Practicability of Time-driven Activity-based Costing on Profitability of Restaurants in Makurdi Metropolis of Benue State, Nigeria

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Abstract: This paper looks at the practicability of implementing time-driven activity-based costing system (TD-ABC) in small service businesses in Benue State and analyzes profitability of its varying customers. This research is carried out to establish if the application of TD-ABC in small scale service oriented businesses in Makurdi metropolis of Benue State will enhance their performance in terms of profitability. Regarding the goal of this study, the research design is an application research by case study. The researcher randomly selected out of the identified small scale service businesses one Restaurant and studied it using questionnaires, interviews to get data for this work. The result showed that using TD-ABC system, in comparison with their existing method provides more data on cost and profitability of customers served. The conclusion was that managers of small service businesses can make use of time equations in TD-ABC to calculate necessary time for activities engaged in delivering a unit of service. The recommendation is that small service businesses should implement TD-ABC to enhance their cost accumulation process and pricing of services, hence increase their profitability.

Keywords: TD-ABC, Small service business, Customer profitability analysis

1. Introduction

In this Era of global competition, evolving information technology and a renewed commitment to quality and excellence in services rendered, the main challenges of managing service businesses is development of cost information for enhanced strategic decision and proper pricing of services. The continual quest for a suitable costing system to generate this information is therefore a matter of prime priority. Accumulating proper cost data per customer is necessary because it facilitates managerial decisions that dovetail into total profitability of the business organization. Customer cost data help identify which one is profitable or not (Kuchta & Troska, 2007).

The Central Bank of Nigeria (CBN,1988), in its monetary policies circular No: 22 of 1988 defined Small Scale industries as those who has annual turnover not exceeding N500,000. For the purpose of this paper, Small Scale service businesses are those with staff strength less than twenty and asset not exceeding N400,000.

Competition has resulted to an increased attention to the introduction of various products and services of high quality, all in an attempt to satisfy customer’s profitability. It takes resources of the organization to produce a product or service. These resources carry some cost and as they are consumed cost is incurred, regrettably these resources are scarce and are insufficient in supply. Time is one of those vital resources. Whatever is scarce call for efficient allocation to the competing areas of need. This efficient allocation curtails waste and paves way for accrued commensurate benefit whenever the resources are consumed. They are different activities involved to accomplish the task of delivering different services; the knowledge of the activities involved in making a

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product or service is invariably having knowledge of the resources each service consumes and the resultant cost so incurred. Presently there is broad range of choices on reasons of quality, cost, modernity, packaging, delivery system etc. available to customers thereby making the business arena more complex and competitive.

The need for accurate cost information is critical to any purposeful business. Regrettably, most companies are still using the same traditional cost accounting systems that were developed decades ago. This costing system does not accurately reflect the contribution of indirect cost to individual services. For the last two decades, activity based costing (ABC) was introduced to enhance proper cost accumulation. ABC rather than just listing cost factors and assigning them to products based on artificial allocations, it examines processes and work flows to identify actual activities that add cost there by providing a trend data on unit cost. This wider and more realistic view of cost allows managers to base strategic decisions on more accurate cost information. ABC estimates the cost of the work activities that consume resources and then links this cost to the services that are provided. Even though ABC system alone may not transform a business into a world-class competitor, it is an important tool to help world-class firms make effective strategic decisions.

Although there is more literature on ABC with respect to manufacturing companies as compared to service organizations. Rendering of service is very important because it adds value to the product in the hand of the consumer. The activities involved to deliver service needs to be accurately accumulated so that the cost of that service would be appropriate. Activity based costing is therefore a competitive weapon which service organizations can also use to enhance the quality of their services, increase profit and remain competitive.

The common small scale businesses dominant in Benue State are service oriented. There is need to nurture them via good management. The traditional ABC mentioned above fell short as a good management tool because it was expensive to build and maintain, too long to implement and it did not capture the complexity of operations of many companies (Kaplan & Anderson,2003). These problems mitigated the adoption of this costing system even by big manufacturing companies. The continual search for a better costing system ushered in the Time Driven Activity Based Costing (TD-ABC). TD-ABC is an evolving management weapon for better strategic managerial decisions and has been used in some manufacturing organizations. It has addressed all the limitations of the traditional ABC. The researcher wish to study if it’s applicability in small scale service oriented businesses could enhance their profitability and encourage entrepreneurship for the overall interest of the economy. This paper looks at the aspect of unit cost ascertainment of service which has a relationship with profit, and sustainability of any profit making businesses especially service organizations.

A vibrant economy could be a function of how entrepreneurship is encouraged and how successful small scale businesses are doing in supporting the bigger organizations. Efficient management skills encourage entrepreneurship, growth and survival of small scale businesses. In developing countries like Nigeria where the economy is not yet stable, there is high poverty level, unemployment, overdependence on government, low participation in private businesses by individuals for fear of failure etc. These pose a problem and threat for growth and development which are key ingredients of better living.

Nigeria is currently pursuing vision 20-20-20. The vision is that by the year 2020, Nigeria will be one among the top 20 most industrialized nations of the world. The onus is on her to address key developmental issues like management of small businesses that would help transform the economy for the better. Government efforts for enhancing the economy are sometimes frustrated because of the porous nature of our economic base. There could be many solutions to this problem which one of them is efficient and effective management of small scale business and enhancement of entrepreneurship skills.
It is worrisome if a given economy has so much money but one can not really find successful service organizations. The small ones that do start at all fall by the side soon after take off. Most of them attribute their failure to lack of profit and low patronage. Basic industrial inputs like materials and labor are relatively cheap in Nigeria and Benue State in particular, the issue of unprofitability should not have arisen all things being equal. Lack of proper management becomes suspect. The aspect of interest that is sought to be addressed in this work is: whether these businesses understand their real cost of operation. It is important for businesses to know its cost of operation in order to have better pricing and enhance profitability.

The research questions for this work are: Do proper cost management enhance the profit of an organization? Do small service businesses accurately accumulate the cost of providing a unit of service? Do various services require equal resources (time) to provide them? Can TD-ABC help achieve proper cost management? Research hypothesis for this paper is stated in the null form thus: Ho1: Small service businesses do not accurately accumulate the cost of providing a unit of service. Ho1: Various units or products or service do not require same activities to produce or provide them.

It will be time consuming and expensive to study all manufacturing or service organizations available. For this reason the study is restricted to one small scale service oriented businesses with similar pattern of operation within Makurdi metropolis. All the data needed for the study was collected from the sampled business. It is therefore hoped that the result of this study can be generalized to apply to all other similar businesses. This study will be beneficial to owners/managers of small service businesses in Benue State, the academia and to the entire economy of Nigeria.

It is truism that you can not assess, manage or control what you do not know. Attempt is therefore made to practicalize TD-ABC as a means of improving the understanding of cost with a view to improving pricing decisions and profits of small businesses. The study is premised on the notion that cost information is an essential ingredient to profitable pricing of services. The objective of this paper therefore is to throw more light on the importance of ascertaining actual cost of operation, equip managers with relevant skills for better and sustainable decision making that will improve their efficiency and profitability and to show that the ABC concept is not only for big manufacturing companies.

The structure of this work is as follows: Section one is the introduction as seen immediately above. Section two reviewed related literature on relevant subheadings. Section three is research methodology. Section four is devoted to presentation of data and analyzing same with emphasis to practical application of TD-ABC. Section five has the conclusions and recommendations and suggested further research path.

2. Conceptual Clarification and Literature Review

2.1 Costing an Overview

Cost is an outflow of a resource, whether in cash, as payable, a rendered service, or as a trade or barter, that is consciously made with expectation of benefit to the organization: goods, property, or services required. Costing is a mechanism that gives information on the cost structure of an organization. The purpose of cost accounting therefore is to render provide cost information for prudent stewardship of the overall organizational resources. Cost management is therefore the use of cost accounting systems and methods to guide current and future operations towards specified objectives. Costing is the analysis and interpretation of cost data to enhance decision-making process.
To Cooper & Kaplan (1992) units makes up the whole and therefore costing should be primarily concerned with the units cost to tract accurate cost of operation. To Anderson (1995) Costing is simply the ascertainment of costs. It gives factual information on which management accountants can build up his presentation of planning and control of operations. Costing enables a business not only to find out what various products or service have cost but also what they should have cost by unveiling where losses and waste are occurring.

We are experiencing an ever changing business environment, these changes are a function of knowledge and information we are exposed to. The development and use of information especially cost management information is a crucial factor in the effective management of business operations.

2.2 The Concept of Unit Cost

To Gary (2001) Unit cost is the average total cost of producing one unit of output. It is clear that each unit of product has unique demand on the resources of the organization. Resources cost money and as such the cost of a unit could not just be arbitrarily ascertained but in agreement with resources so consumed. To MacArthur (1992), a resource is an economic element that is applied in the performance of activities e.g. salaries, materials etc. In a competitive economic environment these economic elements are scarce and therefore how much a unit of product or service consumes should be the base of ascertaining its costs.

To Ligget, Trevino, and Lavella (2003) resources are used to perform activities, those activities are the real work carried out in an organization and each unit of product or service requires unique activities which should be traced to it in arriving at cost of production. To Shields, (2001) an activity is a value adding process which consumes resources. A unit of product or service is therefore a function of the activities performed and resource consumed. It is then truism to say that to know the true cost of a unit is the first step to total cost ascertainment or costing. A good costing system is therefore one that keeps track of the activities needed to complete each unit of product or service and the resources consumed by each activity.

2.3 The Concept of Customer Profitability Analysis

In this competitive era businesses realized that satisfying the needs of customers by offering them diverse products and services enhances customer loyalty and increase profitability (Ngai, 2005). This should be however done wisely and that is where customer cost information and profitability comes in. Customer cost information is essential for managerial decision making (Dalci et al, 2010). Understanding the true costs of serving specific customers is important for every organization. Those companies who understand which customers are more profitable and which are not are “armed with valuable information needed to make successful managerial decision to improve overall organizational profitability” (Van Raaij, 2005; Dalci et al, 2010).

Many specialists (Kaplan&Anderson, 2007a; Lambert, 2010; Murphy et al, 2005) consider that ABC permits customer profitability analysis by comparing the revenue streams with the service costs associated with specific customers or customer groups.

Customer profitability is an application of segmented reporting in which a customer group is treating like a segment. Moreover, Cotton (2005) affirms that the efficient using of customer profitability analysis enables firms to increase the customer satisfaction and increase their profitability. Customer profitability analysis identifies the cost and benefit of serving specific customers or customer groups to improve an organization overall profitability. To Ngai (2005) profitability is a guide to effective management. Profitability motivates both management and other employees, enhances progress and growth, and also the wealth of shareholders.
2.4 The Traditional Costing System

Over the years the most difficult task of management is computing unit cost, the difficulty is in determining the proper amount of overhead cost assigned to each job, unit of product or service. Some approaches exist and have been used to compute unit cost such as – plant wide overhead rate, departmental overhead rate and activity based costing. The first two commonly referred to as the traditional costing system, are both based on output volume to allocate factory overhead cost to products or service. The plant wide rate assures that in proportion to the overhead allocation base used, all products or service benefits from the overhead incurred. On the other hand the departmental rate method used various volume based procedural rates for each department.

The idea was that products cost are more likely to reflect different usages in departments, however, this did not take into consideration varying cost of different processes or activities within a department. In the time past total manufacturing cost was dominated by labor and correspondingly, products requiring the highest labor input were driving most of the production costs. All efforts was on measuring and controlling direct labor costs. In such a case the costing system was to measure the resource consumed in production to the volume or individual products produced. The unit cost arrived at using that method of allocation was distorted because products do not necessarily consume most support material in proportion to their production volume. From the foregoing it becomes clear that cost was not ascertained as supposed and the main aim of costing was partially eroded.

2.5 Activity Based Costing

Information on product cost and product profitability is a prerequisite for cost-conscious management. Only if there is cost information available, is management basically able to make various decisions that take the cost perspective into account. Therefore, to understand causes and effects of product or service cost is vital in terms of a company’s short and long-term planning.

The contemporary manufacturing and service business environments are characterized with automation, product diversity and total overhead has increased to the point in some companies that a correlation no longer exist between it and direct labor. The consumption of an organization resources are unrelated to the physical volume of units produced. The quest for a more reasonable and detailed method of allocating overhead to unit cost continued until the emergence of ABC. The key idea of ABC is that, activities drive costs of any organization by consuming its resources (Adamu, 2010). The design of an ABC system rests on identifying the relationship between an indirect resource and the activity that causes it.

According to Hill (1995), ABC is concerned with the cost of activities within a company and their relationships to the manufacturer of specific products rather than to functional base. The basic technique of ABC is to analyze the indirect costs within a company and to discover the activities that cause those costs. Such activities are called cost-drivers and can be used to apply overheads to specific products.

To Schoreder (2000), a cost driver is an event associated with an activity that results in the consumption of the firms resources. Traditional cost accounting uses one cost driver (direct labor or machine hours) as the basis for allocating overhead costs, and this can be inaccurate and misleading because it may apply too much cost to one product and not enough to another. ABC system achieves improved accuracy in the estimation of costs by using multiple cost drivers to trace the cost of activities to those products or services associated with the resources consumed by those activities, hence preferable.

To Maskell (1991), several practical cases indicate that ABC can be of value for product pricing, production decision making, overhead cost reduction, and continuous improvement. To Krumwiede, and Roth, (1997) An ABC approach uses multiple drivers to reflect how resources and
activities are actually consumed which provides a more accurate assignment of cost than traditional cost systems that typically rely on a limited number of volume based measures, such as direct labour hours or sales volume.

To Bhimani and Pigott (1992), ABC is an examination of activities across the entire chain of value adding organizational processes. It unveils the underlying causes or drivers of cost and profits. To Foster, Gupta, and Sjoblom (1996), ABC offers a workable and more effective insight into overhead allocation and recovery. It improves the quality of costs and management allocating information; it also gives managers a wider understanding of the economies of production.

As many companies have acknowledged that while the improved products cost information provided by ABC is useful, its real power lies in its ability to identify cost reduction opportunities. (Anonymous, 1992). ABC has been extended from cost view to process view. That is to say according to Turney, P.B.B (1991) that ABC has moved from product costing to process improvement that help managers to understand their operations.

Problems/limitations of the Traditional ABC: This traditional ABC was however more appropriate for pilot studies or department levels. Several problems arose when companies attempted to scale up this seemingly straightforward approach to cover the whole organization. There was problem maintaining the model to reflect changes in activities, processes, products, and customers (Kaplan & Anderson, 2004). The process to interview and survey employees to get their time allocations to multiple activities was time consuming (making it take a long time to implement) and costly. Costly in the sense that, the model needed constant update so as to maintain true activity cost driver rates. The time and cost to estimate an ABC model and maintain it has been a major barrier to widespread ABC adoption. Another problem was that this model did not capture the complexity of the operation of many companies. If heterogeneity is introduced within an activity, it requires re-estimating the amount of cost that should be assigned to the new activity thereby consuming time and incurring more cost.

2.6 Time-Driven Activity Based-Costing

TD-ABC is an emerging alternative approach for costing that addresses all the problems and limitations of the traditional ABC as highlighted above. It is simpler, less costly and faster to implement, and allows cost driver rates to be based on practical capacity of the resources supplied (Kaplan & Anderson, 2003). Under traditional ABC, the result of the calculation is per transaction. It assumes in essence that each occurrence of the transaction consumes the same quantity of resources. It is on this assumption that TD-ABC differs. It is of the opinion that duration (time) drivers are more accurate than transaction drivers that are more expensive to measure.

Kaplan & Anderson (2004) articulate the difference between transactional and ‘effort’ cost drivers. Transactional cost drivers count the number of times an activity is performed, like number of set-ups, number of shipment, number of purchase orders, and number of customer orders. When the resources required to perform each of an activity vary, such as when some set-ups are more complex to do than others, or when some customer orders require more time and effort to process than others, then simply counting the number of times an activity is performed gives an inaccurate estimate of the resources required to accomplish a work.

Service businesses offer heterogeneous services each with varying degree of consumption of resources. It is good therefore for a cost system to use duration drivers which estimate the time required to render each service. Time is a valuable resource in service businesses and must be used judiciously to enhance profitability. TD-ABC gives service business owners the opportunity to manage time and other resources profitably.

Kaplan & Anderson, (2004), argues that the essence of activity-based costing and activity-based management is the measurement of the organizations capacity. To this end TD-ABC systems
requires two estimates: the unit cost of supplying capacity and the consumption of capacity (unit times). TD-ABC therefore has two estimates simply put as Unit Cost Estimate and Unit Time Estimate.

2.6.1 Unit Cost Estimate: This approach starts by estimating the cost of supplying capacity. This means all the resources required to enable the performance of the varying activity or services is identified. The sum of all these resources in monetary terms is calculated per given period. This cost system also call for the estimation of the practical capacity of the resources supplied. Theoretically the capacity under traditional ABC is put at 100% but under TD-ABC emphasis is on estimating practical capacity than the theoretical capacity. Practical capacity is therefore estimated at 80% of theoretical capacity. This estimate allows for 20% of employee time for say breaks, answering calls, arrival and departure and other things unrelated to actual work performance. If it is a machine the same time is given for downtime due to maintenance, repair, and scheduling functions (Kaplan & Anderson, 2003).

The basic objective in all ABC design is to be approximately right so the analysis is not greatly sensitive to small errors in estimating parameters. With estimates of the cost of supplying capacity and practical capacity, unit cost can be calculated by dividing cost of capacity supplied over the practical capacity of resources supplied (Kaplan & Anderson, 2004).

2.6.2 Unit Time Estimate: Under TD-ABC there is a need to estimate the time required to perform a transactional activity/service. It therefore means the time required to render each of these diverse services in small businesses will be estimated. This can be obtained either by direct observation or by interviews. Precision is not critical; rough accuracy is sufficient (Kaplan & Anderson, 2004).

2.6.3 Time Equations: In general, not all small business services are the same and require the same amount of time to provide. Each business can conveniently ascertain or predict what makes some transactions or services to be simpler or more complex and time consuming to provide. TD-ABC approach estimates the total resource (time) demanded to render each service by a simple equation generally called ‘Time Equation’. This equation is the sum of all the time taken to render whichever type of service to a particular customer. To Zohreh & Samad, (2011) building an accurate time-based algorithm in one facility will typically serve as a template that can be easily applied and customized to other plants, or even other companies in an industry. This is to say, service businesses can develop this time equation for some category of services which makes it easier for them to calculate customer service demand of their time. This approach allows for more variety and complexity in services thereby enhancing more accuracy hence addressing one of the limitations of traditional ABC.

TD-ABC is quite easy to update to reflect changes in a business operating conditions. If a new variety of service is identified or introduced, the simple thing to do is to estimate the unit time required for that new service. This time will be added to the Time Equation algorithm model of each customer characteristics and total time computed. With this equation as a model, it becomes easy to update when more special services are introduced. By updating the model on the basis of events rather than on the calendar (once a quarter or annually), you get a more accurate reflection of current conditions (Kaplan & Anderson, 2003). Small service businesses can estimate this Time Equation for the services they render to varying customers to enhance proper utilization of resources in line with benefits derivable there from.

2.7 Activity Based Costing in Service Organizations

The current accounting literature is filled with activity based costing articles about cost drivers in manufacturing settings but very few examples of cost driver applications in service organizations exist. According to Gordon (1993), a number of the applications of cost drivers in manufacturing plants, however, involve service functions rather than manufactured product. Since cost driver and ABC concepts improve the cost measurement and allocation information for service departments within manufacturing firms, service businesses could also use cost driver and ABC concept.
Services vary from one customer to the other, because of this; allocations should vary with the quality or complexity of service. What then is the issue is how to track these activities involved in each service and the resources consumed by it to arrive at an accurate unit cost of service.

The theory behind ‘cost drivers’ is the causal relationship between cost and the resources used by the service, contract or unit. There is therefore every need to unitize service cost (Ngai, 2005). Variable costs vary with change of activity and it is precisely this variation, and the activity that causes the variation, that gives rise to the search for cost drivers.

According to Gordon (1993), ABC was implemented in the library of Australian universities and found to be successful. A library is service oriented and a success of ABC in it shows service organizations operating at small scale can also borrow this concept of ABC from both manufacturing and big service organizations in order to understand cost per unit of service.

Product or service profitability is the relation of a product’s selling price and its cost. The higher the price or the lower the cost, the better is the product’s profitability. Product variety is an interesting issue relating to profitability. How broad a product line is the better from the profitability point of view. To Yeh and Chu (1991), Kekre and Srinivasan, (1990) the broadening of product line increases a company’s power to compete in the market. It leads to higher market share and end performance. However, Yeh and Chu (1991) is of the view that a company may lose its cost advantage at the same time if the operations are not well understood.

Most small scale service businesses offer variety of services in order to satisfy their customers. This is the same as broadening product line which under normal circumstances should make the business profitable and grow bigger. Borrowing from Yeh and Chu (1991) that a company may lose its cost advantage as it expands, the researcher is of the opinion that broadening of product/service line should be done wisely. In this case, TD-ABC system is a wise approach to consider along with the variety of services rendered. To Mughal and Osborne (1995) it is profitable to increase product variety by making more models out of one product.

Services offered by service businesses can differ, first to satisfy customers and secondly to make more profits. Profitability here is a function of the business to be able to get the accurate cost data of each unit of service by effectively allocating indirect cost. The service industry is critical to the economy and must be regarded as such. It is for this reason that the area is worth studying.

3. Research Methodology

This research is carried out to establish if the application of TD-ABC in small scale service oriented businesses in Makurdi metropolis of Benue State will enhance their performance in terms of profitability. The case study method provides opportunity for the researcher to understand the nature of accounting system that is in use before the TD-ABC is practicalized comparatively. Regarding the goal of this study, the research design is an application research by case study, using descriptive survey. The researcher randomly selected out of the identified small scale service businesses and studied those using questionnaires, interviews to get data for this work.

Restaurants use similar pattern of pricing their services in Makurdi metropolis. The researcher selected one out of them as case study for this work. The one selected was the most popular in terms of size and patronage so that external validity will not be jeopardized.

With the help of interview with the staff of various small service businesses, processes, activities and services were identified to calculate cost of different customer groups and determination of their profitability using TD-ABC model. Interview also helped to identify the time consumed for different activities/services. Time Equations were then estimated and the time of each
activity/service was multiplied by the practical cost capacity rate to assign costs to different category of customers.

The method the researcher used in the collection of data in this was a combination of questionnaire, interview and observation. The methods were combined because of convenience for the respondents. For example, questionnaires will not go down well with illiterates that own or work in such businesses, but one could conveniently interview such persons and also observe what is been done by them. There are also some salient issues observation can not review but a questionnaire could capture answers to them.

4. Data Presentation and Practical Application of TD-ABC

4.1 Practical Application of TD-ABC in Apple Gate Restaurant, Banks Road, Makurdi-Benue State

Apple Gate is one of the predominant restaurants scattered across Makurdi metropolis. Their menu items pounded yam, turning food which is served with a variety of native soups namely Ashwe, Okoro, Vambe, Genger, Vegetables etc in different plates. They are some staffs that are employed for washing these plates. Customers are served at a time; a plate of food with four native delicacies and then a meat of their choice. With all these, the charge is per plate of food excluding meat. These soups are purchased in village markets and transported to Makurdi town. Preparing these soups and different type of meat consumes time and ingredients of the cooks. The expenses incurred by the restaurant dovetail to providing capacity to serve their varying customers. The time and other resources taken to serve these customers too are not the same; it varies with the type of service demanded.

A flat charge per chosen menu under-charges some customers while others are over-charged which culminate in distorting cost and profit figures of the restaurant. A proper costing system is of paramount importance to the restaurant to enhance their profitability. All the above information was gathered by the researcher by participant observation and interview of staff of the restaurant. The practice in this Apple Gate restaurant is the same to other similar restaurant in Makurdi, Benue State.

By interview with the manager and staff of Apple Gate Restaurant, time consumed for different services was identified. By the strength of this, time equations were estimated and time of each service type was multiplied by the practical cost capacity rate to assign costs to different customer groups. Lastly, cost and profitability of different customer services/group by traditional costing system operative in the restaurant and TD-ABC was compared to establish clear conclusions.

4.2 The Existing Costing System in Apple Gate Restaurant

An extract was made from the books of Apple Gate Restaurant for the month of November, 2011. The extract shows sales income analysis for the month. Customers are served a plate of food with four different native delicacies at a flat charge of two hundred naira only. There is however assorted meat with different prices per piece. Total income from meat and food is added to arrive at total income per sales day. All the days sales are summed up to get the sales per month of N1,281,500 while total operational cost for the month was put at N1,938,000. Going by the costing system in operation, a loss was recorded for this month.

4.3 Allocation of Cost under TD-ABC System Using the Same Data as above

A study of the restaurant operations revealed several activities in providing the capacity to render their routine services. These include cooking the various menu items, taking orders, preparing the kitchen, washing plates and calculating bills. This restaurant has a total of 22 staff and
they work from 8am – 6pm each day. This means each staff work theoretically for ten hours per
day. TD-ABC uses time as a main driver of costs, because capacities of most resources like staff
and equipment can be measured by time (Kaplan & Anderson, 2007a). The aforesaid shows time
required to do an activity is a key input of TD-ABC. Measurement of activities was therefore done
by direct observation (time average was calculated during activity execution), interview with staff
and the manager.

4.4 Unit Time Estimate
Below were the time measurement revealed. 38 minutes to prepare and serve a plate of food, 20
minutes to prepare and serve each of the four native delicacies, 38 minutes for fish, 29 minutes for
goat meat, 27 minutes for beef and 38 minutes for chicken. Armed with this information, time
equation was developed as follows:

\[ Service\ time = 38 \text{ min. (for plate of food only)} + 20 \text{min.} \times \text{(number of plates of the delicacies)} + 38 \text{min. if Fm} + 29 \text{min. if Gm} + 27 \text{min. if Bm} + 38 \text{min. if Cm.} \]

Fm is fish meat, Gm is goat meat, Bm is beef meat and Cm is chicken meat.

4.5 Unit Cost Estimate

\[ Unit\ cost\ estimate = \frac{Total\ cost\ of\ capacity}{Practical\ capacity\ of\ resources\ supplied} \]

This restaurant has 22 staff each work for 10 hrs a day amounting to 600 minutes per day and
18,000 minutes per month. Under TD-ABC practical capacity is allowed at 80% of the theoretical
capacity. Practical capacity will now be 14,400 min. (18,000*80%) per staff and 316,800 min from
all the staff per month.

\[ Unit\ cost\ estimate = \frac{1,938,000}{316,000\ \text{min}} = N6.13 \]

This unit cost means, every one minute spent to serve a customer is valued at it. Unit time
estimate multiplied by the unit cost estimate help cost each customer service. These two estimates
are now used to re-compute the sales income of Apple Gate Restaurant and the result rather showed
a sales income of N3,379,808 as against N1,281,500.

Results/findings
The results show that income analysis using TD-ABC gave a higher income than the traditional
costing system. The new income figure when subtracted from the cost for the month resulted to a
profit of N1,441,808 (N3,379,808 – 1,938,000) instead of a loss when traditional costing was used.
Among other reasons is that, time which is so vital in rendering a service has been better captured
using TD-ABC.

5. Hypothesis Testing
Delphi technique was used to test the hypothesis in this work. Experts who were
managers/owners and long serving staff of this business were identified. Questionnaires were
served to them several times. Each round of questionnaires was analyzed to establish if responses
were stable. The analyses show that the average of very good and excellent answers gave a
significant percentage of 96% which was needed to confirm that the proposed model was a
welcome development. Coupled with the results of income re-computation using TD-ABC the two
hypotheses were then supported and accepted.
6. Conclusion and Recommendations

It is clear that the existing costing system in the sampled small businesses is not suitable to analyze customer profitability. The system did not capture other services in its cost accumulation process. The difficulties of implementing and maintaining traditional ABC systems have prevented activity-based costing systems from being an effective, timely and up-to-date management tool. TD-ABC has overcome these difficulties. It’s easy and fast to implement, inexpensive, fast to update and it captures the complexities of an organization.

Time is a vital resource especially in service businesses. The major recommendation is therefore that TD-ABC which emphasizes time usage in costing services be embraced by service businesses. TD-ABC is hence a better costing system for small service businesses if profitability, growth, sustainability and development are to be emphasized.

Awareness seminars with respect to costing of services should be organized by relevant government agencies to educate small service business owners and managers of this Time-Driven Activity based Costing.

The researcher recommends studies on implementation of TD-ABC system to similar small service businesses like tailors, car wash, mechanics and dry cleaning outfits.

Surely, this work is limited to the extent that it did not study several small service businesses to justify the applicability of TD-ABC.

References

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