OU卢商业学校

Endurance Agyenim-Boateng

CORNERSTONES OF THE ACTIVITY-BASED COSTING SYSTEM: A LITERATURE REVIEW OF PROFESSIONAL PERSPECTIVE

Master’s Thesis
Department of Accounting
October, 2017
This study is based on the cornerstones which forms the components of Activity-based costing. These cornerstones work together to bring about the successes that firms reap after implementing the ABC system. Firms exist mainly to gain profit by providing goods and services that will satisfy customers by delivering them with the value they demand. The cost system used by firms is therefore an essential decision to be made by the firm in question. Activity-based costing has been accepted and implemented by numerous firms who speaks so highly of it. But one will want to probe more into the system to understand the main elements that combine to form the system. This gave way to the main objective of this study to uncover and compile the cornerstones of the ABC system which has been compiled by practitioners in professional literatures.

The study uncovered eight cornerstones of the ABC system which work hand in hand to achieve the aims and goals of the organizational cost system. Some of the cornerstones are basic to the survival of the cost system but nevertheless, they still work in cooperation with the others to ensure a smooth running of the system.

The results also established the link that exists between the cornerstones and how the correlate which each other in the process of spreading overhead costs to cost objects.

Keywords

Activity –based costing, Cornerstones, Cost

Abstract of Master’s Thesis

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<th>Unit</th>
<th>Degree Programme</th>
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<td>Department of Accounting</td>
<td>M.Sc. (Econ. &amp; Bus. Admn)</td>
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<tr>
<td>Author</td>
<td>Supervisor</td>
</tr>
<tr>
<td>Agyenim-Boateng Endurance</td>
<td>Sinikka Moilanen (Dr.)</td>
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**Title of Thesis**
Cornerstones of the Activity-Based Costing system: A Literature Review of Professional Perspective

**Subject**
Accounting

**Type of Work**
Master’s Thesis

**Time of Publication**
October 2017

**Number of Pages**
84

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Additional information
Acknowledgements

I am exceedingly grateful to the Almighty God who gave me unlimited wisdom and knowledge to start and complete this work effectively. His grace, mercy and everlasting love can never be overlooked and I am extremely grateful to God.

I cannot thank my supervisor Professor Sinikka Moilanen enough, I gave her lots of stress for this work because of the green nature of my exposure to academic writings. Her counselling, guidance, advices and contributions immensely encouraged me to work hard to complete my research. Without her, this work would have lost its worth and value and I am very grateful for her insights. And to all my lecturers in University of Oulu, I am very grateful. On this note I will like to acknowledge that any shortcoming of this work is to be associated to the author of the work.

Much appreciation to Pastor James and Pastor Sunday for their insights and proofreading, advice and corrections which made me realize how messy my work actually was. I appreciate the sleepless nights I gave Precious Maxi-Gula and my big brother Emmanuel Agyenim-Boateng over this work. I was overwhelmed by your unimaginable sacrifices for me.

I am greatly obligated to the Agyenim-Boateng family, my mum who has been my backbone, Mrs. Agyenim-Boateng, your love and support is highly appreciated, you will always remind me of how I can do it and how you support me with prayers. And to all my siblings (Team GRACE) I am so grateful and I hope you can see the result of those unending annoying calls for advice. And to daddy, Dr. Agyenim-Boateng (Ph.D.) I am speechless when it comes to your support, I have always looked up to you, and I am very grateful daddy.

I can never forget the part that my friends Forster Boateng, Emmanuel Armoh and Francis Boafoh played in my life during the time I was dedicated to finishing this project. Your love, encouragements, technical help, inspiration and tolerance to my unending drama is greatly appreciated. You three always inspire me to get my priorities right and you are the real definition of ‘there is a friend that sticks closer than a brother’, Thank you very much.

Finally, anyone who contributed in any form toward this accomplishment is highly appreciated, thank you all very much.
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1 INTRODUCTION

1.1 Background

An organization exists purposely to provide goods or services either for profit or not for profit. Every organization incurs costs, hence cost is inevitable to the organization. Cost comes about due to the activities that the organization performs to do what it exists to do. The cost system used in the firm forms an integral part of the organization and so must be managed well since the success of other aspects of the organization depends on it.

In this current and constantly changing global economy, it has become prudent to use effective and efficient cost systems in the calculation and allocation of cost especially indirect costs. The mode of allocating overhead cost is a huge decision to be made by a company since it has the possibility of affecting the profitability of the firm. In the past, firms and academic professions only competed among themselves on a local level. In such recent times of improved technology and information growth, there is the need for a more effective and efficient allocation of cost to products. This development will serve as a guide in the decision and performance of the activities, of which the traditional absorption cost could not provide such improved information to assist the firm in competing effectively (Kaplan and Cooper, 1988).

The Activity-based costing (ABC) came into the picture because of the deficiencies of the traditional cost system’s inability to provide managers with accurate information (Kaplan and Cooper, 1988). There have been various setbacks regarding the use of the traditional method to calculate and allocate overhead cost to products. These setbacks led to the introduction of the ABC to calculate and allocate overhead costs to products, to be used as a system to mitigate most of the limitations of the old absorption cost system. Gunsekaran (1999) stated that, the absorption cost method is not capable of providing adequate and error free benchmark to the accomplishment of activities. The authors added that, the absorption cost method cannot communicate accurate knowledge concerning value added activities (Kaplan and Cooper, 1988; Gunsekaran 1999).

The ABC system per Kaplan and Anderson (2003) is a transaction driven based model that depends on activities that takes place in the production process. Such activities
may include purchase order issue, process customer request, machine set up among others. He also expressed ABC as an effective means of allocating and calculating indirect cost to products on the operating activities of the organization. ABC allocates costs by having cost drivers which are factors that can influence the cost of a cost activity, an example is a number of the purchase order, machine hours, and number of parts among others as stated by Kaplan and Anderson (2003). Jones and Dugdale (2002) proposed that, ABC can be likened to a container which holds different equipment or devices to be exploited when the need arises. (Kaplan and Anderson 2003; Jones and Dugdale 2002).

Direct labor hours and direct machine hours were used to distribute overhead costs to the product cost since they are both single-volume measures as mentioned by Datar and Gupta (1994). But these single-volume modes of allocation of indirect costs to products are prone to making errors and mistakes when determining and allocating costs. Companies are motivated to improve their systems (most importantly cost systems) due to their quest to achieve a competitive advantage in a highly competing and constantly changing business environment. This quest therefore has made it prudent for companies to strategies themselves especially in their management system in other to achieve set business objectives as well as compete effectively.

It has become necessary to replace the traditional absorption system with ABC which can provide accurate cost measures to allocate indirect costs to products. ABC obviously has enormous merits coupled with few setbacks too, the subject of ABC has not only affected the choice of cost system of its practitioners but it has had an influence about research in the academia as well. Most research literatures in the Management accounting journal and other accounting journals are focused and concentrated on ABC. The question now is, what is the main foundation on which the ABC system dwells? By this question, then we can get to know about the cornerstones of the ABC system which determines the success or failure of the system in the organization (Datar and Gupta 1994).

Since the inauguration of ABC in 1987, there has been enormous attention given to it both by the industries and researchers in the academia (Bjornenak and Mitchell 2002). Pierce and O’Dea (1998); Kaplan and Anderson (2003); Stratton et al (2009) are only but a few of researchers who took interest in the subject of ABC. It is an obvious fact
that ABC has left a mark on several accounting journals which cannot be easily wiped off. A lot of research journals have been attracted to the subject ABC apart from the professional journals, although most of the research on ABC emerged from the professional journals (Shields 1997).

These other journals are very insightful and eye-catching despite their few in terms of the number (Bjornenak and Mitchel 2002). ABC can now affect the exploration, tuition and performance of management accounting function. This is because of the important function of the accounting journal which acts as an intermediary for transfer of information. In order to supply an avenue for ABC facts that are learned by study or experience in detail to make it available to its cult. However the ABC research is more concentrated in developed countries since most developing countries have not recorded much research on ABC (Lana and Fei 2007; Bjornenak and Mitchel 2002; Shields 1997).

1.2 Earlier research and motivation

ABC came into play in 1987 but gained grounds in 1990 where companies accepted, adopted and started to implement. Bjornenak and Mitchell 2002 conducted a research about the development of ABC but their study was limited from 1987 to 2000. Their research was also a literature review using both academic and professional literature for their study. But this study is different even though professional literature is being used but the concentration of this study is limited to only the cornerstones of the ABC system. Also, Bjornenak and Mitchell 2002 used both academic and professional literatures for their study but again this study is limited to only professional literatures. This study is to bring out the cornerstones on which the ABC system dwells as illustrated by professional literatures. ABC was implemented by most companies in 1990 (Kaplan and Cooper 1998).

It is necessary to identify the building blocks of the ABC system as enlightened in the professional literatures and coherently gather them to add up to existing knowledge. There is the need to discuss in detail the elements that come together to form the ABC system and how they work hand in hand to establish the success of the system. An extensive consideration of the foundation on which the ABC system which has been
helping most companies is based on is needed therefore needed. In a nutshell, the main
objective of this study is to bring out a collaborated knowledge of the cornerstones of
ABC as presented practitioners in the professional literature.

Most researchers in their research have enlightened in their own little way about the
cornerstones which make up the ABC system which insights the main purpose of this
research to go deep into what professionals have written previously concerning the
building blocks of ABC. This principal goal of the research has been segregated into
three parts to create an effective understanding of the study. The three sub objectives
of the study is;

1. To compile the cornerstones of ABC as reflected in professional
literature into a whole document for easy accessibility and add to the
existing knowledge.
2. To identify the similarities and differences of ABC cornerstones as
reflected in theory and professional literature.
3. To enlighten the roles of each cornerstone and how they collaborate
with each other to bring out a successful ABC system.

However, even though the cornerstones are mainly based on the presentation made by
Turney, (1992); it will be enlightened in the light of the views of other authors as well.
(Bjornenak and Mitchel 2002; Turney 1992). The cornerstones of ABC are spoken
about in most literatures but this study is to create a concise compilation of the
cornerstones in the light of professional literatures.

1.3 Research question

Most companies have accepted ABC system and implemented it in their cost systems.
It is therefore relevant to compile the basic elements on which the system depends to
run. These basic elements are the cornerstones of the ABC system. The research
question for this study is; how are the cornerstones of the Activity-based costing
reflected in professional literatures? By this question, the author will compile and
illustrate the image that the cornerstones of ABC have been painted in professional
literatures. How these cornerstones were presented in the professional literatures,
correlate with each other and how those cornerstones of ABC reflected in professional literatures differ from those presented by academic literatures if any to add to knowledge.

The research question has however been divided in three basic forms. The first question is; how are the cornerstones of ABC reflected in professional literatures? And the second question is; what are the similarities and differences of ABC cornerstones as reflected in theory and Professional literatures? The final question to be answered by the research is; how does the individual cornerstones correlate with each other to bring a successful ABC system in an organization?

1.4 Methodology

The research is a qualitative research which will make use of data from the professional literatures published in the journals of the strategic finance journal and the Harvard Business Review journal. The data include published professional literatures but will not be selective about the countries which they were published to provide an extensive use of the academic knowledge. The study employed the qualitative content analysis (QCA) method to answer the research questions. This research method will be exploited in the section 3 below.

1.5 Structure of the research

The research has been divided into five (5) main parts; the first part is the introduction which gives a brief summary of the research, then the study explores relevant literature in chapter 2; chapter 3 showcase methodology for the study; the extracted data were analyzed in chapter 4 and finally, chapter 5 discusses the results found and end the study with an insightful conclusion.
2 LITERATURE REVIEW

This section will highlight the important issues to know and understand in the cost system as a whole and issues pertaining to traditional costing and mostly the ABC system in detail to broaden the understanding of what the ABC system itself is.

2.1 General overview of cost

The benefit to be obtained by making a decision in an organization as compared to the cost to be incurred by making such a decision must be greater and such decisions are of importance to the firm and its management. The firm however will be prone to stop functioning effectively if its managers do not have a clue about the results of a decision they make in the organization. Managers are supposed to act rationally and so the benefits of adopting a managerial accounting technique should be more than the cost needed to implement it (Zimmerman 1997 and Johnson and Kaplan 1987).

2.1.1 Why do Organizations assign costs to products?

An organization may assign cost to product due to its demand for cost information for two (2) basic reasons, these two reasons are;

For External usage: cost information that is necessary for the determination of the cost of production is needed by financial accountants for their periodic reports which are normally intended for external usage (Drury 2012). The financial accounting reports are delivered on periodic basis mostly annually, they are mandatory to be prepared and given to the shareholders, lenders, investors, government agencies and other external interested parties who based on the financial reports of an organization to make essential decisions. The main source of information for the financial accountant is that which is provided by the cost accountant in relation to the cost of goods sold and inventory in hold which necessarily determines the profit to be attained by the organization in that particular accounting period.

An inadequate cost information delivered to the financial accountant can go a long way to affect the financial reports of the organization hence might lead to misleading judgements and errors in the decision of its users. Due to this, the accuracy of the cost
to be assigned to products are primarily very important for strategic decisions in the company (Drury 2012).

For internal usage: there are necessary information disclosures in regard to the cost assigned to products that are required for decision making. This is because the cost assigned to a product might include some elements which do not make any impact in decisions such as depreciation cost. Depreciation costs are not an actual cost incurred on the product but are categorized under accounting cost and so do not actually influence decision making in the organization. Certain strategic decisions made in the organization may demand the disclosure of such costs which are embedded in the product cost with regards to its inventory for accounting reasons (Drury 2012).

However certain non-manufacturing costs even though they are not directly related to the manufacturing of goods are relevant for decision making. It is not only about calculating costs and assigning them to products but the provision of relevant information that will aid management in the steps to take. Management needs to know the impact that each product is making to the overall profitability of the firm to decide whether to increase the production of a particular product or to cease its production, whether to enhance the use of the machine and reduce labor or to continue using labor intensive methods. This information is supposed to be conveyed to management through with the help of an appropriate cost system (Drury 2012).

Horngren et al. (2011) notwithstanding demonstrated that there are basically three main aims of allocating costs to products and services responsible for their existence. That explains the main target that the organization has behind the allocation of costs to cost objects (Horngren et al. 2008; Kaplan and Cooper 1998). Every action that the management in a firm takes can have an impact on the organization. The impact whether positive or negative will depend on the kind of decision taking in the circumstance the firm finds itself. Due to this, the custodians of the firm are to be access the impact of every decision that they take and measure if it will help the organization before making such decisions to avoid negative effects. Cost decisions are a very important decision and so the managers much turn all stones and be well informed before taking any step since the decision can affect the profitability of the...
firm. Every addition or subtractions made to this system can influence the organization (Horngren et al. 2008, p. 180)

The three basic aims for allocating costs per Horngren et al. (2012) are;

*Motivation:* some companies allocate costs in a way that will stir up managers and encourage them to bring out the best in them to benefit the organization. Cost allocation is therefore used as an encouragement tool that will enhance the performance of certain departments and sections in the firm. Some firms do not allocate cost to certain departments that provide them with certain beneficial internal services to boost their moral and development for such sectors within the firm to be encouraged in the performance of their services. Other firms may decide to allocate costs to these internal service providers with the aim to make them aware of the cost they add to the overall cost of the organization as a whole. In effect, they encourage them to enhance their performance in a way that the benefits they provide to the company will be more than the associated costs that they bring along. In both cases, the motivational aim is attained but by different applications, and so the allocation of cost to cost objects is aimed at encouraging managers to bring about an enhancement in their performance (Horngren et al. 2008, p. 180).

*Cost allocations are for calculating Income and Valuing Assets:* Financial accountants rely on management accountants to provide them with useful information for the preparation of financial accounts. The allocation of cost has a resultant effect on the cost of goods sold on the face of the financial statements from the determination of the cost of inventory from the books of the management accountant. The determination of the cost of sales depends on the cost of inventory, and so it can be said that the determination of income in the income statement highly depends on the allocation of cost. Due to this, cost allocation is aimed at determining the income that was made in the firm at the end of the financial period. This allocation information can also be used by managers for strategic planning, performance measuring and controlling in the organization (Horngren et al. 2008, p. 180).

*To explain costs and have a proof of the costs:* Cost allocation is necessary to serve as a proof of how managers arrived at the overall cost of a product or service. It is also important in contracts especially government contracts where the funds are normally
given out using the reimbursement method. With the information available during the allocation of cost, the firm can be able to know how much has been spent to calculate the cost plus a profit margin. In most instances, prices are calculated based on the cost and so the cost information from the allocation of cost might be useful to provide a proof for a bid which has been approved (Horngren et al. 2008, p. 180).

The above three purposes of allocating costs are not the only reasons, cost allocation has lots of purposes but the above are the basic ones. Other cost allocation purposes could be to reduce waste, to determine the prices of goods, to evaluate the performance of managers and services and to make decisions in the organization that are affected by the cost system of the organization (Horngren et al. 2008, p. 180).

2.1.2 How the traditional cost system allocates overhead costs

In manufacturing firms, the traditional cost system uses four main stages to allocate overhead cost to various cost objects especially in manufacturing firms with the use of the two-stage allocation process (Drury 2012, p. 50). The four stages are;

Firstly, the indirect costs of production are charged to the production and service cost centers. Most manufacturing firms have two basic sectors, one that deals with the production of goods and services and the other that deals with supporting services to the production sectors. These supporting services department do not actually engage in the production of goods and services but they support the production department by providing them with certain useful services that will help them in their process such as material procurement, and factory support among others. In this stage, the overhead cost will be assigned directly to the cost centers which are responsible for those costs (Drury 2012, p.52).

The cost of overheads to be allocated to products are an indirect cost to the product but when it comes to the cost centers, some of them are not indirect costs but they are direct costs to the cost centers. This is because, some overhead cost (such as indirect labor and indirect material cost) can be directly traced to a particular cost center (hence it been a direct cost to the cost center) but it cannot be traced to the cost object which
could be product or service directly (hence it been an indirect cost to the cost object. Those overhead costs which cannot be traced to a particular cost center directly are to be allocated to the cost centers by using the right basis of allocation. The basis of allocation can be in the form of an area, a floor size, a number of employees and plant and machinery amount among others (Drury 2012, p. 52).

Secondly, the costs that were charged to the service cost sectors are to be reassigned to the production cost centers. It is not right for cost incurred in production to be directly allocated to the service cost center since these support departments have no direct links with the products produced. This is because the support units of the organization themselves do not participate in the actual production of goods and services but they assist the other sectors of the firm by providing beneficial supports that helps them in their duties. Due to this, it is only right to reassign the cost that was allocated to the service cost centers back to the production cost centers (Drury 2012, p. 55).

Since the production cost centers are directly involved in the production of goods and services, it will be highly impracticable and unacceptable for products to absorb the cost through the service cost centers. Notwithstanding, the cost of providing these essential support services are also part of the cost of the product. The reciprocal method is used to apportion the cost of service cost centers to production cost centers in cases where the service cost centers provide support service to themselves. In traditional cost system, product cost should be assigned to cost centers that are directly engaged in the production of the products. The reassignment is normally based on the amount of support received by each of the production cost centers from the service cost center on pro rata basis (Drury 2012, p. 55).

In the third stage, the adequate overhead rate must be determined by means of calculation for the respective production cost centers in the organization (Drury 2012, p.55). The determination of the overhead rate is necessary because each of the cost centers may have different products that are produced over there. The case is different from when the cost center engages in the production of just one product, then all the cost can be assigned to that product. In computing the overhead rates, the consideration
factor is mostly on the portion of time that is allocated to the particular product by the cost center. In most cases, the direct labor hour, machine labor hour or the direct wages are used as allocation bases for the overhead rate computations (Drury 2012, p. 55). The overhead rates will therefore be; amount in € per machine hour or amount in € per direct labor hour. The formula for computing the overhead rate is;

\[
\text{Overhead rate} = \frac{\text{Cost center overheads}}{\text{Cost center direct labor hours or machine hours}}
\]

The final stage of this traditional cost system allocation of overheads is to finally charge the indirect cost that is attributed to each product to the appropriate cost object or product (Drury 2012, p. 56). This final stage will be done with the help of the overhead rates that were computed in the third stage, the actual hours spent on the particular product by the cost center is multiplied by the overhead rate of the product to get the amount of overhead cost to be assigned to that product (Drury 2012, p. 56). For instance, if the overhead rate of product X is €9 per machine hour, and the amount of machine hours used on the product says 10, then the total overhead cost to be allocated to product X will be €90 (€9*10).

To get the total cost of the product, the direct cost of that product is added to the overhead cost assigned to that product to get the total cost for producing that product (Drury 2012, p. 56). Further calculations are made by dividing the total cost of the product by the number of units produced to get the cost per unit of the product. This is how the traditional cost method goes about to allocate cost to various products in the firm (Drury 2012, p. 56). Figure 1 shows how costs are assigned using the traditional cost system;
Figure 1. The flow of cost to cost objects (products) using the traditional cost system (Kaplan and Cooper, 1998, p 83).
2.2 ACTIVITY-BASED COSTING (ABC)

2.2.1 Concept of ABC

The concept of ABC hails from the 1980s precisely 1983 (Kaplan 1983). Due to its ability to mitigate and provide solutions to most of the limitations that were facing most companies using the absorption costing, the ABC was accepted and implemented by firms as the savior to the allocation of costs and the provision of essential cost information. ABC came to play because of the failure of the traditional cost system to provide managers with relevant cost information necessary in strategic and developmental decision making. This resulted in cost inaccurate cost information which brought about inappropriate and wrong decision making (Kaplan 1983, 1988).

With the information provided by the ABC system, managers can easily predict the effect of a change in an activity on the resource base of the organization and prepare toward it through effective planning and control measures. The ABC ascertains and explains cost more clearly (Cooper and Kaplan 1999). The traditional cost system assigned indirect overhead costs to costs objects using volume based methods but this approach is enhanced by the ABC system by creating a connection between the numerous and different products and the resources used in producing them, not only the visible products (Kaplan and Cooper 1998, 1999).

The traditional cost system assumes that the two (2) main bases on which it uses to allocate overhead costs (namely; direct labor and machine hours) can greatly affect the degree of resource spent in the long term. By this the traditional cost system therefore concentrates on these two bases for the allocation of the overhead cost to various cost objects (Drury 2012). ABC uses a different allocation base unlike the traditional cost system. ABC in its initial stage of allocation (first stage) uses a vast amount of cost drivers of diverse categories and an extensive amount of cost drivers for each activity performed in the production process in its second stage allocation.

There are certain activities which are not directly connected to the transformation of raw materials into finish goods, but they have associated expense cost and so this expense is linked to the activity in the ABC system to bring out the true cost of production. Kaplan and Cooper (1998) stated that, the traditional cost system depends immensely on the use of unit cost drivers to assign cost to cost object but the ABC
system does not employ unit cost drivers in its cost assignment (Kaplan and Cooper 1998, Drury 2012).

Managers of the organization with the aid of the ABC system can now have a transparent view of the economy of the organization’s operations and performance to make needed decisions pertaining to the organization. Kaplan and Cooper (1998) revealed that unlike the traditional cost system which provides a solution to only one question among the questions posed by the management of the organization which is to find a way for the firm to meet the demands of the preparation financial statements and serving departmental cost control demands. The ABC system actually provides solution to about four questions of the organization’s cost system (Kaplan and Cooper 1998), these questions are;

1. What are the key activities that the resources controlled by the business are used to execute?
2. The next question addressed by the ABC system is, what is the cost incurred by the organization as a result of carrying out an activity or a business process?
3. What is the purpose behind the performance of the organizational activities and its business process? The main aim and reason why the organization execute the activities in the firm.
4. For each product, service and customer of the organization, what is the necessary quantity of each activity demanded?

These activities that are performed in the organization are also related to cost, because in the performance of activities there is the use of organizational resources which brings the cost to the organization (Kaplan 1984). With the use of the ABC system, the challenges facing the cost system of the organization can be identified and necessary attention demanded to solve the problem can be sort for, also ABC system spots favorable openings in the cost system that can be used to the benefit of the organization in relation to products and customers (Gunasekaran 1999). Among the few information provided by the traditional cost system, it does not include non-financial information that management can base on for effective decision (Kaplan 1984). Even the few financial information that is provided by the traditional cost
system is not enough for the purposes intended for it (Turney 1996; Kaplan 1984; Gunasekaran 1999 and Turney 1996).

ABC is a non-volume-based method that allocates costs to their cost object with the use of cost drivers according to the activities that are performed in the organization. ABC uses transactions in assigning costs to cost objects using the activities in the organization and so it can also be called Transaction-based accounting or Transaction costing. The ABC system unlike the traditional cost system (which uses only direct labor hours and machine hours) segregates the overall overhead cost into smaller and numerous cost pools for the allocation of costs to cost objects, since there can be a lot of activities performed in one department (Horngren et al. 2008; Kaplan and Cooper 1998).

Figure 2 shows how ABC assigns indirect overhead costs to cost objects from resources to the activities performed and then finally to the cost objects while figure 3 shows a comparison of both ABC and traditional costing cost assignments.

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**Figure 2** Flow of cost from resources to cost object using ABC system. (Kaplan and Cooper 1998, p 84).
2.2.2 How ABC works

With the constant global and environmental changes in the ways of doing business and performing activities coupled with the recent technological advancement, it makes the business environment prone to changes and difficult to predict. Managers need direction which should be given by the cost accountant using the cost system. Cost information provides managers with directions that can serve as a map source to guide them in their decision making in this prevalence changing global economic environment. Managers can no longer govern and make strategic decisions relying on past experiences because there are always new issues demanding their attention and change that goes on in the business environment. By this every decision that is to be taken by management in recent times must be taken as if they are doing it for the first time and consider information provided to them by the ABC system to guide them make very quality decisions (Kaplan and Cooper 1998).
There can be exceptions to this, for instance companies that are already established producing and maintaining old products in an environmental setting that is dependable and has a well-established connection with its customers (Kaplan and Cooper 1998). This company can then operate with the traditional cost system and still achieve its aims but for most companies who are always introducing new products, services and features that are targeted at new customers and increase in the customer base of the firm. It is necessary to be abreast with cost information due to the quick development in technology globally since this company will be working in a dissimilar environment. If the firm in question does not acquaint itself with the necessary cost information needed in the different environment, it can have an adverse impact on its survival (Kaplan and Cooper 1998).

ABC comes into the picture to provide the required direction in the form of cost information (economic and operations) and interpretation for managers to serve as a map to guide them in their decisions (Kaplan and Cooper 1998). This will enhance the understanding of management concerning the economic benefits that each product, service, customer and Business Units (BUs) bring into the organization. The firm can then decide whether to continue or to abandon a particular process, product, customer or service due to their cost and benefit information provided by the ABC system. With ABC system, managers can now determine where to concentrate organization resources to profit the firm, Location to target or abandon. Which business process demands management attention and adjustments to be made in it can now be made by the management of the firm with the help of the map that is provided by the ABC system which makes directions very clear and visible (Kaplan and Cooper 1998).

With ABC, there is first the identification of activities performed in the organization in the production process. Then the indirect costs of the organization are piled up and allocated to the various activities performed in the organization. After this, the cost that is allocated to the activities is then further allocated to the cost objects responsible for such activity costs which could be products, services or other determinants. For every activity performed in the firm, there must be its associated cost driver (a unit of an activity which can cause a change in the cost of the activity), they can influence the activity (Horngren et al. 2008).
Hierarchy of ABC

ABC system classifies activities performed in an organization based on the hierarchy, the hierarchy of activities ranges from; Unit, batch, product and customer sustaining and facility sustaining (in order of significance). In the production of every individual product, there is the performance of an activity, this is termed as the unit-level activities since it deals with the production of one unit of product. An example off unit-level activity is complete inspection performed on a particular product. Batch-level activities are carried out for the production of every single batch of products. Products produced in batches are normally homogenous and the quantity of units in a batch are not considered in batch-level activities, an example is machine set-up (Kaplan and Cooper 1998).

The third hierarchy which is the product and customer-sustaining activities are performed to ensure that an individual product is produced and sold to the intended customer, an example is improvement in the features of a product. The last hierarchy is facility sustaining activities which are carried out by the organization to ensure that, the facilities used in production are preserved against danger independent of the amount of units or batches produced. The establishment of Activity hierarchy is necessary because it ensures that there is a cause and effect relationship between the expenses and the activities performed by tracing the expense to the exact activity (Kaplan and Cooper 1998).

Figure 4 shows the hierarchy of activities in the ABC system.
When using the ABC to allocate indirect overheads to the cost objects, there are four basic steps to follow;

The basic goals for allocating the costs must be identified, the main activities centers, activities performed in the organization and its associated cost drivers must also be determined and established to show the link that exists between them (Horngren et al. 2008). What does the firm seek to achieve by allocating its indirect overhead cost? Is it for price determination, Performance measurement, or for strategic decision making? The main aim behind the allocation of indirect cost to cost objects must be identified. Furthermore, the main resources that the organization processes which it has command over to use to achieve its aim must also be identified. Organizational resources could be financial resources and non-financial assets such as buildings, plants and machinery (Horngren et al. 2008).

Organizations achieve its purpose with the use of the resources they possess. Also, the activity centers where the activities performed in the organization takes place in the organization must also be identified with the various activities that are performed there. The unit of each activity which is the cost drivers must also be determined and
linked to the activities they relate to respectively. The cost drivers must have a well-grounded connection with the activity performed in such a way that there should be a consequential relationship between the cost driver and the resources of the organization (Horngren et al. 2008; Kaplan and Cooper 1998).

There should also be the availability of information about the cost driver and data about the cost driver should be accessible by the organization (Horngren et al. 2008). Whenever there is a performance of an activity, it signifies that some amount of resource has been used and so there should be reason for spending this money (Kaplan and Cooper 1998). Cost driver determines the extent of resources that is exerted toward the performance of a particular activity of the organization (Turney, 1992). Therefore a list of the major activities that are performed in the production stream has to be made and recorded, by way of this, it can boost the morale in the organization since the image of the organizational atmosphere can be seen in the activities performed by the firm. When the core purpose of ABC is to ascertain the cost relating to customers and product, the number of activity gathered can be moderately few (say 10-20 activities) as compared to when the ABC system has other significant primary focus. The size of the organization in question to a large extent determines the number of activities performed in the production process (Kaplan and Cooper 1998; Horngren et al. 2008; Kaplan and Cooper 1998 and Turney, 1992).

Secondly, the link that exists between the activities, resources must be drawn and their interrelationship that exists between them must also be determined with the use of a process-based map. There is a need to establish the relationship that exists between the resources that are consumed in the organization and the activities that are performed. The performance of activities in the organization leads to the depletion of the company’s resource base and so the link that exists between the activities and the resources that are under the control of the organization must be established and noted down. After the establishment of this link, there has to be a representation of this link visually in a diagram form with the aid of a process map. This step is to communicate to the managers the amount of resources that is spent on each activity by linking the activity to the resource base to find out how much the firm spends on each activity performed. This information can be obtained from the financial system of the organization which has categorized each expense according to their spending code;
this information is collected by the resource cost driver and traced to the activities that are performed in the organization according to the spending on each expense in the system (Horngren et al. 2008; Kaplan and Cooper 1998).

The means of identifying the resource driver and the associated cost of each resource driver is duly recorded in the ABC system. In relation to personnel resources for instance, there could be a form given to employees who are engaged in production to fill stating the hours they in performing an activity (for example 5%) , this figure can then be linked with the cost of the expense to know the cost per the activity. When it comes to non-personnel resources, the system may either estimate the percentage of resource used on the activity or depend on the direct measurement (Kaplan and Cooper 1998).

The activities performed in the organization includes the total of all the work that are required to bring about the existence of a product or service, this activity could be performed in the company or could even be outsourced outside the company (miller, 1992). As established earlier that the performance of activities are the cause of cost in the organization, it is very necessary to identify the various activities performed in the organization, this will help the managers to be convinced that the cost incurred in the company are based on what is actually happening on the ground of production and that the cost figures have not been cooked up (Innes et al., 1994). What does the production unit do with the resources that are under their control in the firm? This is the reason for identifying the activities performed in the organization to link the resources to the activities performed respectively (Miller, 1992; Innes et al. 1994; Gunasekaran 1999).

Thirdly, necessary information about costs must be gathered, and there should be a visual representation that shows the material evidence and interrelation between cost driver units, resources of the organization and activities performed in the activity centers of the organization. Relevant information about cost in the organization can be obtained from management by way of interviews. When the right source of personnel are interviewed concerning relevant data about cost, the information will be available. This can be done with the aid of the process map. The cost driver of each activity must be identified. “An activity cost driver is a quantitative measure of the output of an
activity” (Kaplan and Cooper 1998). The loopholes in the organization that can restrict an advancement of the organization through its cost system can be discovered through the use of cost drivers. (Horngren et al. 2008; Kaplan and Cooper 1998; Turney, 1992).

Table 1 gives examples of activities performed in an organization and their associated cost drivers as mentioned by Kaplan and Cooper 1998;

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>ACTIVITY COST DRIVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run machines</td>
<td>Machine Hours</td>
</tr>
<tr>
<td>Set up Machines</td>
<td>Setups or Setup Hours</td>
</tr>
<tr>
<td>Schedule Production Jobs</td>
<td>Production Runs</td>
</tr>
<tr>
<td>Receive Materials</td>
<td>Material Receipts</td>
</tr>
<tr>
<td>Support Existing Products</td>
<td>Number of Products</td>
</tr>
<tr>
<td>Introduce New products</td>
<td>Number of New Products Introduced</td>
</tr>
<tr>
<td>Maintain Machines</td>
<td>Maintenance Hours</td>
</tr>
<tr>
<td>Modify Product Characteristics</td>
<td>Engineering Change Notices</td>
</tr>
</tbody>
</table>

The design of the cost driver can be selected by the ABC designer from 3 main types which include the Transaction drivers, Duration drivers and the Intensity drivers (Kaplan and Cooper 1998).

The last step is to compute the cost of each activity and allocate them to the products, service and other cost objects in the organization. There is also the need to provide necessary explanations to the cost information provided by the activity-based cost system to aid management in their strategic decision making. Information about unused capacity, the profitability of products and services to the company can aid in management decisions for planning and control. The cost per product, service, customer, department among others can also be calculated and explained (Horngren et al. 2008). The cost to be allocated to each product will depend on the cost driver rate of the product. The cost driver rate has a formula of; Expense/Cost driver (Kaplan and Cooper 1998). Upon getting the cost driver rate, the rate is multiplied by the quantity
of cost drivers used by the product to get the cost to allocate to the product. This total cost to be allocated to the product can then be further divided by the total quantity of products produced to get the indirect overhead cost per unit of the product. (Horngren et al. 2008; Kaplan and Cooper 1998).

2.2.4 Significance of the ABC system

There have been numerous articles concerning ABC since its inauguration in the late 1980s, ABC has obviously gained attention by both academicians and practitioners due to the contribution and complexity of its adoption and implementation. This aspect of the research is to demonstrate the importance the system of ABC has brought into the contribution of knowledge and the benefits that implementers have reaped from the system in comparison to the challenges that were faced in the past with the use of the traditional cost system. This aspect of the research is to bring out the favorable consequences that are associated with the implementation of ABC into the cost system of the organization (Kaplan 1983).

The primary purpose of this research is to access ABC and identify the complete reality concerning the implementation of ABC system in the cost systems of companies and what researchers have identified in professional literatures that have been published in Harvard Business Review and Strategic Finance Journal. Research on ABC is made up of 3 main breeds which include the Consulting research, Basic research, and Critical research (Lukka and Granlund 2002). By the author of this research’s understanding, this research is based on the consulting research genre of ABC research which is aimed at telling readers about the development of ABC research right from its onset in the late 1980s (Lukka and Granlund 2002).

The benefits which are accrued to an organization upon implementation of ABC are elaborated below;

Product and service pricing: cost is very important to consider when it comes to the pricing of a product or service in which the company deals in, in manufacturing a product he cost is essential in pricing arrangements for business-to-business transactions (Lere 2000). The cost of the product can affect the price of the product which has a way of affecting the profitability base of the company and so when there
is an error in the cost system it will negatively affect the product’s price which can be to the detriment of the organization. ABC provides an adequate data about the per unit cost of the product which is necessary for the pricing decisions of the company which was solicited by Amarshi et al. in 1989 especially for firms that encounters uncertain environmental setting in their capacity (Banker and Hughes 1994).

The contribution of Amarshi et al. 1989 was further supported when Goebel et al. (1991) explained that, ABC helps in given separate prices for products whose production the organization exerts different efforts. He illustrated that ABC makes available an extensive documented information about different efforts on products since some customers may expect a high quality and expensive services while others do not require such high costly services. By this reason, both customers should not be charged equally, the customer requiring the high cost service must pay more (Lere 2000; Amarshi et al.1989; Banker and Hughes 1994; Goebel et al. 1991).

Banker and Hughes (1994) in their research also established that, in circumstances in which negative consequences are paid for by the company due to demand for products surpassing the capacity. They also added that, when the costs of capacity are carried out ex ante, adequate unit cost can be obtained from the use of activity-based costing to use to get the optimal price of products. ABC is important in pricing decisions because the ascertaining of the cost of a product may differ when it comes to the activities performed in producing a product or service even though the cost might not differ when it comes to volumes of product (Banker and Hughes 1994; Lere 2000).

The attitude of customers to the manufacturing cost of a product constantly changes and these changes must be considered by the organization in their pricing decision. ABC therefore acquires the essential information about the changes in customers’ perspective in relation to the cost in order for the decision makers of the organization to know the consequences that will have on the cost of manufactured goods and vice versa. When it comes to pricing arrangements that are made on orders, the information provided by ABC will be used by the marketers of the company to know the alterations that the customer has made in relation to his/her cost specification in order for the marketers of the organization to take advantage of it and negotiate a favorable price for the firm (Lere 2000).
Also, when it comes to the cost of orders, ABC delivers information about how the cost of the order can be brought down according to the specification of the customer. ABC provides different ways to reduce the cost of order this can help the marketer to be able to compete effectively with prices since ABC can also suggest ways in altering activities to make prices more competitive. The ABC system suggests territories within the organization which can be shaped in relation to their operations which can allow for a reduction in the price of goods to fit into the desires which the customer wants from the company (Lere 2000).

*The Profit that is associated with a particular Product:* At the end of the day, the main focus of most businesses is to make a profit through its endeavors. The firm will want to know where to commit its resources to acquire its objectives. Cost information from ABC will aid the company to enhance its products, channels and facilities by identifying the profitable ones to focus the firm’s resources, ABC makes the profitability analyses of company easy (Cooper and Kaplan 1991).

The use of the traditional cost system was not able to segregate profit into the individual elements provided by each product and so managers may conclude that the overall profit of the organization belongs to all the products of the firm as stated by Turney 2005 in the ‘common gents’. But the ABC system presents the profitability of the firm in the state that, the managers can identify products that are not contributing positively to the profit base of the company. As noted in Turney 2005, about 40% of the products in the company broke even with about 25% making a loss. By this, it can be concluded that the profit base of the company was attained by only about 35% of the products (Turney 2005).

When the profit of the firm is segregated into contributions made by each product, the firm can then decide to concentrate on products that are profitable and abandon unprofitable ones or even decide on strategies that will enhance the profitability of loss making products (Turney 2005).

The figure below which is figure 5 shows the pictorial view of the various profit as contributed by each product in a manufacturing company in Turney 2005.
Figure 5 Profitability of products in a firm using ABC (Turney 2005).

Breakdown of customer profitability: When an organization implements ABC into their cost system, it helps them to supply customers with an explanation concerning their profitability analyses. When it comes to management accounting literature, the influence ABC system makes to the customer profitability analysis (CPA) has not been recognized enough (Smith and Dikolli 1995). Some of the customers that are served by the company are unprofitable and so information provided by ABC in the CPA will enlighten managers to know how to strategize and serve customers employing various incentives and innovative measures that will pave a way to lower the possibility of unprofitable customers without reducing the satisfaction to be attained by the customer. In determining the CPA using information from ABC, the customer is viewed as the cost object instead of the product; the customers who are served by the company with the products are the ones to whom the cost is allocated to and not to the product themselves (Noone and Griffin 1997; Smith and Dikolli 1995). The CPA provides the firm with customers that are profitable and those that are not profitable. Noone and Griffin 1997 in their analyses asserted that, on the average, about 20% of the customers of the firm produced about 80% of revenue/profit but when ABC is used. ABC provides information that among the total profit, about 2-3 of it was
produced by 60% of the company’s customer base. That means the company is not making any profit from the remaining 40% of its customer base and so the company is making a loss in respect to the 40% customers who are not able to make enough revenue to cover their cost (Noone and Griffin 1997).

With the information provided by the ABC to the CPA, managers can now make decisions concerning the customer mix in the organization to classify customers for short term and long term decision making regarding the profitability of customers. An analyses made by Turney 2005 about the profitability of customers contributed to the overall profitability base of the company, it was found out that about 20% of the company’s customers achieved about 500% of the profit base; with 20% of customers also contributing about 400% of profit and the remaining 60% of customers broke even. Turney 2005 also established that about 120% the profit base of the firm in the example was contributed by a single customer. By this segregation, we can see the profitable customers as well as the non-profitable customers (Smith and Dikolli, 1995; Noone and Griffin 1997; Turney 2005).

The information provided by ABC helps the organization to separate profitable customers from non-profitable ones using the cost benefit approach. This will make it easier to identify profitable customers using the cost of providing activities necessary for the product since some customers require costly activities while others do not Goebel et al., (1991).

The figure 6 below shows the pictorial view of this company under illustration by Turney 2005.
The Use of ABC information to select supplier: An organization may depend on external sources for its inputs used in the production of their products. The organization will want to choose a supplier who will contribute to a lower overall cost of the company’s product. When it comes to choosing the suppliers, the firm should not only consider the bids offered by the supplier but also consider the quality of product and service offering made by the supplier (Robinson and Timmerman, 1987). In response to this, there was a system made to classify suppliers based on the offerings they offer to a company, and these features include; ‘satisfactory’, ‘neutral’ and ‘unsatisfactory. Roodhooft and Konings, 1995 presented some benefits that attribute to the use of ABC in relation to the selection of a vendor for the firm.

To begin with, ABC provides information that is non-financial in nature in order for the management of the firm to identify challenges that are faced by the organization which is as a result of the vendor in question to present an actual measure to it. ABC also compares the cost in their absolute form in terms of invoice cost, delivery time, material quality, among others, this will help the management to know which component to adjust or reduce to reduce cost. Finally, ABC provides information that
aids the company to achieve efficiency by way of distinguishing cost components in their level of significance which can assist the firm to make strategies that will cause a reduction in the cost driver rates to reduce cost. Not only does the purchasing company benefit from ABC but also, the vendor company benefits as well by way of improving its systems to enhance the quality of their offerings, this can also foster a good customer and vendor relation for both parties (Roodhooft and Konings, 1995).

*ABC helps with cost supervision:* Ittner et al., 2002 provides a comparison of the effects of ABC on companies that implement it and also the case of the companies that do not implement ABC. They concluded that, the quality associated with the use of ABC was greater and also ABC was associated with a lower cycle time. This association impacted essentially to give its adopters lower cost, so the manufacturing cost of non-adopters is relatively higher than that of the adopters of ABC system (Ittner et al., 2002).

2.2.5 Limitations of the ABC system

To every good system, there are other characteristics that undermine its usage and the activity-based costing system is no exemption. There has been a number of disadvantages that have been associated with the use of this system. These demerits gathered from the use and application of ABC system have been acknowledged by both practitioners as well as academic researchers as recognized by Bjornenak and Mitchell, (2002) in their research. This part of the research is to bring out the various limitations that critics of the ABC system have identified. Some of these criticisms are responsible for why most firms don’t want to adopt and use the ABC system as compiled by Krumwiede 1998a, while other researchers also raised some queries concerning some of the premises the ABC system is based on (Bjornenak and Mitchell 2002; Noreen 1991; Krumwiede 1998a).

ABC has been mostly used in companies that are based in the United States of America, it has also been used by some companies in Europe especially Germany as cited by SMAC (1993). Every cost system has its own pros and cons which should be considered by organizations before adopting it. This is because ‘at the end of the day’,
the firm will want to acquire a cost system whose benefits outweighs its cost involved to implement it. Organizations should therefore consider the merits and demerits of the adopting and use ABC system itself since it can work for other firms but does not necessarily mean it will work for the particular firm in question. The limitations associated with the use of the ABC system is as follows;

*ABC is an expensive system:* The cost of putting together the ABC system and its administration is very costly and so some firms may not be able to afford it. Even the cost of the ABC software itself is mostly extravagantly priced and very expensive for some firms to bear. There has been the assertion that the accumulation of data used for the ABC process necessitates a lot of money, time and effort to make the system successful; this makes the system very costly to implementers. Also, the use of the ABC system demands details that are accurate and exact in nature. But these details are mostly not easy to get and even when attained, it can be very costly and time consuming as well. Apart from the cost of the system software itself been high, the software requires certain high standards that must be met in the use of the software. Employees have to upgrade themselves to suit the demands of the system too in their level of knowledge and skills needed for a successful implementation of the system (SMAC 1993; Rasiah 2011 and TİTİZ et al., 2010).

*ABC implementers are likely to face implementation problems:* This is due to the problems that these firms face when they implement ABC. Most of the firms that cannot deal with the challenges that they encounter after implementing ABC resorts to abandoning the system. About 9% of firms based in the United Kingdom (UK) who adopted ABC quit using the system due to the problems they encountered with the system (SMAC 1993). Hiromoto (1988) also commented in his work that the ABC system is hardly used by companies in Japan. McGowan and Klammer (1997) also stated that, most firms that implemented the ABC system has abandoned it because they realized the system might have a negative impact on their performances and so they had to quit using the system. The amount of detail that the ABC entails to make it successful is too much (Rasiah 2011) and so it demands a lot of focus towards its implementation. Due to that, a little mistake in the implementation problem might cost managers a lot. Also, if the detail involved is not adhered to, it can lead to the data required for the system to be inadequate which can also affect the organization
Firms who do not produce different types of products may not find the ABC system very beneficial: For firms to benefit from the system of ABC, there have to be some particular circumstances before the firm can reap the benefit that is accrued to the use of the ABC system. That means if the firm does not attain such critical criteria, they might have a negative impact on the use of ABC system (Noreen, 1991).

ABC is criticized to have some serious theoretical challenges which might affect the firm negatively: The ABC system is based on the theoretical premises of assigning cost to activities than to products. The ABC system talks against the volume based assignment of the cost that was used in the traditional cost systems. But then even in the ABC system, it sometimes uses the help of some volume-based cost drivers such as machine hour and labor hour to assign costs (Evan and Ashworth, 1995). Some researchers have also commented on the basic assumption that the ABC system is built on concerning the impact of activities on cost in the organization which necessitates the premises that, activities creates cost. But this assumption is criticized because the effect that activities have on costs has not been logically or empirically proven (Noreen, 1991; Evan and Ashworth, 1995; Piper and Walley, 1990).

Prone to Errors made in the cost assignment: Due to the numerous cost pools that are normally encountered with the implementation of the ABC system, it paves a way for making mistakes during the calculation and assignment of cost (Datar and Gupta, 1994). Also, the system of ABC demands that the accounting system of the organization will be updated regularly. Due to this, if the organization delays in the updating of their system then the inputs in the ABC system might be made in error which can also lead to an output that has error in the cost assignment (Rasiah, 2011). Furthermore, due to number of activities that are performed by the organization, especially large organization which performs a lot of activities in the production of goods and services. The managers might skip some activities that are carried out in the production of products in the process of assigning the cost to activities. When the activities are ignored, no cost will be assigned to such an activity for it to be transferred
to cost objects and so the final cost assigned will have an amount of unassigned cost which makes it under cost and erroneous. (Ittner et al. 2002; Datar and Gupta 1994 and Rasiah 2011).

2.2.6 Activity-based costing in service sectors

ABC is dominated mostly in the manufacturing sector and companies that produce physical goods. Most literatures on ABC is mostly based on the manufacturing sector with less focus on the non-manufacturing sector. But these non-manufacturing sectors cannot be excluded when it comes to the relevant elements that fuels the development of an economy. Even though the origin of ABC is from the manufacturing sector, it is applicable in all business sectors and so it can be used in service sectors as well. Both the manufacturing and service sectors operate in the same environment which is constantly changing due to new technology and so the service sector also demand effective cost systems to help them compete effectively with other rival companies.

Service firms as compared to manufacturing firms are more labor intensive since the provision of service mostly require using people and so is the performance of the activities, which is a more reason why they need ABC to provide what their customers need. ABC can be used in the service sectors as a mechanism to enhance the profit the firm receives from its customers and cause an increase in the economic affairs of the firm. The managers in the service sectors such as the hospital, banking, and insurance among others also demand the additional information that ABC provides in other to make strategic decisions that can be affected by the cost system of the firm (Chea 2011; Baxendale and Dombusch, 2000).

The information provided about the cost of a product using ABC is not approved for the purpose of financial reporting of a firm, although this is a demerit to ABC, it is not really relevant in the service sector since stock valuation is not acknowledged in the service sector (Clarke and Mullins, 2001). ABC suits service providing companies even better than that of the manufacturing firms as explained in Kaplan and Cooper (1998). This contribution was further explained that due to the indirect nature of costs
incurred in the service sector, it deems it very necessary for them to apply ABC and reap beneficial results (Clarke and Mullins 2001; Kaplan and Cooper 1998).

Due to the indirect nature of costs incurred in the service sector, it deems it very necessary for them to apply ABC and reap beneficial results. In the service sector, most of the work is done by people other than machines and so the direct labor costs can be effectively assigned to their respective services which generated such costs. But the other costs are then gathered together into a single cost pool which uses a volume-based apportionment method (such as a percentage of direct labor) to allocate overhead costs to services. This method was prone to distortion of costs assigned in the service sector which gives a reason for the use of ABC to the service sector (Kaplan and Cooper 1998; Pirrong 1993).

In contrast to the use of ABC in manufacturing firms, the service sector does not use the cost drivers’ method in assigning costs to services provided. Rather, cost is assigned based on gathering of cost about their functionality which could be professional, administration or client development. These costs are further allocated due to the activities performed which are responsible for the differences in cost of services. This can give the firm an opportunity to assess the cost of different services rendered by the company. It can also provide a basis for assessing the performance of the firm in the past and give them a forecast of what to anticipate in the future for planning and control purposes (Pirrong 1993).

2.2.7 Determinants of the success of the ABC system

The ABC system like any other cost system has conditions and some duties to be performed by the management of the firm to necessitate the successful implementation of the System and reap benefits for the firm. This section of the research is going to bring out the necessary conditions and situations in the firm that can bring about the successful implementation of the ABC system. The organizational behavior in the particular firm has a large extent to influence the success or failure of the ABC system, the success of the system is less dependent on technological issues (Shields 1995). If the company wants to generate the full benefits of the ABC system, they should be
prepared to meet the conditions for its success. Turney, (1996) commented on five success factors that can ensure effective implementation of the ABC system which has been elaborated below;

1. *Management must be willing to change*: Introducing ABC into the cost system of the organization signifies the need for the whole organization to change. This change will be successful if it is backed by the management of the firm. An organization cannot maintain the ABC system just as the old system the organization was used to since they are distinct in method and application (Turney 1996). The management of the firm must then be persuaded to change to meet the demands of the new system which is ABC. The management of an organization must be willing to accept a new cost system and give the relevant supports needed to sustain such system (Gunasekaran and Sarhadi 1998). The big question is how will the management of a firm be fully persuaded to accept the ABC system and what it entails? Not just as a cost system but they must be ready to make the system effective in enhancing the performance of the organization.

Most of the time, it is difficult to convince the management of the organization because some of them feel once they implement the ABC system the, performance of the organization must be positively enhanced. But it does not work that way, the managers will have to put in an effort to make the system work. Shields (1995) expressed the need for managerial support to the ABC system as very essential because the management of the organisation have to match the cost system with other organisational strategies such as employee compensation for an effective implementation. The ABC system will fail if it is fought against by the top management because most essential decisions are made by the top management and the system needs their inputs to survive (Shields 1995; Turney 1996; Cohen et al 2005 and Gates 2005).

2. *Employee training*: Employees are those to work with the system to ensure its success so they should be motivated to accept the system and trained to know the basic elements of the system coupled with how to
work with it. The employees must be made to understand the system and the need for a change in order for them not to fight the system but embrace it to work with it (Baird et al. 2007; Krumwiede 1998).

3. *Linking the success of ABC to performance measurement:* when the system is matched to performance and the reward for it, it will encourage and boost the morale of employees. This motivation will encourage them to give out their best to the effective running of the system. This will enhance the success of the cost system since it is linked with a performance measure. There have however been other disagreement to linking the ABC system to performance measures in the organization stating that when ABC system is linked with a performance measure it does not yield the expected results (Shields 1995; Shields and McEwen 1996; Baird et al. 2007).

4. *User-friendly technology:* ABC is mostly resisted due to the difficulty in the use of the system, however if the system has the required input and the availability of users to express their concern toward the IT system coupled with required feedbacks, this limitation will be minimized (Gurses 1999).

5. *Lack of opposing forces to the system:* The implementation of the ABC system must not be fought against by other systems in the organization, such competitions might restrict the system from surviving. Resources necessary for the effective flow of the system must be made available for the smooth running of the system. The system must not be made to compete with other systems for personnel and other essential resources in the organization. The system is prone to fail when it is made to compete with other initiatives such as JIT for resources, this is because, mostly these opposing innovations threatens the priority of ABC and may win over the ABC system (Leahy 2004; Chongruksut 2002 and Shields 1995).
2.2.8 The corner-stones of ABC

The earlier ABC model consisted of only a single dimension which was intended to provide management with an error-free cost information. It will aid them in the making of critical decisions which are associated with cost in the company. But as time move on, organizations that implemented the old ABC model experienced certain challenges in relation to the system. Some of these challenges included; the model not able to give quality information about the execution of an activity, the system could not factor in the operational information concerning the activities. The cost pool that linked cost to activities were so extensive and so costs were not linked to their respective activities since the outline of essential qualities of activities were not available.

Due to the flaws of the earlier ABC model, it was further developed to bring about the two-dimensional ABC which does not only provide information about cost for the management use internally in the organization but also provide necessary operational and strategic information for users who are not in the organization. The two-dimensional ABC which represents the second-generation of ABC has two main components which are the cost assignment and the process view. ABC is mainly represented by the cost assignment view which seeks to determine the cost of products while the process view represents the managerial role played by the information provided by the ABC system after cost has been assigned, mainly nonfinancial information (Turney, 1992; Oliver 2000).

Figure 7 shows a pictorial view of the second generation of ABC, showing the cost assignment view (Vertical) and the process view (horizontal) of ABC;
Cost Assignment View

The basic organizational obligation of the cost system is to accurately assign the cost to cost objects, the cost assignment view of the second-generation ABC provides a solution to this quest. The lucrative nature of the company economically can be visually represented by the cost assignment view, where the ABC process is utilized to provide error-free findings necessary for the strategic decision making in the company. The ABC cost assignment view presents the company with the building blocks of the ABC system. This building blocks are also the corner stone of the ABC system which aids in the successful running of the system. The flow that exists in the cost assignment view of ABC is from top to bottom (vertical) and the type of information that flows through from top to bottom are financial cost information that are necessary for strategic and operational decision of the management in the company (Turney, 1992).
The building blocks of ABC that are associated with the cost assignment view are;

**Resources**: Resources are the elements that are used as inputs of production and non-production which generates a cost to the company through its operations (Turney, 1992). The costs that the organization incurs to bring the product or services to the customer are all part of the resources. For a company that engages in the production of manufactured goods, resources may take the form of direct labor and materials and other cost producing elements that supports the production of goods such as the salary of procurement officers. The resource of the organization can be referred to as the foundation of cost in the firm because the resources economically brings about cost to the organization (Palaiologk et al. 2012). There are other cost generating units that are not engaged in the production process or support production but are necessary to get the product to the intended customer, for instance advertising cost.

The resources that bring about cost to the organization passes through the activities to be performed in the production process. Therefore, the cost of an organizational resource is assigned to the activity that the resource is used in performing, for instance if a machine is used in performing a task, the cost of the machine is assigned to the task it is used to perform. Since the organization basically exists to make profits, it can achieve this aim when the cost incurred in production is less than the revenue gained from its resource use. The organization must get an economic gain for proper use of resources. Costs are basically dependent on resource usage therefore the resources used by an activity determines the cost of such activity. Therefore, the number of labor hours exerted on an activity will determine the cost of the activity since labor is a resource. (Turney 1992; Kohli and Jaworski 1990; Becker et al. 2009).

**Activity**: Activities show the routine in which the work to be done in the company in other to bring the existence of a product is done. The way and manner in which the tasks of producing a product is done and the stages that the product passes through before it comes out as a final good are all represented by the performance of an activity in the organization. “Activities are units of work” (Turney, 1992). Resources exist in the organization to be used, the use of resources in production connotes the performance of activities (Goebel et al. 1990). Therefore, the depletion of resources in the organization is due to the performance of activities towards production (Gunasekaran and Sarhadi, 1998). The nature and essential elements of the activities
in the organization must be fully explained before the assignment of cost is done. Examples of activities performed in a manufacturing company includes; machine setup, inspection, machine running, scheduling, bottling and labeling, among others. When determining the total cost of a product using ABC, the total cost of activities performed to produce the product are summed up to get the cost of the product (Ray 2012).

The work that is carried out in the organization in its production process can be referred to as activities. Activities contains both raw materials used and the result of such activity which could be a product. Therefore, the managers of the organization must identify the relevant activities performed in production process. Kaplan, (1984) further explained that, the notion of activities that are performed in the organization are the main elements of consumption of the resources of the organization. Which is the primary proposition of the ABC system, other than the traditional cost system which bases its allocation of cost on the premise that, products and services consumes resources (Oliver 2000; Kaplan 1984; Drury 2012 and Ray 2012).

Activity cost center: In most of the time, the activities that are performed in the organization are numerous and so might create confusion when trying to assign costs to activities. Due to this, it is therefore very necessary to segregate the activities of the organization into what is called the activity centers (Turney, 1992). An activity cost center is the aggregate of similar activities that are performed, such activities could be from the same unit or department within the organization. An example of the activity center is the inspection activity center that includes all activities that are performed in relation to inspection in the organization. Necessary data about the manner of the work executed is contained in the activity center and the manager of such department is duly informed about the task. In an organization, whereby the activities performed in the production process are not uniform, there is the possibility that the cost centers that will be set up for those activities will be very few as compared to firms which perform a uniform set of activities within its cost centers. (Turney, 1992; Chutchian-Ferranti, 1999; Drury, 2012).

Resource driver: The activities that are performed in the production of goods and services are connected to the resources, this connection is known as a resource driver. The basic means of getting the cost of a resource in the organization is from the general
ledger and so this resource driver allocates costs of resource which it picks from the general ledger to the activities. The cost of an activity performed in the organization are based on resources used in the organization, hence assigning the cost of the resource to their respective activities is made possible with the use of the resource cost (Palaiologk et al., 2012). Activities uses resources which thereby produces cost for the organization (Oliver, 2000). It can therefore be concluded that, cost primarily emanates from the use of resources, therefore the allocation of cost from resources to activities is done with the aid of resource drivers (Goebel et al., 1990).

The resource drivers therefore judge the extent of resource used by an activity to assign a cost to such activities (Palaiologk et al., 2012). However, in the case where the activities utilized in a particular firm for the production of goods and services differs from each other within the cost center, it is likely that the measurement of the activity resource consumption may contain some error due to the activities not been homogenous (Drury 2012). This is the reason why most of the time, the activities in the cost centers are boosted to reduce the amount of error in the measurement of the cost of overheads that were utilized by cost objects. This aids in the provision of accurate cost information and reduces errors in cost information. (Turney 1992; Drury 2012; Palaiologk et al., 2012).

**Activity cost pool:** To every activity there is an assigned cost, the aggregate of costs that have been charged to an activity represents the activity cost pool. The cost pool must not include resources that were not utilized in production, the only cost of resources used in production must be aggregated in the cost pool. The sum of all cost that relates to an activity represents its cost pool (Gunsekaran and Singh, 1999; Turney 1992; Tse and Gong 2009).

**Cost element:** Cost element is a segment of the activity cost pool, it represents how much is used to settle for a resource and allocated to an activity (Turney, 1992).

**Activity driver:** Costs are assigned to cost objects using techniques which are known as activity drivers. Palaiologk et al., (2012) tries to define a cost driver as, “A cost driver can be any situation or event that causes a change in the consumption of an activity or influences its quality”. When the resource driver allocates resource cost to activities, the cost must be further assigned to cost objects since the activities are not
the destination of those costs. This is when the activity cost drivers come to play by assigning costs allocated to activities to the respective cost objects (Turney, 1991). Depending on the amount of resource usage of an activity, each activity has its own associated cost driver (Gunsekaran and Singh, 1999). Activity drivers provide in quantitative form the number of times an activity has been executed on a cost object and the degree of work exerted toward the performance of that particular activity (Turney, 1992). Future cost determinations are empowered by the activity cost drivers, they make the ascertainment of future costs possible. The cost of activity can also be determined using a unit of output produced by such activity, this output unit is therefore the activity driver since it aids in the determinant of the cost of the activity (Chutchian-Ferranti, 1999; Palaiologk et al., 2012; Turney 1992).

Cost object: Activities are performed to arrive at a required objective, the focus for performing activities is to produce goods and services to satisfy the customers of the organization. Products and Customers are the cost objects of the organization, they are those who will bear the final cost that is assigned (Turney, 1992). Anything of which cost can be independently ascertained and allocated to, it can be in the form of product, service, department or customer (Hansen and Mowen, 2009).

Figure 8 shows the pictorial view of the building blocks of the cost assignment view, how the cost assignment view of ABC assigns costs from resources through activities to the cost objects.
Process View

The process view of ABC gives more information about the non-financial aspect of the carrying out of activities in the organization that has the tendency to influence the volume of activities that is performed. The process view also provides necessary data about the manner in which activities are carried out and the level of accuracy in the performing of an activity. Non-financial information flows from side to side rather than from up to bottom (horizontally). The information flows from cost drivers to activities and then finally to the performance measures. The information provided by the process view factors in the demand for value by customers and so the performance of the organization need to be enhanced so that customers will gain the required value for their money (Turney, 1992).
**Cost driver:** The degree of the task that is carried out in the organization is represented by the cost driver, it explains the weight of work that has been carried out in the performance of an activity (Turney, 1992). In performing the activity of machine setups in a manufacturing firm, the cost driver that is used is the number of machine setups, this will show the number of machine setups that was used in performing the setup. Cost drivers can therefore be described as the bases for allocation of cost as illustrated by Ray (2012).

Cost drivers can be used in different levels which are unit, batch, product and facility levels. The cost drivers are very necessary because it provides the organization with relevant data concerning the efficient way of performing a task and so if the organization would like to take advantage of loopholes that creates opportunity, it will be discovered using cost drivers since they are linked to each activity. Therefore, Drury demonstrated that, the primary driving factor that aids in the assignment of overhead cost using the ABC is the cost driver (Drury 1989). Cost drivers can be further expressed as been the determinant factor of the cost of an activity or product, also the cost drivers are subject to vary depending on how they are managed within the organization (Porter 1985).

**Performance measures:** Activities are performed to meet the requirements that are demanded by the organization and its customers both internal and external. Performance measures of the process view of ABC explains the extent to which an activity performed is able to meet the demands of the customers of the organization, both within and outside the organization. It defines the consequences of activities performed and provides information that determines the yardstick about the quality of work done by performing an activity (Turney, 1992).

Each building block which is also the corner stone of ABC was established to serve a significant purpose which is targeted to be achieved, this purpose was outlined by Turney, (1992).
Table 2. The building blocks of Activity-based costing and their related purpose in the system (Turney, 1992).

<table>
<thead>
<tr>
<th>BUILDING BLOCK</th>
<th>PURPOSE</th>
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<tbody>
<tr>
<td>Resource</td>
<td>Resource Management</td>
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<td>Activity</td>
<td>Activity Management</td>
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<tr>
<td>Activity Center</td>
<td>Process Management</td>
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<td>Resource Driver</td>
<td>Resource Management</td>
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<td>Activity Cost Pool</td>
<td>Cost Reduction</td>
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<td>Activity Cost Element</td>
<td>Resource Management</td>
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<tr>
<td>Activity Driver</td>
<td>Activity Management</td>
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<tr>
<td>Cost Object</td>
<td>Strategic Management</td>
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<tr>
<td>Cost Driver</td>
<td>Cost reduction</td>
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<tr>
<td>Performance Measures</td>
<td>Performance Assessment</td>
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</tbody>
</table>
3 DATA GATHERING AND METHODOLOGY

This study is an analytical research where there is an analysis of information that exists prior to the inception of the study which is accessible to make significant conclusions (Kathari, 2004). The study consists of the use of secondary data to conduct a literature review on the cornerstones of the ABC system. The secondary data used comprises of only professional literature, the author specifically specialized in using only professional literature and not both academic and professional literatures to narrow the research. The data was gathered from two main journals in the database of the University of Oulu library. These two journals were Harvard Business Review and Strategic Finance Journals. The Strategic Finance Journal used to be called the Management Accounting Journal and some of the articles which were picked from that journal bears that name. Most of the articles were gathered from the Strategic Journal with few from the Harvard Business Review. This is because the Harvard Business Review itself has a limited number of articles of ABC published in it.

About 43 scholarly literature were selected from both the Harvard Business Review and the strategic finance journals. The articles were then selected based on their content as supporting the research question. Due to this the number of articles were reduced to 14 articles which spoke about the cornerstones of ABC in its content and could relate to answering the research question. The 14 articles selected comprise of 13 from the strategic finance journal and one article from the Harvard Business Review.

The primary objective of this study is to provide a comprehensive summary on the cornerstones of the ABC system based on professional journal presentation to add to existing knowledge. To dive deep into the data gathered to make an effective conclusion pertaining to the research question (Polit & Beck, 2006). The research made use of content analyses which is, “...a research method that provides a systematic and objective means to make valid inferences from verbal, visual or written data to describe and quantify specific phenomena” (Downw-Wambalt, 1992 p. 314). In this study, the author made use of written data in the form of professional literatures. Content analyses can be either quantitative or qualitative. Due to this underlining
objective, the research made use of qualitative content analysis method (QCA). QCA can be used for analyzing data which are in the form of texts which have a central and common subject to get an understanding from them (Miles & Huberman, 1994) just as been used in this study because all the professional literatures gathered are grounded on the cornerstones of the ABC system. The QCA can be defined as, “Qualitative content analysis is one of many qualitative methods used to analyze textual data. It is a generic form of data analysis in that it is comprised of a theoretical set of techniques which can be used in any qualitative inquiry in which the informational content of the data is relevant” (Forman & Damschroder, 2007).

The methods for analyzing and interpreting data to make sense out of it are limited in number, the QCA method is one of the limited methods which are used currently (Schreier 2012). The QCA method ensures the consistency and bias free analysis of data for the intended purpose (Downe-Wamboldt, 1992; Schreier 2012). To examine the data effectively using QCA method, there is an underlining requirement to consider which is to segregate the whole data into parts that give accounts for the study been conducted. These segregated parts could be in the form of concepts, categories or models (Cavanagh 1997; Elo & Kyngas 2008; Hsieh & Shannon 2005). The research was conducted by dividing the whole into parts using the cornerstones as a primary means of focus and division. The research was conducted based on two phases which includes the preparation and the reporting phase. During the preparation phase, the data was coded based on the authors of the professional literatures (Elo & Kyngas, 2008).

The reporting phase comprised of observations made from the data content using the inductive approach. The researcher used a purposeful sampling method in determining the data to be used, thereby weeding out those data that were not essential to the purpose of this research (Creswell 2013). The researcher made the study as narrow as possible, due to this, the amount of data used for the analysis was limited to 14. As observed by Zikmund et al., (2013) that, qualitative research normally uses a limited amount of data sources. Therefore, this study was not based on the response from a large quantum of data but from fourteen data sources. This made the management of the data very easy for the researcher in the analysis and interpretation (Silverman 2001;
Furthermore, the researcher made use of the latent analyses of the content analyses method in analyzing the data.

This analysis goes deep into the data to explain it and to bring out the basic purpose of what has been written in the data; according to the information communicated by the data to achieve a reliable study based on the results. (Berg 2001; Catanzaro 1988; Morse & Richards, 2002). The latent analyses uses four steps to achieve its objectives. Firstly, the decontextualization; where the data is read thoroughly over and over to draw an understanding of what is meant by the content of the data. Secondly, recontextualization; using the aim of the research, the researcher then determines if all the areas have tackled (Burnard, 1991) using meaning units and themes (Flicks, 2002) to answer the questions. After determining the meaning units, the researcher must decide whether the other texts left in the data are relevant to answering the research question. If not, then those irrelevant ones must be eliminated (Burnard 1991; Burnard 1995). The next stage is the categorization stage where the content of the meaning units are further narrowed without losing the essential elements they contain (Graneheim & Lundman, 2004).

Lastly, Patton (2002) explains that, the author of the study must identify the significant intent of the phenomenon under studies which will make it easier to be understood (Patton, 2002). For the reason of organizing this study, the articles chosen were given code names to make the presentation and reading very easy. The code names were formed from the initials of Professional Article which was PA, to differentiate one article from the other, the author added alphabets from ‘A to N’. By this, PAA is identified as the first professional article, PAB the second and so on.

The information concerning the selected articles from the two journals has been summarized in the table 3 according to their topics, authors, cornerstone in that article, code name and the year the article was published in the journal.
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>AUTHOR(S)</th>
<th>JOURNAL</th>
<th>CODE NAME</th>
<th>YEAR PUBLISHED</th>
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<tr>
<td>2 Using ABC to determine the Cost of Service</td>
<td>a) Michael Krupnicki  b) Thomas Tyson</td>
<td>Management Accounting</td>
<td>PAB</td>
<td>1997</td>
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<td>3 Teaching Activity-Based Costing</td>
<td>Ralph L. Benke Jr</td>
<td>Management Accounting</td>
<td>PAC</td>
<td>1992</td>
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<td>4 ABC in France</td>
<td>a) Pierre-Laurent Bescos  b) Carla Mendoza</td>
<td>Management Accounting</td>
<td>PAD</td>
<td>1995</td>
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<td>5 A New view of Activity-Based Costing</td>
<td>a) Douglas Sharp  b) Linda F. Christensen</td>
<td>Management Accounting</td>
<td>PAE</td>
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<td>6 Using ABC to Support Continuous Improvement</td>
<td>a) Peter B. B. Turney  b) Alan J. Stratton</td>
<td>Management Accounting</td>
<td>PAF</td>
<td>1992</td>
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<td>7 New Technologies Support ABC</td>
<td>Mary Lee Geishecker</td>
<td>Management Accounting</td>
<td>PAG</td>
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<tr>
<td>8 ABC: A Pilot Approach</td>
<td>Alan W. Rupp</td>
<td>Management Accounting</td>
<td>PAH</td>
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<tr>
<td>9 How ABC can add value to decision making</td>
<td>a) Linda F. Christensen  b) Douglas Sharp</td>
<td>Management Accounting</td>
<td>PAI</td>
<td>1993</td>
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<td>10 Transfer pricing with ABC</td>
<td>a) Robert S. Kaplan  b) Dan Weiss  c) Eyal Desheh</td>
<td>Management Accounting</td>
<td>PAJ</td>
<td>1997</td>
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<td>11 ABC in a virtual corporation</td>
<td>a) Tim R. V. Davis  b) Bruce L. Darling</td>
<td>Management Accounting</td>
<td>PAK</td>
<td>1996</td>
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<tr>
<td>12 Measuring and Managing Customer Profitability</td>
<td>Gary Cokins</td>
<td>Strategic Finance</td>
<td>PAL</td>
<td>2015</td>
</tr>
<tr>
<td>13</td>
<td>Linking Strategy-based costing and innovation-based budgeting</td>
<td>Michael F. Latimar</td>
<td>Strategic Finance</td>
<td>PAM</td>
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<tr>
<td>14</td>
<td>The current status of Activity-Based Costing: an interview with Robin Cooper and Robert S. Kaplan</td>
<td>Alfred M. King</td>
<td>Management Accounting</td>
<td>PAN</td>
</tr>
</tbody>
</table>

The selected literatures according to the table were read thoroughly to identify the cornerstones that were considered in the article and analyze the issues which the author was putting across. These lessons drawn from the chosen literature were compiled and presented in the analyses of this study to make it presentable for readers and easy to understand.
4 DATA ANALYSES AND DISCUSSION

4.1 Data Analysis

In this section, the author analyzed the basic elements of ABC that are examined in the professional literatures that forms the part of the foundation of the ABC system in relation to its implementation and other relevant information necessary to add to knowledge. Bahnub (2010) in his book *Activity-based management for financial institutions* commented that the cornerstones of ABC represent the costs that have been incurred as well as the handling of the way costs is incurred.

The foundation on which the concept of the ABC system stems from resides within the cost view and process view of the ABC system. PAC commented that, the way in which the company produces outputs with the inputs in the firm is pointed out through the cost view of the ABC system.

“The cost view indicates the general flow of costs from input to output. Its elements consist of resources, resource drivers, activity pools, activity drivers, and cost objects.” —PAC

On the other hand, PAC made mention of the process view of the ABC which also contains three of the building blocks of ABC. The process view of ABC concentrates more on the provision of information especially nonfinancial information which might not be visible in the cost financial information but can be identified with the use of the process view which helps in the decision making.

“The process view indicates the general flow of transactions and information. Its elements consist of cost drivers, activity pools, and performance measures.” —PAC

This was supported by what Turney (1992) and Oliver (2000) explained in their research. They also analyzed that the process view is mainly concerned with the managerial aspect of non-financial information relating to ABM. The cornerstone elements in the process view can therefore be viewed as the part of the cornerstones that provides details of the non-financial elements of the ABC system. The elements that are in the cost assignment view and process view forms the cornerstone of the ABC and the ABM systems. ABC when fully integrated into the financial system of
companies is worth the troubles other than when only a section of it is been used as stated in PAA;

“After a company has integrated ABC into all of its main-stream financial systems, and ABC numbers have become the yardsticks of performance, the system dramatically changes the way an organization’s people think. Then, the average quality of the decisions made day in and day out will be vastly higher than before. When that happens you bet that the company’s performance will show it”.-PAA

This was further confirmed by Cokins (2002) that for a firm to enjoy the full impact of ABC, it must not be selective in its implementations. The phases of implementation must be adhered to in full and not in parts.

This study is limited to ABC only and so the role played by Activity-based management (ABM) is eliminated to give way to narrow the research to focus on ABC alone. Due to this, the performance measures cornerstone is excluded from the cornerstones under analysis since it is related basically to ABM according to Bahnub (2010).

Resource

The implementation of ABC system into a company is not an easy job as seen by some managers due to the way it has been illustrated in textbooks and other articles. Some implementers requires the ABC to work automatically right from the decision to implement it but the design and implementation itself are more difficult a task as commented by PAB;

“Actually sitting down and laying out an activity-based costing system for a real company is much more difficult than a typical textbook ABC problem. Determining what causes a cost to occur is much more difficult than it originally might seem.”–PAB

Holman (1995) contributed to what PAB about the layout of how ABC allocates costs to cost objects. He based his contribution on two stages of cost allocation by the ABC system, that is from the resources to activities and then from activities to the cost
objects. These two steps as proposed by Holman (1995) may seem easy at a glance but a lot more work goes into it. As indicated by PAB that figuring out the source of the cost itself is not an easy task, Laitinen (1998) also tried to provide a solution to it by adding that, the cost of resources is allocated based on the amount used by each cost object and hence this gives rise to the use of the cost and effect connection. The resource driver is used to determine the specific amount of resource consumed by a cost object. From the illustration above, it is glaring that, the resource usage is the cause of costs in an organization.

Due to the difficult nature of the implementation process, the system relies heavily on the acceptance and assistance that management can offer to aid in its success, this was observed in an illustration made in PAB which was;

“*This project proved how important management support and adequate resources are to implement an ABC system properly.*” – PAB

This is because, for a successful implementation of the ABC system, there will be the need of expertise, information and most importantly the need to change which could be resisted by employees, but when the system has the full support of management then, these hurdles can be overcome more easily. The resources must also be managed very well to reduce uncertainties in the information provided by the ABC system and improve decision making in the organization. Furthermore, the resource allocation for the ABC system must be sufficient to fit the task ahead and the top management are the best to handle such issues which makes their support very necessary (Mellemrik, Monsen and Olson 1988; Player and Keys 1995a).

PAL further added to what resources are in an organization by stating that;

“*Resource ... provide the available capacity to perform work.*” –PAL

Lynn (2004) p. 63 supported PAL’s assertion by explaining how the capacity is provided by resources in the organization by explaining that, the resources provide a means of doing the job in the organization to understand the reason behind the costs incurred in the organization. That is, there is work supposed to be done in the organization but with what is the work going to be done? Who is going to do the work? Without putting resources in an organization, work cannot be done. Work here could be the production of products or the provision of services.
Activities

Activity-based costing has been talked about by most academicians and practitioners as a cost saving system that boosts company’s financial performance. Notwithstanding, PAC added to the numerous definitions and explanations that have been given on ABC in this manner;

“By definition, activity-based costing is the collection of financial and nonfinancial data about an organization’s significant activities and the tracing of the data to the organization’s products and services. ABC systems focus on activities rather than on product and services as the fundamental cost object.”
–PAC

Kaplan and Cooper, (1988) assessed that, the ABC concentrates much on the activities rather the destination of costs which is products or services. Kaplan and Anderson furthermore added that, the ABC due to its transaction based system dwells more on the activities other than cost objects unlike the traditional costing which confirms PAC’s contribution. PAG also contributed that, the size of the firm has a role to play in the number of activities that are performed in that firm. PAG stated that;

“Some businesses may have only a few critical activities, while more complex companies may have several hundred.”-PAG

The contribution of PAG was confirmed by Wilcox et al. (2000) and Cotton et al. (2003) that, the activities performed in smaller firms are limited compared to that of larger firms and so the size and complexity of the firm can have an effect on the amount of activities to be done.

PAN added that, the capacity usage of the firm is supposed to be determined by the ABC model.

“A well designed ABC system should identify the practical capacity to perform each activity and use that capacity to generate cost of performing the activity.”- PAN

The statement of PAN is supported by Kaplan and Cooper (1992) when they also elaborated that, the ABC system unlike the traditional cost system allocation of
overhead costs is able to identify the capacity usage for every activity which also makes visible the idle capacities and unused activities.

PAM also explained obligatory costs which was supported by Sanchez et al. (2011) as;

“Customers, stakeholders, and regulators mandate obligatory activity cost costs. Customer costs stems from efforts to bring on new customers and service existing ones. Stakeholder costs stem from efforts by human resources, purchasing, finance, and public relations to transact business with employees, suppliers, and investors. Regulatory costs include those imposed by state, federal, and local municipalities, as well as public safety and other government oversight agencies.” –PAM

ABC system runs in an organization using basically the activities that are performed in the organization to trace costs to their various cost units. Identifying activities are therefore an integral aspect of a successful ABC system and that is why activities form part of the corner stones of the ABC system. An illustration made by PAC in an attempt to explain the importance of finding out what the activities of an organization are with regards to implementing an ABC system in an organization was that;

“Implementation of Activity-based systems involves the identification and description of activities, called an activity analysis, and the subsequent determination of those activities which add value to the organization’s products and services.” –PAC

There are different ranges of activities performed in an organization which makes their importance vary as well. Ben-Arieh and Qian, (2008) mentioned that some activities are major activities, from this, it can be understood that those activities that are not major to the production process in the organization can be tagged as minor activities. Gunasekaran and Sarhadi, (1998) expressed agreement with PAC, they stated that, the activities of an organization must be segregated value-added and non-value-added activities. This will pave a way for the non-value-added activities to be excluded from the activities of the organization to save the organization from unnecessary cost since they are not granting the customer any further satisfaction for their money. Lat (1993) also further added that, the activities used in the organization will depend on the type
of business the organization is engaged in; this will then translate into the divisions needed in activities. Lynn (2004) calls the division of activities primary and secondary activities. Where primary activities are the main function of the business while the secondary activities are mostly administrative in nature.

Activities form an essential element of the ABC model such that it cannot be foregone when implementing an ABC system in the organization, this can be seen in a comment made by PAC as;

“Thus, activities are the focal point in the ABC system.” -PAC

PAC is probably justified by stating that the activities form a major aspect of the ABC system, this can be noticed from the figure 7 which showed the second-generation ABC as illustrated by Turney (1991). The activities cornerstone is in the middle of both the process and the cost assignment view in figure 7. Therefore, it can be concluded that activities are very crucial to both the process and cost assignment view and hence the ABC system.

There are very basic activities that are performed in the organization to bring about the production of goods or the provision of services but there are other activities that directly deliver customer with the value for their money which in a way makes those customers very satisfied with the product or service. The distinction of such activities must be made clear from other activities which are not directly related to the provision of value for customers. PAC further explained that;

“Value-added activities are those that contribute directly to customer satisfaction, thereby increasing the value of the product or service. Support activities, those that provide direct support to value-added activities, and sustaining activities, those that maintain the organization, also are needed.” – PAC

Lynn (2004) estimated that, about 80% of activities in most organizations are primary with the 20% remaining acting as secondary activities. This is to say that activities been performed in the organization are supposed to be segregated according to their level of ‘importance’ in meeting customer satisfaction and creating value for them. When the activities in the organization are identified and classified in terms of value-added, support, and sustaining activities, it will make it easier to figure out those
activities that are not very relevant to the organization which needs to be weeded out to reduce cost and its related effects. (Porter 1985; Glad and Becker 1996).

This is what PAC tried to further illustrate by stating that;

“The remaining unnecessary activities, called nonvalue-added activities, are targeted for elimination in ABC system.” –PAC

PAL however has a different perspective about taking out those activities that do not directly add value to the product. PAL presented that when those activities are excluded in the organization, it could negatively affect the performance of the company. This can be seen in the statement made in PAL as;

“Some activities in an organization don’t contribute directly to customer value, responsiveness, and quality. That doesn’t mean those activities can be eliminated or even reduced without doing harm to the business. For example, preparing required regulatory reports certainly doesn’t add to the value of any product or to the satisfaction of the customer. Yet that type of work activity is valuable to the organization because it enables the company to function in a proper legal manner.” –PAL

If the activities performed are non-value added, then they do not deliver any satisfaction to the customer. The customers on the other hand want value for their money in the form of low price coupled with high quality products and services. Gunasekaran and Sarhadi, (1998) specifically stated that, if the activity is not delivering value to the customer, then it must be taking out from the organization.

PAL’s statement has been confirmed by Popesko (2008) who stated that, those supporting activities are relevant for the day to day running of the organization. Sanchez, Chaminade and Olea, (2000) also added that, those invisible activities must be managed effectively by the management for it to provide value for customers instead of eliminating them. Because they aid the organization by their functions.

PAH also contributed to the process that indirect costs travel through activities to their respective cost objects. It stated that;
“Costs are allocated to activities, and costed activities are allocated to cost objects.” –PAH

Holman (1995) confirmed that, the cost of activities is traced from the resources used in performing such activities, the cost of activities is further allocated to the cost objects from the activities. Activities are therefore seen as the central point of allocating cost to cost objects using the ABC system.

*Activity pools*

According to PAC;

“Activity pools are at the center of the ABC model and are part of both the cost view and the process view.” –PAC

This can be identified from figure 8 as illustrated by Turney (1992). Popesko (2010) also confirmed that, the activities are the core of the ABC model

They further explained that,

“The activity pools are the accumulations of costs and other nonfinancial measures associated with particular activities.”–PAC

*Resource Drivers*

Resource drivers can be seen as the link between resources and activities since they direct costs from resources to the activities. PAC’s concern about what resource drivers are was that;

“Resource drivers are measures of the amount of resources consumed by specific activities, and activity requirements of particular cost objects.” –PAC

The cost basically emanates from the use of resources and so these costs must be carried over to the activities since the performance of activities depletes the resources (Goebel et al. 1998). According to Turney (1992), resource drivers connects resources to activities thereby making it possible to allocate the cost of resources to the activities.
PAF also gave a comment about resources;

“Resource drivers assign the cost of resources to activities. For example, the resource driver “percentage of effort” might be used to assign the cost of people to the activities they perform.” –PAF

Palaiologk et al., (2012) also contributed to what PAF stated that, activities consume resources during their performance and so, the cost of resources must be assigned to such activities. This assignment is possible with the resource driver when assigning resource cost to activities.

PAC further explains in detail how resource drivers work;

“Resource drivers are used first to assign resource costs to activities; then, activity drivers are used to assign activity costs to cost objects.” –PAC

The resource driver provides explanation about the purpose behind the use of resources by assigning such costs to the activities responsible for their existence (Lynn 2004, p. 63). The resource costs are then traced to the activities that were carried out which consumed such resources. Popesko (2010) also confirmed that costs are first allocated to activities with resource driver from resources to the particular activities.

Activity Cost Drivers

Before the existence of a cost, there must be something to trigger it into existence and these factors that triggers the occurrence of cost are referred to as cost drivers. According to PAC;

“Cost drivers are factors that cause activities to occur. The identification, measurement, and control of cost driver is a key objective of a successful activity-based system.” –PAC

The activity cost driver therefore determines the origin of a cost. The bases for a cost to occur is determined by the cost driver as supported by Ray (2012).

When inquired of what PAD has to say about the cornerstones of ABC, it was discovered that it made a contribution about cost drivers and this was what was discovered;
“Process costs are allocated to the products by means of cost drivers. The cost driver is a variable that suitably reflects the variation in process costs depending on the activities consumed by the products.” –PAD

From the above illustration, it can be deduced that, the cost of products cannot be assigned to cost objects without the use of cost drivers with regards to the ABC system. Cost drivers determine the extent to which cost can be allocated to an activity performed since it is the varying factor. The cost drivers serve as a measuring estimate for allocating cost to activities. (Porter 1985; Drury 1989).

PAJ presented a different choice for the rates of activity cost drivers other than the one presented by PAI which focused on the timing of activities to calculate the rates. PAJ’s choice for calculating the activity rate is the use of standard activity cost driver rates which can foster forecast of the cost of cost objects within the accounting year (Nye et al., 2001). It also prevents the monthly or quarterly uncertainty shifts of product cost back and forth which is as a result of the changes in the real use of facilities, cost and capacity. PAJ puts it as;

“The use of standard activity cost driver rates enables product costs to be calculated in a predictable manner throughout the year. It also eliminates monthly or quarterly fluctuations in product costs caused by variations in actual spending, resource usage, and activity levels.” –PAJ

PAE also had something to add to the reasons why a company has to identify its cost drivers and this was what it had to say about it;

“Better measurements of resources consumed are achieved if we identify correctly the factors that cause a particular cost to change and use these cost drivers as our allocation base.” –PAE

The activities performed in the organization must bear their respective costs depending on the resources consumed. This is however possible with the use of cost drivers (Popesko, 2010). This well explains that, to get to know the actual cost of the resources that has been used in production, the factors that is responsible for varying costs should be considered and carefully identified to aid in the assignment of costs to cost objects.
PAI made two suggestions about segregations of activity costs into three categories in order to aid in the determination of the activity cost driver rate. Firstly, they suggested that the costs of activities in the organization must be classified into short-term variable, short-term fixed and committed fixed costs (Kaplan and Norton, 1996).

“Categorizing activity costs into short-term variable, short-term fixed and committed fixed costs rather than accumulating these costs only as aggregated totals.” –PAI

They further suggested secondly that;

“Determining the allocation rates for both categories of fixed costs based on the capacity provided through the occurrence of these costs.” –PAI

PAF also commented about cost drivers stating that;

“Cost drivers determine the work-load and effort required to perform an activity. They include factors relating to the performance of supplier activities as well as factors internal to the activity.” –PAF

The cost drivers therefore describe and determines the weight of work done by performing an activity. Turney (1992) supported that the cost drivers access the degree of work that has been done during performing activities. It was further confirmed by Ray (2012) that, before the cost of an activity performed can be allocated to cost objects, the activity cost driver serves as the base for allocation.

PAK illustrated that cost drivers when selected carefully are of more quality than the basis for cost allocation that is provided by the traditional standard cost method.

“Well-chosen cost drivers, however, usually are superior to traditional standard cost bases for allocating costs, such as percent of direct labor or percent of total sales.” –PAK

A further analysis made by PAL concerning cost drivers was that;

“Work is performed by employees or assets, and resources are converted into some type of output in the work activities module. Activity cost drivers are the mechanism to accomplish this assignment.” –PAL
Resource costs are assigned to activities responsible for their depletion using cost drivers (Drury, 1989).

**Activity Drivers**

“Activity drivers assign the cost of activities to products and customers. For example, the activity driver “number of purchase order” might be used to assign the cost of the activity “preparing purchase orders” to the parts that are purchased.” – PAF

Activity drivers expressly define the actions and events that consumes resources (Lynn 2004 and Drury 2001).

**Cost Center**

PAD defines a cost center as;

“A cost center is a department that generally has its own manager. Each cost center performs activities that are consistent with ABC.” – PAD

Activities that bear some similarities are gathered in one cost center unit for easy identification. The relevance of the cost centers is to segregate the activities performed in the organization to avoid confusion during cost assignment especially in organizations whose production process are uniform (Turney 1992). He further affirmed that, the activity cost centers are units in the organization that offers similar activities. Most of the activities performed in the cost center are uniform and homogeneous, however in situations where the process in production are not uniform, the cost centers set up for such organization is very few than those firm whose production process are uniform.

By the above definition, one could say that cost centers are departments which enjoy a little autonomy in the sense that, they can make certain decisions on their own since they have their own manager who supervises and oversees all activities that are taking place in the department. Cost centers can also be a department that incurs cost by carrying out activities in that department and due to that has been assigned a manager to account for such costs. (Chutchian-Ferraati, 1999; Drury 2012).
**Cost Object**

Cost information is necessary for decision concerning products, services, customers, department among others. These final recipients of costs represent the cost objects. Those items for which cost ascertaining in necessary for in the organization.

“Cost objects are the specific items receiving the assignments of output costs.”

–PAC

Cost object is the reason for the incurrence of cost. Why are costs incurred? For the provision of goods and services and so the products and/or services becomes the cost object for the company. Customers can also be seen as cost objects as specified in PAL as;

“Customers are the origin that results in the consumption of all of a supplier’s expenses and subsequent costs.” –PAL

PAL further suggested that to know that customers are the expenses in the organization that brings about cost are incurred; the observer should look at the ABC cost assignment network from the opposite direction (bottom to top). This will inform the observer that the resources that are employed by the company are mostly to satisfy the customers need. PAL puts it as;

“The polar-opposite switch reveals that all expenses originate with a demand-pull from customers – and the calculated costs simply measure the effect in the reverse direction.” –PAL

Popesko (2010) stated that, the cost object of a good cost system must be wide enough since it contributes to the accuracy of the cost system.

Table 4 presents the various professional literatures and their respective cornerstones that was found in them.
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<thead>
<tr>
<th>CORNERSTONE</th>
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<td>Performance measure</td>
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<td>d) Cost Objects</td>
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<td>e) Cost Drivers</td>
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<td>a) Activities</td>
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4.2 Discussion

According to Turney (1992), the main obligation of a cost system in an organization is to determine and assign costs to cost objects. Turney also spoke about the cost assignment and process view of ABC contains the cornerstones of the ABC. It indicates the main building blocks on which ABC leans to achieve the cost aims that an organization seeks to achieve (Turney 1992). This was further confirmed by the results PAC illustrated that the cost assignment view ensures that the transformation of input to output is successfully done and cost for it accounted for it while the process view showed the common flow of transactions and nonfinancial information in the company.

However, the results failed to mention the form in which the cost assignment and process view takes as shown in the theory which stated that, the cost assignment review performs its assignment in a vertical order while the process view works in a horizontal manner (Turney, 1992). Bahnub (2010) also discussed the cornerstones of ABC based on both the cost assignment view and the process view. (Turney, 1992 and Bahnub 2010).

In this final section of this study, the author will go further into discussing, comparing and contrasting the data and the theory concerning the building blocks of the ABC system in an organization. The discussion will be based on the cornerstones that contribute in the assignment of cost since our focus is mainly on ABC system.
Based on the professional literatures gathered, there are approximately eight cornerstones of the ABC system even though the theory presented 10 cornerstones. The explanation of the differences will be discussed in the latter part of this section. Theses eight cornerstones include; 1. Resource, 2. Activities, 3. Activity pool, 4. Resource drivers, 5. Cost objects, 6. Cost drivers, 7. Cost center, and 8. Activity drivers. The cornerstones of the ABC system are the main building blocks of the system that makes it possible for the costs to be assigned to their various cost objects effectively.

The cornerstones are enhanced with the use of drivers to make the cost assignment possible. But each driver performs its roles distinctly from the other. The activities are linked to their various cost objects using the activity cost driver while the resource driver also promotes the assignment of resource cost to responsible activities. (Palaiologk et al., 2012). The assignment of cost based on the cornerstones are mainly three steps: that is from resource to activities and then to the cost objects. This marks the two stages of cost assignment of the ABC system (Pohlen and La Londe, 1994). The study however establishes that; the activity cost pools are in the cost centers; cost are therefore allocated firstly from resources to activities using the resource drivers. After the costs are assigned to activities, the cost of activities is hence transferred to cost objects using activity cost drivers (Ray 2012).

Every company incurs cost based on the resources used in performing activities, resources are used by a firm in creating revenue and wealth for the firm. The management of the firm are expected to seek for means whereby the activities performed in the organization uses as minimum resource as possible. (Kaplan and Cooper, 1991). Activities is one of the cornerstones of the system, the performance of which gives rise to cost in the organization. Activities are mostly uniform and are performed many times in the organization to get work done (Michalska and Szewieczek, 2007). The activities that are performed in the organization can be said to be the main cornerstone of the ABC based on the knowledge of the author, this is because without activities, there is no ABC. Cost drivers as established are those forces that have the ability to cause an alteration in the cost of an activity (Schniederjans and Garvin, 1997).
To conclude the discussion section, it can be affirmed that the ABC system uses two main cost drivers in assigning costs. These two main drivers are the resource and the activity cost drivers. This is what Becker et al., (2007) tried to communicate that, the determinant of cost in ABC is possible due to the use of cost drivers. By this, it can be understood that the cost of activities is determined by the resource driver while the cost of cost objects on the other hand is also determined by activity cost drivers. Subject to the analyses; the resource and activity drivers perform similar functions in different forms.
5 CONCLUSION

The aim of this study was to provide a complete document on the cornerstones of ABC based on professional literatures, which could serve as a reference for further studies. The study provides an extensive compilation of elaborated issues concerning the cornerstones of ABC system as established by fourteen (14) professional literatures. The cornerstones of the ABC system which serves as the foundation for the system is not only an essential issue for research but also relevant for decision-making in the organization. The study sought to achieve these objectives; (1) the identification of each cornerstone from different authors’ view and (2) the compilation of the different thoughts and (3) how the cornerstones correlate with each other.

Even though there was a thorough literature review for the purpose of the study, the author did not come across in any of the literature the principal cornerstones as well as those cornerstones that act as supporting cornerstones. This serves as an opportunity to contribute to the knowledge base of the ABC system concerning the study. The cornerstones were divided into two parts; a) the primary and b) the secondary cornerstones. The primary cornerstones can be further explained as those cornerstones that are primary to the ABC system while the secondary cornerstones satisfy for supporting ones.

The primary cornerstones are: 1. Resources, 2. Activities and 3. Cost drivers. Without these three basic cornerstones, the ABC system cannot effectively function to yield the desired results. This is not to say that the other cornerstones labelled minor are not necessary for the effective running of the ABC system because they all perform their roles which add up to the effective results that are yielded by the ABC system. Only that some cornerstones are very primary to the system than others which ensures the smooth running of the ABC system to benefit the organization as a whole. These three basic cornerstones may be said to dominate the other six (6) such that, they cannot be taking out of the ABC system.

The first primary cornerstone of ABC is resources, without resources, there will be no cost to assign to cost objects. This was supported by Bahnub (2010) which illustrated that resources provide the firm with a chance to perform its activities. Those things the organization uses in the attempt to satisfy its customers which in effect creates a cost for the organization can be classified as resources according to the data. It can therefore
be established that, the firm cannot exist without resources. Therefore, resources are very primary determinant of cost in every enterprise hence the ABC cannot allocate cost without the existence of resources. (Bahnub 2010)

Activities are actually the center of the ABC system, even the name of the cost system (Activity-based costing) denotes that the activities cannot be excluded from the foundation of the system. This is because, costs are assigned primarily using the activities performed in the organization. ABC just like any other cost system assigns the cost of resources to cost objects, the only difference that ABC poses is that, the costs are assigned using activities performed in the organization. Activities are the work that is done in an organization either by a system or people (Bahnub 2010).

It can also be illustrated by the action that is actually done to get the work done. Data further established that, Activities in the ABC system are very significant and cannot be done with. It can be noticed that the activities cornerstone carries most of the volume of the data. About 43% of the results were concentrated on activities, this is because the activities are at the center of the ABC system. The nature, number, criteria and classification of activities in an organization must be identified and duly explained before the assignment of the cost is started as suggested by Turney (1992). In figure 5, it can be noticed that, activities cornerstone is at the center of both the process and cost assignment view in the second-generation ABC. Activities is therefore a very significant primary cornerstone of the ABC system. Particularly, activities in the organization can be done by either a system or by people as Bahnub (2010) stated.

The final major cornerstone according to the author’s analyses is the cost drivers which according to theory demonstrates the degree with which a given job is done in the organization as suggested by Turney (1992). Using the empirical result as a basic guide, it can be categorically stated that, a cost driver is anything that brings about cost into existence. Those factors that influence the occurrence of a cost in the organization. Results also indicated that before a cost can be assigned to a cost object using an ABC system, there will be the need to identify the varying factor which is the cost driver. The varying factor determines the extent of the cost to be assigned to an activity that has been performed. Cost drivers acting as varying factors define the degree of work-load that is needed for an activity to be performed. Therefore, the significance of the
cost driver in assigning costs cannot be disputed hence it qualifies to be a major cornerstone. (Turney 1992).

The study could answer the research question such that, it extensively explained what the cornerstones of the ABC system are and their basic functions as well as their supporting functions to make the system a success. As highlighted by the data as shown in figure 8 that, resources are connected to activities through resource drivers while activities and activity cost pools are connected to the cost objects via activity drivers (Turney, 1992). Furthermore, the cornerstones have been compiled for extensive further research purposes. Although the compilation of the individual cornerstones was from different perspectives, they fit into each other since most of them are very similar to what the other authors are putting across. This makes it very easy to understand what they are and how their individual duties differentiate from each other.

This study is significant because it provides an extensive compilation of the cornerstones for managers to consider. Which can serve as a conclusive guide to managers and academicians to know and understand each cornerstone for what they stand for. This will help the management of an organization to be reminded of the importance of each cornerstone and so none of these cornerstones should be neglected since they all work together towards the aim of the ABC system in the organization. All the individual cornerstones presented in section 4 despite their nature are very relevant to the achievement of the organizational cost goals which can be translated into profitability in the organization. Due to this, the managers of the firm have to ensure due care and maintenance of the individual cornerstones to ensure that they perform their respective functions effectively.

Limitations of the research

Subject to the above-mentioned conclusions there is the need to add that the study however encountered many challenges which translated into limitations of the research. Firstly, the theory content of the cornerstones established was not sufficient and this is because there was not enough literature accessible to the researcher which was relevant to the subject matter. Most of the literature found deviated from what the researcher was interested in and so the theory is quite narrow. Even though the
literature was scant, the author believes that, this work will add up to the scarce resources which can aid in future research since this area is an under researched area.

The research also made use of secondary data in the form of professional literature which makes it prone to the disadvantages that are related to the use of secondary data. Reichmann (1962) reported that, the demerits presented using secondary data; “some reports do however, actually misinterpret and emphasize quite erroneous conclusions, thus helping to bring statistics into unjustified disrepute”. Hence, the study might show effects from the use of such data. Even though the secondary data used has limitations, in theoretically based research such as this, such setbacks are quite unavoidable.

Furthermore, the data used for the research was skewed toward one country such that, it used only data from Harvard Business Review and Strategic finance journal. These two journals are US based, since the premises of these two journals are from the US, it makes the results gathered tilted to that specific country. Which is why this thesis is relevant because it adds to the research base which paves a way for further research to be conducted using literature or data from other premise countries or continent.
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REFFERENCES FOR DATA


