time used.

4.2 Analysis of Empirical Results

ABC system has been extensively applied in service industries. Our review showed that 70% of the empirical studies covered are based on service industries, 10% on manufacturing and 20% on both manufacturing and service industries. The outcome of its application showed mixed results though a greater proportion of it is positive. While some researches might be considered outdated (Badad & Balachandran, 1993), modern ones were conducted using “intervening” variables.

The question of its practicability in service industries is unnecessary as studies showed that ABC is 100% practicable in service industries including the financial sector (Innes Mitchell & Sinclair, 2002) and the public sector (Brown, Myring, & Gard, 2003). The use of ABC

system in service firms have greatly aided in providing accurate information on activities and processes (Armstrong, 2002; Badad & Balachandran, 1993; Krishnan, 2006). This is mainly due to apportionment based on “activity” instead of volume and the use of cost-drivers. The emphasis on activity under ABC however, threatens the abandonment of non-routine operation in the production system. Because activities involved in such operations are not frequent, they may not be considered in determining the cost-driver.

Other reviews also indicate that lesser attention is being paid to smaller firms. Askarany, Yazdifar, & Askary’s (2010), discovery is that ABC application is more pronounced in bigger companies than in smaller firms. Where different cost-drivers needs to be computed for cost determination, then ABC system proves too expensive for service industries (Badad, & Balachandran, 1993). There then arise the question of how many or which particular cost-driver could be used for a particular purpose. Baykasoglu, & Kaplanoglu, 2008) suggested that for the system to function well in the service industries it must be integrated with business modelling process and analytical hierarchy approach.

For its application in the public sector, ABC is difficult to design and install for the simple reason that the system doesn’t have any profit motive. However, if implemented it creates awareness about existence of the system and improved decision making. It has also been proved (Cagwin, & Bouwman, 2002; Innes, Mitchell, & Sinclair, 2002), that the practicability of ABC in the financial sector helps in the improvement of returns on investments (ROI) and that where more activities are carried out there is higher overhead cost incurred. Cooper and Kaplan (1992) however, defied the underlying assumption about ABC. That it is activities that lead to cost. Their research showed that reduction in resource demand (labour) is not as a result of a fall in activities but due to management’s behaviour.

5. CONCLUSION

Profitability is no doubt the major objective of every business public or private. Its interpretation may be different depending on the nature and type of business or whether it is a public or private sector. For positive returns however, one needs to apply the most modern technique of costing. Most businesses have failed either because of lack of proper processing of cost or proper accountability of cost. ABC has therefore; breathed a new life of hope into the accounting process for cost management in service industry.

Even though ABC is unique to manufacturing industries, service firms should be given the opportunity to practice it so as to assess their performance effectively. Given this opportunity the managers will be able to know which special tool of economic analysis to apply in their determination of cost and profit.

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