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Analysis of Factors Influencing Activity-Based Costing Applications in the Hospitality Industry in Yenagoa, Nigeria

Appah, Ebimobowei and Bariweni Binaebi
Department of Accounting, Faculty of Business Education, Bayelsa State College of Education, Okpoama Brass-Island, P.M.B. 74 Yenagoa, Nigeria

Abstract: This research examines the factors influencing activity-based costing application in the hospitality industry in Yenagoa, Nigeria. To achieve this objective, primary and secondary data were used. The secondary data include books, journals, periodicals, unpublished research materials and the internet and the primary data include interview and a well structured questionnaire administered to one hundred and 165 respondents in the 50 hotels sampled from the population. The data collected from the questionnaire were analyzed using relevant econometric tests such as unit root, granger causality and diagnostic, ordinary least square and descriptive statistics for the purpose of analysis. The results suggest a positive relationship between the factors influencing the adoption of ABC and the hospitality industry in Yenagoa. On the basis of the findings, the study concludes that for ABC adoption to be successful in the hospitality industry, owners and operators should invest on training, software and hardware, man-hour and commitment from all level of staff. Therefore, useful recommendations were provided for hotels in Yenagoa, Nigeria to fully adopt ABC costing technique for effective and efficient cost analysis and determination.

Keywords: Activity-based costing, cost distortion, decision usefulness, hospitality industry, performance measurement, Yenagoa, Nigeria

INTRODUCTION

The objective of any cost accounting system is to provide relevant and timely information to management for effective and efficient decision making. According to Adamu and Olotu (2010) this information supports better management of organizational resources in the production of products or provision of services and improves competitiveness in terms of costs, quality and profitability. Also Ofurum and Ogbonna (2008) state that managers in every field of human Endeavour need information that is relevant, objective and timely for planning, decision making and controlling of business activities in order to achieve the goal of the organization. Appah (2004) opine that cost accounting information is designed to suit particular organization, product, process and personality for organizational decision making. However, the complex nature of business organizations in the 21st century has made traditional costing accounting system ineffective and inefficient. Drury (2004) suggest that over the years the increased opportunity cost information and the decreased cost of operating more sophisticated cost systems, have increased the demand for more accurate product costs. Elhaman (2012) stated that activity based costing technique has been successfully developed to avoid the deficiencies of the traditional costing techniques of using direct labour to assign indirect cost.

It is against this background that Activity Based Costing (ABC) emerged. Therefore, Omoregie (2002) argue that ABC seeks both to allocate overheads to product costs on a more realistic basis other than production volume basis as well as showing the correlation between overhead costs and the activities that caused them.

ABC was promoted as a method for reducing the inaccuracies with traditional cost accounting systems that arise from prevalent technology and competition (Dood and Lavelle, 2002). The perceived deficiency of ABC is the use of a single cost driver for assigning overhead costs of products. As a result, this costing system fails to account for the changes occurring to cost structures in the modern business environment, where direct labour is no longer accounting for the majority of a products cost (Khana, 2002). Khana (2002) argues that the primary defects of traditional costing systems are the inability to provide useful feedback or understand and allocate overhead costs. Doyle (2002) also argues that traditional systems have the potential inability to account for the size and diversity of products, as a larger or more complex item that may produce more revenue, may also consume a larger than presumed overhead.

Maher, (2005) opine that ABC is a costing method that assigns costs first to activities and then to the

Corresponding Author: Appah, Ebimobowei, Department of Accounting, Faculty of Business Education, Bayelsa State College of Education, Okpoama Brass-Island, P.M.B. 74 Yenagoa, Nigeria

products based on each product's use of activities. It is based on the concept that products consume activities and activities consume resources. Lucey (2004) suggest that ABC is a method of charging overheads to cost units on the basis of benefits received from the particular indirect activity. Hilton *et al*. (2000) also argue that ABC traces costs of resources to activities and then to products and services based on the use of activities. Therefore, if managers want their products to be competitive, they must know: the activities that go into making the good or producing the service and the cost of those activities. To reduce a product's costs, managers will likely have to change the activities consumed by the product or service. Therefore, most research in the area of activity based costing concentrates on the manufacturing sector. Thus, the objective of this study is to examine the relevance of activity based costing adoption in terms of the cost drivers used to determine cost of service in hotels, handling of their indirect costs, costing of services to their customers, basis of billing their customers and implementation of ABC technique in the hospitality industry in Yenagoa the capital of Bayelsa State, Nigeria. Therefore, the objective of this study is to examine the application of activity based costing technique on the hospitality industry in Yenagoa, Bayelsa State, Nigeria. To achieve this objective, the study was divided into five interconnected sections. The next section presents the literature on activity based costing system. The third section provides the materials and methods. The fourth section presents the results and discussion while the final section presents the conclusion and recommendations.

LITERATURE REVIEW

The nature and scope of activity-based costing: Dood and Lavelle (2002); Kiani and Sangaladji (2003) state that ABC grew to become a well known concept in the 1980s when introduced into the Journal of Cost Management by Cooper and Kaplan. This method of costing allocates overhead costs to products based on actions that cause costs to occur (McCabe *et al*., 2004). In the initial stages, activities that are responsible for overhead cost consumption are established and costs that are consumed by these activities are identified. Following this, cost drivers are established to assign the activity costs to individual products or services. This allows costs to be traced to products depending on the individual activities that they consume (Ittner *et al*., 2002). ABC was developed as a result of the evident increasing overhead costs in manufacturing firms, sourcing many of the traditional costing inaccuracies (Hussain and Gunasekaran, 2001; Swenson and Barney, 2001). The majority of literature has explored the application of ABC in these environments and numerous studies have noted that the use of ABC in the manufacturing sector is still predominant (Bidanda *et al*., 2003; Johnson, 2002; and Sievanen and Tomberg, 2002). ABC is also important in the service sector due to the need to reduce the costs of services for retaining competitive capabilities (Clark and Mullins, 2001). According to Klein (2003), there is the need for an ABC system to compare benchmarks, measure performances and enhance quality of production of goods and services in contemporary organizations. The applicability of ABC to these areas and to all organizations in general, is attributed to the universal existence of activities (Kennedy and Affleck-Graves, 2001). As a result, ABC has been evident in areas such as database marketing (Doyle, 2002) the financial industry (Dodd and Lavelle, 2002), the healthcare industry (West and West, 1997) telecommunication, transport, wholesale and distribution and information services sectors (Kennedy and Affleck-Graves, 2001) and hotel industry (Adamu and Olotu, 2010).

Activity-based costing is a two-stage process. In the first stage it assigns all costs of resources to the activities in activity centers based on the resource drivers (Lucey, 2004). The amount paid for a resource and assigned to an activity is called a cost element (Omoregie, 2002). A cost pool is the classification of cost elements associated with one activity. According to Appah (2004) a cost pool does not have to contain only one activity. It can be formed by classifying a large number of activities into a few groups. In the second stage, costs are assigned to cost pools are then assigned to the products based on the products consumption activity and then level of the activity in the activity-based costing hierarchy. However, Drury (2004) argues that the design of activity-based costing involves four stages of identifying the major activities that take place in an organization; creating a cost pool/cost centre for each activity; determining the cost driver for each major activity; and assigning the cost of activities to products according to the product's demand for activities.

Advantages of activity-based costing: The use of ABC in manufacturing and non-manufacturing firms is advocated to be advantages. For example, studies show that activity-based costing increases the accuracy of cost allocation to products (Clark and Mullins, 2001), resulting in a more detailed view of the true costs and activities of individuals. It is also argued that greater processing of costs information and subsequent realization of accurate and relevant cost measurements are beneficial for making sound decisions and consequently taking appropriate actions (Hicks, 2005). Arguably the most debated advantage of ABC is whether or not the use of the advanced management technique improves firm performance. Lucey (2004) documents that the main claims made regarding.

ABC include: More realistic product costs are provided especially in Advanced Manufacturing Technology

factories where support overheads are a significant proportion of total costs; more overheads can be traced to product; ABC recognizes that it is activities which cause cost, not products and it is products which consume activities; ABC focuses attention on the real nature of cost behaviour and helps in reducing costs and identifying activities which do not add value to the product; ABC recognizes the complex city and diversity of modern production by the use of multiple cost drivers; ABC provides a reliable indication of long run variable product cost which is relevant to strategic decision making; ABC provides useful financial measures and finally ABC is flexible enough to trace costs to processes, customers, areas of managerial responsibility, as well as product costs.

The advantage of ABC according to Qian and Ben-Arieh (2008) is that ABC is a more accurate cost-estimation method. They argued that ABC helped managers to become aware of original parameters that created demands on indirect and keep up resources which can identify and remove non-value adding activities. Ben-Arieh and Qian (2003) and Qian and Ben-Arieh (2008) illustrated that ABC approach had demonstrated to be more accurate than traditional costing system. Singer and Donoso (2008) conducted several test on the validity of ABC cost estimation and they concluded that the accuracy of estimation of costs made by ABC was valid. Activity based costing was more accurate product costing than the traditional volume based methods.

Empirical evidence: There exist several empirical studies on Activity-Based Costing (ABC) on the performance of organizations. These studies document the contributions of ABC adoption on the effective and efficient performance of the various organizations when compared with non-adoption of ABC. Kennedy and Affleck-Graves (2001) examined the link between activity-based costing implementation and creation of shareholder value framework and event study methodology. They got responses from 47 ABC users and 187 non-ABC users. They found that choice of management accounting system such as activity-based costing for a sample of UK firms had a significant impact on firm value (27% over the three years from the beginning of the year in which activity-based costing was first introduced).

Cagwin and Bouwman (2002) in their survey of 210 internal auditors found that the firms with diverse product portfolio and with high proportion of overheads cost when they have adopted activity-based costing along with other strategic initiatives such as JIT and TQM, it resulted in substantial improvement in their return on investments. The other enabling conditions for the efficacy of the ABC in the organizations are sophisticated information technology systems, absence of excess capacity and competitive environment.

Ittner *et al*. (2002) examined the relationship between the extensive use of activity-based costing and plant level operational and financial performance indicators such as cycle time, quality, manufacturing cost improvements and return on assets. The quality variable was captured through finished product first pass quality yield in percentage terms and scraps and rework cost as a percentage of sales. The survey questionnaire was mailed to 25, 361 US firms who have subscribed to industry week. They received a response from 2789 firms, resulting in a response rate of 11%. They found 26% of the respondents did use activity-based costing extensively. They found moderate evidence that activity-based costing use is positively associated with the manufacturing performance. They demonstrated through path analysis that activity-based costing use has a positive indirect association with manufacturing cost reduction through improvements in quality and cycle time. No significant association with return on assets of activity-based costing use was observed.

Maelah and Ibrahim (2007) study of ABC adoption in Malaysia found that it is at infancy stage, with 36% adoption rate. The factors that influence ABC adoption are decision usefulness of accounting information, organization support and internal measures of performance. Rasiah (2011) document that in Malaysia most operations managers believed that their present costs systems were adequate for decision making. Activity based costing systems were evaluated as somewhat more useful, but no relevant literature was found to indicate that either the external and internal environment of the firm was correlated with the choice of cost system.

MATERIALS AND METHODS

The primary data for the study were generated through the administration of questionnaire conducted to evaluate the factors influencing activity based costing adoption in the hospitality industry in Yenagoa, the capital of Bayelsa State, Nigeria on two hundred and fifty responds (managers and accountants) on fifty (50) hotels (see appendix). The study was conducted between September-December 2010. The study used instruments developed by Maelah and Ibrahim (2007), Adamu and Olotu (2010) and Moll (2005) but modified by the author for this study. The Yaro Yamen model was used for the purpose of sample size determination. A total of 163 usable questionnaires were completed and used for the analysis representing 65%. The modified questionnaire was pre-tested using 10 hotels in the study. A reliability and internal consistency test was done on the collected data using Cronbach Alpha and Pearson Product Moment Correlation Coefficient model, to explore the consistency of the questionnaire. The result of the reliability test shows that the questionnaire design is highly reliable and consistent at 0.732 and 0.781. Excel software helped us to transform

the variables into format suitable for analysis, after which the econometric view (e-view) was utilized for data analysis. The ordinary least square regression, granger causality, unit root and diagnostic tests were adopted for the purpose of data analysis. Asterious and Hall (2007), Wooldridge (2006) document that the ordinary least square regression analysis shows the direction of causing/affecting between the dependent and independent variable. Gujarati and Porter (2009), Brook (2008) suggest that unit root test such as Dickey-Fuller, Augmented Dickey-Fuller, Philips-Perron and Kwiatkowski, Philips, Schmidt and Shin (KPSS) are used to determine the stationary and nonstationarity of variables. Granger Causality test refers to the ability of one variable to predict (and therefore cause) the other (Kozhan, 2010). Diagnostic tests were also conducted to determine the assumptions of the classical near regression model of multicollinearity, heteroskedasticity, autocorrelation, normality of disturbance. The ordinary least square was guided by the following linear model:

$$Y = f(X) \quad (1)$$

where, X are the factors that determines ABC adoption:

$$Y = f(X1, X2, X3, X4, X5) \quad (2)$$

where,
X1 = Potential cost distortion
X2 = Usefulness of accounting information
X3 = Top management support
X4 = Performance management
X5 = Training

$$ABC = \alpha + \beta_1 COD + \beta_2 UAI + \beta_3 TOM + \beta_4 PEM + \beta_5 TRA + \varepsilon \quad (3)$$

The a priori expectation of the linear model is presented below:

$$\partial COD/\partial ABC>0;\ \partial UAI/\partial ABC>0;\ \partial TOM/\partial ABC>0;\ \partial PEM/\partial ABC>0 \text{ and } \partial TRA/\partial ABC>0$$

where,
ABC = Activity-Based Costing Adoption
COD = potential cost distortion
UAI = Usefulness of Accounting Information
TOM = Top management
PEM = Performance measurement
TRA = Training; β_1, β_2, β_3, β_4, β_5 are the coefficients of the regression
α = The intercept of the regression
ε = The error term capturing other explanatory variables not explicitly included in the model

RESULTS AND DISCUSSION

The Table 1 shows the descriptive statistics for the dependent variable (ABC) and independent variables (COD, UAI, TOM PEM and TRA) for the mean, median, maximum, minimum, standard deviation, kurtosis, skewness and Jarque-Bera. The results indicate ABC of 12.763664, 12.0000, 24.00000, 8.00000, 2.969132, 1.625906, 5.662649 and 121.4398; COD of 13.09091, 12.00000, 23.00000, 10.00000, 2.413929, 1.064531, 4.493633 and 46.50144; UAI of 12.97576, 12.00000, 22.00000, 8.00000, 2.544606, 1.165301, 4.731323 and 57.95064; TOM of 12.57576, 12.00000, 21.00000, 9.00000, 2.247360, 1.086730, 4.657091 and 51.35538; PEM of 12.41818, 12.00000, 20.00000, 9.00000, 1.925670, 1.034649, 4.722467 and 49.83611 and TRA of 6.745455, 12.00000, 22.00000, 7.00000, 4.773727, 1.0869.

Table 2 presents the multiple regression result and the results indicate that ABC is significantly related to COD, UAI, TOM, PEM and TRA (i.e., 0.0006, 0.0033, 0.0275, 0.0307 and 0.0458 is greater than the critical value of 0.05). This implies the acceptance of the alternative hypothesis that potential cost distortion, usefulness of accounting information, top management support, performance measurement and training of employees are significant related to the adoption of ABC technique in the hospitality industry. This result is consistent with the study of Moll (2005), Maelah and Ibrahim (2007), Adamu and Olotu (2010) that the factors that influence ABC adoption are decision usefulness of accounting information, organization support and internal measures of performance. The R^2 and adjusted R^2 of about 50 and 43% shows that the model explains 50 and 43% of the variability of the dependent variable (ABC) while the balance are outside the model, that is 50 and 57%, respectively.

Table 1: Descriptive statistics

	ABC	COD	UAI	TOM	PEM	TRA
Mean	12.76364	13.09091	12.97576	12.57576	12.41818	6.745455
Median	12.00000	12.00000	12.00000	12.0000	12.00000	12.00000
Maximum	24.00000	23.00000	22.0000	21.0000	20.00000	22.00000
Minimum	8.00000	10.00000	8.00000	9.00000	9.00000	7.00000
Standard deviation	2.969132	2.413929	2.544606	2.247360	1.925670	4.773727
Skewness	1.625906	1.064531	1.165301	1.086730	1.034649	1.086914
Kurtosis	5.662649	4.493633	4.731323	4.657091	4.722467	4.187321
Jarque-bera	121.4398	46.50144	57.95064	51.35538	49.83611	42.17991
Probability	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Observation	165	165	165	165	165	165

E-view output

Table 2: Ordinary least square multiple regression

Dependent variable: ABC
Method: Least squares
Date: 12/13/11Time: 14:13
Sample: 1 165
Included observations: 165

Variable	Coefficient	S.E.	t-statistic	Prob.
C	4.601174	2.037506	2.258238	0.0253
COD	0.328328	0.093452	3.513332	0.0006
UAI	0.266254	0.089345	2.980057	0.0033
TOM	0.293073	0.102981	2.845894	0.0275
PEM	0.236823	0.115680	2.047225	0.0307
TRA	0.245022	0.103634	2.364301	0.0458
R-squared	0.504108	Mean dependent var		12.76364
Adjusted R-squared	0.425622	S.D. dependent var		2.969132
S.E. of regression	2.750458	Akaike info criterion		4.897098
Sum squared resid	1202.838	Schwarz criterion		5.010042
Log likelihood	-398.0106	F-statistic		6.422807
Durbin-Watson stat	1.925425	Prob (F-statistic)		0.000018

E-view output

Table 3: Breusch-Godfrey serial correlation LM test

F-statistic	8.269744	Probability	0.230385
Obs*R-squared	15.72562	Probability	0.370385

E-view output

Table 4: White heteroskedasticity test

F-statistic	1.418153	Probability	0.176969
Obs*R-squared	13.91325	Probability	0.176985

E-view output

Table 5: Ramsey RESET test

F-statistic	1.009835	Probability	0.366633
Log likelihood ratio	2.109047	Probability	0.348358

E-view output

Table 6: Unit root test (ADF)

Variable	ADF	1%	5%	Stage
ABC	-4.071106	-3.4722	-2.8795	Level
COD	-3.547454	-3.4722	-2.8795	Level
UAI	-4.036829	-3.4722	-2.8795	Level
TOM	-3.678941	-3.4722	-2.8795	Level
PEM	-4.539028	-3.4722	-2.8795	Level
TRA	-3.848270	-3.4722	-2.8795	Level

E-view output

Table 7: Pairwise Granger Causality Tests

Date: 12/13/11 Time: 14:57
Sample: 1 165
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
COD does not Granger Cause ABC	163	1.54590	0.02633
ABC does not Granger Cause COD		2.54603	0.08160
UAI does not Granger Cause ABC	163	1.45180	0.01725
ABC does not Granger Cause UAI		1.68234	0.18925
TOM does not Granger Cause ABC	163	0.38804	0.04903
ABC does not Granger Cause TOM		1.55125	0.21519
PEM does not Granger Cause ABC	163	0.21019	0.03065
ABC does not Granger Cause PEM		4.20803	0.01658
TRA does not Granger Cause ABC	163	0.04156	0.04930
ABC does not Granger Cause TRA		1.69897	0.18620

E-view output

The Table 3 presents the Breusch-Godfrey serial correlation LM test. The result indicates that there is no autocorrelation because the probability of 0.230385 is greater than the critical value of 0.05.

Table 4 shows the White Heteroskedasticity test and the result indicates that there is no evidence of heteroskedasticity. That is, 0.176969 is greater than 0.05.

The Table 5 presents the Ramsey RESET test for model specification and the result indicates that the model is properly modeled.

Table 6 presents the Augmented Dickey-Fuller Unit Root test for stationarity of the variables. The results indicate that all the variables are stationary at level data. That is, ABC, COD, UAI, TOM, PEM and TRA of -4.071106, -3.547454, -4.036829, -3.678941, -4.539028 and -3.848270 is greater than the 1 and 5% values of -3.4722 and -2.8795. This implies that all the variables are stationary at level data. The stationarity at level data implies that ordinary least square can be used for analysis (Asterious and Hall, 2007; Brook, 2008).

The Table 7 shows the pair wise granger causality test for the dependent variable (ABC) and independent variables (COD, UAI, TOM, PEM and TRA). The results indicate that COD granger cause ABC and ABC does not granger cause COD. This is also peculiar to ABC and UAI, TOM, PEM and TRA respectively.

CONCLUSION AND RECOMMENDATIONS

The study examines the factors influencing the adoption of activity-based costing in the hospitality industry in Yenagoa the capital of Bayelsa State, Nigeria. To achieve this objective, a well structured questionnaire titled Activity-Based Costing Adoption in The Hospitality Industry (ABCAHI) was administered to one hundred and 165 respondents mostly accountants and managers of the 50 hotels sampled in the study. The results indicates that the factors of potential cost distortion, usefulness of accounting information, top management support, performance measurement and training of employees are very important in the adoption of ABC in the hotel business to effectively and efficiently determine the most suitable cost driver

to arrive at cost of service in hotels, the basis of billing customers and the handing of indirect costs. The findings suggest that most of the hotels sampled in the study do not adopt activity-based costing. The result also indicates that the adoption of ABC in the hotel business is at the initial stage of implementation. Therefore, the study concludes that ABC adoption in the hotel business in Yenagoa is very low because most of the sampled hotels are used to the traditional techniques. Therefore, Maelah and Ibrahim (2007) documents that activity based costing system is a tool to provide management with a more accurate product costing. It provides organizations which the hospitality industry is not an exception with a whole spectrum of usefulness in decision making. The information gathered from activity-based costing can be used for planning, budgeting and performance measurement. Therefore, the decision for the hospitality industry to adopt activity-based costing requires the investment of funds for training; software and hardware development, man-hour and commitment from all staff in the hospitality industry. On the basis of the conclusion, the following recommendations are provided:

- Hotel owners and operators should be educated on the need to apply activity-based costing in the determination of appropriate overhead cost in the billing system
- Appropriate and reliable costs drivers should be identified that would provide the basis for costing hotel services
- Hotel owners and operators should be given the needed seminars and workshops on the merits of activity-based costing compared with the traditional techniques
- Researchers in the field of cost and management accounting should develop appropriate cost drivers different from those applied in the manufacturing industry that would enable operators in the hospitality industry develop suitable cost drivers for billing and serving their customers

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APPENDIX

Sample of the study:

S/N	Name of hotel	S/N	Name of hotel
1	Latik hotels Ltd.	26.	Udeme hotel
2	Ayala hotels Ltd.	27.	Atlantic choice hotel
3	Peretimi hotel Ltd.	28.	Monalisa hotel and suites
4	Gateway hotel	29.	Golden gate hotel
5	Ebisco hotel	30.	Hotel De glory land
6	Dim rose hotel	31.	Jame class hotel
7	Vic-Anthony hotel	32.	Laroszy hotel
8	Ebenezer Hotel	33.	Nitoko hotel
9	White Eagle hotel	34.	Osiri Classic hotel
10	Sumlite hotel	35.	Prince Ken hotel
11	Intercontinental hotel	36.	Residence Sorrentina hotel
12	Ididie hotel	37.	Sam carribeam hotel
13	Gill helina hotel	38.	Sam Flower hotel
14	Dau Karina hotel	39.	Treasure Garden hotel
15	Kadita hotel	40.	Tolda hotel
16	Green Villa hotel	41.	Uzevie Classic hotel
17	Nikton hotel	42.	Creek motel
18	Samphino hotel	43.	Rebatel hotel and suites
19	Orotex hotel	44.	Meglam hotel
20	Arietalin hotel	45.	Matho crystal hotels
21	Ayoks hotel	46.	Ebitare hotel
22	Emytel hotel	47.	Katsina hotel
23	Gevtex hotel	48.	Ngene hotal
24	Bay Bridge hotel	49.	Parkins suites
25	Baraih hotel	50.	Kadita hotel

Ministry of commerce and industry, Bayelsa State, Nigeria.

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