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**ANALYSIS OF ACTIVITY BASED COSTING AS A TOOL FOR  
MANAGEMENT DECISION MAKING IN SELECTED  
MANUFACTURING COMPANIES IN YOLA, ADAMAWA STATE**

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**ABSTRACT**

*This research is focused on analyzing activity based costing as a tool for management decision making in selected manufacturing companies in Yola, Adamawa state. The main objective is to ascertain whether activity based costing serves as a tool for management decision making. Survey research design was adopted. The population of the study consists of 25 staff each from the selected manufacturing companies in Yola i.e Adama Beverages Ltd and Bajabure Industrial Company. Data for this research was collected from both primary and secondary sources. To facilitate the data analysis, two hypotheses were formulated and data was analyzed using chi-square on the Statistical Package of Social Sciences (SPSS). Findings from the study reveal that ABC serves as a tool for decision making in manufacturing companies by virtue of a positive relationship between ABC and Management decision making and that there is a high relationship between ABC and management decision making. The study concludes that ABC serves as a tool for management decision making and therefore recommends that manufacturing companies should strive to adopt the ABC approach in computing costs as this will aid managements in avoiding unnecessary or excess costs as is common with other traditional costing techniques.*

**Keywords:** *Activity based costing, assessment, management, decision making, tool*

## **Introduction**

Manufacturing firms face an ever increasing competition in today's global market place. Companies must react quickly and manufacture high quality low cost products to be successful in the business environment. To make proper decisions, managers must have accurate and up to date costing information.

The Activity Based costing (ABC) system is a method of accounting used to find the total cost of activities necessary to make a product. The ABC system assigns cost to each activity that goes into production (Blakely-Gray 2018).

Mahal and Hossain (2015) revealed that ABC can radically change how managers determine the mix of their product line, price their product, and identify the location for sourcing component and access new technology. As a result of the change, the traditional costing system which one size fits all approach is not adequate for today's business situation. Not only is the traditional costing method unable to supply the tools measuring cost, it cannot provide managers with the information needed to Run manufacturing operation profitably.

Activity-based costing system, commonly known as the ABC system, emerged as a costing method capable of overcoming the limitations of traditional costing systems in the face of economic and technological developments, namely, the arbitrary and imprecise allocation of indirect costs from distortions in the imputation criteria (Quesado and Silva 2021).

Businessjargons (2021) defines management as the process of administering and controlling the affairs of the organization, irrespective of its nature, type, structure and size. It is an act of creating and maintaining such a business environment wherein the members of the organization can work together, and achieve business objectives efficiently and effectively. Management is the act of getting people together to accomplish desired goals and objectives using available resources efficiently and effectively. Since organizations can be viewed as systems, management can also be defined as human action, including design, to facilitate the production of useful outcomes from a system. This view opens the opportunity to manage oneself, a pre-requisite to attempting to manage others (Boundlessbusiness 2021).

According to Dikov (2019), many organizations lack efficient cost accumulation techniques and this may lead to inconsistency in the record kept by cost management for planning, formulation of policies and for control purposes. As such information provided to the management will not be adequate

and reliable for decision making in the organization. The Activity-Based Costing method identifies the activities in the company and assigns their costs to production based on actual consumption.

One of the most recognized definitions is of the Chartered Institute of Management Accounting (CIMA) and defines the ABC method as an ‘approach to costing and monitoring of activities which involves tracing resource consumption and assigning costs to final outputs.’ The method achieves this objective based on consumption estimates, using cost drivers to attach costs to outputs.

The Activity-Based Costing (ABC) model is used to get a sound estimate of the cost elements of products, services, and activities, to support the decision-making process within a company.

Dikov (2019) also posited that ABC model can be looked at from the perspective of two aims:

- Product aim – identify and cancel unprofitable products and services, and lower prices of overpriced ones;
- Process aim – identify and eliminate ineffective or useless processes and implement process concepts that lead to the same products at improved yields.

The Activity-Based Costing method assigns the company’s resource costs to products and services provided to clients via activities. We use it mostly as a tool to analyze product and customer cost and profitability, to support strategic decisions like pricing, outsourcing, management of process improvement projects, and others.

ABC bases its system of cost accounting on activities, which can be any tasks, events or other units of work. Each activity has a cost driver, which can be anything like purchase orders, machine setups, quality checks, and others.

Financial analysts mostly use the model in costing, pricing and profitability analysis. It helps the company to develop a better sense of its costs and to adopt the most appropriate pricing strategies.

Activity-Based Costing can help in two ways:

- It replaces one company-wide cost pool with more cost pools linked to company activities;
- It provides a new base for allocating costs so that they are assigned based on the event that generates them, not based on volume measures.

Traditionally indirect costs were analyzed as caused equally by all products the company was making. With the increase in indirect costs' share, this became too inaccurate. Products spending more time in an expensive machine should cost more than those requiring less time in specialized machinery. This discrepancy presented a possibility that cost allocation is even more inaccurate when two products share typical costs, as one might be subsidizing or dragging down the other.

The Activity-Based Costing originated from George Staubus's Activity Costing and Input-Output Accounting publication. The method was developed in the 1970s and 1980s in the US manufacturing sector and formalized in its current form by the Consortium for Advanced Management-International (CAM-I). A cost driver is the factor that creates and drives the activity. Take machine hours as an example – machine operating hours drive power costs and maintenance costs.

The Activity-Based Costing aids the costing process of the company by extending the cost pools used to analyze overheads and linking indirect costs to specific activities.

We can identify two categories of activity measures:

- Transaction drivers – how many times a task occurs;
- Duration drivers – how long it takes to perform an activity.

Averkamp (2020) opined that activity based costing recognizes that the special engineering, special testing, machine setups, and others are activities that cause costs—they cause the company to consume resources. Under ABC, the company will calculate the cost of the resources used in each of these activities. Next, the cost of each of these activities will be assigned only to the products that demanded the activities. In our example, Product 124 will be assigned some of the company's costs of special engineering, special testing, and machine setup. Other products that use any of these activities will also be assigned some of their costs. Product 366 will not be assigned any cost of special engineering or special testing, and it will be assigned only a small amount of machine setup. Activity based costing has grown in importance in recent decades because (1) manufacturing overhead costs have increased significantly, (2) the manufacturing overhead costs no longer correlate with the productive machine hours or direct labor hours, (3) the diversity of products and the diversity in

customers' demands have grown, and (4) some products are produced in large batches, while others are produced in small batches.

According to Maitrayee (2018), conventional costing systems are built on the assumption that product drives the costs directly. ABC system drives indirect and support expenses, first to the activities and processes and then to products, services, and customers, giving managers a clearer picture of economics of their operations and services. Activities can be defined as a named process, function, or task that occurs over time and has recognized results. Activities use up assigned resources to produce products and services. Inputs are transformed into outputs under the parameters set by controls performed by the organization's employees and their tools. Activities can be perceived as consumers of resources in production of materials, services, events, or information. Activities are the common denominator between business process improvement and information improvement.

Another problem experienced by companies to a lesser degree is the lack of internal project support. In the current context, the development of an adequate costing system is of extreme importance in organizations because they feel the need to properly manage the resources at their disposal and control their costs to achieve efficient and effective management.

## **OBJECTIVES OF THE STUDY**

Therefore, this study assesses;

- i. Whether activity based costing serves as a tool for management decision making and
- ii. The extent of the relationship between activity based costing and management decision making

## **MATERIALS AND METHODS**

### **Research Hypotheses**

To achieve the above objectives, 2 hypotheses were formulated as stated below:

H<sub>01</sub>: Activity based costing does not serves as a tool for management decision making.

H<sub>02</sub>: The extent of the relationship between activity based costing and management decision making is low.

### Research Designs

The research design adopted for this study is the survey research method. The survey design approach was justified on account of its economy, rapid data collection and ability to understand a population from a part.

### Population and Sampling Technique

The population of the study consists of 25 staff each from the selected manufacturing companies in Yola i.e Adama Beverages Ltd and Bajabure Industrial Company randomly selected.

### Method of Data Analysis

Chi-square was used in testing both the two hypotheses on SPSS. The decision rule is to accept the null hypothesis if the Asymptotic cell count value is greater than the P-value and to reject if otherwise.

Df = Degree of freedom (C – 1) (R – 2) 5% or 0.05 was assumed as the significance level

## RESULTS AND DISCUSSION

### Test of Hypothesis 1

As stated before, chi-square was used in testing both hypotheses, the hypothesis is restated as:

H<sub>01</sub>: Activity based costing does not serve as a tool for management decision making.

In testing hypothesis 1 above, responses from question 1-4 on the questionnaire were used.

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
<b>Does Activity Based Costing serve as a tool for Mgt. decision making?</b>	40	80%	10	20%	50	100%

**Does Activity Based Costing serve as a tool for Mgt. decision making? ABC Cross tabulation**

		ABC		Total
		Yes	No	
<b>Does Activity Based Costing serve as a tool for Mgt. decision making?</b>	Senior Staff	10	0	10
	Middle Level Staff	19	1	20
	Staff	7	3	10
	Junior Staff	36	4	40
<b>Total</b>				

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
<b>Pearson Chi-Square</b>	2.2197 <sup>a</sup>	2	.1435
<b>Likelihood Ratio</b>	2.2519	2	.14
<b>Linear-by-Linear Association</b>	0.7742	1	.2051
<b>N of Valid Cases</b>	40		

a. 1 cell has count less than 5. The minimum expected count is 0.4886.

The key result in the Chi-Square Tests table is the Pearson Chi-Square.

- The value of the test statistic is 2.2197.
- The 1<sup>st</sup> and 2<sup>nd</sup> columns have cell counts greater than or equal to 5 except the 3<sup>rd</sup> column: so this assumption (hypothesis) was not met.
- Because the test statistic is based on a 3x2 crosstabulation table, the degrees of freedom (df) for the test statistic is  $df = (R - 1) * (C - 1) = (3 - 1) * (2 - 1) = 2 * 1 = 2$
- The corresponding p-value of the test statistic is  $p = 0.1435$ .

**DECISION**

Since the p-value is less than our chosen significance level ( $\alpha = 0.05$ ), we therefore reject the null hypothesis. Rather, we conclude that Activity Based Costing serves as a tool for management decision making.

Based on the results, we can state the following:

- A significant relationship was found between ABC and Management Decision Making ( $X^2(2) > 2.2197, p = 0.1435$ ).

**Test of Hypothesis 2**

H<sub>02</sub>: The extent of the relationship between activity based costing and management decision making is low.

In testing hypothesis 2 above, responses from question 5-7 on the questionnaire were used.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
<b>What is the extent of the relationship b/w ABC and Mgt. decision making?</b>	40	80%	10	20%	50	100%

**What is the extent of the relationship b/w ABC and Mgt. decision making?**

**Mgt. Decision**

**Making Cross tabulation**

		ABC		Total
		High	Low	
<b>What is the extent of the relationship b/w ABC and Mgt. decision making?</b>	Senior Staff	8	2	10
	Middle Level Staff	17	3	20
	Staff	9	1	10
	Junior Staff	34	6	40
<b>Total</b>				

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
<b>Pearson Chi-Square</b>	.2251 <sup>a</sup>	2	.1455
<b>Likelihood Ratio</b>	2.2940	2	.142
<b>Linear-by-Linear Association</b>	.7852	1	.208
<b>N of Valid Cases</b>	40		

b. 1 cell has count less than 5. The minimum expected count is 0.4955.



The key result in the Chi-Square Tests table is the Pearson Chi-Square.

- The value of the test statistic is 0.2251.
- The 1<sup>st</sup> and 2<sup>nd</sup> columns have cell counts greater than or equal to 5 except the 3<sup>rd</sup> column: so this assumption (hypothesis) was not met.
- Because the test statistic is based on a 3x2 crosstabulation table, the degrees of freedom (df) for the test statistic is  $df = (R - 1) * (C - 1) = (3 - 1) * (2 - 1) = 2 * 1 = 2$
- The corresponding p-value of the test statistic is  $p = 0.1455$ .

## **DECISION**

Since the p-value is less than our chosen significance level ( $\alpha = 0.05$ ), we therefore reject the null hypothesis. Rather, we conclude that the extent of the relationship between Activity Based Costing and management decision making is significantly high.

Based on the results, we can state the following:

- A significantly high relationship was found between ABC and Management Decision Making ( $X^2(2) > 0.2251, p = 0.1455$ ).

## **Discussion**

Findings from testing hypothesis 1 reveal a test statistic of 2.2197 with an Asymptotic significance cell count of 0.4886 at P-Value of 0.1435 which is less than the assumed 0.05 significance level, hence the null hypothesis which stated that Activity based costing does not serve as a tool for management decision making is rejected.

Findings from testing hypothesis 2 reveal a test statistic of 0.2251 with an Asymptotic significance cell count of 0.4955 at P-Value of 0.1455 which is less than the assumed 0.05 significance level. As such, the null hypothesis which states that the extent of the relationship between activity based costing and management decision making is low is hereby rejected.

## **Conclusions**

Based on the findings of the study, it is concluded that Activity based costing serves as a valuable tool for management decision making in Adama Beverages Ltd and Bajabure Industrial Company.

On the extent of relationship between activity based costing and management decision making, the study concludes that there is a high and positive

relationship between ABC and decision making in Adama Beverages Ltd and Bajabure Industrial Company.

### **Recommendations**

By virtue of the study revealing that Activity based costing serves as a tool for management decision, and that a high relationship exists between both, the study recommends that manufacturing companies should strive to adopt the ABC approach in computing costs as this will aid managements in avoiding unnecessary or excess costs as is common with other traditional costing techniques.

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