PROBLEMS ENCOUNTERED WITH THE IMPLEMENTATION OF AN ACTIVITY-BASED COSTING SYSTEM

By

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Submitted in partial fulfilment of the requirements for the degree of Master Technology in Cost and Management Accounting to be awarded at the Nelson Mandela Metropolitan University

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DECLARATION

I, Nangan Christian Konan, hereby declare that the treatise for Master Technology in Cost and Management Accounting to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

Nangan Christian Konan
I would like to express my gratitude to all persons who gave me a great deal of help in my study and research period. In particular, the following individuals are acknowledged:

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- My mother, Mathilde, who supported and encouraged me during my studies.
- My wife, Nina, for all her support during the completion of this document.

This treatise is dedicated to the two most important persons in my life, my mother and my wife.
ABSTRACT

The activity-based costing (ABC) system is a cost allocation technique which appears to have many benefits over the traditional costing systems. However, companies that have attempted to implement ABC have encountered various difficulties. Thus, there is a need to investigate the problems faced by companies while implementing ABC. The main objective of this study was to find solutions to overcome the problems encountered by South African companies during the implementation of an activity-based costing system.

An online questionnaire survey was considered an appropriate measurement method for this study. The targeted population of the study included companies that have dealt with the process of ABC implementation. Thus, some 63 companies were identified as part of the study sampling frame. A total number of 21 questionnaires were returned out of the 63 questionnaires sent to the targeted companies, giving a response rate of 33%. The quantitative data were processed using STATISTICA software, leading to appropriate descriptive statistical analysis, including frequencies, means, medians and standard deviations. The results of the empirical study revealed that the major problems faced by South African companies while implementing an ABC system were:

- the lack of basic knowledge and skill of ABC techniques by employees;
- the fact that ABC was complex and required too many detailed records;
- the fact that ABC was too time-consuming for the personnel; and
- employees’ resistance because they do not exactly know ABC.

Based upon the relevant literature and the empirical study, recommendations were made in order to address the identified problems. However, due to the small sample size (21 firms) and the low response rate (33%) observed, the findings of this study could not be generalised to the entire targeted population. Future research could investigate the ABC adoption rate in South Africa.

**Key words:** activity, activity-based costing (ABC), cost, driver, implementation, problem, success.
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<td>ABM</td>
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<td>101</td>
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<td>Annexure B: Questionnaire</td>
<td>102</td>
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</tbody>
</table>
1.1. INTRODUCTION

During the 1980s the limitations of traditional product-costing systems began to be widely publicised. These systems were designed decades ago when most companies manufactured a narrow range of products, and direct labour and materials were the dominant factory costs. Overhead costs were relatively small, and the distortions arising from inappropriate overhead allocations were not significant. Information-processing costs were high, and it was therefore difficult to justify more sophisticated overhead allocation methods (Drury, 2012: 254).

According to Drury (2012: 254), today companies produce a wide range of products; direct labour represents only a small fraction of total costs, and overhead costs are of considerable importance. Simplistic overhead allocations using a declining direct labour base cannot be justified, particularly when information-processing costs are no longer a barrier to introducing more sophisticated cost systems. Furthermore, the intense global competition of the 1980s has made decision errors due to poor cost information more probable and more costly. According to Holzer and Norreklit (1991), quoted in Drury (2004: 374), over the years the increased opportunity cost of having poor cost information, and the decreased cost of operating more sophisticated cost systems, increased the demand for more accurate product costs.

It is against this background that activity-based costing (ABC) has emerged.

According to Proctor, Burton, Pierce and Burmiston (2009: 250), the main objective of ABC is to produce an accurate cost for each product in the range. The thinking behind ABC is that, in order to control costs, it is necessary for costs to be calculated accurately. A positive side-effect of this is that other important decisions, for example setting prices, will then be that much more effective. ABC achieves this increase in accuracy through a simple logic:

- Products cause activities to happen.
- Activities cause costs to be incurred.
This causation link, fundamental to ABC, is illustrated in Figure 1.1 below.

**Figure 1.1: The ABC causation link**

![Diagram of ABC causation link]

Source: Proctor *et al* (2009: 250)

Niemand, Meyer, Botes and Van Vuuren (2006: 170) confirm that the ABC system is based on the principle that products are created from activities and costs are allocated on the basis of activities. However, in spite of the far-reaching rewards associated with ABC, only a small proportion of South African companies have endeavoured to realise the benefits of this revolutionary costing and management technique (Wessels & Shotter, 2000: 216). Besides, Marivic (2004: 13) claims that in the last decade there is growing evidence that many firms that have attempted to implement ABC are experiencing problems with the implementation of ABC and, in the extreme, are not having success with it. Therefore, there is a need to investigate the difficulties hindering the successful implementation of ABC.

**1.2. PROBLEM STATEMENT**

This leads to the following question which represents the main problem that will be addressed by this research:

What are the difficulties encountered by South African companies while implementing an ABC system?

To address the main problem, the following sub-problems need to be considered:

- Are companies able to weigh up their need to adopt an ABC system over the traditional costing systems (TCS)?
- What are the current problems experienced during the implementation of an ABC system?
- Can the critical success factors (CSFs) in implementing ABC be clearly identified in the South African environment?
- What are the steps involved in an ABC system implementation?
1.3. OBJECTIVES OF THE STUDY

1.3.1. Main objective

The main objective of the study is to find solutions to overcome the difficulties encountered by companies while implementing an ABC system in the South African environment.

1.3.2. Sub-objectives

In order to achieve the main objective of the research, the following sub-objectives have been formulated:

- to determine the advantages of adopting an ABC system over the traditional costing systems;
- to identify the problems experienced while implementing an ABC system;
- to identify the critical success factors in implementing ABC; and
- to examine the process involved in the implementation of an ABC system.

1.4. RESEARCH DESIGN AND METHODOLOGY

The research procedures which the study will follow to investigate the main and sub-objectives are presented by means of:

1.4.1. Literature study

In order to achieve the objectives of this study, a relevant literature review examining ABC and its implementation, will be conducted to provide a conceptual framework for this treatise. Many different sources of information will be used, such as books, journal articles, electronic databases, the internet and other relevant sources.
1.4.2. **Empirical study**

The empirical study will consist of the following:

1.4.2.1. **Sample selection**

To carry out the empirical study, a minimum of twenty companies using an ABC system in South Africa will be chosen.

1.4.2.2. **Measurement instrument**

In order to obtain empirical perspectives, an online questionnaire will be sent via email to selected companies using ABC as their costing system. Those companies will be distinguished by:

- identifying some selected Johannesburg Stock Exchange (JSE) companies as being ABC user firms;
- identifying ABC user companies that had been mentioned by previous research studies; and
- selecting some ABC users through the internet website of consultancies which provide software and external assistance to ABC user companies.

The questionnaire will be developed from the literature review analysis.

1.5. **DELIMITATION OF THE RESEARCH**

Delimitating the research serves the purpose of making the research topic manageable from a research point of view. The current study will be conducted in South Africa and companies will not be selected by looking at their sector of activity but regarding the fact that they have implemented or are implementing an ABC system.
1.6. PRIOR RESEARCH ON THE RELEVANT TOPIC

Sartorius, Eitzen and Kamala (2007: 1) state that ABC has been researched extensively in developed countries. A study by Elhamma (2012: 82) illustrates that in the United States, the United Kingdom and France, surveys between the early 1990s and 2008 have indicated an increasing extent of ABC adoption in each of these countries. In the United States, the adoption rate of the ABC method increased from 11% in 1993 to 52% in 2003 and that of the United Kingdom’s companies increased from 6% in 1991 to 23% in 2001. Manufacturing firms in France increased their ABC adoption from 15.9% in 2002 to 33.3% in 2008.

However, Sartorius et al (2007: 1) acknowledge that research on the adoption of the ABC method in South Africa is limited. As reported in Wessels and Shotter (2000: 216), Wessels (1999:43, 53) observed that only 15.18% of the responding listed companies in South Africa have attempted to implement ABC.

Furthermore, Sartorius et al (2007: 1) indicate that the adoption rate of ABC in listed companies in Gauteng is 12%. Given that listed companies in Gauteng constitute 51% of all listed companies in South Africa, it is reasonable to assume that this rate is applicable to all listed companies within South Africa.

1.7. DEFINITION OF CONCEPTS

The following definitions of concepts related to this research study are:

1.7.1. Activity

Activity is any discrete task that an organisation undertakes to make or deliver goods or a service (Hilton, Maher & Selto, 2008: 53). Drury (2012: 253) also points out that activities consist of the aggregation of many different tasks and are described by verbs associated with objects. According to the Chartered Institute of Management Accountants (2005: 3), Niemand et al (2006: 172) and Proctor et al (2009: 252), activities can be classified and analysed into four major categories, which are: unit-level activities, batch-level activities, product-sustaining activities and facility-sustaining activities.
1.7.2. Activity-based costing (ABC)

ABC is an approach to the costing and monitoring of activities which involve tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilise cost drivers to attach activity costs to outputs (The Chartered Institute of Management Accountants, 2005: 3).

1.7.3. Cost

As a noun, cost is the amount of cash or cash equivalent paid or the fair value of other consideration given to acquire an asset at the time of its acquisition or construction (International Accounting Standards 16).

As a verb, cost means to ascertain the cost of a specified thing or activity. The word “cost” can rarely stand alone and should be qualified as to its nature and limitations (The Chartered Institute of Management Accountants, 2005: 9).

1.7.4. Cost centre or cost pool

The area of an organisation for which costs are collected for the purposes of cost ascertainment, planning, decision making, and control. Cost centres are determined by individual organisations; they might be based on a function, department, section, individual, or any group of these. Cost centres are of two main types: production cost centres in an organisation are those concerned with making a product; while service cost centres provide service to other parts of the organisation (Dictionary of accounting, 2010: 116).

1.7.5. Cost driver

Cost driver is a factor influencing the level of cost. Cost driver is often used in the context of ABC to denote the factor which links activity resource consumption to product outputs, for example the number of purchase orders would be a cost driver for procurement cost (The Chartered Institute of Management Accountants, 2005: 13).
1.8. SIGNIFICANCE OF THE RESEARCH STUDY

Jacob (2005) and Van de Walt (2005), quoted in Sartorius et al (2007: 2), state that the importance of the implementation of an ABC system is underlined by the need for South African companies to find ways to reduce costs in the new market-led environment.

This implies that if ABC is successfully used to reduce costs and increase the competitiveness of firms in South Africa, it might serve as an impetus to other African countries to adopt ABC and modernise their management control systems. Therefore, if the problems associated with implementing ABC in South Africa are excessive, relative to the benefits of implementing ABC, South African companies should be aware of this before attempting the costly exercise of implementing ABC (Sartorius et al, 2007: 2).

1.9. CHAPTER OUTLINE

The research study has been divided into the following chapters:

Chapter One: Introduction and background of the study

This chapter introduces the research problem and the objectives of the study. Chapter One also provides a brief explanation of the research design and methodology adopted for the study.

Chapter Two: Activity-based costing (ABC)

This chapter will mainly provide a literature review which indicates the advantages of adopting an ABC system and the difficulties faced by companies during its implementation.

Chapter Three: Implementation of an activity-based costing system

The purpose of this chapter will be to provide a literature review focusing on the critical success factors of the implementation of an ABC system. In addition, the different stages involved in the implementation of ABC will be discussed.
**Chapter Four**: Research design and methodology

The research design and methodology chapter will discuss the research methods used. Chapter Four will mainly deal with the selection of the sample, the structure of the questionnaire, the data analysis strategy and the limitation of the study.

**Chapter Five**: Empirical study and presentation of the results

In Chapter Five, after reporting the response rate of the survey, the major findings resulting from the empirical study will be presented.

**Chapter Six**: Conclusions and recommendations

This chapter will conclude the study and give recommendations about the topic. The conclusions will be based on both the literature study and the empirical findings. Proposals for further research will also be made.
2.1. INTRODUCTION

Chapter Two will provide an overview of the treatment of overhead costs through traditional costing systems (TCS), describe the mechanism of ABC and then illustrate a comparison between TCS and ABC. Thereafter factors prompting the development of an ABC system in an organisation, as well as benefits and limitations of ABC, will be discussed. Furthermore, ABC development and practical applications revealed by the literature will be outlined. Before concluding this chapter, the problems in the implementation of an ABC system will be discussed.

2.2. TRADITIONAL COSTING SYSTEMS (TCS): TREATMENT OF OVERHEADS

According to Marivic (2004: 8), TCS is designed for companies that have homogeneous products, large direct costs compared to indirect costs, limited ability to collect data and low costs. However, many companies have found that ABC tends to assign costs to products based on an arbitrarily developed average rather than the actual resource usage. As a result, products that are more complex to build and consume more resources (for example, more inspections, machine setups, materials) are not necessarily assigned to their fair share of costs. Instead, many of these complex products’ costs could be unfairly assigned to simpler products. Thus, the complex products are undercosted, and the simple products are overcosted (Hilton et al, 2008: 146).

According to Martin (2012: 6), two main issues tend to occur when traditional costing system methods are used to provide information for management decision purposes. One has to do with product-cost distortions or cross-subsidies and the other relates to exclusion of non-manufacturing costs.
2.2.1. Product-cost distortions and cross-subsidies

First, in traditional costing, only production volume-related measures are used to allocate overhead costs to products, even though many products do not consume indirect resources (overhead) in proportion to the volume of products produced. Since many types of indirect resource costs are caused by, or driven by, non-production volume-related product characteristics, such as size and complexity, traditional costing tends to distort product costs. This means that too much overhead cost is allocated to some products, while too little overhead cost is allocated to other products. These distortions are frequently referred to as cross-subsidies (Martin, 2012: 7).

According to Horngren, Datar and Rajan (2012: 140), product-cost cross-subsidisation means that if a company undercosts one of its products, it will overcost at least one of its other products. Similarly, if a company overcosts one of its products, it will undercost at least one of its other products. A product is undercosted if it consumes a high level of resources but is reported to have a low cost per unit and conversely a product is overcosted if it consumes a low level of resources but is reported to have a high cost per unit.

2.2.2. Excluding non-manufacturing costs

A second problem with TCS is that tracing product-related administrative, marketing and distribution costs to product inventories is not a generally acceptable procedure allowable for external reporting. However, engineering design, marketing, distribution and customer service costs are clearly part of the costs of placing a product in the hands of the customer. Since these non-manufacturing costs might differ substantially from product to product and from customer to customer, ABC traces these costs to products and customers using additional cost pools and cost drivers (Martin, 2012: 8).

Marivic (2004: 7) states that traditional costing system is suitable for collecting and accumulating costs but not for converting costs into useful managerial information. Furthermore, Cokins (2001), cited by Marivic (2004: 7), claims that contrary to popular belief, ABC does not replace the established traditional costing that has been adopted for so long now. ABC is really a translator and not a replacement in a
sense that it translates the “chart of accounts” expenses into language that people can understand and also into elements of costs, which give more flexibility.

2.3. MECHANISM OF ABC

ABC is a cost-accounting technique that allows an organisation to determine the actual cost associated with each product and service produced by the organisation without regard to the organisational structure (Marivic, 2004: 9). According to Khozein (2009: 381), ABC focuses on activity as a cost object since activity is the main reason for costing. In such a system, costing is first assigned to activities and then through activities, given to other objects, such as products and services. The basic mechanism of ABC is depicted in Figure 2.1.

Figure 2.1: The mechanism of ABC

Source: 12manage (2012)
In more detail, the approach initially involves dividing the production procedure into a series of activities and allocating overhead costs to each. This model assigns more indirect costs into direct costs compared to conventional costing models. Then, based on the levels of these activities consumed by the final products or services being produced, it allocates overhead cost to each of these. Production costs are thus allocated through a cost driver method in two stages to minimise distortions (Lin, 2012: 13).

Activity-based costing systems differ from volume-based costing systems by linking uses of resources to activities and linking activity costs to products, services, or customers. The first stage assigns factory overhead costs to activities by using appropriate resource consumption cost drivers. The second stage assigns the costs of activities to cost objects using appropriate activity consumption cost drivers that measure the demands cost objects place on the activities (Blocher, Stout and Cokins, 2010: 130). An illustration of the ABC two-stage cost-assignment procedure is provided in Figure 2.2.
Figure 2.2: The activity-based two-stage procedure

Source: Blocher et al (2010: 130)

Blocher et al (2010: 130) state that by using cost drivers in both the first and second stage cost allocations, ABC provides more accurate measures of product or service costs for the cost of activities that are not proportional to the volume of outputs produced.
2.4. COMPARISON BETWEEN TCS AND ABC

The main relevant comparative aspects between TCS and ABC are highlighted in Table 2.1 below.

Table 2.1: A comparison between TCS and ABC

<table>
<thead>
<tr>
<th>TCS</th>
<th>ABC</th>
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<tbody>
<tr>
<td>Overhead costs are accumulated and assigned to products in accordance with organisational structure (that is, departments or cost centres), based on the number of resources used by the product.</td>
<td>Overhead costs are accumulated and assigned to products in accordance with activities, based on the number of resources used by each product.</td>
</tr>
<tr>
<td>Multiple overhead rates are calculated: one per department or cost centre.</td>
<td>Multiple overhead rates are calculated: one per activity.</td>
</tr>
<tr>
<td>The allocation basis is usually based on volume measure, and does not necessarily represent a cause-and-effect relationship between the cost and the allocation basis.</td>
<td>The allocation basis is referred to as a “cost driver”, as a cause-and-effect relationship exists between the cost and the allocation basis.</td>
</tr>
<tr>
<td>The allocation basis is an easily measured and traceable one, and a limited number of bases are used; the costing system is not prohibitively expensive to implement and operate.</td>
<td>Because of the extensive number of cost drivers that must be identified and measured, this costing system can be prohibitively expensive to implement and operate.</td>
</tr>
<tr>
<td>Overhead cost accumulated in service departments is reallocated to production departments. A rate which is applied to products is then determined for each production department.</td>
<td>Overhead cost related to service activities is not reallocated to product departments or activities first and then to the products. The cost driver for the service cost is used to allocate the service-related overhead directly to the products.</td>
</tr>
<tr>
<td>Result: Overheads are averaged out between products. The overheads assigned to products are not representative of the long-term cost savings if the product in question were not produced. Consequently, this method of allocation does not support strategic or long-term decision-making.</td>
<td>Result: The allocated overhead reflects the extent to which that product causes costs to be incurred. In other words, the overhead allocated represents the amount that could be saved in the long term if the product were not produced. Consequently, this method of allocation supports strategic or long-term decision-making.</td>
</tr>
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Source: Roos, Cairney, Chivaka, Fourie, Haji, Joubert, Pienaar, Stack, Streng, Swartz and Williams (2011: 166)

2.5. FACTORS PROMPTING THE DEVELOPMENT OF AN ABC SYSTEM

According to Roos, Cairney, Chivaka, Fourie, Haji, Pienaar, Stack, Swartz and Williams (2008: 166), the extent to which ABC is important for management in an entity depends on three main factors:

- the diversity of the product range (the more diverse, the more important);
- the significance of indirect costs (the more significant, the more important); and
- the level of competition within the industry (the more intense, the more important, as cost accuracy is vital).

Drury (2012: 265) also identifies the same factors as primary requirements to consider before implementing ABC.

2.5.1. Diversity of the product range

Product variety is commonly associated with the need to consider activity-based costing. Whether products are variations of the same product line or products are in numerous product families, adding products causes numerous overhead costs to increase (Kinney & Raiborn, 2011: 129).
2.5.2. Significance of indirect costs

Certain products and services create substantially more overhead costs than others do. Although some of these additional overhead costs are caused by product variety or product/process complexity, others are related to support services. For instance, some products require high levels of advertising; some use expensive distribution channels; and some require the use of high-technology machinery. If only one or two overhead pools are used, the overhead related to specific products will be spread over all products. The result will be increased costs for products that are not responsible for the increased overhead (Kinney & Raiborn, 2011: 130).

2.5.3. Level of competition within the industry

According to Kinney and Raiborn (2011: 130), a change in a company’s competitive environment could also indicate a need for better cost information. In fact, Horngren et al. (2012: 145) note that as markets have become more competitive, managers have felt the need to obtain more accurate cost information to be able to make important strategic decisions, such as how to price products and which products to sell. Making correct pricing and product mix decisions is critical in competitive markets because competitors quickly capitalise on a company’s mistakes.

2.6. BENEFITS OF ABC

According to Weygandt, Kimmel and Kieso (2010: 161), the primary benefit of ABC is its ability to provide more accurate product costing for decision-making purposes. Blocher et al. (2010: 133) report that the major benefits of activity-based costing that many firms have experienced are:

- Better profitability measures - ABC provides more accurate and informative product costs, leading to more accurate product and customer profitability measurements and to better-informed strategic decisions about pricing, product lines, and market segments.
- Better decision making - ABC provides more accurate measurements of activity-driving costs, helping managers to improve product and process value by making better product-design decisions, better customer-support decisions, and fostering value-enhancement projects.
• Process improvement - the ABC system provides the information to identify areas where process improvement is needed.

• Cost estimation - improved product costs lead to better estimation of job costs for pricing decisions, budgeting, and planning.

• Cost of unused capacity - since many firms have seasonal and cyclical fluctuations in sales and production, there are times when plant capacity is unused. This can mean that costs are incurred at the batch-, product-, and facility-level activities, but are not used. Capacity is supplied but not used in production. ABC systems provide better information to identify the cost of unused capacity and maintain a separate accounting for this cost. Overall, the goal is to manage capacity levels to reduce the cost of underutilisation of capacity and to price products and services properly.

2.7. LIMITATIONS OF ABC

According to Accounting for Management (2012: 2), despite an ABC system helping decision-makers to manage overhead costs and understand profitability of products and customers, ABC has many limitations or disadvantages:

• Implementing an ABC system is a major project that requires substantial resources. Once implemented an ABC system is costly to maintain. Data concerning numerous cost drivers must be collected, checked, and entered into the system.

• ABC produces numbers such as product margins that are at odds with the numbers produced by TCS.

• ABC data can be easily misinterpreted and must be used with care when used in making decisions. Costs assigned to products, customers and other cost objects are only potentially relevant. Before making any significant decision using ABC data, managers must identify which costs are really relevant for the decisions at hand.

• Reports generated by ABC systems do not conform to external reports. Consequently, an organisation involved in ABC should have two cost systems: one for internal use and one for preparing external reports.
2.8. ABC PRACTICAL APPLICATIONS

According to Innes and Mitchell (1995: 138), ABC use has extended beyond purely product costing to varied range of cost-management applications, including budgeting, cost modelling, cost reductions, customer profitability analysis, new product or service design, performance measurement, product or service output decisions, product or service pricing, and stock valuation.

2.8.1. Budgeting

According to Glad and Becker (1994: 157), the fundamental activity-based costing system principles and methodology provide a superb basis for the budgeting process. Activity-based budgeting (ABB) is therefore a logical progression from activity-based costing and management. Barfield, Raiborn and Kinney (2001: 682) define ABB as a planning approach applying activity drivers to estimate the levels and costs of activities necessary to provide the budgeted quantity and quality of production. ABB can be applied to nearly any activity and is useful for managing product and period costs.

However, a primary requirement for employing ABB is a thorough understanding of activity-based costing and management (ABC & M) premises and systems. An ABB system comprises, mutatis mutandis, the same principles as ABC & M (Glad & Becker, 1994: 157).

2.8.2. Cost modelling

According to Martin (2012: 17), traditional costing system tends to categorise costs as fixed and variable, whereas ABC structure costs are in a hierarchy of levels, reflecting the way according to which costs vary. In an ABC system costs are classified by unit-level, batch-level, product-level, customer-level and facility-level. This cost modelling is based on the fact that ABC logic looks at costs from a long-run perspective, while the traditional fixed/variable cost behaviour methodology is based on a short-run perspective.
2.8.3. Cost reductions

According to Innes and Mitchell (1995: 139), ABC gives visibility to costs by detailing the organisation’s activities and its respective costs. Instead of simply recording costs by the type of input which they represent, ABC categorises costs by the way in which they are consumed. This novel perspective lends itself to analyses which focus on cost-reduction possibilities.

2.8.4. Customer profitability analysis (CPA)

According to Hartgraves, Morse and Davis (2009: 191), one of the most beneficial applications of ABC is in the analysis of the profitability of customers. Indeed, Blocher et al (2010: 146) state that CPA focuses on identifying customer service activities and cost drivers and determining profitability of each customer or group of customers. Customer service includes all activities to complete the sale and satisfy the customer, including advertising, sales calls, delivery, billing, collections, service calls, inquiries, and other forms of customer service. CPA allows managers to:

- identify most profitable customers;
- manage each customer’s costs-to-serve;
- introduce profitable new products and services;
- discontinue unprofitable products, services, or customers;
- shift a customer’s purchase mix toward higher-margin products and service lines;
- offer discounts to gain more volume with low costs-to-serve customers; and
- choose types of after-sale services to provide.

A good understanding of the profitability of a firm’s current and potential customers can help firms to improve overall profits and to become more.

2.8.5. New product or service design

Hilton et al (2008: 161) state that ABC information for existing products or services can be helpful for estimating the costs of new products or services if the activities used for making these new products or services are similar to those used for making the existing ones.
2.8.6. Performance measurement

Many organisations are now focusing on activity performance as a means of facing competitors and managing costs. To monitor efficiency and effectiveness of activities, performance measures are required. Activity performance measures consist of measures relating to costs, time, quality and innovation (The Institute of Chartered Accountants of India, 2011: 145).

2.8.7. Product or service output decisions

According to Harrison and Killough (2006: 189), ABC information provides analytic value to profit-oriented decisions in a controlled environment. In this regard, Innes and Mitchell (1995: 145) state that the following main types of output decisions to which ABC is applied are:

- establishing output volume levels;
- making or buying a component; and
- dropping or keeping a product service line.

2.8.8. Product or service pricing

Foong and Ho (2009: 78) point out in their study the inadequacy of the traditional volume-based cost allocation approach for formulation of appropriate pricing strategy to meet challenges of the increasingly competitive market. In contrast, the adoption of the ABC approach to cost allocation could improve understanding of management regarding resource consumption for the various activities undertaken within the company, and consequently the ABC information could be used to revise the company's pricing strategy to eliminate or mitigate serious threats from the competitors.

2.8.9. Stock valuation

Cokins (2001: 138) suggests that one use of standard product costs obtained from an ABC system should be the stock valuation. A study about the applications of ABC in the United Kingdom’s largest companies led by Innes and Mitchell (1995: 144) indicated that only 29% of ABC adopters use ABC for stock valuation. This low rate takes into consideration the fact that non-manufacturing ABC users might not
perceive stock valuation as an issue regarding their insignificant level of stock. Even though Innes and Mitchell (1995: 144) observed that for the most part external auditors had accepted this novel means of cost determination for ABC adopters, Hilton et al (2008: 147) state that ABC is used to establish product costs for managerial decision-making purposes, such as whether to continue offering a product, and not for stock valuation for external reporting.

2.9. PROBLEMS IN THE IMPLEMENTATION OF AN ABC SYSTEM

Based on the literature review, some of the most important problems encountered by companies implementing an ABC system are:

2.9.1. Lack of top management support

Sartorius et al (2007: 13) identify the lack of top management support in an ABC implementation project as a central problem for the non-implementation of ABC. According to Majid and Sulaiman (2008: 49), top management seems to be unimpressed with the ABC system and perceives ABC to be the same as that of other costing techniques. As a consequence, top management is quite reluctant to spend the company’s resources on putting ABC into practice. In this regard, Wessels and Shotter (2000: 222) observe that the intensity of the lack of management support increases especially when the top management is more concentrated or focused on other priorities in the firm, as being more important than the ABC initiative or when ABC initiative is not aligned with the company strategy. Furthermore, a key-related problem cited by Wessels and Shotter (2000: 223) is that the implementation of ABC is too time-consuming for operational managers.

According to Wessels and Shotter (2000: 222), another problem experienced by companies to a lesser degree is the lack of internal project support. The project sponsor is the manager or executive within an organisation who is not directly involved in the operational work of the project but who can oversee a project, delegate authority to the project manager and provide support as a trainer or coach to the project manager. The project sponsor has sufficient authority or influence to direct all the staff involved in a project – or as many as possible – and to get the cooperation of key stakeholders. The project sponsor ensures that the project is
aligned with the organisational strategy and compliant with policy (Passenheim, 2009: 17).

### 2.9.2. Technical or resource constraints

According to Marivic (2004: 12), the difficulties in implementing ABC are technical and complex, since the steps involved need detailed records of the costs associated with producing products and services. Marivic (2004: 12) also observes that employees lack basic knowledge and skill of ABC techniques. Furthermore, Sartorius et al. (2007: 13) state that other technical or resource obstacles include a difficult definition of cost centres and cost drivers, a lack of adequate information or technology system, a difficult accumulation of data needed for ABC and a difficult integration of ABC data with another system.

Equally important, according to Majid and Sulaiman (2008: 46), is that one resource constraint encountered by companies during the implementation of an ABC system is the high cost of the implementation, especially the cost of IT (purchasing and updating specific software).

Finally, a study by Wessels and Shotter (2000: 222) indicates that problems linked to a lack of adequate employee resources include that ABC is too time-consuming for accounting personnel; there is a high turnover of ABC project team individuals and only accounting personnel are involved in a project team.

### 2.9.3. Misconceptions about ABC

Sartorius et al. (2007: 13) state that the misconceptions about ABC lead to an inadequate marketing of ABC and a negative publicity within companies. In fact, Marivic (2004: 12) believes that ABC would be adopted more readily by various companies if ABC were marketed better by the accountants themselves. Consequently, companies face employee resistance while implementing ABC. In this regard, Majid and Sulaiman (2008: 49) state that the lower-level employees are sceptical of the new system, primarily because they do not know what ABC is all about.

Furthermore, Sartorius et al. (2007: 14) state that the satisfaction with alternative systems, which is another barrier for implementing ABC, refers to the fact that
decision-makers are satisfied with the current cost system and find ABC inappropriate for the company business sector or only suitable for manufacturing.

2.9.4. Lack of coherence with organisation’s goal and culture

Wessels and Shotter (2000: 222) state that problems pertaining to a lack of coherence with the organisation’s goal and culture are an incompatibility of ABC with company strategy, an inadequate training of managers, an inadequate training of implementers, an inadequate training of users and a resistance to change in organisational culture.

2.9.5. Summary of the main difficulties in implementing ABC system

Khozein and Dankoob (2011: 615) believe that one significant way for achieving a successful ABC implementation is not to repeat the mistakes made by others and to give credence to the mistakes leading unsuccessful entities to failure. To know the failure reasons will aid in implementing an ABC system consciously, and to avoid failure reasons can affect higher successes. Some principle problems cited by the literature hindering the implementation of an ABC system are set out in Table 2.2.
Table 2.2: Summary of the difficulties encountered in implementing ABC

<table>
<thead>
<tr>
<th>Main obstacles in implementing an ABC system</th>
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<tbody>
<tr>
<td><strong>Top management support</strong></td>
<td></td>
</tr>
<tr>
<td>Lack of top management support</td>
<td></td>
</tr>
<tr>
<td>Management resistance; seeing ABC as just a passing “fad”</td>
<td></td>
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<tr>
<td>Management give more emphasis to other priorities in the firm</td>
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<tr>
<td>Too time-consuming for operational managers</td>
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<tr>
<td>Absence of project sponsor</td>
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<tr>
<td><strong>Technical or resource constraints</strong></td>
<td></td>
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<tr>
<td>Complex and require detailed records and more effort</td>
<td></td>
</tr>
<tr>
<td>Employees lack basic knowledge and skill of ABC techniques</td>
<td></td>
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<tr>
<td>Difficulty in identifying and defining cost centres and suitable cost drivers</td>
<td></td>
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<tr>
<td>Lack of adequate systems and IT</td>
<td></td>
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<tr>
<td>Difficulty with data collecting and gathering</td>
<td></td>
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<tr>
<td>Difficulty in integrating ABC data with other system</td>
<td></td>
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<tr>
<td>High cost of implementation - especially cost of IT</td>
<td></td>
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<tr>
<td>Too time-consuming for accounting personnel</td>
<td></td>
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<tr>
<td>High turnover of ABC project team individuals</td>
<td></td>
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<tr>
<td>Only accounting personnel on project team</td>
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<tr>
<td><strong>Misconceptions about ABC</strong></td>
<td></td>
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<tr>
<td>Inadequate marketing of ABC - especially by accountants themselves</td>
<td></td>
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<tr>
<td>Negative publicity about ABC</td>
<td></td>
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<tr>
<td>Employees’ resistance because they do not exactly know ABC</td>
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<tr>
<td>Negative perception about ABC</td>
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<tr>
<td>Satisfaction with current system</td>
<td></td>
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<tr>
<td>ABC not suited to business sector</td>
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<tr>
<td>ABC only suited to manufacturing</td>
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<tr>
<td><strong>Lack of coherence with the organisation’s goal and culture</strong></td>
<td></td>
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<tr>
<td>Incompatible with company strategy</td>
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<tr>
<td>Inadequate training of managers</td>
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<tr>
<td>Inadequate training of implementers</td>
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<tr>
<td>Inadequate training of users</td>
<td></td>
</tr>
<tr>
<td>Resistance to change in organisational culture</td>
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</table>

Source: Author’s own compilation (2012)
2.10. CONCLUSION

Chapter Two provided a brief presentation of TCS before introducing ABC. In addition, the factors indicating the need for implementing ABC in an organisation were identified according to the literature, as well as discussing the benefits and limitations of an ABC system. Thereafter, practical applications of outputs generated by an ABC system were outlined.

Furthermore, problems experienced by companies while implementing an ABC system were also revealed through analysing previous studies. In this regard, Khozein and Dankoob (2011: 614) advise that being aware of the different reasons of failures and difficulties in implementing an ABC system could increase the possibility of success in the future. Chapter Three will firstly focus on the critical success factors of the implementation of an ABC system and secondly set out the different steps involved in implementing an ABC system.
3.1. INTRODUCTION

Chapter Three will discuss the process of implementing an ABC system within an organisation. Firstly, this chapter will highlight the critical success factors (CSFs) in implementing an ABC system and secondly, the different steps involved in implementing ABC will be outlined. This chapter will conclude by providing an overview of the notion of activity-based management.

3.2. CRITICAL SUCCESS FACTORS (CSFs) OF ABC IMPLEMENTATION

According to CIMA Publishing (2011: 133), critical success factors (CSFs) are a limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the business. In their research, investigating factors influencing activity-based costing success, Fei and Isa (2010a: 148) established a research framework which identifies behavioural and organisational variables, technical variables, organisational structure variables and organisational culture variables as having a positive relationship with ABC success in an organisation. The proposed framework is depicted by Figure 3.1 below:

**Figure 3.1: Critical success factors of an ABC system implementation**

Source: Fei and Isa (2010a: 149)
3.2.1. Technical variables

Lana and Fei (2007), cited by Fei and Isa (2010a: 149), reviewed previous empirical studies about factors affecting ABC success and summarised the technical factors used by past research. Technical factors are:

- software packages;
- gathering data on cost drivers;
- identifying activities;
- knowledge of data requirement and data collection; and
- the participation of external consultants.

3.2.1.1. Software packages

Majid and Sulaiman (2008: 39) believe that obtaining suitable ABC software is one of the pertinent factors to ensure a successful ABC system implementation. According to Gosselin (2005: 17), many consulting firms have developed ABC software to facilitate data processing. Moreover, surveys have revealed that electronic spreadsheets are more commonly used than ABC software because the costs of customisation of the ABC software are too high.

The Chartered Institute of Management Accountants (2001: 5) advises one to use spreadsheets at the beginning of the ABC project until the company identifies exactly what its needs are, and then buy the software that meets these needs. However, Innes, Mitchell and Sinclair (2000: 354) concluded in their research that a technical characteristic of the system, such as the type of software adopted, has no association with success.

3.2.1.2. Gathering data on cost drivers

According to Miller (1996: 99), data gathering is a critical element to a successful ABC implementation. However, Cooper, Kaplan, Maisel, Morrissey and Oehm (1992: 300) reported in their study some difficulties in gathering data needed for the activity-based model, especially for the cost drivers. Further, Miller (1996: 40) states that data gathering is an integral part of each step reviewed through the process of ABC implementation. Data gathering plays a significant role in the activity analysis. Thus,
in order to gather data on cost drivers, Turney (1992: 241) suggests three primary sources for ABC data:

- the accounting department, which provides data about the cost of resources;
- information about activities, which comes from people who do the work; and
- information about activity drivers, which is found in the company’s information systems.

3.2.1.3. Identifying activities

Activities form the basis of measurement of all relevant information in an ABC system. It is therefore imperative to define the activity at the right level of detail. Too much detail would cause an information overload and too little detail might lead to insufficient information being available for analysis (Glad & Becker, 1994: 199).

3.2.1.4. Knowledge of data requirement and data collection

Drury (1992: 111) states that data collection is the cornerstone of an activity-based costing system. Indeed, by collecting the appropriate information, it is possible to conceive an activity database from which various analyses can be undertaken. Depending on the structure of the organisation, data is collected in different ways. For instance, in some departments staff members complete their own forms; in others, existing records, such as sale invoices, are analysed. Because the information reported by ABC is used to help managers make decisions, data collection needs to be accurate enough to ensure managers make the right decisions.

3.2.1.5. Participation of external consultants

Player and Keys (1999: 21) assert that a consultant’s role is to help the company be successful - a role that includes a knowledge transfer from the consultant to company management and users of ABC information. If ABC team members do not have time or do not know how to implement an ABC system, a consulting approach can help implementation of the move forward.

In fact, Liu and Pan (2007: 262) reveal in their study that the involvement of external consultation during the early stages of the ABC project is perceived as necessary
and useful because of the novice state of ABC application. Furthermore, Cooper et al (1992: 299) add that external consultants play a facilitating role and are typically involved in tasks such as:

- conducting initial training and awareness seminars for management and the ABC team;
- helping the ABC team to structure interviews;
- assisting the ABC team in transferring both hard data from the company’s databases and soft data from management interviews and estimates into an ABC software; and
- assisting in the data analysis and preparation of reports and presentations to the project sponsor and senior management.

3.2.2. Behavioural and organisational variables

Shield and Young (1989), as cited by Fei and Isa (2010a: 149), identified the following seven behavioural and organisational variables that are important to cost management practices:

- top management support;
- linkage to competitive strategies;
- performance evaluation and compensation;
- non-accounting ownership;
- sufficient resources;
- training in designing, implementing and using the cost management system; and
- consensus about the clarity of the objectives of the cost management system.

3.2.2.1. Top management support

Wessels and Shotter (2000: 217) list top management support for the ABC project as one of the first main influencing factors for the success of an ABC system implementation. Further, a study by Fei and Isa (2010b: 2306) highlighted the fact that only top management support is positively and significantly associated with ABC successful implementation. The stronger the top management support of the ABC implementation; the higher level of ABC success could be achieved. In addition, Wessels and Shotter (2000: 218) confirm that management support is furthermore
crucial by providing resources (time, personnel, funding) and ensuring that other projects in the firm do not take precedence over the ABC initiative.

### 3.2.2.2. Linkage to competitive strategies

Shields (1995), and Shields and McEwen (1996), as cited by Fei and Isa (2010b: 2304), reported that ABC success is still influenced by the degree to which an ABC system is linked to the competitive strategy of a company. If a company could integrate ABC and the competitive strategy closer, the company has a higher possibility of implementing an ABC system successfully.

However, Fei and Isa (2010b: 2304) concluded that there is an insignificant relationship between ABC successful implementation and the competitive strategy of the enterprise.

### 3.2.2.3. Performance evaluation and compensation

According to Miller (1996: 200), activity-based costing information, when integrated and linked to performance evaluation and compensation, is used as a performance model of compensation and reward. Linkage and integration of ABC to the compensation and reward systems of the organisation will motivate ABC’s full integration. People pay attention to projects that are visible, given attention by management and that affect their revenue. In many respects, performance evaluation and compensation are linked and integrated with activities. Employees are paid for doing activities. Most job descriptions include description of activities and tasks. Organisations pay and hire people to do the activities required to deliver their products and services to the customer and to run and administer the business. Salaries are compensation for doing organisational activities. Activities that require significant skill levels or specialised knowledge are compensated at higher levels than activities that require minimal skill or knowledge.

### 3.2.2.4. Non-accounting ownership

A study by Maelah and Ibrahim (2007: 121) revealed that there is a significant positive relationship between non-accounting ownership and ABC implementation. The support received from non-accounting departments has a positive significant
influence on ABC adoption and implementation. Furthermore, Blocher et al (2010: 151) identify non-accounting ownership as a key factor for a successful ABC implementation. The process of ABC implementation requires close collaboration among management accountants, engineers, and manufacturing and operating managers. Managers need to perform as a team in identifying activities, cost drivers, and requisite information, both financial and non-financial. Management and employees could then be more willing to implement the ABC system because they feel included and share in ownership of the new system.

3.2.2.5. Sufficient resources

Shields (1995:161), quoted in Wessels and Shotter (2000: 218), states that adequate resources are one of the variables that appear to be significantly correlated with ABC successful implementation. Furthermore, Sartorius et al (2007: 15) concluded in their study that adequacy of resources with the ABC project is among the critical success factors for ABC implementation in South Africa. Therefore, Cooper et al (1992: 295) list resources required to develop an activity-based costing system as including internal personnel, outside consultants, time, data and software.

3.2.2.6. Training in designing, implementing and using an ABC system

Good training is important to provide a fast understanding of ABC to its users. Well-trained users are able to quickly assimilate ABC information and put it to use in successfully improving the ABC system. Training is a key element of information empowerment; the further down the organisation the management goes with training, the greater the impact ABC will have (Turney, 1992: 297).

3.2.2.7. Consensus about clarity of the objectives of the ABC system

Turney (1992: 149) noted the importance of communicating the organisation’s objective to the people in the organisation. Each person should understand the importance of the company’s mission and how each objective relates to their activity. When employees understand the positive impact of the new ABC system on the company’s objectives, they become more involved in the ABC project.
3.2.3. Organisational structure variables

In order to test the impact of organisational structure on the successful implementation of ABC in an organisation, Fei and Isa (2010c: 8) used two dimensions of organisational structure: centralisation and formalisation. Further, the results of Fei and Isa (2010c: 11) indicate a positive and significant relationship of ABC’s successful implementation and the two indicators tested namely centralisation and formalisation. The findings confirm that ABC success correlated with the overall organisational structure.

3.2.4. Organisational culture variables

Culture is the set of values, guiding beliefs, understandings and ways of thinking that are shared by members of an organisation. Culture represents the unwritten, feeling part of the organisation (CIMA Publishing, 2011: 414). In order to investigate the relationship between ABC’s successful implementation and organisational culture, organisational culture factor is divided into four perspectives: outcome orientation, team orientation, attention to details, and innovation (Fei & Isa, 2010c: 5). Furthermore, the findings of Fei and Isa (2010c: 11) establish a positive and significant relationship between ABC’s successful implementation and all sub-components of organisational culture (outcome orientation, innovation, team orientation and attention to details). Consequently, the results also confirm that overall organisation culture of an entity is significantly and positively correlated with ABC success.

3.3. IMPLEMENTING AN ACTIVITY-BASED COSTING SYSTEM

In an ever-global competitive world of business, it is imperative that companies should discover and implement new techniques in order to be more productive, efficient and profitable. But like all other innovations, careful analysis must be taken before shifting to new methods and techniques. It is important that companies contemplating effecting the much-needed change in their costing procedures make a thorough and careful analysis of both costing systems. The benefits in shifting from one technique over the other must be greater than the costs that would be incurred in the long run (Marivic, 2004: 7).
For this reason, Khozein (2009: 380) suggests that an ABC system should be implemented consciously, intelligently and conservatively. Furthermore, Akyol, Tuncel and Bayhan (2007: 583) explain that if the outputs of the ABC process are nearly identical to the outputs of the current traditional costing systems, then it is not logical to implement ABC because ABC consumes lots of time, data, efforts and resources, as well as being costly.

Seal (2011: 132) suggests that before proceeding further, it would be helpful to get a better idea of the overall process of assigning costs to cost objects (products, services and customers) in an ABC system. Thus, Figure 3.2 provides an example of a visual perspective of an ABC system model.

**Figure 3.2: Activity-based costing model example**

Source: Adapted from Seal (2011: 132)

An implementation model provided by Garrison, Noreen and Brewer (2010: 315) identifies five primary steps for implementing an activity-based costing system:

- Define activities, activity cost pools, and cost drivers.
- Assign overhead costs to activity cost pools.
- Calculate cost driver rates.
- Assign overhead costs to cost objects.
- Prepare management reports.
3.3.1. Define activities, activity cost pools, and cost drivers

The first step consists of identifying and defining the activities, the activity cost pools and then the different cost drivers.

3.3.1.1. Define activities

The first major step in implementing an ABC system is to identify the activities that will form the foundation for the system. This can be difficult, time-consuming, and can involve a great deal of judgement. A common procedure is for the individuals on the ABC implementation team to interview people who work in overhead departments and ask these people to describe their major activities. Ordinarily, this results in a very long list of activities (Garrison et al, 2010: 315).

Martin (2012: 30) defines an activity as representing the kind of work or task executed in an entity. For instance, purchasing represents a main activity for a company. The activities selected in the ABC process usually represent main activities that are made up of many sub-activities, tasks and sub-tasks. For example, many different types of work must be performed in the purchasing department, but all of this work may be conveniently classified as purchasing so that the complexity of the ABC design is kept to a manageable level. The different types of activities, along with some examples, are summarised in Table 3.1 below.

Table 3.1: Distinction between main activities, sub-activities, tasks and sub-tasks

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main activities</td>
<td>A major type of work, function or high level activity</td>
<td>Purchasing raw materials</td>
</tr>
<tr>
<td>Sub-activities</td>
<td>A lower-level type of work, or activity that supports a main activity</td>
<td>Preparing purchase orders</td>
</tr>
<tr>
<td>Tasks</td>
<td>A minor type of work that supports a sub-activity</td>
<td>Calling vendors</td>
</tr>
<tr>
<td>Sub-tasks</td>
<td>Part of a task</td>
<td>Dialling a vendor’s phone number</td>
</tr>
</tbody>
</table>

Source: Martin (2012: 30)
3.3.1.2. **Methods for identifying and classifying activities**

According to Drury (2011: 229), activities are identified in a company by carrying out an activity analysis. Hilton *et al* (2008: 150) state that companies generate their activity lists in a variety of ways, including the following approaches:

**(a) Top-down approach**

Some organisations use ABC teams of people from the top levels of management. This top-down approach can generate an activity dictionary quickly and inexpensively. A large consumer products company used this approach to develop activity dictionaries for many of its operations.

**(b) Interview or participative approach**

This approach relies on the inclusion of operating employees on the team and/or interviews with them. This approach is more likely to generate a more accurate activity dictionary than is the top-down approach. People doing jobs usually know more about their jobs than their supervisors do. One danger associated with the interview or participate approach, however, is that employees might not disclose their activities truthfully if they are concerned about the possible effects of giving higher-level management-specific information about what they actually do. Another danger is that employees might not recall their work processes accurately.

**(c) Recycling approach**

Reusing documentation of processes developed for other purposes is possible. Many companies, for example, have sought and achieved ISO 9000 certification, which requires thorough documentation of their processes. Recycling this documentation into an activity dictionary can be relatively straightforward.

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1 The International Organisation of Standardisation (ISO), based in Geneva, administers ISO 9000 certification of companies who either desire or are required by customers to certify the quality of their processes.
3.3.1.3. Hierarchy of resources and activities

Hilton *et al* (2008: 149) state that the objectives of classifying resources and activities are to create accurate descriptions of how the entity performs its work and the ability to trace the cost of resources acquired and activities performed to goods and services produced. According to Seal (2011: 126), activities can be combined and organised into five general groups of activities, as follows:

- unit-level activities;
- batch-level activities;
- product-level activities;
- customer-level activities; and
- organisation-sustaining or facility activities.

(a) Unit-level activities

Unit-level activities are performed each time a unit is produced. The costs of unit-level activities should be proportional to the number of units produced. For example, providing power to run processing equipment would be a unit-level activity since power tends to be consumed in proportion to the number of units produced.

(b) Batch-level activities

Batch-level activities are performed each time a batch is handled or processed, regardless of how many units are in the batch. Costs at the batch-level depend on the number of batches processed rather than on the number of units produced, the number of units sold or other measures of volume. For example, the cost of setting up a machine for batch-processing is the same regardless of whether the batch contains one or 5000 items.

(c) Product-level activities

Product-level activities relate to specific products and typically must be carried out regardless of how many batches are run or units of product are produced or sold. For example, activities, such as designing a product, advertising a product and maintaining a product manager and staff are all product-level activities.
(d) Customer-level activities

Customer-level activities relate to specific customers and include activities such as sales calls, catalogue mailings and general technical support that are not tied to any specific product.

(e) Organisation-sustaining or facility activities

Organisation-sustaining or facility activities are carried out regardless of which customers are served, which products are produced, how many batches are run, or how many units are made. This category includes activities such as clearing executive offices, providing a computer network, arranging for loans, preparing annual reports to shareholders, and so on.

3.3.1.4. Aggregating activities

Garrison et al. (2010: 315) state that a large list of activities causes some difficulties. Despite the fact that having a great number of activities provides more accurate costs, it is costly to design, implement, maintain and use an ABC system including a huge number of activities. Consequently, the original lengthy list of activities is usually reduced to a handful by combining similar activities.

According to Cooper (1990b), cited by No and Kleiner (1997: 70), the number of tasks performed by a company is typically so vast that it is economically unfeasible to define a different cost driver for each task. Therefore, many tasks must be combined into each activity. A single cost driver is then used to trace the costs of activities to cost objects.

When combining activities in an ABC system, activities should be grouped together at the appropriate level. Batch-level activities should not be combined with unit-level activities or product-level activities with batch-level activities, and so on. In general, it is best to combine only those activities that are highly correlated with each other within a level (Garrison et al., 2010: 315).

3.3.1.5. Activity cost pool or activity cost centre

According to Seal (2011: 126), an activity cost pool is a subset in which costs are accumulated that relate to a single activity in an ABC system. For instance, the
customer orders cost pool will be assigned all costs of resources that are consumed by taking and processing customer orders, including costs of processing paperwork and any costs involved in setting up machines.

3.3.1.6. Cost drivers

According to Garrison et al (2010: 310), an activity measure is an allocation base in an ABC system. The term “cost driver” is also used to refer to an activity measure because the activity measure should “drive” the cost being allocated.

In order to characterise a cost driver, Hilton et al (2008: 153) suggest that an appropriate cost driver should:

- logically have a cause-and-effect relationship with the activity and its costs;
- be measurable;
- predict or explain the activity’s use of resources with reasonable accuracy; and
- be based on the resource’s practical capacity to support activities.

According to Glad and Becker (1994: 123), two stages of cost drivers are identifiable, one at the first-stage allocations, called resource cost drivers, and one at the second-stage allocations, called activity cost drivers.

(a) Resource cost driver

According to Turney (1992: 101), resource cost drivers are the links between the resources and the activities. Resource cost drivers take a cost from the general ledger and assign it to the activities. Cokins (2001: 17) adds that resource cost drivers are used in order to trace expenditures to work activities. Blocher et al (2010: 132) provide some typical examples of resource cost drivers:

- the number of labour-hours for labour intensive activities;
- employees for payroll-related activities;
- setups for batch-related activities;
- moves for materials-handling activities;
- machine-hours for machine repair and maintenance; and
- square feet for general maintenance and cleaning activities.
(b) Activity cost driver

According to Turney (1992: 108), activity cost drivers are methods used in order to assign costs attached to each cost centre to products, services and customers. Common practice required that only one activity cost driver must be selected for each activity centre. Drury (2004: 380) identifies three main types of activity cost drivers used in an ABC system:

- **Transaction driver**

Transaction driver is the most common type of cost driver and is based on the assumption that overhead costs will be driven by the number of times an activity is performed (Roos et al., 2011: 160). However, Garrison, Noreen and Brewer (2007: 322) argue that transaction drivers are probably the least accurate types of activity measure. For instance, a transaction driver is identified as the number of bills sent out to customers. This cost driver is satisfactory if all bills take about the same amount of time to be prepared. But, if some bills are simple and others are very complex to prepare, a more accurate type of cost driver, known as a duration driver, might be used.

- **Duration driver**

According to Garrison et al. (2010: 310), duration drivers are measures of the amount of time required to perform an activity; for example, time spent preparing individual bills. In general, duration drivers are more accurate measures of resource consumption than transaction drivers, but take more effort to record. For that reason, transaction drivers are often used in practice.

- **Intensity driver**

Intensity drivers directly charge for the resources used each time an activity is performed. Whereas duration drivers establish an average hourly rate for performing an activity, intensity drivers involve direct charging based on the actual activity resources committed to a product (Drury, 2004: 381). According to Roos et al. (2011: 161), an intensity driver recognises that certain types of products might use resources more intensely than other products.
3.3.2. Assign overhead costs to activity cost pools

According to Glad and Becker (1994: 32), it is important to understand the behaviour of the cost element and its relationship to the cost object in order to develop a good costing system. Costs are distinguished in:

- direct traceable costs;
- activity-traceable costs; and
- unallocated costs.

3.3.2.1. Direct traceable costs

In traditional, volume-based costing systems, only direct material and direct labour are considered direct costs. All other production costs are lumped together in one (or a few) overhead cost pool and applied to products on the basis of a volume-related measure, such as direct labour. Thus, all of these costs are treated as indirect costs with respect to the firm’s products. In contrast, under an activity-based costing system, an effort is made to account for as many costs as possible as direct costs of production. Any cost that can be traced to a particular product line is treated as a direct cost of that product (Hilton, 2005: 186). In addition, Seal (2011: 127) states that as many overhead costs as possible are directly traced to the ultimate cost objects (products, services, customers) in implementing an ABC system.

3.3.2.2. Activity traceable costs

According to Drury (1992: 74), the general ledger is the primary source of cost information for an ABC system because costs reported under the financial accounting system are reconciled through the management accounting system. In an activity-based costing environment, the general ledger account structure evolves from one where cost is accumulated by nature to one where costs are computed by activity.

Drury (2012: 258) states that at this stage the objective is to determine how much the entity is spending on each of its activities. Certain costs can be directly traced to specific activity cost pools but others, such as labour and other overhead costs, might be indirectly and jointly shared by several activities. In such situations, Seal
suggests that the overhead costs are allocated amongst the activity cost pools through an allocation process called first-stage allocation. The first-stage allocation in an ABC system is the process by which overhead costs are assigned to activity cost pools. Besides, Glad and Becker (1994: 124) point out that the cause-and-effect element used to allocate costs to activities is the resource cost driver. The resource cost drivers therefore describe the relationship between the cost element and the activity. Seal (2011: 128) believes that the best way to obtain information on resource cost drivers is to interview people involved in activities in order to find out what percentage of time they spend dealing with the said activities.

### 3.3.2.3. Unallocated costs

Generally, a small element of cost remains unallocated due to the fact that it is difficult to trace to any specific activity or cost object. An example of such a cost might be general management expenses (chief executive’s salary) or small sundry expenses, such as postage, which cannot be related to a particular activity with any accuracy. Such expenses are normally small in relation to total expenses (less than 5% of total costs) and could be allocated to cost objects in proportion to other costs or might be covered by a small increase in the target margin (Glad & Becker, 1994: 35).

Drury (2012: 262) defines the cost of unused capacity as representing the difference between the cost of resources supplied for an activity and the cost of resources effectively used for this activity. Therefore, Hilton et al (2008: 155) recommend against allocating the cost of unused capacity to any cost objects. For instance, the cost of unused storage capacity of a warehouse and employee time paid for but not used in production should not be charged to cost objects.

### 3.3.3. Calculate cost driver rates

Hilton et al (2008: 153) define a cost driver rate or activity rate as the estimated cost of resource consumption per unit of the cost driver for each activity. This rate is calculated by dividing the activity cost by the estimated level of activity in the cost driver base. A cost driver base is the total of activity for each activity cost pool. Cost driver rate is calculated by using the following formula:
Cost driver rate = \( \frac{\text{Activity cost}}{\text{Cost driver base}} \)

Source: Drury (1992: 54)

Furthermore, Hilton et al (2008: 153) state that many companies develop cost driver rates for a typical or average month in order to save time and effort of calculating cost driver rates for every month. Indeed, companies update these predetermined cost driver rates once or twice a year.

3.3.4. **Assign overhead costs to activity cost objects**

According to Seal (2011: 133), the process of assigning overhead costs to activity cost objects in the implementation of an ABC system is called second-stage allocation. In the second-stage allocation, cost driver rates are used to apply overhead costs to products and customers. Hansen and Mowen (1997: 122) clarify that assigning overhead costs to cost objects is done using the cost driver rates computed and measuring the amount of resources consumed by each cost object. Thus, the overhead assigned from each cost pool to each cost object is computed as follows:

Assign overhead costs (to a cost object) = resources consumed x cost driver rates

Source: Hansen and Mowen (1997: 122)

3.3.5. **Prepare management reports**

According to Garrison et al (2010: 323), the most common management reports prepared with ABC data are the product profitability report and the customer profitability report. These reports help companies to channel their resources to their most profitable growth opportunities while at the same time highlighting products and customers that drain profits. In fact, Hilton et al (2008: 158) agree that these are important for measuring and managing both product and customer profitability in order to decide whether to drop either products or customers.
3.3.5.1. **Product profitability report**

According to Balakrishnan, Sivaramakrishnan and Sprinkle (2009: 416), ABC provides useful information to establish a product profitability report which provides accurate estimates of product margins. As a consequence, if a company is not able to generate a price above its cost, dropping the product from its portfolio might be the best option.

3.3.5.2. **Customer profitability report**

Knowing which of a company’s customers are most profitable is useful information. If a business has an ABC information system, it can make a good estimate of the relative profitability of its customers (Proctor *et al*., 2009: 250). According to Balakrishnan *et al* (2009: 417), the customer profitability report allows companies to examine the profitability of individual customers or market segments, and take appropriate actions to improve profitability.

3.4. **MULTISTAGE ACTIVITY-BASED COSTING SYSTEM**

According to Horngren, Sundem and Stratton (2002a: 142) traditional two-stage allocation process in ABC implementation is the simplest ABC system process. It is possible to use more than two stages of overhead allocation in order to obtain more accurate costs and a better understanding of the processes applicable in a firm.

In practice, because of a firm’s complexity due to the diversity of its products, services, and manufacturing or operating processes, some activities are intermediate cost objects for other activities, while others are assigned directly to cost objects. To capture and calculate accurately the costs for this complexity, some firms use multistage activity-based costing rather than two-stage ABC. In multistage ABC, resource costs are assigned to certain activities, which in turn are assigned to other activities before being assigned to the final cost objects (Blocher *et al*., 2010: 152). Figure 3.3 illustrates a multistage activity-based costing system.
Figure 3.3: Multistage activity-based costing system

Source: adapted from Horngren et al (2002a: 141)

3.5. ACTIVITY-BASED MANAGEMENT

According to VanDerbeck (2010: 198), activity-based management (ABM) is defined as the use of ABC information in order to improve business performance by reducing costs and improving processes. In addition, Horngren, Bhimani, Datar and Foster (2002b: 345) state that ABM describes management decisions that use ABC information to satisfy customers and manage profitability.

Furthermore, Crosson and Needles (2011: 171) state that ABM is a management approach that identifies all major operating activities, determines the resources consumed by each activity and the cause of the resource usage, and categorises the activities as either adding value to a product or service or not adding value. ABM mainly focuses on reducing or eliminating non value-adding activities. Horngren et al (2002a: 153) add that one of the most useful applications of ABM is distinguishing between value-added activities and non-value-added activities.
3.5.1. **Value-added activity**

According to Kimmel, Weygandt and Kieso (2008: 877), value-added activities are those activities that improve the value of a product or service from the customer's point of view. In the production process, value-added activities imply resource consumption and related costs that final customers are willing to pay for. Value-added activities are activities of actually manufacturing a product or performing a service.

3.5.2. **Non-value-added activity**

Non-value-added activities are unnecessary and are not valued by internal or external customers. Non-value added activities often are those that fail to produce a change in state or those that replicate work because it was not done correctly the first time. Because of increased competition, many firms are attempting to eliminate non-value-added activities and non-essential portions of value-added activities because they add unnecessary costs and impede performance. Therefore, activity analysis attempts to identify and eventually eliminate all unnecessary activities and, simultaneously, increase the efficiency of necessary activities (Hansen, Mowen & Guan, 2007: 432).

3.5.3. **Activity analysis**

According to Pandikumar (2007: 423), activity analysis is one of the important characteristics of ABM. Thus, activities must be assessed in the light of value addition. The usefulness of each activity must be probed on a periodical basis.

Eliminating activities that add little or no value to customers reduces resource consumption and allows the firm to focus on activities that increase customer satisfaction. Knowing the values of activities allows employees to see how work really serves customers and which activities might have little value to the ultimate customers and should be eliminated or reduced (Blocher et al, 2010: 139).

Further, Blocher *et al* (2010: 139) define a high-value-added activity as improving the value of the product or service to the customers whereas a low-value-added activity consumes time, resources, or space, but adds little to satisfying customer needs.
Reduction or elimination of low-value-added activities reduces costs. Low-value-added activities are those that:

- can be eliminated without affecting the form, fit, or function of the product or service;
- begin with prefix “re” (such as rework or returned goods);
- result in waste and add little or no value to the product or service;
- are duplicated in another department or add unnecessary steps to the business process; and
- produce an unnecessary or unwanted output.

An example of activity analysis is provided in the following Figure 3.4 below.

**Figure 3.4: Example of an activity analysis**

Source: Blocher et al (2010: 140)
3.6. ACTIVITY-BASED COSTING SOFTWARE

According to Majid and Sulaiman (2008: 50), the use of appropriate ABC software that is tailored to the needs of the company might be an important factor in ensuring the success of ABC implementation. Glad and Becker (1994: 199) report that several packaged software systems are already commercially available and some are relatively inexpensive and might be the ideal solution for the first-time user.

Cooper et al (1992: 25) note that due to the fact that ABC developments are relatively recent, most companies have not yet adapted their existing financial systems to support ABC analysis. Consequently, the majority of ABC systems are currently implemented using specially designed stand-alone systems. Besides, Glad and Becker (1994: 199) argue that the issue is often debated whether an ABC & M system should be integrated into existing systems or operated as a stand-alone system.

3.6.1. Stand-alone system

On the one hand, Glad and Becker (1994: 199) define a stand-alone system as a system that can be used without interfering with the existing system although the latter typically provides the information for the former. A stand-alone system has the following characteristics:

- could be run as an ad hoc system when required;
- could take longer to provide results as support systems must first be “closed off”;
- is ideal for experimentation as existing systems are not affected;
- packages are normally available which might make implementation cheaper;
- uses actual costs and outputs (no need for standard costs); and
- provides limited cost management capabilities as information might be available too late.

3.6.2. Integrated system

On the other hand, Glad and Becker (1994: 199) state that an integrated system is run simultaneously with other systems and information is received and fed back in an automatic fashion. An integrated system has the following characteristics:
would have to be implemented with other support systems, and such support systems must be able to support ABC principles;

- is normally more complex and might take longer to implement;

- offers excellent cost management capabilities if information is made available fast (real-time);

- might use target costing to encourage continuous improvement;

- might be the only solution where large volumes of information are handled; and

- allows the use of electronic data interchange which might prove to be useful in handling large volumes of data.

3.7. CONCLUSION

Chapter Three has outlined the overall process of the implementation of an ABC system. The main factors influencing a successful implementation of an ABC system were established. Then, the main steps involved in ABC implementation were identified before providing a brief overview of activity-based management. In Chapter Four the research design and methodology will be discussed.
CHAPTER FOUR
RESEARCH DESIGN AND METHODOLOGY

4.1. INTRODUCTION

In Chapter Two and Chapter Three, the researcher conducted a relevant literature review examining ABC and its implementation process in order to provide a conceptual framework. Thus, Chapter Four presents the methodology that is employed for this research, providing information about the applied research method, the targeted population, the sample used for the purpose of the study, the measurement instrument, and the data analysis strategy.

4.2. CONCEPT OF RESEARCH

According to Leedy and Ormrod (2005:2), research is a systematic process of collecting, analysing and interpreting information in order to increase the understanding of a phenomenon about which there is an interest. Although research projects vary in complexity and duration, research typically has eight distinct characteristics:

- research originates with a question or problem;
- research requires clear articulation of a goal;
- research requires a specific plan for proceeding;
- research usually divides the main problem into more manageable sub-problems;
- research is guided by the specific research problem, question, or hypothesis;
- research accepts certain critical assumptions;
- research requires the collection and interpretation of data in an attempt to resolve the problem that initiated the research; and
- research is cyclical.

4.3. RESEARCH DESIGN

According to Creswell (2009: 3), research designs are plans and procedures for research that impact on the decisions from broad assumptions to detailed approaches of data collection and analysis. Indeed, Bless and Higson-Smith (1995:
63) specify that a research design has two meanings. On the one hand, research design is defined as the planning of any logical research approach from the first to the last step. In this sense, research design is a programme to guide the researcher in collecting, analysing and interpreting observed facts. Very often this process is described as a planning. On the other hand, a second and more specific definition of a research design relates directly to the testing of hypotheses. Research design is a specification of the most adequate operations to be performed in order to test specific hypotheses under given conditions.

4.4. RESEARCH APPROACH

According to Glatthorn and Joyner (2005: 39), there are two major research approaches which are the qualitative research approach and the quantitative research approach. Creswell (2009: 3) explains that the differences between qualitative and quantitative research approaches is in the basic philosophical research assumptions brought to the study, the types of research strategies used overall in the research (for example quantitative experiments or qualitative case studies), and the specific methods employed in conducting these research strategies (for instance collecting data quantitatively on instruments versus collecting qualitative data through observing a setting).

Therefore, before indicating the appropriate research approach used in this study, the characteristics of these two approaches are discussed and a detailed comparison between the qualitative approach and the quantitative approach is provided in Table 4.1.

4.4.1. Qualitative research approach

Leedy and Ormrod (2005:133) define the term qualitative research approach as including several approaches to research that are, in some respect, quite different from one another. Yet all qualitative approaches have two things in common. Firstly, qualitative research approaches focus on phenomena that occur in natural settings that are in the real world. And secondly, qualitative research approaches involve studying those phenomena in all their complexity.
According to Creswell (2009: 4), the qualitative research approach is a means of investigating and understanding the meaning individuals or groups of people attribute to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participants’ settings, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of data. The final written report has a flexible structure.

Roberts (2010: 143) states that the qualitative approach is based on the philosophical orientation called phenomenology, which focuses on people's experience from their perspective. Investigation begins with broad, general questions about the area under investigation. Data are collected into the field by means of observations; in-depth and open-ended interviews; or written documents. Rather than numbers, the data are words that describe people's knowledge, opinions, perceptions, and feelings, as well as detailed descriptions of people's actions, behaviours, activities, and interpersonal interactions.

4.4.2. Quantitative research approach

According to Nardi (2006: 16), researchers are frequently interested in describing the number of people involved in certain behaviours or holding specific beliefs. Some want to make use of archival data that have been collected by others over the years, such as all the information gathered during a census. Others like to focus on explaining the way people act or in predicting how they might act in the future. Underlying all these is an assumption that social phenomena can be systematically measured and scientifically assessed. For many of these kinds of questions and assumptions, the use of quantitative methods is most appropriate.

Creswell (2009: 4) defines the quantitative research approach as a means of testing objective theories by examining the relationship among variables. The variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures. Nardi (2006: 17) concludes that quantitative methods involve writing questions for surveys and in-depth interviews, learning to quantify or count responses, and statistically analysing archival, historical, or own data. According to Roberts (2010: 142), researchers collect data that are primarily
numerical and result from surveys, tests, and experiments. Most quantitative research approaches handle variables and control the research setting. Quantitative designs comprise descriptive research, experimental research, quasi-experimental research, ex post facto/causal comparative research, and correlational research.

4.4.3. Comparison between qualitative and quantitative research approaches

According to Creswell (2009: 3) often the distinction between qualitative and quantitative research is framed in terms of using words (qualitative) rather than numbers (quantitative), or using closed questions (quantitative hypotheses) rather than open-ended questions (qualitative interview questions). Some differences between the qualitative and the quantitative approach are provided in Table 4.1.
Table 4.1: Distinguishing characteristics of qualitative and quantitative approaches

<table>
<thead>
<tr>
<th>Question</th>
<th>Qualitative</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the purpose of the research?</td>
<td>• to describe and explain</td>
<td>• to explain and predict</td>
</tr>
<tr>
<td></td>
<td>• to explore and interpret</td>
<td>• to confirm and validate</td>
</tr>
<tr>
<td></td>
<td>• to build theory</td>
<td>• to test theory</td>
</tr>
<tr>
<td>What is the nature of the research process?</td>
<td>• holistic</td>
<td>• focused</td>
</tr>
<tr>
<td></td>
<td>• unknown variables</td>
<td>• known variables</td>
</tr>
<tr>
<td></td>
<td>• flexible guidelines</td>
<td>• established guidelines</td>
</tr>
<tr>
<td></td>
<td>• emergent design</td>
<td>• predetermined methods</td>
</tr>
<tr>
<td></td>
<td>• context-bound</td>
<td>• somewhat context-free</td>
</tr>
<tr>
<td></td>
<td>• personal view</td>
<td>• detached view</td>
</tr>
<tr>
<td>What are the data like, and how are they collected?</td>
<td>• textual and/or image-based data</td>
<td>• numeric data</td>
</tr>
<tr>
<td></td>
<td>• informative, small sample</td>
<td>• representative, large sample</td>
</tr>
<tr>
<td></td>
<td>• loosely structured or non-standardised observations and interviews</td>
<td>• standardised instruments</td>
</tr>
<tr>
<td>How are data analysed to determine their meaning?</td>
<td>• search for themes and categories</td>
<td>• statistical analysis</td>
</tr>
<tr>
<td></td>
<td>• acknowledgement that analysis is subjective and potentially biased</td>
<td>• stress on objectivity</td>
</tr>
<tr>
<td></td>
<td>• inductive reasoning</td>
<td>• deductive reasoning</td>
</tr>
<tr>
<td>How are the findings communicated?</td>
<td>• words</td>
<td>• numbers</td>
</tr>
<tr>
<td></td>
<td>• narratives, individual quote</td>
<td>• statistics, aggregated data</td>
</tr>
<tr>
<td></td>
<td>• personal voice, literary style</td>
<td>• formal voice, scientific style</td>
</tr>
</tbody>
</table>

Source: Leedy and Ormrod (2005: 96)
4.4.4. Appropriate research approach

Fei and Isa (2010a: 147) observed after reviewing selected journal articles that most of the research on ABC implementation was conducted by means of the quantitative approach, such as questionnaire surveys, and very little research used a qualitative approach. In fact, 73% of the articles reviewed between 1995 and 2008 made use of surveys to explain phenomena related to the implementation of an ABC system in various organisations. Therefore, for the purpose of this research, a quantitative research approach, specifically a descriptive research was conducted through a survey.

4.5. RESEARCH METHOD: SURVEY

According to Leedy and Ormrod (2005: 183), research survey involves acquiring information about one or more groups of people about their characteristics, opinions, attitudes or previous experiences by asking these people questions and tabulating their answers. The main purpose is to study a large population by surveying a sample of that population; thus, this approach might be called a descriptive survey or normative survey. Basically, a survey is quite simple in design: the researcher poses a series of questions to willing participants, summarises their responses with percentages, frequency counts, or more sophisticated statistical indexes; and then draws inferences about a particular population from the responses of the sample.

Thomas (2003: 44) states that surveys are most useful for revealing the current status of target variables within a particular entity, such as within a nation, region, neighbourhood, religion, ethnic group, political party, business organisation, gender group or university. Furthermore, the accuracy of description is enhanced if the status of variables is cast in numerical form (frequencies, correlation coefficients, averages, and extent of variability). In addition, Mitchell and Jolley (2007: 215) indicate that a survey can be a relatively inexpensive way to get information about people’s attitudes, beliefs and behaviours. With a survey, research can collect a lot of information on a large sample in a short period of time.
4.6. RESEARCH POPULATION AND SAMPLING

In this section, the population targeted for the purpose of this study is identified. Then, the sampling frame and the sample method are presented.

4.6.1. Targeted population

Bless and Higson-Smith (1995: 85) define targeted population as the entire set of elements, events or group of people that are the object of research and about which the researcher wants to determine some characteristics. Thus, targeted population is often referred to universe or population. Moreover, Salkind (2010: 1052) points out that defining clearly the targeted population is a fundamental component of research design because the way in which the population is defined determines whether or not the findings drawn from a subset of the targeted population can be generalised to the entire population.

The targeted population identified for this research study therefore includes all organisations operating business activities in South Africa and that have dealt with an ABC system. The targeted population specifically refers to:

- organisations that are currently implementing an ABC system;
- organisations that implemented an ABC system and use it; and
- organisations that implemented an ABC system and do not use ABC any more.

The reason why the above-mentioned types of organisations were chosen as the targeted population is that they are able to provide relevant information about the overall process of ABC implementation. Since those organisations went through the process of ABC implementation, they might have information about the benefits of ABC, the difficulties encountered during the implementation of ABC, the critical success factors of ABC implementation and the different steps involved in the implementation of an ABC system.

4.6.2. Sampling frame

A sampling frame is simply a listing of all the members of the targeted population. The sampling frame can exist if the population is finite. If the sampling frame is available it can be used to draw the sample, and it is essential for some sampling
methods, but it is not required for other sampling methods (Stopher, 2012: 266). In this research study, an exhaustive list of members belonging to the defined targeted population is not available or unknown. Consequently, the result of this research study cannot be readily expanded to the population.

However, some JSE-listed companies, as well as other non-listed companies, were identified as part of the study sampling frame. Thus, 63 companies will be used as the sampling frame of this study. The researcher made use of various methods in order to detect ABC user companies:

- identifying some selected JSE companies as being ABC user firms;
- identifying ABC user companies that had been mentioned by previous research studies;
- selecting some ABC users through the internet website of consultancies which provide software and external assistance to ABC user companies.

### 4.6.3. Sampling method

According to Stopher (2012: 7), a sample is a subset of a population. A sample may be either a large proportion of the population or a very small proportion of the population. Bless and Higson-Smith (1995: 88) state that the sampling theory used to elaborate a sample distinguishes between probability sampling and non-probability sampling.

According to Salkind (2010: 922), non-probability sampling is conducted without the knowledge about whether participants chosen in the sample are representative of the entire population. In some instances, the researcher does not have enough information about the population to undertake probability sampling. The researcher might not even know who or how many people or events make up the population. In other instances, non-probability sampling is based on a specific research purpose, the availability of subjects.

Purposive sampling is known as one type of the non-probability method. Thus, the sampling method utilised in this study is the purposive sampling method. Indeed, Leedy and Ormrod (2005: 206) state that in purposive sampling, people or other units are chosen for a particular purpose. For instance, the researcher might choose
people who he has decided are typical of a group or who represent diverse perspectives on an issue.

4.7. QUESTIONNAIRE DESIGN

Thomas and Brubaker (2008: 175) define a questionnaire as a research instrument consisting of a series of questions that participants in a survey answer about their life condition, beliefs, or attitudes. A questionnaire can be administered either as a printed or electronic document that respondents fill out or as a list of queries posed by an interviewer, who then compiles interviewees' answers either by writing on a printed form or by recording the replies on audiotape or videotape.

4.7.1. Type of questionnaire: internet self-administered questionnaire

In this study, a self-administrated questionnaire was sent to participants in order to collect their opinions and experiences related to problems encountered throughout the process of ABC implementation within their organisations. According to Mitchell and Jolley (2007: 216), a self-administered questionnaire is a type of questionnaire that is filled out by participants in the absence of an investigator. Self-administered questionnaires have two main advantages. Firstly, self-administered questionnaires are easily distributed to a large number of people. Secondly, self-administered questionnaires often allow anonymity, allowing respondents to provide honest answers to highly personal questions.

The online questionnaire administered to participants was created by means of Google Drive tools. Participants accessed the questionnaire by clicking on a link embedded within the email sent to them. Once the questionnaire has been completely filled in by the respondent, the information provided is systematically captured in a spreadsheet. The data captured are simply exported for data analysis process.

4.7.2. Type of questions

Brace (2008: 45) states that questions are asked and data recorded in many ways. Different types of questions are appropriate for different purposes and different types of data are used and analysed differently. It is important to understand the range of
question types available because the choice of question type determines the information that is generated. For the purpose of this study, the following types of questions were used to design the questionnaire, namely dichotomous questions, multiple-choice questions, open-ended questions and scale-type questions.

4.7.2.1. **Dichotomous questions**

Brace (2008: 56) identifies dichotomous questions as the simplest of closed questions. Dichotomous questions are questions which allow only two possible answers: for example, yes or no, true or false, agree or disagree.

4.7.2.2. **Multiple-choice questions**

Multiple-choice questions allow respondents to select multiple-answer options for a single question. Multiple-choice questions are well suited when a question has many possible correct answers (Visioncritical, 2012: 1).

4.7.2.3. **Open-ended questions**

According to Bless and Higson-Smith (1995: 120), open-ended questions give the participants a complete freedom to express their answers as they wish, as detailed and complex, as long or as short as respondents feel is appropriate. There are no restrictions, guide-lines, or suggestions for participant answers.

4.7.2.4. **Scale-type questions**

According to Trochim (2006: 6) Likert-scale questions are one of the most common scale-type questions which attempt to measure on an interval level. Brace (2008: 73) states that Likert-scale questions present respondents with a series of attitude dimensions, for each of which respondents are asked whether, and how strongly, they agree or disagree, using one of a number of positions on a five-point scale.

Moreover, Mitchell and Jolley (2007: 225) point out that Likert scale questions are extremely useful in questionnaire design. Whereas dichotomous questions allow respondents only to agree or disagree, Likert questions give respondents the freedom to strongly agree, agree, be neutral, disagree, or strongly disagree. Thus, Likert questions yield more information than dichotomous questions. Furthermore,
because Likert questions yield interval data, responses to Likert questions can be analysed by more powerful statistical testing than dichotomous questions.

4.7.3. Description of the questionnaire

According to Connaway and Powell (2010: 164), a cover letter should accompany the questionnaire. Basically, the objective of the cover letter is to explain briefly the purpose of the study and to stress the importance of each participant. People are likely to complete the questionnaire if the cover letter stresses the potential usefulness of the study for the respondent. Therefore, a cover letter (see Annexure A) was included in each email sent to participants in order to introduce the researcher and the objectives of the research. The cover letter indicates also a link to access the questionnaire.

The questionnaire (see Annexure B) is divided into four sections. Questions included in the questionnaire were designed after taking into consideration the information obtained from the literature review.

Section 1 is dedicated to the respondent’s personal information. Respondents are required to provide information about their current position within their company, their total years of professional experience and the highest level of education achieved.

Section 2 collects information about the company, such as the business sector, the number of employees and its approximate annual turnover. The last question of Section 2 uses a scale-type question intended to describe the company’s business environment.

Section 3 discusses some benefits of ABC and the difficulties encountered by organisations while implementing an ABC system. This section comprises two multiple-choice questions and two scale-type questions.

Section 4 discusses factors influencing a successful ABC implementation before asking questions related to the overall process of ABC implementation.
4.8. RELIABILITY AND VALIDITY

According to Bless and Higson-Smith (1995: 130), the principles of reliability and validity are fundamental in a research approach. Indeed, the purpose of reliability and validity is to evaluate the measurement instrument.

4.8.1. Reliability

Reliability is concerned with the consistency of measures. On the one hand, a measurement instrument which produces different scores every time it is used to measure an unchanging value has low reliability and cannot produce an accurate measurement. On the other hand, an instrument which always gives the same score when used to measure an unchanging value can be trusted to give accurate measurement and is said to have high reliability. In most cases, the reliability of a measurement instrument is the degree to which that instrument produces equivalent results for repeated trials (Bless & Higson-Smith, 1995: 130).

4.8.2. Validity

Balian (1988: 114) claims that all research instruments must first be considered in terms of their validity. The term validity simply refers to assess whether the measurement instrument measures what it is supposed to measure. Again, Miller (2012: 3) defines validity as the extent to which the measurement instrument measures what it purports to measure.

Although both are important to an evaluation of an instrument, validity and reliability are actually entirely different things. An instrument with very high reliability is useless if it has poor validity. Similarly, an instrument with very low reliability should not be used merely because it has very high validity (Bless & Higson-Smith, 1995: 135).

4.9. DATA ANALYSIS STRATEGY

The researcher used the descriptive statistic method to analyse and interpret data collected. According to Balian (1988: 204) the descriptive statistic method concerns merely the description of data found in a study. Examples of descriptive statistics used in the current study include the mean, median, standard deviation and
response percentages. Bar charts and pie charts are presented with regard to descriptive data to assist in explaining the statistical measures. Statistical data analysis software, namely Statistica, was used to analyse data.

4.10. CONCLUSION

In Chapter Four, the research design and methodology selected for this study were described. In fact, the researcher used a quantitative research approach, especially a survey, due to its suitability for the type of investigation being conducted. Characteristics of the targeted population were provided, as well as the sample selected for the empirical study. Then, the measurement instrument was described and the data analysis strategy explained. The next chapter will present the findings of the empirical study.
CHAPTER FIVE
EMPIRICAL STUDY AND PRESENTATION OF THE RESULTS

5.1. INTRODUCTION

In Chapter Five, the response rate of the survey is presented and then the results of the empirical study are outlined. The empirical results are discussed in the form of an analysis of the data obtained from the questionnaires sent to participants. The results are presented with both the aid of tables and figures to describe how the respondents answered the various questions. The presentation of the empirical study includes the findings related to the personal background of the respondents, the company information and the respective study objectives.

5.2. RESPONSE RATE FOR THIS STUDY

The online survey questionnaires were addressed to companies identified as performing activity-based costing in South Africa. The questionnaire, sent with a cover letter, was addressed to a total number of 63 firms between August and October. Moreover, the questionnaires were addressed to the financial managers or alternatively to other skilled staff members of these organisations in order to obtain as accurate an answer as possible. A total number of 21 questionnaires were received out of the 63 sent to the targeted companies giving a response rate of 33%.

However, many targeted companies did not reply and others were unreachable. In addition, some respondents were unwilling to participate in the study, stating that they were busy with their daily tasks and end of year works. Again, some firms declined to answer the questionnaire due to compliance with their company policy.

Further, the results of the survey were used to classify the companies which had gone through the process of ABC implementation into three main categories. Respondents were required to specify the current level of ABC adoption of their company. Consequently, Table 5.1 presents the level of ABC adoption within respondent companies.
### Table 5.1: Current level of ABC adoption within respondent companies

<table>
<thead>
<tr>
<th>Current level of ABC adoption</th>
<th>Number (N°)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC is currently being implemented</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>ABC has been implemented and is currently used</td>
<td>15</td>
<td>71</td>
</tr>
<tr>
<td>ABC was implemented, but not used any more</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The findings revealed that a large majority of the companies (71 %) have implemented and use the ABC method as their costing system. In addition, 19% of the companies in the sample are currently implementing ABC, whereas 10% had implemented the said system but do not use it any more.

5.3. **PERSONAL BACKGROUND OF THE RESPONDENTS**

The questionnaire starts by collecting primary information about the respondent’s personal background. Section 1 in the questionnaire (see Annexure B) includes queries related to the following information pertaining to the respondent:

- current position;
- total years of professional experience; and
- highest level of education achieved.
5.3.1. Current position of the respondents

Question 1.1 in the questionnaire asked the respondents to provide information concerning their current position in their company. The question allowed only one answer of the five following which are “director”, “senior manager”, “manager”, “supervisor”, and “accountant or finance manager”. The following Figure 5.1 illustrates the distribution of the current position of the respondents.

![Figure 5.1: Current position of the respondents](image)

Source: results obtained from the analysis of the empirical research

Of the 21 individuals who took part in the survey, 52% held a position of accountant or finance manager, 29% of the respondents were senior managers, 10% were directors, and only 9% were managers.
5.3.2. **Total years of professional experience of the respondents**

Question 1.2 in the questionnaire required the respondents to indicate the total number of years corresponding to their work experience. The different periods suggested in the questionnaire comprised a period of less than 2 years, a period from 2 to 5 years, a period from 6 to 10 years, and a period of more than 10 years. For the purpose of clarity, certain periods were combined in the results because no respondent had a professional experience of less than 2 years or a professional experience of between 2 and 5 years. Therefore, Figure 5.2, which depicts the total years of professional experience of the respondents, was presented in terms of professional experience either of less than 5 years or of more than 5 years.

**Figure 5.2: Years of professional experience of the respondents**

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years</td>
<td>48%</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The majority of the respondents precisely 52% had a long professional experience of more than 5 years, whereas 48% of the respondents had a professional experience of less than 5 years.
5.3.3. **Highest level of education achieved by the respondents**

In terms of education, respondents were asked to indicate their highest level of education achieved. The question provided possible answers for undergraduate and postgraduate degrees. Table 5.2 presents the distribution of the highest level of education of the respondents.

**Table 5.2: Highest level of education achieved by the respondents**

<table>
<thead>
<tr>
<th>Academic qualifications</th>
<th>Number (N°)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor degree</td>
<td>9</td>
<td>42</td>
</tr>
<tr>
<td>Bachelor Technologiae</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Honours</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Masters (non-MBA)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Postgraduate diploma</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

Table 5.2 above, indicated that the majority (61%) of respondents have obtained various undergraduate degrees, presented as follows:

- Bachelor degree (42%); and
- Bachelor Technologiae (19%).

Then, 39% of the respondents have achieved the following different postgraduate degrees:

- Honours (19%);
- Postgraduate Diploma (10%); and
- Masters non-MBA (10%).
5.4. COMPANY INFORMATION

Section 2 of the questionnaire mainly focused on presenting the characteristics of the company. Basic information, such as the industrial sector, the number of employees and the approximate annual turnover was required.

5.4.1. Industrial sector

Respondents were asked to indicate to which of 11 industrial sectors their company belonged. A list of 11 industrial sectors obtained in the National Small Business Amendment Act 2003 (2003: 8) was used to design Question 2.1. Table 5.3 shows the industrial sectors which respondent companies belonged to.

Table 5.3: Industrial sectors

<table>
<thead>
<tr>
<th>Industry sectors</th>
<th>Number (N°)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Catering, accommodation and other trade</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Community, social and personal services</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Construction</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Finance and business services</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Retail and motor trade and repair services</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Transport, storage and communications</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>Wholesale trade, commercial agents and allied services</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

Only 5 out of the 11 industrial sectors were represented in the findings. The “transport, storage and communications” category (33%) constituted the largest proportion of the companies, followed by “manufacturing” (19%), “finance and business services” (19%), and “construction” (19%). “Community, social and personal services” (10%) had a relatively small representation in the sample.
5.4.2. **Number of employees**

Respondents were asked to indicate the number of employees in their companies. The number of employees ranged from less than 200 to more than 1500 employees. Figure 5.3 shows the number of employees in respondent companies.

**Figure 5.3: Number of employees**

As shown in Figure 5.3 above, 71% of the companies employed more than 1500 people. In a lower proportion, 10% of the companies had between 201 and 1500 employees, while 19% employed less than 200 individuals.

5.4.3. **Annual turnover**

Question 2.5 of the questionnaire classified companies according to their annual turnover. The annual turnover ranged from less than R 5 million to more than R 64 million. The results of the empirical study unanimously revealed that all the 21 companies participating in the survey had an annual turnover of more than R 64 million. The findings imply that all the companies are large companies.
5.5. ACHIEVEMENT OF THE RESPECTIVE STUDY OBJECTIVES

The main objective of the study was broken down into four interrelated sub-objectives. The realisations of the sub-objectives led toward to the achievement of the main objective of the study. Consequently, specific questions related to the sub-objectives were posed to the respondents through the empirical study. Then the empirical findings were discussed.

5.5.1. Main objective: to find solutions to overcome the difficulties encountered by companies while implementing an ABC system

As stated in Chapter One, to help achieve the main objective of the study the following sub-objectives were outlined:

- to determine the advantages of adopting an ABC system over the traditional costing systems;
- to identify the problems experienced while implementing an ABC system;
- to identify the critical success factors in implementing ABC; and
- to examine the process involved in the implementation of an ABC system.

In Section 2, Question 2.2 asked the respondents whether their company currently operates business activities in South Africa. The aim of Question 2.2 is to circumscribe the study to the South African business environment since the JSE also trades in some foreign company shares. All 100% of the respondents confirmed that their company performed business in South Africa.

5.5.2. Sub-objective 1: to determine the advantages of adopting an ABC system over the traditional costing systems

In order to address the first sub-objective, the following questions were asked during the empirical investigation:

- Question 2.6: please rate the attributes which best describe your company’s business environment.
- Question 3.2: to what extent do you agree or disagree with the benefits obtained by your company in implementing ABC?
- Question 3.3: please indicate the extent to which ABC is used in your company.
In the first place, respondents were asked in Question 2.6 to rate the attributes which best describe their company's business environment, on a 5-point Likert-scale, ranging from 1= not descriptive to 5=extremely descriptive. Table 5.4 presents the results.

**Table 5.4: Companies' business environment attributes**

<table>
<thead>
<tr>
<th>Companies' business environment attributes</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity of production / service processes</td>
<td>4.33</td>
<td>4</td>
<td>0.66</td>
</tr>
<tr>
<td>Variation in technical complexity among products / services</td>
<td>4.24</td>
<td>4</td>
<td>0.77</td>
</tr>
<tr>
<td>Diversity in products / services</td>
<td>4.00</td>
<td>4</td>
<td>1.00</td>
</tr>
<tr>
<td>Intensity of competition in the industry</td>
<td>3.86</td>
<td>4</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The above-mentioned business environment attributes, namely, the complexity of production or service processes, the variation in technical complexity among products or services, the diversity in products or services and the intensity of competition in the industry, are prone to a favourable business environment for the implementation of an ABC system in a company. Each attribute had a mean score close to 4 and a median equal to 4. Consequently, the above-mentioned attributes significantly describe the business environment of all the 21 companies involved in the survey. In brief, all the companies had the characteristics for prompting the development of an ABC model.
In second place, Question 3.2 asked the companies to what extent they agree or disagree with the benefit obtained over the traditional costing systems in implementing an ABC system. Opinions collected by the survey have been summarised in Table 5.5.

**Table 5.5: ABC benefits over traditional costing systems**

<table>
<thead>
<tr>
<th>ABC benefits over traditional costing systems</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC provides more accurate product costing for decision measurements.</td>
<td>4.57</td>
<td>5</td>
<td>0.51</td>
</tr>
<tr>
<td>ABC provides better product and customer profitability measurements.</td>
<td>4.57</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>ABC gives a better cost estimation for pricing decisions, budgeting, and planning.</td>
<td>4.57</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>ABC provides information for identifying areas where process improvement is required.</td>
<td>4.48</td>
<td>5</td>
<td>0.68</td>
</tr>
<tr>
<td>ABC provides better information for identifying the cost of unused capacity.</td>
<td>4.43</td>
<td>5</td>
<td>0.68</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The mean score of all ABC benefits was close to 5 with an individual median equal to 5. All benefits of ABC over the traditional costing system methods were strongly approved by all respondent companies which had implemented an ABC system.
In third place, respondents were asked in a multiple-choice question to indicate in which of the 9 specified areas of application their company uses ABC. Respondents indicated whether or not their company used ABC for each specified areas of application. Figure 5.4 presents the proportion of ABC users adopting each specific application.

**Figure 5.4: Activity-based costing (ABC) applications**

![Activity-based costing (ABC) applications](image)

Source: results obtained from the analysis of the empirical research

As shown in Figure 5.4, each of the areas obtained a high utilisation rate except for “stock valuation” which was not part of the ABC application. In general, “cost modelling” was the area of application with the highest percentage (81%), followed by “product or service pricing” (76%) and “cost reductions” (62%). “Customer profitability analysis” and “new product and cost design” had both an equal percentage of utilisation of 52%. In the same trend, “performance measurement” and “product or service output decisions” had both an equal percentage of utilisation of 43%. Finally, only 29% of ABC users made use of ABC for budgeting purposes.
5.5.3. Sub-objective 2: to identify the problems experienced while implementing an ABC system

Question 3.4 in Section 3, asked respondent companies which have already implemented ABC or were in the process of ABC implementation, to indicate the extent of the problems experienced while implementing ABC. The level of difficulty encountered was ranked on a 5-point Likert-scale with 1= not at all and 5= to a very large extent. In Table 5.6 results are provided as mean, median and standard deviation.

**Table 5.6: Obstacles in the implementation of an ABC system**

<table>
<thead>
<tr>
<th>Obstacles in the implementation of an ABC system</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees’ lack of basic knowledge and skill of ABC techniques</td>
<td>3.48</td>
<td>4</td>
<td>1.25</td>
</tr>
<tr>
<td>ABC is complex and requires too many detailed records</td>
<td>3.05</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>ABC is too time-consuming for personnel</td>
<td>2.67</td>
<td>3</td>
<td>1.35</td>
</tr>
<tr>
<td>Employee-resistance because they do not exactly know ABC</td>
<td>2.67</td>
<td>2</td>
<td>1.24</td>
</tr>
<tr>
<td>Inadequate and insufficient training of users</td>
<td>2.48</td>
<td>2</td>
<td>1.12</td>
</tr>
<tr>
<td>High cost of implementation especially cost of information technology</td>
<td>2.43</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Management placing more emphasis on other priorities in the firm</td>
<td>2.24</td>
<td>2</td>
<td>1.18</td>
</tr>
<tr>
<td>Difficulty in identifying and defining cost centres and suitable cost drivers</td>
<td>2.14</td>
<td>1</td>
<td>1.28</td>
</tr>
<tr>
<td>Negative perception of ABC</td>
<td>2.14</td>
<td>2</td>
<td>1.15</td>
</tr>
<tr>
<td>Inadequate marketing of ABC especially by accountants themselves</td>
<td>2.14</td>
<td>2</td>
<td>1.31</td>
</tr>
<tr>
<td>Absence of a project sponsor</td>
<td>2.00</td>
<td>1</td>
<td>1.48</td>
</tr>
<tr>
<td>Lack of top management support</td>
<td>1.86</td>
<td>2</td>
<td>0.96</td>
</tr>
<tr>
<td>Resistance to change in organisational culture</td>
<td>1.67</td>
<td>1</td>
<td>0.97</td>
</tr>
<tr>
<td>ABC incompatible with company strategy</td>
<td>1.29</td>
<td>1</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research
In Table 5.6, obstacles encountered by companies in South Africa while implementing an ABC system were rank ordered in terms of the extent to which they were experienced. Based on the value of the mean scores, the biggest obstacles confronted “to a moderate extent” by respondent companies were:

- Employees’ lack of basic knowledge and skill of ABC techniques (mean score = 3.48);
- ABC is complex and requires too many detailed records (mean score = 3.05);
- ABC is too time-consuming for personnel (mean score = 2.67); and
- Employee-resistance because they do not exactly know ABC (mean score = 2.67).

Inversely, ABC incompatibility with company strategy (mean score = 1.29) was not perceived as a major obstacle. From an overall point of view, all the different problems were experienced “to a little extent” by South African companies while implementing an ABC system (combined mean score = 2.30).

5.5.4. **Sub-objective 3: to identify the critical success factors in implementing ABC**

Question 4.1 asked the respondent companies to indicate the importance of each factor influencing an ABC successful implementation. The level of importance was ranked on a 5-point Likert-scale with 1= not important at all and 5= very important. In Table 5.7, findings are provided as mean, median and standard deviation.
### Table 5.7: Critical success factors in implementing an ABC system

<table>
<thead>
<tr>
<th>Critical success factors in implementing an ABC system</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active top management support</td>
<td>4.24</td>
<td>5</td>
<td>1.18</td>
</tr>
<tr>
<td>Adequate knowledge of data requirement and data collection</td>
<td>4.19</td>
<td>5</td>
<td>1.21</td>
</tr>
<tr>
<td>Top management has provided adequate resources</td>
<td>4.10</td>
<td>4</td>
<td>1.00</td>
</tr>
<tr>
<td>Providing sufficient training about implementing and using ABC</td>
<td>3.95</td>
<td>4</td>
<td>1.07</td>
</tr>
<tr>
<td>Selecting the appropriate ABC software package</td>
<td>3.86</td>
<td>4</td>
<td>1.20</td>
</tr>
<tr>
<td>Accounting staff has shared ownership of ABC implementation with non-accounting staff</td>
<td>3.57</td>
<td>4</td>
<td>1.25</td>
</tr>
<tr>
<td>ABC has been closely tied to competitive strategies of the company</td>
<td>3.52</td>
<td>4</td>
<td>1.21</td>
</tr>
<tr>
<td>Company organisational structure and culture suit ABC</td>
<td>3.52</td>
<td>4</td>
<td>1.29</td>
</tr>
<tr>
<td>Linkage of ABC successful implementation to employee performance evaluation and compensation</td>
<td>3.48</td>
<td>4</td>
<td>1.25</td>
</tr>
<tr>
<td>Participation of external consultants in ABC project</td>
<td>2.57</td>
<td>2</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The results are rank ordered in Table 5.7 and the majority of the factors had an important influence on a successful ABC implementation. In fact, the median of most critical success factors was between 4 and 5. In particular, respondents expressed the strongest importance for the following factors:

- an active top management support (median=5); and
- an adequate knowledge of data and data collection (median =5).

However, the participation of external consultants in the ABC projects was perceived by the respondents as being of “little importance” in the successful implementation of an ABC system with a median of 2.
5.5.5. Sub-objective 4: to examine the process involved in the implementation of an ABC system

In order to address the last sub-objective, respondents were asked the following questions:

- Question 4.2: do you agree or disagree with the following steps which must be taken when implementing ABC?
- Question 4.3: what has been the main method used to identify the company activity list?
- Question 4.4: in which of the following categories does your company classify its activities?
- Question 4.5: what is the main category of cost drivers used by your company?
- Question 4.6: do you think that it is important to define the value-added and non-value-added activities as part of the ABC implementation process?
- Question 4.7: how satisfied are you with your current overhead cost allocations and overall product/service costing system?

Question 4.2 of the questionnaire asked the companies to indicate whether they agree or disagree with the steps which must be taken when implementing ABC. The answer to Question 4.2 was presented through a 5-point Likert-scale with 1= strongly disagree and 5= strongly agree. Table 5.8 below presents the results.

**Table 5.8: Steps which must be taken when implementing ABC**

<table>
<thead>
<tr>
<th>Steps which must be taken when implementing ABC</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define activities, activity cost centres, and activity measures</td>
<td>4.67</td>
<td>5</td>
<td>0.48</td>
</tr>
<tr>
<td>Assign overhead costs to activity cost centres</td>
<td>4.57</td>
<td>5</td>
<td>0.51</td>
</tr>
<tr>
<td>Calculate activity rates</td>
<td>4.62</td>
<td>5</td>
<td>0.50</td>
</tr>
<tr>
<td>Assign overhead costs to cost objects using the activity rates and activity measures</td>
<td>4.57</td>
<td>5</td>
<td>0.51</td>
</tr>
<tr>
<td>Prepare management reports</td>
<td>4.52</td>
<td>5</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research
As shown in Table 5.8, each single step has a mean score close to 5 and a median equal to 5. All companies which went through the process of ABC implementation strongly agreed with the five major steps of ABC implementation.

Further, companies were required to indicate which method was mainly used to identify the list of the company activities. The choice was given between “top down approach”, “interview or participative approach” and “recycling approach”. The findings are depicted in Figure 5.5.

Figure 5.5: Method used to identify the list of activities

Source: results obtained from the analysis of the empirical research

The above pie chart illustrated in Figure 5.5 revealed that the majority of the companies (71%) made use of the interview in order to identify their list of activities. Then the rest of the companies used the top-down approach (10%) and the recycling approach (9%).

Companies were asked in Question 4.4 to indicate in which categories they classified their different activities. The choice was given to select one or more categories if that was applicable to the company. The possible answers included “unit-level activities”, “batch-level activities”, “product-level activities”, “customer-level activities” and “facility-level activities”. Figure 5.6 presents in percentage the proportion of companies which chose each individual category of activity.

Figure 5.6: Categories of activities

According to Figure 5.6, 62% of the companies classified their activities in “product-level activities” and 38% in “customer-level activities”. In a lower proportion, only 24% of the companies classified their activities in “unit-level activities”, 19% in “facility-level activities” and finally 10% in “batch-level activities”.

Source: results obtained from the analysis of the empirical research
Thereafter, respondents were asked in Question 4.5 to indicate the main category of cost driver used by their company between “transaction drivers”, “duration drivers” and “intensity drivers”. The results are portrayed in Figure 5.7.

**Figure 5.7: Categories of cost drivers**

Source: results obtained from the analysis of the empirical research

Figure 5.7 indicated that 53% of the companies made use of “transaction drivers” as their main category of cost drivers, followed by 33% of the companies which used “duration drivers” and then 14% using “intensity drivers”.

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Question 4.6 in the questionnaire, which asked the respondents, “Do you think that it is important to define the value-added and non-value-added activities as part of the ABC implementation process?” is answered in Table 5.9. A 5-point Likert-scale with 1= not important at all and 5= very important was used to collect the respondents’ opinions. The results are summarised in Table 5.9.

Table 5.9: Defining the value-added and non-value-added activities as part of the ABC implementation process

<table>
<thead>
<tr>
<th>Defining the value-added and non-value-added activities as part of the ABC implementation process</th>
<th>Number (N°)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not important at all</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Of little importance</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Of medium importance</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>Important</td>
<td>7</td>
<td>32</td>
</tr>
<tr>
<td>Very important</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

The results show that 38% of the respondents felt that defining the value-added and non-value-added activities as part of the ABC implementation process was of medium importance. However, 42% of the respondents expressed a favourable opinion whereas only 20% of the respondents granted no significant importance to that statement.
In Question 4.6 respondents were asked to give their level of satisfaction with the current overhead cost allocation and overall product or service costing system. Table 5.10 below summarises the opinions obtained.

**Table 5.10: Level of satisfaction with regard to the current overhead cost allocations and overall product/service costing system**

<table>
<thead>
<tr>
<th>Level of satisfaction with regard to the current overhead cost allocations and overall product/service costing system</th>
<th>Number (N°)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasonably satisfied, although some improvement might be useful</td>
<td>17</td>
<td>81</td>
</tr>
<tr>
<td>Very satisfied, no improvement required</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Needs improvements, but is still usable</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Dissatisfied, system requires major improvement</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: results obtained from the analysis of the empirical research

Table 5.10 revealed that 81% of the respondents were reasonably satisfied with their costing system, although some improvement might be useful; whereas 19% of the respondents claimed that their costing system needed improvements, but was still usable.

**5.6. CONCLUSION**

The researcher made use of descriptive statistics, such as frequency distribution, mean, median and standard deviation, to analyse and present the research findings. Results were presented either by way of tables or figures. Firstly, the response rate of the study was observed. Secondly, the questions in the questionnaire related to the personal information of the respondents and the company information were discussed. Thirdly, the questions in the questionnaire pertaining to the main objective and the sub-objectives of the study were analysed.

In the next and final chapter, the researcher will integrate both the literature review and the findings of the empirical study in order to provide final conclusions and recommendations.
6.1. INTRODUCTION

The central objective of this research was to find solutions to overcome the difficulties encountered by companies while implementing an ABC system in South Africa. This final chapter encompasses the most important findings based upon the results of the survey and the literature review, both of which were presented in the previous chapters. Several recommendations will be made. The limitations of this study will then be highlighted and some suggestions for future research will also be provided at the end of this chapter to conclude this research study.

6.2. SIGNIFICANT FINDINGS RELATED TO THE RESEARCH OBJECTIVES

In Chapter One the main objective was broken down into four interrelated sub-objectives to ensure a better understanding of the central problem of this study. Therefore, in order to achieve the main objective of finding solutions to overcome the difficulties encountered by companies while implementing an ABC system in the South African environment, the following sub-objectives had to be answered:

- To determine the advantages of adopting an ABC system over the traditional costing systems.
- To identify the problems experienced while implementing an ABC system.
- To identify the critical success factors (CSFs) in implementing ABC.
- To examine the process involved in the implementation of an ABC system.

The main findings obtained from the analysis of the empirical study and the literature review are presented as follows:

6.2.1. Findings of the sub-objective 1: to determine the advantages of adopting an ABC system over the traditional costing systems

The main goal of the first sub-objective was to determine the advantages of adopting an ABC system over the traditional costing systems. This sub-objective was achieved by presenting the key characteristics of the type of organisations able to
implement an ABC system, then evaluating some major benefits of ABC compared to those of TCS and finally indicating the different usages of ABC within an entity.

Firstly, the findings of the survey showed that all companies which participated in the study met the following basic requirements of implementing an ABC model:

- the complexity of production or service processes;
- the variation in technical complexity among products or services;
- the diversity in products or services; and
- the intensity of competition in the industry.

In the light of the results obtained, the business environment of these companies appeared to be favourable for an ABC implementation. In fact, Ross et al (2008: 166) and Drury (2012: 265) identify the above-mentioned business environment attributes as the primary requirements to consider before implementing ABC.

Secondly, the findings indicated that respondents strongly agreed with the following benefits obtained when adopting an ABC system:

- ABC provides more accurate product costing for decision measurements;
- ABC provides better product and customer profitability measurements;
- ABC gives a better cost estimation for pricing decisions, budgeting, and planning;
- ABC provides information to identify areas where process improvement is required; and
- ABC provides better information to identify the cost of unused capacity.

These findings are in accordance with Blocher et al (2010: 133) who also identified the aforementioned benefits as being the major benefits of ABC that many firms have experienced.

Finally, despite the fact that an ABC system might be dedicated to various uses, the results of the survey rank ordered the importance of the different applications of an activity-based costing within the South African companies. The most common use of ABC was for cost-modelling purposes. Equally important, but to a lesser extent, South African companies utilised ABC for “product or service pricing”, “cost reductions”, “customer profitability analysis”, “new product and cost design”,

83
“performance measurement”, and “product or service output decisions”. It appeared that only few companies utilised ABC for budgeting purposes.

6.2.2. Findings of the sub-objective 2: to identify the problems experienced while implementing an ABC system

Having a good knowledge of the problems that a company might face during the implementation of an ABC system, will effectively allow people to address these problems. The goal of the sub-objective 2 was to identify the problems experienced while implementing an ABC system. The problems related to the implementation of ABC in South African companies can be ranked according to the level of importance in three main categories:

Firstly, the problems experienced “to a moderate extent” while implementing an ABC system were:

- the lack of basic knowledge and skill of ABC techniques by employees;
- the fact that ABC was complex and required too many detailed records;
- the fact that ABC was too time-consuming for the personnel; and
- employees’ resistance because they did not exactly know ABC.

These results are confirmed by Wessels and Shotter (2000: 222) and Marivic (2004: 12), who also identified the four above-mentioned difficulties as the major problems being experienced by companies when implementing ABC.

Secondly, the other category of problems experienced “to a little extent” included:

- an inadequate and insufficient training of users;
- a high cost of the implementation, especially the cost of information technology;
- the fact that the management placed more emphasis on other priorities in the firm;
- the difficulty of identifying and defining cost centres and suitable cost drivers;
- a negative perception of ABC by the employees;
- an inadequate marketing of ABC, especially by accountants themselves;
- an absence of a project sponsor;
- a lack of top management support; and
- a resistance to change in organisational culture;
Finally, the only problem revealed as not being experienced by South African companies was a possible incompatibility of ABC with the company strategy.

6.2.3. Findings of the sub-objective 3: to identify the critical success factors in implementing ABC

The aim of the sub-objective 3 was to identify the factors which influenced the successful implementation of an ABC system. The empirical study clearly indicated some critical success factors (CSFs) in implementing an ABC system in the South African business environment. These CSFs can be ranked according to the level of importance in three main categories:

Firstly, the CSFs with a very important influence on a successful ABC implementation were:

- an active top management support; and
- an adequate knowledge of data requirement and data collection.

It is important to notice that the top management support which was of a very important influence for a successful ABC implementation was also highlighted by Wessels and Shotter (2000: 217), and Fei and Isa (2010b: 2306), as being the most important CSF. Indeed, when the top management provides an active support to the ABC project, the project has a greater chance of success because managers supply time and required resources.

Secondly, at a lower level, the CSFs with an important influence on a successful ABC implementation were:

- top management providing adequate resources (time, commitment, funding, personnel, equipment);
- providing sufficient training about implementing and using ABC;
- selecting the appropriate ABC software package;
- accounting staff sharing ownership of ABC implementation project with non-accounting staff;
- an ABC closely tied to competitive strategies of the company;
- a company organisational structure and culture suiting with ABC; and
• a linkage of an ABC successful implementation to employee-performance evaluation and compensation.

Finally, the only CSF with a little influence on a successful ABC implementation was the participation of external consultants in the ABC project.

6.2.4. Findings of the sub-objective 4: to examine the process involved in the implementation of an ABC system

The goal of the sub-objective 4 was to highlight the main steps of the implementation of an ABC system, as well as to identify the different methods applied throughout the process of implementation.

The findings of the empirical study confirmed the five main steps for implementing an activity-based costing model as suggested by Garrison et al (2010: 315).

• Step one: define activities, activity cost centres, and activity measures.
• Step two: assign overhead costs to activity cost centres.
• Step three: calculate activity rates.
• Step four: assign overhead costs to cost objects using the activity rates and activity measures.
• Step five: prepare management reports.

Respondents with one regard strongly agreed with the five steps involved in the process of ABC implementation.

Further, the survey showed that 81% of the companies which have been through the process of ABC implementation made used of the interview or the participative approach to identify the list of their activities. Several reasons might explain this result. In fact, Miller (1996: 85) revealed that most activity-based costing implementations utilised a participative approach to define business processes and activities because that approach produced a detailed description of the activities. Besides, Hilton et al (2008: 151) pointed out that the participative approach is likely to generate a more accurate list of activity, compared to the top-down approach.
The categorisation of the activities is an important component of the ABC implementation. The empirical results revealed that companies mainly categorised their activities in “product-level activities” and “customer-level activities”.

Equally important, the empirical findings revealed that the majority of the companies made use of “transaction drivers” to assign overhead costs from the cost pools to products, services and customers. The findings obtained are in accordance with the information provided by the literature in Chapter Three. In fact, according to Roos et al (2011: 160), transaction drivers are the most common type of cost drivers. Again, Garrison et al (2007: 322) explained that transaction drivers are often used in practice because they require less effort to be computed.

6.3. RECOMMENDATIONS

The main objective of the study was to find solutions to overcome the difficulties encountered by companies while implementing an ABC system in South Africa. Thus, based on the findings of the empirical study and the literature review, some recommendations can be made to effectively address the problems encountered with the implementation of an ABC system:

- Before initiating an ABC project, top managers should weigh up the opportunity of adopting such a system, because ABC is costly and might require a lot of resources. An assessment should be made to establish the advantages and disadvantages and then make sure that the benefits obtained would be greater than the cost of the system.
- Company management should be strongly committed to the ABC project and a project sponsor should be a member of the top management. A strong management support would have a high impact on the project because firstly, the top management would supply every need for the success of the project (time, personnel, funds, material, and external assistance) and secondly, this would procure a high value and credibility to the project.
- Adequate personnel training should be carried out in order to familiarise the personnel with the new system. The better the employees would understand the system, the more effective they would perform their job. Emphasising the personnel training would be a good approach to overcome the main difficulty
revealed by the empirical study namely, the lack of basic knowledge and skill of ABC techniques by the employees.

- The ABC team should include employees from all departments so that the ownership of the ABC project would be shared with non-accountants. In addition, the ABC team should broadly communicate the benefits of ABC throughout the company. Complying with this recommendation would allow overcoming the difficulties linked to the employee resistance.

6.4. LIMITATIONS

Throughout this study some limitations could be observed at various levels:

- Sample coverage

The scope of the study is limited by the small sample size which included only some public companies listed on the Johannesburg Stock Exchange (JSE) and some other entities not listed on the JSE. The entities contacted throughout the study were not representative of all categories of industry. In addition, the sampling method used is inadequate to generalise the results obtained. The fact that the size of the population is unknown implies that the findings of the study are not applicable to all ABC user organisations throughout South Africa. The results of this study might have been different if all industrial sectors were represented in the sample surveyed.

- Response rate

Even though a 33% overall response rate was acceptable for this survey research, the number of respondents was very small (21 companies). The real number of ABC users in South Africa is still unknown. Therefore, it was difficult to conduct meaningful statistical tests. The results might have been different if the response rate had been higher and the number of ABC users had been larger. Several reasons might explain the low response rate observed. Firstly, certain companies' policies did not allow enterprises to take part in the research survey because the companies did not want to disclose their practices. Secondly, certain individuals were not interested in the study, claiming that they were busy with end year reports and consequently declined to participate. Thirdly, in certain cases, the link for the online questionnaire was inaccessible from certain companies due to the email security system. Finally, it
was not possible to contact some companies because the email addresses provided 
were unavailable.

- Accessibility of the literature

There has not been much documented research on activity-based costing in South 
Africa. Thus, this has been a limitation during the theoretical part of this study even 
though some problems have been identified.

6.5. AREAS FOR FUTURE RESEARCH

Activity-based costing is a relatively new area in South Africa. Few enterprises have 
implemented an ABC system, in spite of the numerous competitive advantages and 
benefits provided by ABC. Future research could investigate the adoption rate of 
ABC in South Africa. Researchers could conduct a telephone survey throughout the 
different local and regional chambers of commerce and industry existing in South 
Africa. A better knowledge of the ABC adoption rate would improve the 
benchmarking of activity-based costing in South Africa.

Furthermore, activity-based management uses information stemming from activity- 
based costing to identify opportunities for process improvement. Thus, future 
research could also focus on the effective application of activity-based management 
in the process of decision-making improvement.
REFERENCE LIST


Balian, E.S. 1988. How to design, analyze, and write doctoral or masters research. 2nd ed. Lanham, MD: University Press of America.


Your opinion: Problems encountered with the implementation of an activity-based costing system

Dear Sir/Madam,

We are currently doing a research investigating possible ways to overcome the difficulties encountered by South African companies in implementing an activity-based costing system (ABC). We would very much appreciate it if your company could participate in the study by completing a short online survey.

This questionnaire is primarily addressed to the financial department manager but may also be completed by a skilled staff member working in the same department. The survey contains a brief introduction on the first page and can be accessed by clicking on the following link or by copying and pasting it into your browser:

https://docs.google.com/spreadsheet/viewform?formkey=dERRYkFMS2VOUm1RVNpsUnV6bGpsT0E6MQ

It would be appreciated if you could complete and submit the questionnaire by 4th September 2012.

Should you have any queries or encounter any problems while completing the survey questionnaire, please do not hesitate to contact me (e-mail: konan.christian@gmail.com or phone 072 628 4446).

Please note: Your response will be entirely confidential and anonymous. The results will only be used on an aggregated level.

Your assistance and efforts would be most appreciated.

Yours faithfully

Christian Konan

Masters Cost and Management Accounting

Nelson Mandela Metropolitan University (NMMU)
Instructions for the completion of the questionnaire:

1. Please be assured that the information gathered by the questionnaire will be used exclusively for research purposes and will at all times be treated as highly confidential.

2. In order for the study to be successful, participants will need to answer all questions.

3. Please indicate your answer to each question by marking the relevant block with an "X".

4. Some questions may give you the possibility of marking one or more blocks; they will be indicated by the mention “possible multiple-choice”.

Section 1 – Personal background

1.1. What is your current position in your company?
1.1.1. Director 1.1.4. Supervisor
1.1.2. Senior manager 1.1.5. Accountant/Finance Manager
1.1.3. Manager

1.2. How many years of professional experience do you have?
1.2.1. Less than 2 years 1.2.3. 6 to 10 years
1.2.2. 2 to 5 years 1.2.4. More than 10 years

1.3. What is your highest level of education achieved?
1.3.1. National Diploma 1.3.6. Master (non – MBA)
1.3.2. Bachelor Technologiae 1.3.7. MBA
1.3.3. Bachelor degree 1.3.8. Doctorate
1.3.4. Honours 1.3.9. Other
1.3.5. Postgraduate Diploma

Section 2 – Company Background

2.1. Please indicate your company name.
2.2. Does your company currently operate business activities in South Africa?

2.2.1. Yes □  2.2.2. No □

2.3. Please indicate the industrial sector in which your company primarily operates.

2.3.1. Agriculture □  2.3.7. Manufacturing □
2.3.2. Catering, accommodation and other trade □  2.3.8. Mining and quarrying □
2.3.3. Community, social and personal services □  2.3.9. Retail and motor trade and repair services □
2.3.4. Construction □  2.3.10. Transport, storage and communications □
2.3.5. Electricity, gas and water □  2.3.11. Wholesale trade, commercial agents and allied services □
2.3.6. Finance and business services □

2.4. What is the number of employees in your company as a whole?

2.4.1. Less than 100 □  2.4.3. 201 to 1500 □
2.4.2. 100 to 200 □  2.4.4. More than 1500 □

2.5. Please indicate the approximate annual turnover, in million rand, of your company.

2.5.1. Up to R 5 m □  2.5.5. R 39 m to R 51 m □
2.5.2. R 5 m to R 13 m □  2.5.6. R 51 m to R 64 m □
2.5.3. R 13 m to R 26 m □  2.5.7. More than R 64 m □
2.5.4. R 26 m to R 39 m □

2.6. Please rate the following attributes which best describe your company’s business environment.

2.6.1. Complexity of production / service processes None Slightly Moderately Significantly Extremely
2.6.2. Diversity in products / services
2.6.3. Intensity of competition in your industry
2.6.4. Variation in technical complexity among your products / services
Section 3 – Activity-based costing (ABC)

3.1. Has your company ever implemented ABC?

3.1.1. Yes, ABC is currently being implemented

3.1.2. Yes, ABC has been implemented and is currently used

3.1.3. Yes, ABC was implemented, but not used any more

3.1.4. No, ABC has never been implemented (If you mark “no” go to Question 4.7)

3.2. If you answered “yes” to 3.1 above, to what extent do you agree or disagree with the following benefits obtained by your company in implementing ABC?

3.2.1. ABC provides more accurate product costing for decision measurements.

3.2.2. ABC provides better product and customer profitability measurements.

3.2.3. ABC provides information for identifying areas where process improvement is required.

3.2.4. ABC gives a better cost estimation for pricing decisions, budgeting, and planning.

3.2.5. ABC provides better information for identifying the cost of unused capacity.

3.3. Please indicate the extent to which ABC is used in your company (You can select one or more answers).

3.3.1. Budgeting

3.3.2. Cost modelling

3.3.3. Cost reductions

3.3.4. Customer profitability analysis

3.3.5. New product and cost design

3.3.6. Performance measurement

3.3.7. Product or service output decisions

3.3.8. Product or service pricing

3.3.9. Stock valuation
3.4. To what extent have the following problems been experienced by your company in implementing ABC?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all</th>
<th>To a little extent</th>
<th>To a moderate extent</th>
<th>To a large extent</th>
<th>To a very large extent</th>
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<tbody>
<tr>
<td>3.4.1. Lack of top management support</td>
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<td>3.4.2. Management placing more emphasis on other priorities in the firm</td>
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<td>3.4.3. Absence of project sponsor</td>
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<td>3.4.4. Difficulty in identifying and defining cost centres and suitable cost drivers</td>
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<td>3.4.5. Employees' lack of basic knowledge of and skill in ABC techniques</td>
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<td>3.4.6. Complex and requiring too many detailed Records</td>
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<td>3.4.7. High cost of implementation especially cost of information technology</td>
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<td>3.4.8. Too time-consuming for personnel</td>
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<td>3.4.9. Negative perception of ABC</td>
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<td>3.4.10. Inadequate marketing of ABC especially by accountants themselves</td>
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<td>3.4.11. Employee resistance because they do not exactly know ABC</td>
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<td>3.4.12. ABC incompatible with company strategy</td>
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<td>3.4.13. Inadequate and insufficient training of users</td>
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<td>3.4.14. Resistance to change in organisational culture</td>
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</table>
### Section 4 – ABC implementation

4.1. Please rate the following statements which best indicate the importance of each factor influencing a successful ABC implementation in your company.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not important at all</th>
<th>Of little importance</th>
<th>Of medium importance</th>
<th>Important</th>
<th>Very important</th>
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</thead>
<tbody>
<tr>
<td>4.1.1. Selecting the appropriate ABC software package</td>
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<td>4.1.2. Adequate knowledge of data requirement and data collection</td>
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<td>4.1.3. Participation of external consultants in ABC project</td>
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<td>4.1.4. Active top management support</td>
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<td>4.1.5. ABC has been closely tied to competitive strategies of your company</td>
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<td>4.1.6. Linkage of ABC successful implementation to employee performance evaluation and compensation</td>
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<td>4.1.7. Accounting staff has shared ownership of ABC implementation with non-accounting staff</td>
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<td>4.1.8. Top management has provided adequate resources (time, commitment, funding, personnel, equipment)</td>
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<tr>
<td>4.1.9. Providing sufficient training about implementing and using ABC</td>
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<tr>
<td>4.1.10. The company organisational structure and culture suit ABC</td>
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</tbody>
</table>
4.2. Do you agree or disagree with the following steps which must be taken when implementing ABC?

<table>
<thead>
<tr>
<th>Step</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define activities, activity cost centres, and activity measures</td>
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<tr>
<td>Assign overhead costs to activity cost centres</td>
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<tr>
<td>Calculate activity rates</td>
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<tr>
<td>Assign overhead costs to cost objects using the activity rates and activity measures</td>
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<tr>
<td>Prepare management reports</td>
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</table>

4.3. What has been the main method used by your company to identify its activity list?

<table>
<thead>
<tr>
<th>Method</th>
<th></th>
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<tbody>
<tr>
<td>Top-down approach which uses ABC teams of people from the top levels of Management</td>
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<tr>
<td>Interview or participative approach with the inclusion of operating employees on the ABC team and/or interviews with them</td>
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<tr>
<td>Recycling approach which consists in reusing documentations or flow charts of processes developed for other purpose</td>
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</table>

4.4. In which of the following categories does your company classify its activities (you can select one or more answers)?

<table>
<thead>
<tr>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Unit-level activities</td>
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<tr>
<td>Batch-level activities</td>
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<tr>
<td>Product-level activities</td>
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<tr>
<td>Customer-level activities</td>
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<td>Facility-level activities</td>
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<tr>
<td>Other (please specify below)</td>
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</tbody>
</table>

4.5. What is the main category of cost drivers used by your company?

<table>
<thead>
<tr>
<th>Category</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Transaction driver which refers to the number of times an activity is performed</td>
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</tr>
<tr>
<td>Duration driver which refers to the length of time that it takes to perform an activity</td>
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<tr>
<td>Intensity driver which recognises that certain types of products may use resources more intensely than other products</td>
<td></td>
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</tbody>
</table>
4.6. Do you think that it is important to define the value-added and non-value-added activities as part of the ABC implementation process?

4.6.1. Not important at all
4.6.2. Of little importance
4.6.3. Of medium importance
4.6.4. Important
4.6.5. Very important

4.7. How satisfied are you with your current overhead cost allocations and overall product/service costing system?

4.7.1. Very satisfied, no improvements required
4.7.2. Reasonably satisfied, although some improvements might be useful
4.7.3. Needs improvements, but is still usable
4.7.4. Dissatisfied, system requires major improvements

If you are interested in having a copy of the findings of this research, please give your full details below. (Optional)

Thank you for completing this questionnaire