A PROPOSED STRATEGIC MANAGEMENT ACCOUNTING MODEL FOR PROFITABILITY: AN EMPIRICAL STUDY

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Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except were indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the authors and in no way represent those of the University.

Signed _____

Date_____July 2010_____

DEDICATION

This thesis is dedicated to my husband, Mostafa. Without his unerring support and loving patience, this research project would have never come to fruition.

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After a doctoral thesis is completed, acknowledging all individuals who should be recognized is almost an impossible task. However, there are some people who need to be named on an individual basis, because without them it would not have been possible to get to this stage.

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ABSTRACT

This thesis concerns strategic profitability management. The emergence of strategic management accounting has created a growing need for companies to discover the key factors that affect profitability and then to understand how these factors should be managed. To fulfil strategic management accounting requirements necessitates the use of appropriate strategic management accounting techniques. However, the traditional profitability system is inappropriate to meet the task. In addition, there has also been a lack of attention paid by researchers to the study of the integration between the most important drivers affecting profitability (cost, assets, and revenue). Moreover, there has inadequate investigation of the management of each driver using strategic management accounting techniques. Therefore, this study attempts to create a new model for managing profitability to fulfil the requirements of strategic management and to evaluate the perceptions of managers related to the influence of such a new proposed model on profitability. A broadly positivist view, which utilizes both deductive reasoning coupled with a quantitative approach, was employed to create the profitability model.

The creation of profitability model is enacted through an exploratory study. In order to create the profitability model, this thesis proposes three models for managing the key profitability drivers (cost, assets and revenue). The building of these models is based on the determination of the most important factor (driver) and approach that affect profitability in each model's case. In the light of such determination, strategic management accounting techniques were proposed to manage each driver in each model. The comprehensive profitability model is also proposed using the measurement levels of the cost, assets and revenue models. Models were tested in the Egyptian communication and information technology sector. A self-administrated questionnaire delivered and collected by hand was used to examine the hypothesized relationships. A total of 190 valid responses were used for quantitative analysis. The hypotheses related to the components of all the proposed models were examined via non-parametric measure of association, Spearman's rho technique and ordinal regression technique.

The study found that there is a positive association between each proposed driver in the cost, assets, and revenue and profitability models. It also found that there is a positive association between each proposed approach in the assets and revenue model, and profitability. The main conclusion of this thesis was that the profitability model, which contains the measurement levels of the cost, assets and revenue models, is the most appropriate model because its predictors are most strongly associated with the

profitability. The findings of this study can be generalized to the Egyptian ICT sector's members. In addition, the generalization of findings beyond the Egyptian ICT sector should be made with caution.

KEYWORDS

Strategic management accounting, profitability management, customer value creation, intellectual capital, value creation approach, customer profitability analysis.

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CHAPTER ONE: INTRODUCTION

THE MAIN FOCUSES OF THIS STUDY

This research focuses on strategic management accounting and in particular the managing of profitability. This is enacted through an exploratory study conducted within the Egyptian ICT sector at this time. The research therefore presents an initial examination, which is both bounded by its timing and the confines of the sample used. It however, aims to provide the basis for further research to test the findings presented here. The roots of strategic management accounting have a long history being developed from cost and management accounting. The following traces history brief to locate the project historically and within the current domain of strategic management accounting practice.

Due to the increase of companies' size in the early 1800s, cost accounting was developed to meet the need for measuring and monitoring performance (Eldenburg and Wolcott, 2004). In the early 1900s, cost accounting information was used in preparing external financial reports by providing companies with information about the cost of goods sold and inventory using simple methods to allocate costs to product (Eldenburg and Wolcott, 2004). There were few significant changes in the cost accounting system from early 1900s to mid 1970s (Eldenburg and Wolcott, 2004).

Cost accounting was defined by Institute of Management Accountants (IMA) as "a technique or method for determining the cost of a project, process, or things. Such information is determined through direct measurement, arbitrary assignment, or systematic and rational allocation" (IMA, 1983, p 25). It provides information for the internal purposes of management accounting. Such information is used for planning, controlling, and decision-making. In addition, it also provides information for the external purposes of financial accounting though determining the cost of production and sales (Hoque, 2003 and Horngren, Bhimani, Dater and Foster, 2005). The most important issues in cost accounting are: cost-volumes, profit analysis, budgeting, relevant costing, job-costing, process costing, and activity-based costing (Hoque, 2003).

Management accounting practices were in place by 1925 (Drury, 2008) to provide organizations with relevant information for the purpose of decision making. The information produced by cost accounting was inadequate to fulfil the requirements of the decision making process. However, organizations used it for both financial and

management accounting purposes because the costs of using two separate systems to generate cost information for financial accounting and for management accounting exceeded the additional benefits (Drury, 2008).

The Chartered Institute of Management Accountants (CIMA) considers management accounting to require the identification, generation, presentation, interpretation, and use of information relevant to:

- Formulating business strategy;
- Planning and controlling activities;
- Decision making;
- Efficient resource usage;
- Performance improvement and value enhancement;
- Safeguarding tangible and intangible assets, and
- Corporate governance and internal control (CIMA, 2000, p3).

It can be concluded that management accounting concerns collecting, measuring and reporting financial information used internally by managers for planning, controlling and decision-making purposes (Hoque, 2003; Eldenburg and Wolcott, 2004). In order to achieve this role, management accounting uses data from the financial and costing accounting systems (Lucey, 2003).

In the mid 1980s companies witnessed dynamic and complex changes. The following are examples of such changes:

- Changing environmental factors (sociological, technological, economic and political) (Hoque, 2003);
- Increasing competition in a global market, which leads to a focus on customer satisfaction (Drury, 2008);
- Shifting to a focus on value creation and the reduction of waste (Horngren et al., 2005), and
- Changing manufacturing systems and technologies, and using new management approaches (Drury, 2008).

However, management accounting used the same practices that had been developed in the 1925 (Drury, 2008). Such practices were insufficient to fulfil the requirements of theses changes. Therefore, criticisms of the traditional management accounting system

increased during the late 1980s and early 1990s. A key drawback of traditional management accounting is the focus of its report on costs only and its ignoring of other key issues in today's competitive environment such as quality and customer satisfaction (Drury, 1998). This means that it mainly emphasizes financial and quantitative information. Another significant criticism of traditional management accounting is its emphasis on internal activities and its ignoring of the external environment represented by customers and competitors (Drury, 1998).

Therefore, strategic management accounting emerged in the late 1980s to address the irrelevance of traditional management accounting by adopting new techniques and approaches (Roslender and Hart, 2003). Strategic management accounting was used to manage strategies and competitive advantage (Hoque, 2003). It concerns integrating management accounting and marketing management views to fulfil the requirements of strategic management (Roslender and Hart, 2003). In addition, it focuses on both internal and external, as well as financial and non-financial information about the company, its customers and competitors (Brouthers and Roozen, 1999). Moreover, it achieves competitive advantage by focusing on costs and/ or focusing on the differentiating of products (Crury, 2008). The most important techniques developed by strategic management accounting are: activity based-management, target costing, product life cycle costing, customer profitability analysis, attribute costing, value chain analysis and the balanced scorecard (Horngren et.al, 2005; Crury, 2008).

According to Lucey (2003), it is difficult to distinguish between cost accounting used for internal purpose and management accounting. He stated that there is no specific interval line between them. It can be argued that internal cost accounting information could be represented as the main part of management accounting or even strategic management accounting particularly with regard to the techniques used by both strategic management accounting and cost accounting. This includes customer profitability analysis, which is a key technique used by strategic management accounting. It uses activity based costing as a cost accounting technique in order to measure customers' costs accurately. Therefore it can be concluded that cost information generated from cost accounting techniques is a key element in strategic management accounting.

Improving profitability is one of the most important goals for companies. In order to achieve this goal, companies use different approaches and different techniques that are affected by the development of management accounting. Consequently, the emergence of strategic management accounting has created a growing need for companies to

change the way they manage profitability and to define a new mechanism for discovering actions and techniques that will improve profitability, in order to fulfil the requirements of strategic management accounting.

The existing profitability system in traditional management accounting is not compatible with the requirements of strategic management accounting. Managers and researches are searching for a new model to strategically manage profitability, which provides managers with strategic information about where it is likely that their actions will have the greatest impact on profitability. This will be achieved by discovering the most important factors that affect profitability and understanding how these factors should be managed using strategic management accounting techniques. Therefore, this research attempts to create a new model for managing profitability to fulfil the requirements of strategic management. Such a model takes into account key strategic dimensions that affect profitability and uses the most appropriate strategic management accounting techniques to manage profitability. This research also focuses on evaluating the perceptions of managers related to the influence of such a new proposed model on profitability. Thus, the creation of such model and the findings of this research are expected to offer both theoretical and practical contributions to this field of study.

STRUCTURE OF THE THESIS

This thesis has a further nine chapters. Chapter two, which concerns strategic management and its connection to management accounting, is presented in order to recognise how the strategic management approach affected management accounting and creates new requirements that should be achieved by management accounting systems. This review of the literature on the strategic management approach addresses definitions, reasons for its use, its goals and requirements, financial and non-financial benefits, and the process of strategic management is also introduced and analysed. The role of traditional management accounting in providing information required by strategic management is explained in order to determine to what extent traditional management accounting provides strategic management with relevant information. Different views on the concept of strategic management accounting and its general framework are discussed in order to recognize its most important characteristics.

A critical review of the existing literatures related to profitability management is also presented in chapter three in order to identify key profitability drivers in the strategic management accounting context. Different views from the literature on the key profitability drivers are introduced and analysed.

Based on the emergence of strategic management accounting and the review of the profitability management literature that was discussed in the previous chapters, the specific research problem is developed in section one of chapter four. This is followed by the development of research questions for the profitability model. Developing of the aim and objectives of the current study is also presented in this section. Section two of chapter four discusses the research methodology followed to create the strategic profitability model and investigate its relationships. Justification is made for the broadly positivist research approach and associated deductive and quantitative approaches used in the current study.

Development of the strategic profitability model is presented in chapter five. In order to develop the profitability model, this chapter divides into four sections. The cost model is presented in section one as a key driver for managing profitability. A critical review of literatures is introduced in this section to determine the most important cost driver that affects profitability. In order to manage such a driver, the proposed steps which include: customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and identifying cost-value gap and decision-making are explained and analysed. This section ends with hypotheses related to the cost model. The assets model is presented in section two as another key driver in the profitability model. A critical review of literature is introduced in this section to determine the most important assets driver that affects profitability from a strategic perspective. The assets driver that should be used in managing assets is one of the key recent issues discussed in the accounting literatures. Therefore, a review of literature related to intellectual capital is presented, reasons for its emergence, the concept, components, and characteristics; their importance and role in the knowledge environment are discussed in this section. Approaches to value definition of intellectual capital are analysed in order to determine the appropriate approach for its management. To manage this driver, three proposed stages are explained and analysed, along with the proposed indicators used in each stage. Finally, hypotheses related to the assets model are formulated.

The development of the revenue model is presented in section three as one of the most important drivers in the profitability model. A critical review of literature is analysed in this section to determine the most important revenue driver. Then, the value management approach is presented as the main approach used to manage the revenue driver. Customer satisfaction and customer loyalty along with the proposed indicators are analysed and introduced to mange the value that the customer obtains from the company. A customer profitability analysis technique is analysed and proposed to mange

the value that company obtains from its customers. This section ends by presenting hypotheses related to the revenue model. The composite profitability model represented in the combination of the cost, assets, and revenue models is discussed in section four. Finally, hypotheses related to the profitability model are formulated.
Chapter six discusses the research method used in carrying out the research study. The survey approach is discussed, followed by methods of data collection and development of questionnaire. Then sampling, measurement and scales are discussed. In addition, reasons for choice of these methods are given. Particular attention is given to data analysis techniques used in examining the hypotheses.

Chapter seven presents the context and details of the findings. It investigates the relationships in each proposed model together with testing of reliability. In chapter eight the outcomes are discussed in the light of hypotheses. The major findings are also discussed in relation to the outcomes of previous studies. How the strategic information generated from the proposed profitability model helps in decision making is discussed in the last section of chapter eight.

The final chapter draws conclusions for the whole project based on its aims and objectives, the methods utilized to achieve them, and the major findings. The contribution to knowledge of the project is discussed. Limitations of the project are also discussed, along with areas of further research.

CHAPTER TWO: STRATEGIC MANAGEMENT AND ITS CONNECTIONS TO MANAGEMENT ACCOUNTING

INTRODUCTION

The principal purpose of this chapter is to explain and analyse the impact of strategic management on management accounting. To achieve this purpose this chapter is divided into two sections. The first focus is on strategic management (what strategic management is, reasons for employing strategic management, the goals and requirements of strategic management, financial and non-financial benefits of strategic management, the process of strategic management). The second section centres on strategic management accounting (the role of traditional management accounting in providing information required by strategic management, development of the concept of strategic management accounting, the difference between traditional management accounting and strategic management accounting, the general framework of strategic management accounting).

STRATEGIC MANAGEMENT

What is Strategic Management?

Before analysing the definitions of strategic management and determining the core elements of the concept, it is necessary to identify the main approach to strategy that this study adopts. The two main approaches to strategy are: emergent strategy which identified by Mintzberg (1987) as "patterns or consistencies realized despite, or the absence of, intentions" (p.70). This approach assumes that the 'actual' strategy results from the integration between planned strategy and non-estimated emergent strategy (Mintzberg, 1987). Another key approach is the rational approach, which assumes that companies can achieve their objectives through a structured step-by-step process (Norton, 2007). The rational approach is the dominant viewpoint in both practice and the strategy literature. Therefore, this approach forms the basis of the discussion that follows and is applied in the development of this research.

David (1997) illustrated that strategic management is the art and science of formulating, implementing, and evaluating strategies to enable the company to achieve its goals. According to David, strategic management focuses on the *integration* of management, marketing, accounting, production, processes, research and development, and information systems, so that the company can be successful. It is clear here that the

focus is on strategic management *processes*, illuminating an important aspect – the necessity of integration between different fields inside the company to achieve success. This means that strategic management does not take place at the management level alone. The definition also sheds light on the purpose of strategic management; however, it deals with it only briefly. This is further explained by the study conducted by Dess and Lumpkin (2003), who emphasized that strategic management is crystallized through three main processes:

- The analysis of strategic goals, as well as the internal and external environment, and determining the reasons why some companies are superior to others.
- Decision-making in the light of the answer to two main questions:
    - What are the competing industries?
    - How can competition take place?
- Implementation, which is concerned with the procedures related to the distribution of main resources and the performance of the necessary steps in accordance with the above two processes.

It is clear from the above that Dess and Lumpkin (2003), in defining the concept of strategic management, emphasizes the *process* of strategic management. However, they do not clearly and succinctly express the concept of strategic management. Nor have they shown its main goals, which are an essential component of the definition. This definition also ignores a very important factor in the success of strategic management processes, namely 'assessment'. This is further illustrated by Awad (2004), who defines strategic management as the process that includes the design, performance, and evaluation of processes with *long-term* effect, which aim to increase the organization's value from the viewpoint of customers, shareholders, and society as a whole. Strategic management therefore focuses on customer satisfaction and on attracting new customers to the organization to increase its opportunity to out perform its competitors and to achieve profits. It can be argued that Awad's definition focuses on two aspects: the main processes of strategic management and its main goals. As such, it is more inclusive and encompassing than the previous definition.

However, further definitions have been analysed. A key definition in this area which focuses on the steps of the strategic management process is suggested by Johan and Frank (2005). They define strategic management as the process by which companies identify their purpose and objectives, determine the actions for achieving their objectives in the light of environmental changes, then implement these actions, and finally evaluate

the results. Although this definition determines all the steps of strategic management, they are general steps for management and do not describe a particular approach.

Strategic management has also been defined by Eissa (2007) as the process of making decisions related to preparing strategic plans; obtaining resources; allocating resources for strategic organizational units; and exercising sufficient strategic control to make sure that the strategic centres that implement the plans achieve the goals of the company.

Eissa (2007) adds that strategic management is concerned with achieving complete harmony between the environmental circumstances surrounding the company; the new strategies that need to be implemented; and the capabilities and capacities of the company.

The above definition emphasizes a vital aspect – the necessity of creating conformity between the three elements mentioned above. This represents the crucial element for the success of strategic management. It is perhaps for this reason that some regard strategic management as both a science and an art. It is clear from the above definitions that most recent characterizations focus on the *process* of strategic management. This means that the process of strategic management is the critical element in defining and understanding the concept which is discussed later in this chapter.

Reasons for employing strategic management

There are many reasons that have made it necessary to employ a strategic management approach. The following present some of most important:

- Globalization: meaning not only more international trade among organizations, but also including the flow of capital, the human element, information networks, and speed in conducting and concluding deals. All this has led to increase the fierceness of competition. Therefore, globalization requires companies set strategies to face complexities and sometime contradictory directions (Dess and Lumpkin, 2003).
- Intellectual capital: knowledge has come to be a key resource, and a direct source for creating competitive advantages for many companies, especially those related to ideas, such as technology and computer companies. In addition, intellectual capital represents an indirect source for creating competitive advantages for all the companies that attempt to achieve distinction through creating customer value. In the twentieth century, managers were concerned with tangible resources, such as land and equipment, in addition to intangible resources, such as trademarks and

customer loyalty. Today, however, more than 50% of products in developed economies are based on intellectual assets and intangible skills. Profitability is increased through effective knowledge management in accordance with specific strategies instead of efficient control of material and financial assets (Dess and Lumpkin, 2003).

- Change acceleration: it is observed that the rate of economic, social, political, and technological change accelerated in the initial part of the 21st century. Such changes have created both opportunities and threats. Therefore, setting strategies and dealing with opportunities and risks have become more important issues in contemporary companies (Awad, 2004).
- Resource scarcity: conflict over scarce resources has become a defining characteristic of the modern business context. Companies have to set strategies that guarantee the provision of resources in time and with the required quantities and attributes (Awad, 2004).
- Concern for the environment: growing concern with environmental protection and the increasing power of green groups and their impact on companies have made it necessary to set strategies for confronting such powerful groups (Awad, 2004).

Goals and requirements of strategic management

There is agreement amongst most authors who discuss strategic management (e.g. see Porter, 1985; and Shank, 1989) about the main goal, which is to achieve competitive advantage. Awad (2004) adds another goal which is to increase the company's value from the perspective of customers, shareholders, and society as a whole. This research adopts Awad's view that strategic management should be aimed at increasing the value for stakeholders, this is partly based on issues of sustainability and also because it accords with the world view of accounting and finance – the creation of value often expressed in monetary terms. According to Awad (2004), achieving strategic management goals entails:

- Determining priorities and their relative importance, by setting long-term objectives, annual objectives, and policies.
- Preparing the internal environment of the company by adopting and operating advanced technical and technological methods in design, planning, and production; and adopting and activating development approaches in management accounting, such as activity analysis, value analysis, and total quality.

Arabi (1999) identified the requirements for achieving strategic management goals as follows:

- Focusing on the market and the external environment, studying and analysing ways of benefiting from competition, represented in new competitors and existing competitors in the industry and market, and negotiating a position in terms of the power of customers and suppliers respectively, in addition to resisting threats.

- Taking strategic decisions, whose main characteristics are:
    - They are concerned with the way the company's activities benefit by the opportunities available in the surrounding environment.
    - They budget between the company's activities and resources, with a view to gaining an advantage from strategic opportunities.
    - They are affected by the values and expectations of those in charge of setting the company's strategies that affect the company's long-term ambitions.
    - They result in reducing the company's main resources.
    - They include all stakeholders (e.g. shareholders, customers, employees, and suppliers).
- Finding an objective criterion for judging the efficiency of management.

Dess and Lumpkin (2003) suggests that the achievement of strategic management goals requires distinguishing between "efficiency" and "effectiveness" and the relationship between them, which is one of the most important attributes of strategic management. Some studies in the field of strategic management have referred to the difference between "doing the right thing" which represents "effectiveness" and "doing the thing right" which represents "efficiency" (Hosking, 1993 and Loeb, 1994).

According to Loeb (1994), there is a difference between doing the right thing and doing the thing right. Loeb argues that in order to focus on effectiveness (doing the right thing), the orientation is towards the future, the vision, the mission, and the strategic direction. In this respect, thinking is directed towards answering the how questions. On the other hand, focusing on efficiency (doing the thing right) requires concentrating on control, and answering why and what questions. This is further supported by Hosking (1993), who shows that about 90% of companies' added value is generated from focusing on effectiveness, which he defines as doing things that optimize the results of an organization's overall activities, as distinct from efficiency, which "involves doing

things quickly and well". In this way, the focus of strategic management is on achieving effectiveness.

Financial and non-financial benefits of strategic management

David (1997) confirmed that there are benefits resulting from adopting the strategic management approach. Such benefits have been divided into two types – financial and non-financial, as shown below.

Financial benefits of strategic management

David (1997) believes that the companies that adopt the strategic management approach are more successful and profitable than those that do not. David (1997) and Hitt, Ireland and Hoskisson (2007) indicate that from 50% to 80% of the improvement and growth in companies' profitability is achieved through a diversification strategy. This is further affirmed by Hill and Jones (2008) who suggest that strategic management gives a company a competitive advantage, making it the key approach to maximize profitability.

Non-financial benefits of strategic management

According to David (1997), applying the strategic management approach achieves a number of non-financial benefits, the most important of which are probably the following:

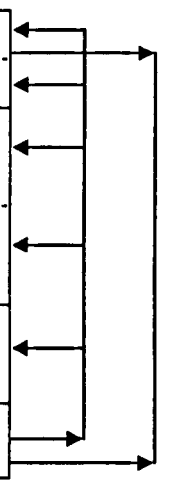
- It helps the company to identify, define, and set priorities, and to understand competing opportunities;
- It enables the company to understand competitors' strategies;
- It helps the company to set a framework for improving, coordinating, and controlling activities;
- It reduces the effects of opposing conditions and threats;
- It leads to the allocation of resources and time in a more effective way;
- It establishes a framework for internal communication between individuals;
- It lays a clear foundation for determining the responsibilities of individuals;
- It encourages the development of the ability to think amongst employees;
- It provides an integrated approach based on co-operation and motivation for problem follow-up;
- It encourages change-oriented behaviour, and
- It offers employees an ability to recognize how to manage work and improve productivity.

The process of strategic management

According to Lei and Pitts (2002) strategic management consists of four major steps. The authors summarize these steps in Table 2.1 below.

Table 2.1: The Strategic Management Processes

Analysis	External Environment	Opportunities, Threats
	Internal Environment	Strength, Weaknesses
Formulation	Mission	Customers to be served Competencies to be developed
	Polices	Goals, Guidelines for major activities
Implementation		Organization structure, Systems, Culture, etc.
Evaluation		Cycle to earlier steps



Source: adapted from Lei and Pitts (2002)

The properties of the strategic management process are suggested by Awad (2004):

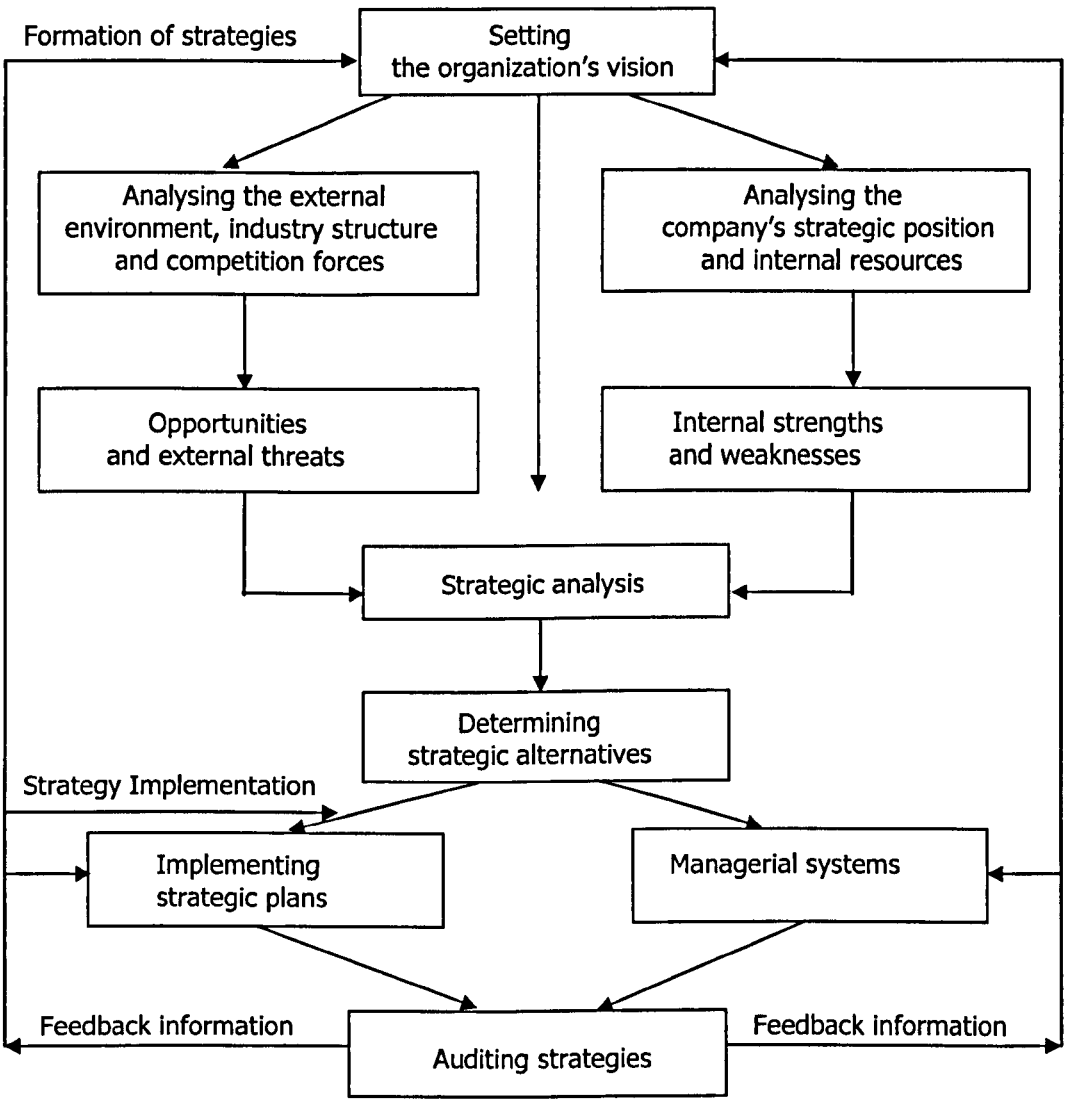
- No stage can begin unless the previous stage has been finished;
- The quality of each stage depends on the quality of the previous one;
- The stages of strategic management are interrelated and integrated, with the result that any change that takes place in any of them affects other stages, whether the preceding or the following;
- Strategic management is a continuing process of evaluating and depicting changes in the internal and external environment's, implemented on a regular basis; and
- Strategic management should be regarded as a necessary process that requires a continuous flow of information.

According to Awad (2004), strategic management consists of three main stages. The first is the design stage; the second is implementation; the final is evaluation. Awad affirms that most theoretical studies that have dealt with the strategic management approach have agreed on the stages and processes of strategic management.

Most recent studies, e.g. Abuo-Alfutouh (2004) and Jay and William (2006), have proposed a detailed model for strategic management. These models differ from one

study to the other in the degree of detail exhibited. However, they all agree on the main processes of strategic management. Examples of these studies are outlined below.
The following figure shows the suggested model by Abuo-Alfutouh (2004):

Figure 2.1 Processes of Strategic Management



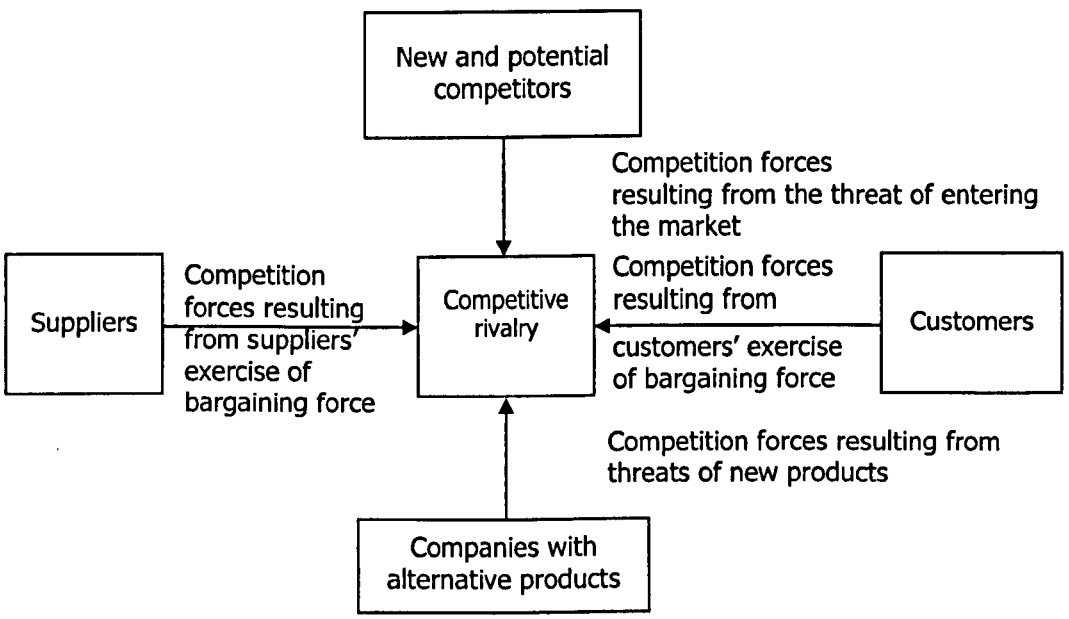
Source: adapted from Abuo-Alfutouh (2004)

According to Abuo-Alfutouh (2004) an integrated model for strategic management consists of four processes as follows:

- Process one: determining the company's vision;

- Process two: analysing the external environment. Abuo-Alfutouh (2004) explains that the external environment consists of firstly, the general environment, including the social, technical, economic and international legal environments; and secondly, the private environment, including the competitors, the consumers, the suppliers, the government, and international organizations. At this stage, the author states that analysis of the industry and competition forces is carried out, along with analysis of the company's position with reference to the industry's main success factors, represented by those factors related to technology, manufacturing, and marketing. Similarly, competition forces, which are analysed at this stage, are considered an essential element in the analysis of the external environment. The following figure illustrates competition forces:

Figure 2.2 Competition Forces



Source: adapted from Porter (1980)

- Although the analysis of competitive forces represents a key issue, there is a recent trend that aims at combining cooperation and competition between companies in one approach which named coopetition (Luo, 2004). Companies that adopt such an approach share some resources and compete in other aspects to improve their performance. This recent approach improves performance and contributes in building a strong position in the global market.

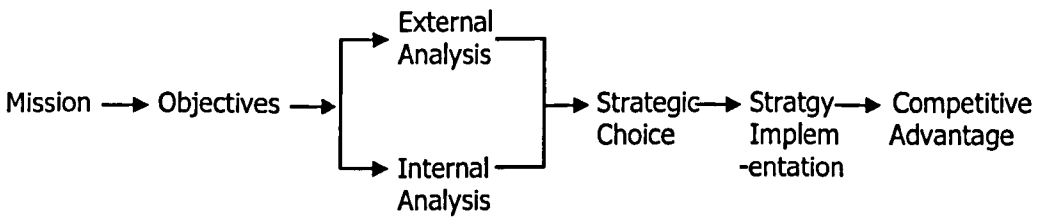
- Process three: analysing the internal environment. This aims at identifying the strengths and weaknesses inside the company, which is necessary for determining the opportunities that the company can use, and the ways of confronting the threats identified by the analysis of the external environment. It is a general term that refers to the analysis of weaknesses and strengths, and the analysis of competitive advantages. A "competitive advantage" can be defined as an advantage for the organization that is achieved when it follows a specific competitive strategy. A competitive advantage represents the key strategic element that offers an essential opportunity for the organization to achieve continuous profitability compared with its competitors. According to Abuo-Alfutouh (2004), there are two competitive strategies which are the cost leadership strategy, which is intended to achieve the lower cost advantage; and the differentiation strategy, which is intended to achieve the higher quality advantage. To achieve this, it is necessary to manage the company's resources effectively and this can be done by adopting new approaches such as 'value net' (Walters, 2004). Such an approach requires shifting the focus from inside the company to an outward customer focus by exploring how value can be created for customers (in relation to the value produced by competitors) through value creating systems, which are explained later in this research. However, other possible options for competitive advantage can be seen in a 'confrontation strategy', introduced by Cooper (1995). This strategy does not aim at avoiding competition, rather "it competes head-on for companies' share of the market by developing and exploiting temporary competitive advantage" (Cooper, 1995, p.11).
- Process four: selection of strategy. The selection of strategy is done in the light of the strategic alternatives available. This is cumulative process that takes place over time rather than a task that is performed at a certain point in time. Although the mission or aims of any organization may continue without change for several years, a strategy may change in time in response to the internal or external conditions of the organization. This affirms the main attributes of strategic management referred to above, which were described as a continuous process requiring a continuous flow of information. Abuo-Alfutouh (2004) suggests categorising strategies in any company into the following:
    - Corporate Strategy: This focuses on the overall picture of strategic alternatives and makes sure each unit adds to overall performance.
    - Business Strategy: This is represented by the plan set for directing and managing a certain business unit.
    - Functional Area Strategy: This refers to the functionally determined approaches and the movements made by management with the purpose of

supporting the total strategy of the business unit. The need for such strategies appears in functional fields such as production or marketing.

- Operating Strategy: This refers to a number of detailed approaches as well as movements adopted by managers of sub-units and managers of geographical areas for achieving the performance goals related to the strategy, each within the limits of their responsibility.

Jay and William (2006) introduce another model for strategic management, which can be summarized in figure 2.3.

Figure 2.3 Strategic Management Processes



Source: adapted from Jay and William (2006)

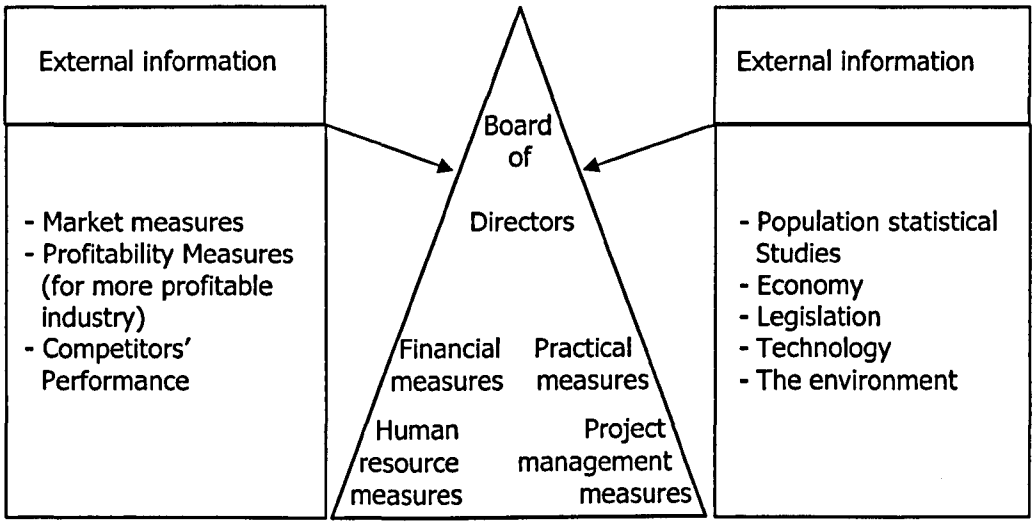
As mentioned above, there is no substantial difference between most studies that have proposed a comprehensive and integral model for strategic management, except with reference to the degree of activation. However, Dess and Lumpkin (2003) add another important dimension to the strategic analysis stage, which is that it must include a study and analysis of intellectual capital as the basis for value creation, this also adds a third side in the strategic analysis triangle. Accordingly, strategic analysis stage includes internal environment analysis, external environment analysis and intellectual capital analysis. It can be concluded that the three key elements of strategic management are internal, external environments and intellectual capital, which should be focused on and reflected in all company functions.

STRATEGIC MANAGEMENT ACCOUNTING

The role of traditional management accounting in providing information required by strategic management

In order to study the role of management accounting in providing information, it is necessary first to determine the information required by strategic management. The information required by strategic management can be represented by the following figure

Figure 2.4 Information Required by Strategic Management



Source: adapted from Abuo-Alfutouh (2004)

Figure 2.4 shows that strategic management requires not only financial, but also non-financial information. Arabi (1999) added that strategic management can achieve its goals by depending on detailed and analytical information, financial and non-financial, external and internal, and pre- and post-information. Therefore, it requires the following information on:

- The choice of competing alternative production technology patterns, e.g. on the differences in the cost structure of the company using a certain production technology compared with the cost structures of competitors;
- Competitors' costs;
- Suppliers;
- Customers' markets;
- Customer profitability analysis;
- New products;
- The time consumed at each stage of the product's life cycle and the cost of each stage, and
- The products necessary for the market and determining the mixture of products that achieves the highest profit in the market.

After the discussion and analysis of the properties and types of information required by strategic management to achieve its goals, it is clear that traditional management accounting cannot fully meet this information need.

According to Yazdifar (2003), the information provided by traditional management accounting is inappropriate for strategic management for the following reasons:

- The traditional management accounting system does not focus on strategic planning, but only focuses on external reports and inventory evaluation. This is not appropriate for the strategic management approach, which requires companies to put the strategic dimensions in accounting;
- It focuses on the financial measures and not the non-financial ones;
- It focuses on the production activities, not the sub-activities;
- The traditional system ignores associative relationships with suppliers and customers;
- Traditional management accounting ignores associative relationships with activities;
- The traditional system ignores the costing position of competitors;
- It focuses on the volume of production as a sole cost driver;
- Traditional management accounting does not pay attention to submitting reports on quality;
- The traditional system focuses on short-term decisions;
- Traditional management accounting does not pay attention to customer profitability;
- It ignores analysing and measuring cost throughout the product's life cycle, and
- It performs cost analysis under the available circumstances, not the competing circumstances.

Moreover, Narver and Slater, (1990) indicated that the traditional management accounting ignores the attributes of product which represent a key element that create value for customers. Furthermore, Although there has been an increase in the importance of intellectual assets, traditional management accounting remains focusing on physical and financial assets and ignore most intellectual assets (Zeghal and Maaloul, 2010).

The above variation in the nature and kind of information needed by strategic management, and the inability of the traditional management accounting system to meet the information needs of strategic management, leads to the emergence of the strategic management accounting approach to fulfil the strategic management requirements.

Development of the Concept of Strategic Management Accounting

The concept of strategic management accounting has been defined by many studies, e.g. Simmonds (1981); Porter (1985); Bromwich, and Bhimani (1989); and Shank (1989). In order to give an accurate definition of strategic management accounting, it is necessary to analyse the development of the concept in these studies. The term strategic management accounting was introduced by Simmonds (1981, 1982). He stated that strategic management accounting was concerned with the provision and analysis of management accounting data for companies and their competitors and the use of such data in developing and rationalising the business strategy. He further argued that strategic management accounting has an external dimension and focus, and that, therefore, it must expand its efforts to include all the data on cost, volume, price, cash flow, market share of competitors and identification of the strategic position of the company and its competitors. This definition confines the role of strategic management accounting to data collection and analysis, in addition, confining the data being collected to the company and its competitors only. This was affirmed by Ashour (1995), who explained the concept of strategic management accounting as the management analyses and remedies related to the company and its competitors, especially those related to the relative directions and levels of costs, price, volume, and market share. This definition sheds light on the types of data collected and analysed by the management accountant. The previous definitions were supported by that definition of Fathy (2002), who stated that strategic management accounting is the provision and analysis of management accounting data on the company and the markets, costs, and strategies of the company's competitors, with the purpose of using such data for developing, rationalizing, and designing a successful strategy for the company to support its competitive position. This definition emphasises the purpose of collecting and analysing such data on the company and its competitors, which is an important step towards a clear definition of strategic management accounting.

A second significant definition was developed by Bromwich (1988) who defined strategic management accounting as a type of management accounting that goes beyond collecting data on the company and its competitors to search for evaluating the competitive advantages of the company and the value that the company adds to its competitors, and evaluates the benefits that the product provides to customers such as, quality, lower cost and product flexibility. Bromwich (1988), therefore, believes that the new concern of strategic management accounting is focused on both products and

customers. To achieve this, he introduces a new approach called attribute based costing to link the cost to the customer benefits. The author assumes that the main process of strategic management accounting is to determine the cost of providing future benefits to customers. It could be suggested that, this definition adds a further role for strategic management accounting apart from data collection and analysis, which is the role of evaluation (i.e. the evaluation of the competitive advantages of the company and of the benefits gained by customers). In addition, this definition adds another type of required data, so that the data to be collected will fall into three types (related to products, customers, and competitors). This is further developed by Bromwich and Bhimani (1989), who stated that strategic management accounting focuses on the following: (1) the external aspects of the final product market; (2) the places where companies make profits; (3) the areas where they encounter their competitors; and (4) the work of the management accountant which begins at the factory's floor level. Therefore, it can have a direct impact on confrontation of the market challenges. The main strength of this study is that it added a new dimension to the purposes of strategic management accounting, which is achieving benefits for shareholders through focusing on fields that achieve profits to the company. Therefore, it does not only focus on customers and competitors, but pays attention to shareholders as well.

A third approach to defining strategic management accounting focuses on the connection between strategic management and the use of cost information as the main element in strategic management accounting. This approach was led by Porter (1985, 1998), who specified three main strategies to achieve competitive advantage. The first one is cost leadership, which focuses on reducing costs. To achieve this strategy and hence achieve competitive advantage, Porter suggests a framework for strategic cost analysis which focuses mainly on the value chain analysis technique. The second strategy is differentiation, which focuses on the unique quality of the product. The third one focuses on a narrow segment of the market. The author emphasises the importance of determining the strategies and identifying the use of management accounting techniques in order to manage these strategies. However, he does not introduce a clear definition of strategic management accounting. Porter's (1985) framework is developed by Shank (1989); and Shank and Govindarajan (1992), who suggested that the framework for strategic cost analysis consists of three main techniques, which are value chain analysis, strategic positioning analysis, and cost driver analysis. Shank and Govindarajan (1992) provide a more in-depth explanation of strategic management accounting. According to Shank and Govindarajan, strategic management accounting focuses on using cost information at each stage of the strategic management cycle. They explain that the cycle

of strategic management consists of the following four stages. The initial stage is to formulate a strategy, the second stage is to reflect this strategy throughout the company, the third stage is to prepare and apply tactics to implement the strategy, and the last stage is to evaluate performance to monitor the success in meeting strategic objectives. Shank and Govindarajan's perspective is further affirmed by Roslender (1995), who stated that the principal purpose of strategic management accounting is to provide accounting information for formulation, implementation and realization of strategy in order to achieve competitive advantage, and hence increase profitability.

A fourth approach to defining strategic management accounting has been outlined by Clarke (1995) as a method for providing information on the company's markets and competitors that focuses on internal data from a strategic perspective. This definition ignores the role of strategic management accounting in the analysis and evaluation of information and confines its role to the provision of such information. In addition, Clarke's definition does not refer to the purpose of collecting such data, which may lead to the inaccuracy within the definition.

According to Eissa (2007) strategic management accounting consists of a set of management accounting techniques that help generate information that benefits management in creating conformity between the environmental level on which the company is expected to work; the strategies that must be applied; and the capabilities, capacities, and management systems that can implement the proposed strategies. The main strength of this definition is it casts light on two important aspects: it shows that the collection and analysis of data which is referred to by most of the above definitions will not achieve its goal without the use of the management accounting techniques that help transform such data into information that benefits management. It also highlights the role of management accounting in serving the purposes and achieving the requirements of strategic management. Management accounting has developed new techniques that create the conformity referred to above, which is the key to the success of strategic management.

After the above explanation and analysis of the development of the concept of strategic management accounting, strategic management accounting has been defined by this research as follows:

A type of management accounting concerned with collecting data both financial, non-financial on the company, its competitors, and its customers. It is also concerned with

analysing such data through the use of a set of appropriate strategic management accounting techniques. Such techniques provide information that helps evaluate the strategic position of the company, its competitors, and the benefits that customers gain, to establish a successful future strategy. This supports competitive advantage and increase profitability improvement opportunities.

The Difference between Traditional Management Accounting and Strategic Management Accounting

After studying the development of the concept of strategic management accounting and defining this concept, it is relevant to refer to the most important differences between traditional management accounting and strategic management accounting. These are represented by the following points:

- Traditional management accounting has a strongly internal focus. It focuses on internal efficiency while ignoring relations with suppliers and customers, which leads to the waste of many opportunities for achieving competitive advantages, and hence improving profitability. On the other hand, strategic management accounting has a strongly external focus; it is concerned with various stages of the whole value chain, of which the firm is a part (Shank and Govindarajan, 1992).
- The main purpose of collecting and analysing data in strategic management accounting is to provide the principal information such as quality, time, and customer satisfaction and cost improvement for the formulation, implementation and realization of strategies. But the purpose of collecting data in traditional management accounting is to serve the decision making, planning and control process (Roslender and Hart, 2003).
- The characteristics of the data used in each approach also differ. Traditional management accounting relies on historical, internal, financial, and post-information. On the other hand, strategic management accounting uses future, internal and external, pre-information, post-information, financial and non-financial data (Simmonds, 1981).

The General Framework of Strategic Management Accounting

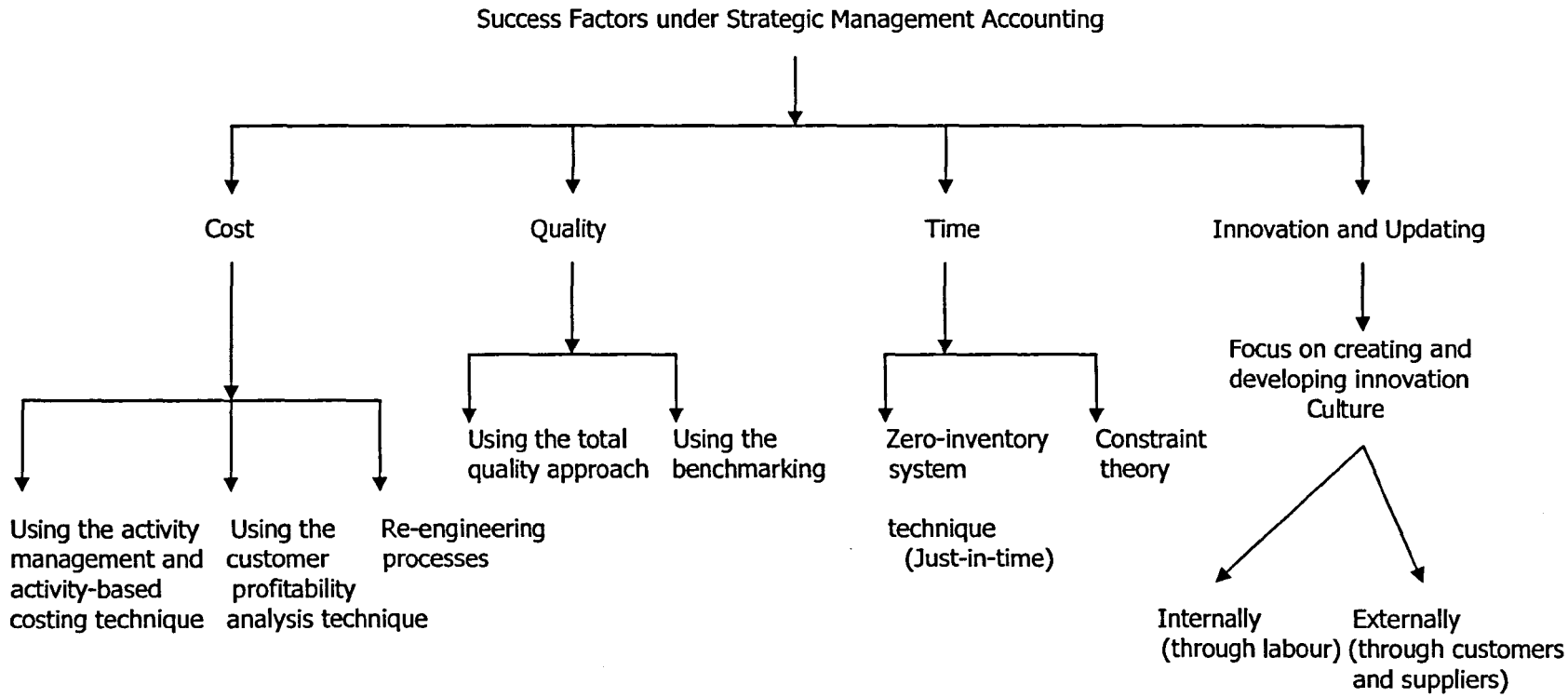
There is a lack in contemporary studies of a clear, unified framework for strategic management accounting and its components and techniques. The following are examples of some of the studies that have tackled this topic.

Eissa (2007) proposed a framework for the components of strategic management accounting. According to Eissa (2007), the framework consist of the following stages: first, identifying the company's environmental level; second, identifying the strategies or policies that should be implemented at each level; finally, designing a management accounting system that is appropriate for using the strategic planning method. This consists of many techniques, among the most important of which are: activity-based cost analysis, strategic cost analysis, non-financial indices for measurement and performance evaluation. Eissa's study has focused on the strategic planning technique as the most inclusive of internal and external variables that can affect the company. He concluded that the management accounting information system represents one of the company's strategic resources that help improve and support the company's strategic and competitive position. However, Arabi (1999) focused on a suggested framework for the use of the following advanced techniques: cost analysis and measurement during the product's life cycle, customer profitability analysis and decision-support systems. It can be argued that this study does not propose a full framework, but only part of a possible framework, since it confines itself to a set of strategic management accounting techniques without linking them to the dimensions of strategic management accounting.

Another study which also focused on the use of management accounting techniques was conducted by Zaki (2002), which suggests a number of techniques that can be used in strategic management accounting, with a view to assuring the validity of the processes of selecting and implementing the company's strategies. These techniques are strategic cost analysis, activity-based cost analysis, total quality management. Similarly, Abuo-Alfutouh (2004) proposes a number of techniques to be used in strategic management accounting, these techniques are; strategic cost analysis, activity-based cost analysis approach and its contemporary developments, continuous improvement approach, target cost approach, and total quality management.

A significant framework is suggested by Smith's (2000), who shows that the strategic management accounting approach should focus on certain key factors for the success of any company. Smith divides them into four factors: cost, quality, time and innovation. He proposes a set of management accounting techniques for managing each factor from a strategic perspective. Smith's framework is illustrated in figure 2.5.

Figure 2.5 Success Factors under Strategic Management Accounting



Source: adapted from Smith's (2000)

Smith's study represents an addition to the field of strategic management accounting, although it does not represent a general framework. It is a model for strategic management accounting factors of success, which can be regarded as a specific framework rather than a general framework.

The components of the framework for strategic management accounting have been argued by (Clarke and Tagoe, 2002). According to Clarke and Tagoe, the framework of strategic management accounting should be based on the following components: analysing the weaknesses and strengths of both the company and its competitors, Designing an internal system for determining which activities are value adding and which are not, customer profitability analysis, determining and measuring success factors and determining related performance indexes, using the benchmarking approach. This study ignores some of the most important components, especially those related to external environment analysis and identifying opportunities and threats.

After the above analysis of studies on the strategic management accounting, it can be concluded that, it is difficult to suggest a general framework. However, some considerations can be given to designing a framework for strategic management accounting. These considerations can be represented as follows:

- Setting goals based on supporting competitive advantage and increasing profitability opportunities;
- Extending the scope of management accounting to include both the internal and external environments, and creating harmony between them;
- Setting Appropriate Strategies to create harmony between the internal and the external environments, and
- Using Appropriate Management Accounting Techniques – these cannot be specified because they differ according to the strategy being used. Such strategies could adopt target costing, strategic cost analysis, attribute based costing which is advanced by Bromwich (1990), lifecycle costing, balance scorecard.

CONCLUSION

As a result of the rapid and dramatic changes in business environment, companies employ a strategic management approach to face such changes and achieve competitive advantages. Due to the variation in the nature and kind of information needed by strategic management, and the inability of the traditional management accounting system to meet the information needs of strategic management, the strategic management accounting approach has emerged to fulfil strategic management requirements. In order to create a profitability model to meet the requirements of strategic management and provide management with strategic information, strategic key drivers need be identified. Such key drivers are explored in more in the next chapter

CHAPTER THREE: DRIVERS OF PROFITABILITY

INTRODUCTION

The principal purpose of this chapter is to provide an overview of the previous literature on the topic of profitability management in order to identify the key profitability drivers that will be used in the current study. Studies that focus on one driver only for profitability management and improvement will firstly be discussed. This is followed by reviewing studies that focus on more than one driver for profitability improvement and management. This chapter ends by the assessment of these studies and by identifying key strategic profitability drivers.

PREVIOUS STUDIES THAT FOCUS ON ONE DRIVER TO IMPROVE AND MANAGE PROFITABILITY

There are many studies that have focused on the cost dimension as the key driver for profitability improvement through applying different strategic management accounting techniques (see for example: Brausch, 1994; Eissa, 2001; Lenhardt, 2004, 2005; Porter 1985, 1998; Shank and Govindarajan, 1992; and Shank, 1989), which attempt to achieve a competitive advantage which, as indicated earlier, constitute the crucial element for achieving sustainable profitability within a company. As there are many techniques, the focus here is on selected key strategic management accounting techniques and the potential of these techniques to affect profit.

Lenhardt (2004) explains how an activity-based approach should be developed to achieve profits. He analysed and studied the need for providing a process-based information system with a subsystem that is based on the activities within each process and studying emerging benefits. One of the findings of his study is that the current cost system does not provide useful information for decision-makers. Besides, it takes a great deal of time and effort, as well as demanding higher cost in planning and balancing, as well as cost distribution, which does not comply with advanced developments. Therefore, it has been described as "flying blind". Among the findings of the study are that the main requirement for developing process and activity structure is the need for a process structure that provides managers with the information they need to understand their operations and improve decision-making. Such information will also help in developing products and increasing customer profitability. Lenhardt affirms that process-based management contributes significantly to profitability increase:

- Firstly, by defining which products are profitable and how to improve the profitability of unprofitable products.
- Secondly, by setting priorities and action plans to improve product profitability.
- Thirdly, by defining which customers are profitable and which customers cause losses for the company.
- Fourthly, by defining where processes might be in need of improvements and determining how to improve the cost system.

He concluded that establishing a process-based information system will have positive impact on profitability and will achieve competitive advantages.

The role of information generated from the process management approach in defining hidden profits and developing profitability of both products and customers, was examined by Lenhardt (2005). The study stresses the importance of analysing information in companies on three levels:

- Firstly, on the product lines level, he suggests group proposals for increasing or improving profitability, the most important of which is to increase product selling price and developing processes to reduce product costs.
- Secondly, on the customers' level, the company profitability and customer-generated profits are analysed. According to Lenhardt, such analyses are useful in identifying areas which need improvement.
- Thirdly, on the process level, such information is represented by the cost of every process and its relation to resources utilized.

One of the findings of the study is that this level of analysis helps to define areas of profitability improvement and determine the areas on which the company should concentrate its efforts. Lenhardt (2005) suggests that the greatest process alone consumes 80% of the company's resources and that the greatest five processes consume *only just* more than 80% of its resources. Therefore, it is a necessary to concentrate on such processes, by identifying costs of non-value adding activities and studying the possibility of establishing proposals for their improvement. One of the conclusions of this study is that the information resulting from the process-based costing approach helps to define and improve hidden profits. It also helps in decision making related to directing resources. The positive aspects of such a study surpass its negative ones since it is built on logically connected parts. It is also comprehensive in the points it has covered to achieve its objective. One of the other positive aspects of the study is that it does not discuss the process-based management technique in detail since this topic has been

referred to in many previous studies. Rather, the study concentrates directly on how generated information can be used to develop profits or to achieve what is called "hidden profits". However, the study overlooks the empirical aspect. If it had considered application, its results would be more enriching and illuminating.

The target cost technique is another strategic technique used for managing costing to improve profitability. Brausch (1994) demonstrates target cost technique as one of the cost management tools that aim at reducing the product cost at the design stage. Such a tool is compliant with strategic management techniques and it depends on collective efforts among different activities (such as marketing, processes, accounting, and so on). He concludes that the main objective of the target cost technique is profit improvement, not cost reduction, since cost reduction is just a means to achieve the main objective. The author shows that target cost is represented by the price paid by the customers for the product minus the profit. The resulting difference represents the product cost in the light of which production should take place. In the other part of his study, he clarifies how new products may achieve target profits. The study focuses on the main objective of this technique, which is overlooked by many other studies. However, the study does not explain how the cost reduction process at the design stage can be achieved. It also does not illustrate the supporting techniques that can be applied at this stage to achieve target reduction and consequently profit improvement.

A framework for applying the target cost technique in order to increase competitive capabilities of companies as well as increasing sales, profits and market share is suggested by Eissa (2001). According to Eissa, the framework is established in the light of the following factors: the theoretical and historical background of this technique; the need for applying this technique; the main ideas that affect application of the technique; the relationship between target costs and cost reduction and the influence of application on management accounting information system. One of the most important findings of the study is that there are interrelated links between the target cost technique and the processes of cost reduction. This is further illustrated through practising the following activities: product design and production processes, cost value analysis, and application of value engineering technique. Eissa investigates the application of the target cost technique in the leading Japanese companies and defines the differences between the proposed framework and actual application practices. The author concludes that the target cost technique is affected by strategy, policies and objectives of the company applying the technique. He states that there are differences in the application framework and the actual application steps. The study stresses the presence of such differences

does not mean that the presence of a general integrated framework is insignificant or unimportant. Eissa's research provides an integrated study that covers all theoretical aspects related to the target cost technique. In addition, the study discusses how practical application is implemented and what the problems of application are. This provides the reader with an integrated view of both the theoretical and applied dimensions of this technique.

Strategic cost analysis is a key technique in strategic management accounting. It has been developed by Three main authors, Porter (1985, 1998); Shank (1989); and Shank and Govindarajan (1992). The first author to do research in this field was Porter who in 1985 introduced a framework for strategic cost analysis. According to Porter strategic cost analysis represents a competitive strategy aimed at achieving a profitable position against the competitors. The author uses the value chain analysis technique to establish his framework. He identifies value chain as a technique that aims to divide a company into strategic activities that enable an understanding of the cost behaviour and to determine the aspects of differentiation. Porter suggests the following steps to apply the framework: the initial step is to determine value chain for the company, second to identify cost drivers of each activity, then determine value chain and cost drivers for competitor; the last step is to establish a strategy to reduce the costs through managing cost drivers.

This technique was developed further by Shank (1989); and Shank and Govindarajan (1992), when they provided a more in- depth explanation of strategic cost analysis. They suggest an integrated, comprehensive framework for strategic cost analysis in order to achieve a sustainable competitive advantage and consequently sustainable profitability. According to Shank and Govindarajan, the strategy is a set of integrated actions whose aim is to achieve competitive advantages; and hence achieve sustainable profitability. The authors focused on three techniques that are combined together.

The first technique is 'value chain analysis'. Shank and Govindarajan clarified that the value chain analysis technique consists of a group of interconnected activities, beginning with sources for obtaining raw materials from suppliers and ending with delivering products to end-users. In value chain analysis, activities are divided into primary and supporting activities. The second technique is 'strategic positioning analysis'. Shank and Govindarajan found that it is necessary to add this dimension to strategic cost analysis because the role played by cost measuring and analysis techniques differs according to the competition strategy adopted. According to this study, there are two kinds of

strategies: the cost leadership strategy, based on cost reduction and the product differentiation strategy. The third technique is 'cost drivers analysis'. The study stressed the importance of such analysis in achieving strategic cost analysis. If every company could understand the cost drivers that affect costs, this would help improve its position and gain more competitive advantages than its competitors. That is why it is important to study the influence of each driver. According to Shank and Govindarajan's study, there are two kinds of cost drivers: structural cost drivers and executional cost drivers. They concluded by proposing a comprehensive, integrated theoretical framework for strategic cost analysis. The framework consists of the mixture of three kinds of analysis, aims at achieving a competitive advantage, and complies with the strategic management approach. This study appeared to provide an interrelated framework that is built on a sound logic, which has resolved arguments and unified the vision concerning strategic cost analysis.

Many studies have focused on revenues as a main driver for improving profitability. The common objective of these studies is to change the focus of the company's resources to generate revenues instead of focusing on cost reduction. The following are examples of these studies, which focused mainly on the relationships between different revenue elements and profitability.

A key survey was conducted by Hemi in 1998. It investigated the relationship between customer satisfaction and profitability in 2600 companies operating in the period between 1972 and 1993. According to Hemi, there is a direct relationship between customer satisfaction and profitability because customer satisfaction primarily leads to revenue growth. He explains and analyses how customer satisfaction can be improved in order to increase profitability. In this regard, the study proposes adopting the approach of total quality management to improve customer satisfaction. This will lead to a better understating of the customer (values, measurement, quality, requirements) and translating this into internal measurements and rates to determine how to manage such companies. However, the study does not explain the way the approach should be adopted, or *how* the measures to be used, to achieve this objective. Further, it does not explain *how* the adoption of this approach improves customer satisfaction. What it does do, is provide an explanation and analysis of the management accountant's role in establishing customer satisfaction. One of the findings states that the management accountant can play a vital role in building or re-building customer satisfaction, through improving quality in areas that are subject to control, such as price and debtors, tracing the relationship between customer satisfaction and revenues through defining methods

of measuring customer satisfaction. Although Hemi refers to the role that the management accountant can play in improving customer satisfaction, he does not explain the *way* this can be achieved. He does not show how to improve areas subject to the management accountant's control, represented by pricing and debtors. Similarly, the study does not show which measures the management accountant can use in measuring customer satisfaction. In general, Hemi's study is distinguished by its logical sequence and the interconnection of its parts. First, it proves that there is a relationship between customer satisfaction and profitability. Second, it explains how such satisfaction can be improved in order to increase profitability. Third, it outlines the management accountant's role in improving customer satisfaction.

Woodlock, Kos, Sockel, and Falk (2001) explain how the customer relationship management approach can be used to improve revenues. The authors affirm that a company should redirect its resources towards generating revenues instead of just focusing on cost reduction. According to Woodlock et al. the customer relationship management approach aims at improving relations with customers through providing a database that covers all relevant information related to customers. The data are collected through the integration among all data sources within the company (production, marketing, sales, etc.). The study identified the role of each item of data made available by this approach in managing the relationship with the customer for example: customers' purchasing behaviour, which provides data about the date of purchase is an indicator of the services or products purchased by the customer. Such data are indicators of sales through which customer relations can be managed. In addition to this, the availability of data can help to implement any orders in time, which in turn will help improve the customer relations and increase sales. The same may be applied to all other aspects that can affect the increase of sales. One of Woodlock et al.'s findings is that companies which adopt customer relationship management approach can improve their revenues through providing better products and services than those provided by competitors. Although the study provides many advanced views in comparison to previous studies and introduces a new concept, i.e. customer relationship management, it addresses this concept from only one perspective, that of the data provided and their reflections on sales increase. However, it could be suggested that customer relationship management should be viewed more comprehensively to provide a set of customer-related indicators and examine their relationship with revenue growth.

A key study by Kennedy and King (2004) investigates the effect of the customer relationship management approach on revenue growth and hence profitability increase.

The authors distinguish between the traditional approach and the customer relationship management approach. The study shows that the traditional approach depends on the presence of all data in the possession of the salesperson and recorded in their documents, while the customer relationship management approach regards all data as an asset in a company, which can be affected through improvement of any aspect in the company. Kennedy and King identify value generated out of these assets in terms of cash flows. This value is calculated by the difference between the incoming cash flows generated by a group of customers and the outgoing flows required to retain customers. According to the study, the requirements of applying the customer relationship management are:

1. linking production with demand through an effective system of inventory management,
2. selecting a system that helps the company to achieve the strategy of marketing leadership,
3. increasing effectiveness of sales management through introducing advanced systems that minimize bottlenecks and improve the sales management quality, and
4. determining the company's ability to generate profits through adopting the technique of customer profitability analysis.

However, the study does not deal deeply enough with the requirements of the customer relationship management approach. Though the study identifies such requirements, it does not explain the techniques applied to fulfil each of these requirements. For instance, the study suggests that one of the requirements of the customer relationship management approach is linking production with demand through an effective system of inventory management. The study does not mention how such a system can be implemented. It also does not explain the techniques that should be applied to manage inventory effectively. The same applies to the impacts of these techniques on revenue growth and consequently profitability increase. It could be suggested that all these shortcomings apply to all requirements. Kennedy and King conclude that companies which aim to grow must set priorities for investment in customer relationship management, since this approach can help the companies in revenue growth and hence profitability growth. This study is perhaps more profound than earlier studies that have dealt with the customer relationship management approach. The study adds an important dimension, i.e. regarding customer relationship as part of assets and expressing the value generated out of these assets in terms of cash flows. This reflects the importance of customer focus to generate value and increase profitability.

This approach was investigated earlier by Armour and Mergy in 2003 when they examined the influence of using the customer value management approach on revenues and profitability growth. Armour and Mergy argue that it is essential to change from the customer relationship management approach to the customer value management approach, since recent studies prove that there is an increase in fulfiled revenues achieved through the customer relationship management approach, but this growth does not cover opportunity costs of time management, energy, etc. The authors categorise the dimensions of the customer value management approach into two dimensions. The first dimension is the value that a company provides to customers. The second dimension is the value that customers offer to a company. Armour and Mergy explain the foundations on which the customer value management approach is built and how it differs from other approaches. According to the study, the main such foundations are: identifying current and future needs of customers and broadening the view of these needs compared to the traditional approach, defining and re-building activity chains from the customer's point of view in order to decide which activities are necessary and preparing a model that connects customer's behaviour, profitability and value, and linking this directly with the value affecting the company. Although the study concludes with the foundations of the customer value management approach, it does not show how these foundations should be managed. The study only refers to these foundations. The authors empirically investigate the relationship between using the customer value management approach and profit growth probabilities in the leading financial service companies in Canada and Australia. The study concludes that the companies which adopt the customer value management approach achieve a significant growth in revenues.

Although the study depends on a logical sequence of graduated thinking, it begins where practical studies have ended, being based on the idea that the customer relationship management approach is not sufficient. This starting point is a good one for further research activities. Then, the study proposes an alternative approach, customer value management. It introduces the theoretical study as well as the applied study that tries to define the influence of the customer value management approach on revenues and consequently profitability. However, the study lacks sufficient explanation of how value should be managed from the point of view of both the company and the customer. Thus, their study should have been clearly divided into two parts:

1. management of the value that the company offers to the customers and its related data and techniques, and
2. management of the value that the customer offers to the company and the related data and techniques that help achieving the objective.

Significant research in this area has focused on the importance of an integrated model of customer loyalty and financial performance. Smith and Wright (2004) suggest that this should consist of three variables. The first one is product value attributes, which consist of the quality of post-sales service, product quality, the company image from the customer's view, and the trade mark. These attributes result from implementing internal processes. The second variable is product market attributes, which consist of customer loyalty and average price. The last variable in their model is financial performance, which is represented by the revenue growth rate and the returns on assets. Smith and Wright applied the model to computer sector companies through selecting a group of companies that sold more than 50% of its sales in Britain during 1994-2000. Through the application of a wide-range of statistical tests, the study concludes the more loyal customers are, the more the price increases. The study found that there is a positive, direct relationship between revenue growth and the increase of customer loyalty on one hand and the increase of the rate of returns on assets in computer companies on the other hand. This is because the increase of customer satisfaction and loyalty creates a competitive advantage for the company that consolidates determining higher prices and consequently increasing revenues and returns on assets. Another main result showed that, high-quality post-sale service deeply affects the degree of customer loyalty, which is essential for achieving positive financial earnings. The study recommends that managers should study cause and effect relationship throughout the whole activity chain.

Although this model is not a new one and does not address a new relationship, it is part of a balanced scorecard. The model studies the relationship between customer loyalty and internal processes within the company. It also studies how this affects financial results. This is the same idea on which a balanced scorecard is based. However, the particular value of this study lies in this applied aspect.

All the previous studies that focus on revenues as a driver of profit increase have a number of key issues. They share a common objective to change the focus of the company's resources to generate revenues instead of focusing on cost reduction. They also agree on revenue-generating sources, and that an increase of revenues will only be achieved through focusing on customers.

On the other hand, these studies differ in the specific techniques adopted to improve revenues. However, all focus on customers as shown above. This emphasizes that customer focus is one of the most important drivers to generate revenue.

STUDIES THAT FOCUS ON MORE THAN ONE DRIVER FOR PROFITABILITY IMPROVEMENT AND MANAGEMENT

A key study in this field was conducted by Helmrich (1989) who was concerned with establishing a framework for managing profitability. This framework focused on the components of 'return of assets' formula as a key profitability measure (cost, assets, and revenue) in managing profitability. The development of such a framework is based on three main steps. Firstly, the key component (cost or assets or revenue) that has the largest potential for improving profitability should be determined. Next the most effective approach to improve the performance of the key component should be developed. Finally, the effect of applying this approach on profitability should be measured. Although this study contributes in shifting from cost or revenue management to a broader strategic view represented in profitability management (that focuses on the three key components of profitability) it only focuses on managing the most important component, which may be cost, assets or revenue. This represents one important step for strategically managing profitability, but it does not adequately describe all the steps required.

An alternative model for profitability was developed by Stapleton, Hanna, Yagla, Johnson, and Markussen in 2002. This is based on using the return on net wealth measure. The return on net wealth represents a function in three factors that can be controlled by the management. These factors are: net profit = (sales – costs), assets turnover = (sales / total assets), and leverage = (net wealth / total assets). The authors give two main equations for their model which are:

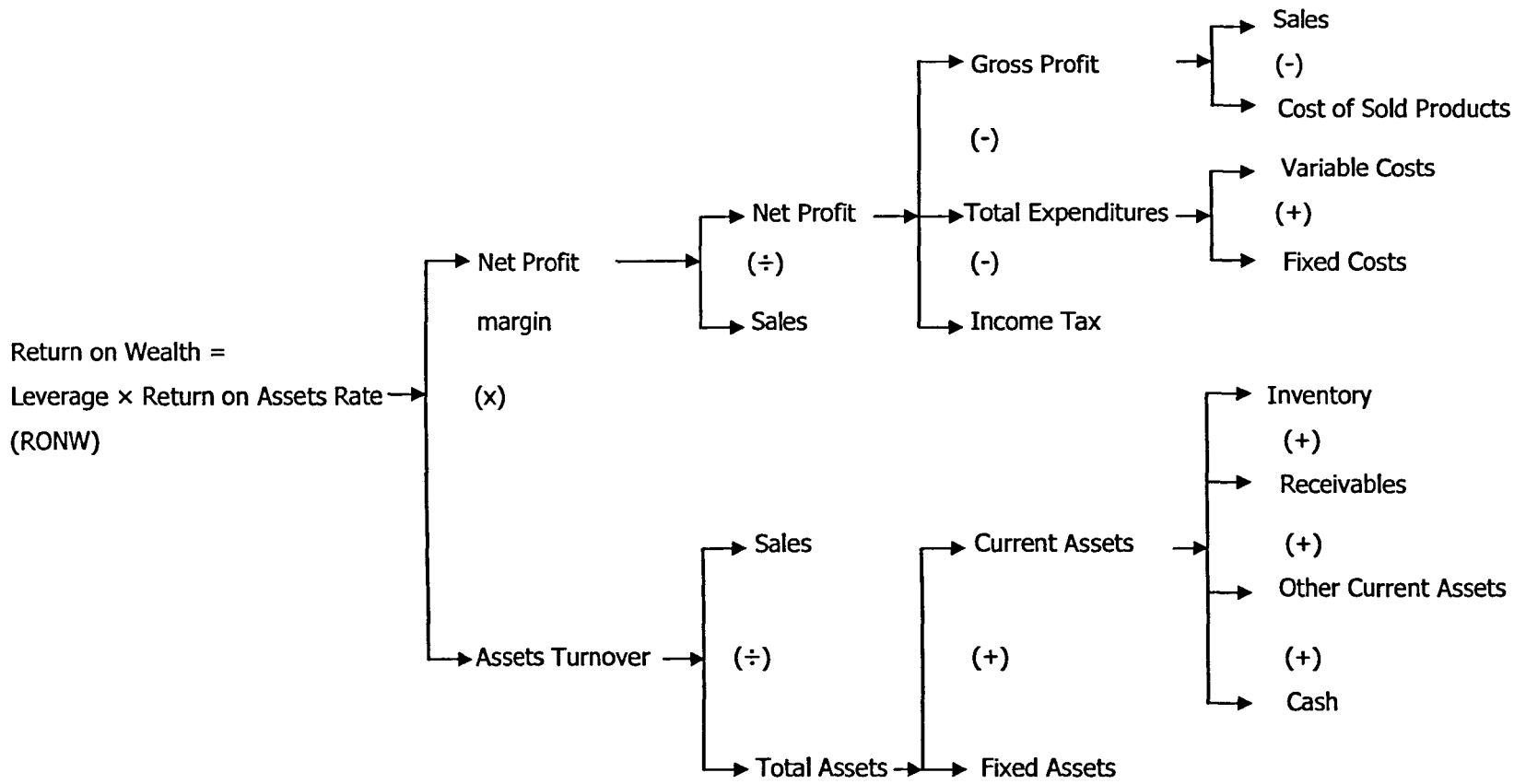
Return on assets rate = contribution margin × asset turnover rate

Return on wealth rate = Return on Assets rate × equity

= contribution margin × assets turnover rate × equity

Stapleton et. al. summarize the model in figure (3.1):

Figure 3.1 Strategic Profit Model using Return on Net Wealth



Source: adapted from Stapleton et al. (2002)

After analysing the previous model, the authors conclude that return on wealth can be improved through: increasing sales, reducing cost of sold goods, reducing variable cost, reducing fixed cost, reducing taxes, reducing inventory, reducing receivables, reducing other current assets, reducing fixed assets, and increasing leverage.

Stapleton et al. (2002) affirm that it is possible to improve "return on wealth" as a profitability measure by focusing on the management of three groups: sales, expenditures and assets. The study was applied to six leading shoe making companies in Canada that adopt advanced techniques of production and customer relationship management. The objective of the applied study was to study the influence of changes of the model's variables on return on wealth in each company. The applied part ends with the conclusion that there is a relationship between the variables of the model and changes in the return on wealth (RONW) rate. The study broadens the vision of profit from a strategic perspective, and it highlights that viewing profit from a strategic perspective requires focusing on three aspects: expenditures, sales and assets. However, it does not explain how to improve these aspects in order to improve return on wealth. It does not propose any techniques that can be used for the improvement of each aspect and their effect on the return on wealth. The study misses a large proportion of its value, since it is confined to determining which aspects are improved. Perhaps the real contribution of the study lies in its applied aspect.

In the same year as Stapleton et al. (2002) published their article, Christopher (2002a) suggested a profit management model. According to Christopher (2002a) the main reasons for changing from cost management to profit management is that cost management focuses only on inputs (operating processes). This does not comply with the strategic management approach, which requires focusing on both inputs and outputs (the market). Christopher clarifies that focusing on outputs requires taking three variables into account. These are price, volume and mixture. Price and volume can be affected by the market and the creation of customer relations. The third variable, mixture, can be affected by four factors:

- firstly, measurements of contribution margin of the product;
- secondly, working to improve reduced contribution margin;
- thirdly, working to improve and increase sales, and
- finally, developing the product to achieve a higher contribution. However, focusing on inputs requires operation management, continuous improvement of operations, and strategic cost management.

According to Christopher (2002b), a proposed model for profit management consists of the following five variables: fixed costs, sales revenues, contribution margin rate, break-even (fixed assets × contribution margin rate), and operational income (sales revenues × contribution margin rate). It could be proposed that the availability of data on these variables will help create the leverages required for improvement. These three leverages are: increasing contribution margin, increasing sales revenues, and reducing fixed costs. Christopher concludes that the proposed framework is beneficial for decision-makers at all levels, from the defining of opportunities to the level of profit management and improvement. The study stresses the importance of changing from cost management to profit management, and from focusing on inputs to focusing on both inputs and outputs. This complies with the requirements of strategic management. In addition, the study has made a clear effort to define the profit leverages and drivers that are required to manage such profits. However, it focuses only on two main drivers: revenues and costs.

The main drivers of profitability to facilitate its management are described in a key study by Fontaine (2004). Real profitability management requires cost reduction and sales increase at the same time, rather than managing sales growth and cost reduction separately. He argues that profit management is a clear process, not a random one. It is a sum of a number of actions that apply to profit drivers and an understanding of how profit drivers influence profits. Identifying profit drivers is a real and essential challenge in profit management. This is because when profit is managed appropriately in the presence in constraints, decision-makers can meet the goals of profitability set by investors. Fontaine explains that effective profit management should provide the answer to the following questions:

1. What is the real net profit planned for the sales mixture?
2. How can the available production capacity be utilized to maximize net profit?
3. What is the best strategy that can be used to maximize each product's contribution to profit?
4. How can strategic planning achieve the best compatibility between the company and its markets? and
5. How can efforts of different sectors in the company (sales, marketing, and production) be directed to manage profits?

Fontaine identifies six main drivers for profit management:

1. Capacity limits (the capacity of the company to produce and sell each group product),

2. Average selling price,
3. Average product cost of materials,
4. Operating expenditure (all costs which occur independently of production activities),
5. Work in-process (changes or deviation in inventory will affect profit estimation),
6. Other revenues that are not directly related to product sales such as sales of surplus or reserve parts or scrap.

The study stresses the importance of interaction between the two faces of profit, namely revenues and costs, for profit management, and dealing with them as one unit, without separating them. This affirms the importance of establishing a comprehensive and integrated model whose components interact to achieve the ultimate goal. In addition, the study states clearly that profit management will not be achieved unless its drivers are defined and managed accurately. However, it does not provide a clear definition of profit management that enables the reader to understand the components and objectives of profit management. The study does not refer to how profit drivers and techniques can be managed to achieve target objective. In addition, the study depends on analysing the factors that influence two main drivers only (revenues and costs). The study has overlooked the third dimension i.e. that of assets, which represents an important element from the strategic management accounting perspective.

General Assessment of Previous Studies and the Identification of Key Profitability Drivers

Most of the studies have focused on one driver for improving profitability, either revenues or costs. Some others have focused on two drivers: revenues and costs. These studies have been limited to addressing the concept of 'profit', which has not been extended to 'profitability' as a more comprehensive concept that complies with strategic management. The previous two trends have been confined to the objective of improving revenues through maximization and/or improving costs through reduction. This objective has not been extended to cover management of drivers as a more comprehensive concept that includes a set of strategic management accounting techniques, which then could then be applied to manage such drivers simultaneously to meet the requirements of strategic management.

Few studies have extended to use the profitability concept by focusing on the key profitability elements that are determined by analysing the components of key profitability measures, such as return on assets. These key elements of profitability are

cost, assets, and revenue. However, the studies have not explained how the main profitability drivers can be managed together in a coherent model or framework using strategic management accounting techniques. Therefore, this research extends the profitability concept and focuses mainly on managing the profitability of shareholders. This means that this study centres on creating value for shareholders. To achieve this, this research explores cost, assets, and revenue as the key drivers in managing profitability to fulfil the requirements of strategic management.

CONCLUSION

There are many points of view on how to improve or manage profit and/or profitability. One view focuses on the importance of the dimension of cost alone to improve profit. Another stresses that the company should improve revenues instead of focusing on costs. A third, perhaps more developed view, emphasizes that a company should focus on both sides of profit – revenues and costs. Many advocates of the last view indicate that another dimension must be added in order to fulfil the requirements of strategic management, i.e. the dimension of assets. This study explores cost, assets, and revenue as the potential main profitability drivers. Using the information from the previous and current chapters, the research problem and objectives are discussed in the next chapter.

CHAPTER FOUR: RESEARCH PROBLEM AND METHODOLOGY

SECTION ONE. RESEARCH PROBLEM

Background and research problem

As mentioned in chapter two, strategic management focuses on the following requirements:

1. Determining priorities and relative importance by setting long-term objectives, annual objectives, and policies;
2. Preparing the internal environment of the company by adopting and operating advanced technical and technological methods in design, planning, and production; and adopting and activating development approaches in management accounting, such as activity analysis, value analysis, time analysis, and total quality;
3. Focusing on the market and the external environment, and studying and analysing ways of benefiting from competition, represented in new competitors and existing competitors in the industry and market, and the negotiation powers of customers and suppliers, in addition to resisting threats (Awad, 2004); and
4. Focusing on the effectiveness concept, which is one of the most important attributes of strategic management. This concept means "doing the right thing" (Dess and Lumpkin, 2003). Loeb (1994) argues that in order to focus on effectiveness, the orientation is towards the future, the vision, the mission, and the strategic direction.

In spite of the emergence of the strategic management approach, and the development of strategic management accounting to fulfil the requirements of strategic management, the traditional profitability system is still suffering from drawbacks. These make it inappropriate to meet the requirements of strategic management. Such drawbacks can be illustrated as follows.

Enhancing profitability in traditional management accounting is achieved by focusing on a single dimension, which is that of cost, whether related to cost follow-up, cost reduction, or otherwise (Helmrich, 1989). This is not appropriate to the strategic management approach for a range of reasons.

Firstly, strategic management considers that focusing on the dimension of cost alone is misleading and incorrect (Brands, 1999). Even though cost is an important part of the financial picture, it does not represent the whole (Brands, 1999). One of the main characteristics of strategic management is the change of focus towards effectiveness, which means doing the right things that maximize the results of total activities rather than efficiency alone, which means doing things right and fast. Under the traditional profit system, the focus is on reducing costs in the right way by using one of the management accounting techniques (i.e. focus on efficiency). It does not focus on "doing the right thing", which maximizes the activity results, probably by focusing on revenues or assets, which has a greater impact on profitability (i.e. it does not focus on effectiveness) (Helmrich, 1989). The focus, therefore, is on the dimension of cost alone, which is not compatible with the requirements of strategic management with respect to a focus on effectiveness (Helmrich, 1989). This is supported by Hosking (1993), who concludes that most companies concentrate 90% of profit improvement efforts on increasing efficiency, even though about 90% of the company's added values are generated by increasing effectiveness. This emphasizes the importance of focusing on effectiveness concept.

Secondly, strategic management and strategic management accounting require changing from an inside-out approach to an outside-in approach by meeting specific customer needs and creating value for customers (McNair, Polutnik, and Silvi, 2001a). This affirms that profit improvement cannot be achieved by reducing costs alone, but rather by redirecting resources to the places that lead to improved profitability and customer satisfaction (Roslende, Hart, and Ghosh, 1998).

Thirdly, in strategic management accounting, profitability is viewed as the result of a number of factors, such as the company's competitive position in the market and the competitive pattern across time, instead of the traditional view of profitability which focuses on one dimension to improve profitability, for example cost (Abuo-AlFutouh, 2004).

Fourthly, the traditional profit system is confined to answering the question "what happened?" (Louis and Elain, 2001). This does not correspond with the strategic management approach and strategic management accounting, which require the answer to different questions, such as where companies encounter their competitors to achieve a competitive advantage. This then enables the answer to where firms make profits as a result of achieving competitive advantage. This represents the critical strategic element

that offers a substantial opportunity for the company to achieve continuous profitability in comparison with its competitors (Felleeg, 2001). The answers to the above questions can only be given through clearly determining profit ability drivers that pose a real challenge under strategic management accounting as well as understanding how profitability drivers affect profits.

Therefore, it can be concluded that the traditional profitability system is inappropriate to meet the requirements of strategic management and strategic management accounting which represent the key problem construct at the concern of the current research.

Developing profitability system that meets the requirements of strategic management requires changing the focus from managing cost to a broader and more inclusive concept which is, managing profitability. This can be achieved by dealing with profitability as the result of a number of key factors or drivers and understanding how each driver affects profitability. In addition, it is necessary to understand how each driver should be strategically managed using a set of appropriate strategic management accounting techniques. However, when reviewing the literature concerned with profitability management in the previous chapter, there appears to be a lack of attention paid by researchers to the integration between the most important drivers that affect profitability (cost, assets, and revenue). They also illustrated that there has been a lack of attention given by researchers to the management of each driver using strategic management accounting techniques.

Aim, objectives and research questions

Due to the inappropriateness of the profitability system to fulfil the requirements of strategic management and the lack of literature that concerns a comprehensive strategic view in managing profitability, which should include key profitability drivers in a coherent construct, the main aim of this study is to develop a comprehensive profitability model to fulfil the requirements of strategic management.

Therefore, the primary research question addressed in this study is:

How can an accounting model for strategic profitability management be developed?

Such a comprehensive model may be developed by integrating cost, assets, and revenue proposed models in a coherent model. This first requires developing separate models for

cost, assets, and revenue and evaluating the perceptions of managers related to the influence of each model on profitability. In addition, it necessitates the investigation the influence of the integration between the three models on profitability from managers' views. Therefore, to answer the above research question a number of subsidiary questions must be resolved:

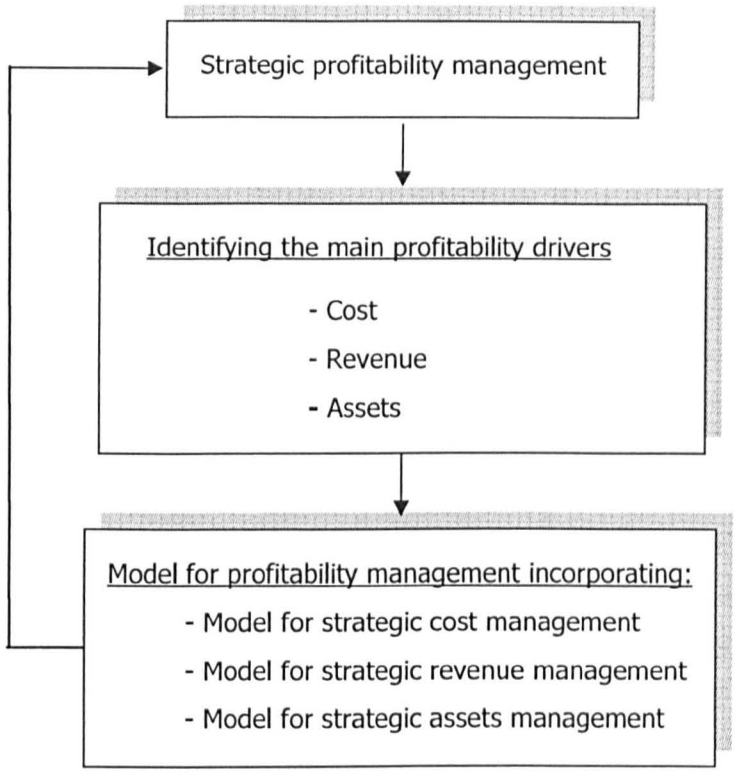
1. To what extent can the proposed cost model predicts the level of profitability?
2. To what extent can the proposed assets model predicts the level of profitability?
3. To what extent can the proposed revenue model predicts the level of profitability?
4. Does the integration between cost, assets, and revenue models predict the level of profitability more effectively than any other combinations?

In order to achieve the aim and resolve research questions a number of objectives were set:

1. To investigate the extent to which the proposed cost model predicts the level of profitability;
2. To examine the extent to which the proposed assets model predicts the level of profitability;
3. To evaluate the extent to which the proposed revenue model predicts the level of profitability; and
4. To asses if integration between cost, assets and revenue models predicts the level of profitability more effectively than any other combinations.

The initial elements of the proposed profitability model can be summarized in the following figure:

Figure 4.1: A Proposed Accounting Model for Strategic Profitability Management



The methodology used in building these models is discussed and justified in the next section.

SECTION TWO. RESEARCH METHODOLOGY

Introduction

Each research project is grounded on a set of epistemological and methodological principles which influence and guide the research. Hooks (2002) identifies the methodology as the choices of principles that support any research in accepting or rejecting knowledge. This is further clarified by Silverman (2006), who explains that methodology refers to how the academic researcher will go about studying any phenomenon. Moreover he determines the main four elements of methodology: firstly, choosing specific methods; secondly, identifying the assumptions about reality and the role of science and the researcher; thirdly, using a number of strategies to answer the research questions; finally, determining all the procedures that will be followed after methods have been chosen.

Therefore, the principal purpose of this section is to justify the empirical management accounting research methodology employed in the study. In order to achieve this, the following section is structured as follows. Firstly, it illustrates briefly how and why empirical management accounting research emerged. Secondly, it argues the characteristics of management accounting research tradition according to the essential criteria determined by the key authors in the area. Next, it identifies, evaluates and explains the characteristics of the current study and related approaches. Finally, it identifies how the research processes selected are used to address the research aim and objectives.

A brief overview of the development of methodology in empirical management accounting research

According to Johnson and Kaplan (1991), management accounting in industry emerged in America between 1800 and 1920 from the manufacturing accounting practices used by managers seeking information about opportunities and new procedures to meet their need for information about efficiency and profitability from internal activity.

Scapens (2006) states that the focus on empirical management accounting research in the U.K began in the early 1980s, when management accounting researchers identified the gap between theory and practice, and the importance of closing this gap. In addition, it was recognized as important to describe industry practice. Since that time, academic researchers in the U.K. began to focus on empirical research in order to describe and explain management accounting practices. Such researchers started to form an objective

view of society regarding individual behaviour and using empirical observation, in addition to a number of researchers adopting a positivist methodology (Ryan, Scapens, and Theobald, 2002).

A positivist approach to social science assumes that things can be investigated and analysed as hard facts, and the relationship between them can be viewed as scientific laws. The main assumption of positivism is that objective reality exists, independent of human behaviour and therefore is not a creation of the human mind (Crossan, 2003). A positivist methodology can be used in different situations because it can be fast and economical, as statistics can be aggregated from a large sample.

A positivist methodology is also appropriate for work on policy decisions (Amaratunga, Baldry, Sarshar, and Newton, 2002). In addition, it may be useful for predicting general trends (Ryan et al., 2002). However, there was a growing acceptance that the positivist approach was inappropriate all research and in particular that related to social and human science (Amaratunga et al., 2002; Crossan, 2003). Amaratunga et al. (2002), state that positivist research is not effective in understanding the process or the importance that people attach to action. In addition, it is not very useful in generating theories because it focuses on what is or what has been recently, so it is difficult for policy makers to anticipate what changes and actions should take place in the future. Crossan (2003) adds that positivist management accounting research does not provide a means to interpret human beings and their behaviours in an in-depth way. He illustrates that humans are not objects and are subject to many influences on behaviour, feelings, preferences, perceptions, and attitudes that positivists would reject as irrelevant. Crossan further argues that such a positivistic approach produces useful but limited data, which leads to superficial investigation of the phenomenon.

This is further explained by Hoque (2006), who illustrates that such researchers do not have enough information about actual accounting practices, how they interact with other organizational effectiveness and adaptability issues. He adds that this approach is inappropriate for specific types of social research problems, where the researcher does not have enough confidence to adopt the view of the world and a related set of ontological assumptions to enable the scientific approach to be used with validity. Smith (2003) affirms that the implementation of innovations and related advanced accounting techniques may be unsuitable to a positivist approach because people are involved and multiple variables are uncontrolled by the researchers, including management's own motivation and agenda. So, he confirms that the positivist approach is of questionable

validity in complex people-centered situations. Similarly, Ryan et al. (2002) state that such research will not be helpful in explaining and interpreting individual behaviour nor will it be useful to guide individual managers or companies in their own economic behaviour.

In 1991 Johnson and Kaplan illustrated that as a result of rapid changes in technology, globalization, dramatic increase in competition that the management accounting approach developed in America had become insufficient to fulfil the needs of mangers worldwide. This is further advocated by Scapens (2006) who discusses that from the late 1980s to date many theories, methodologies and alternatives approaches emerged to fulfil both the requirements of accounting as one of the social sciences and the requirements of management accounting practices. This lead to a transformation from theory dominated by economics to a domain influenced by organizational and social theory, and hence, the emergence of interpretive and critical management accounting research approaches. Such approaches are concerned with the understanding of various organizational and historical contingences, and focus on understanding the social nature of management accounting practices rather than comparing them with the traditional standards of economic theory. Critical and interpretive research focuses on case studies, interviews and questionnaire surveys in order to study management accounting practices.

To summarize, it can be seen from the previous discussion that management accounting has adopted a broad range of methodologies and theoretical approaches including the positivist, interpretive and critical management accounting research. Each methodological approach has its own set of underlying principles and assumptions, so it is essential to review the critically distinct perspectives of these to determine which is appropriate for the current study.

Chua (1986) and Laughlin (1995) are among the most important authors in the field of methodology applied to accounting research. They focused on determining the key criteria or assumptions for distinguishing accounting research.

Chua (1986) extended the study done by Morgan and Smircich (1980), who were key authors in suggesting that all social science research is based on a set of assumptions regarding ontology, human nature and epistemology. Chua explained how these assumptions can be used specifically in accounting research. She used the three basic assumptions to distinguish accounting research as follows:

1. Beliefs about knowledge, which is subdivided into two elements.
    - Epistemological: Chua explains it as the process of determination of acceptable truth by specifying the criteria and process of evaluating a 'truth claim'. Healy and Perry (2000) suggested that epistemological knowledge is the relationship between reality and the researcher in order to find the truth. It can be seen that epistemological knowledge indicates the relationship between researchers and those being researched.
    - Methodological: focuses on answering the question of how researchers can discover what they believe to be known (Crossan, 2003). This is recognized by choosing the appropriate research methods for collecting evidence and investigating reality (Chua 1986; and Healy and Perry, 2000).

2. Beliefs about physical and social reality. The principal purpose of this criterion is to illustrate the degree of objectivity in research. It is concerned with ontology, which refers to the nature of reality. On one hand, ontology can be seen as objective, singular and separate from the researcher. On the other hand it can be seen as subjective and multiple depending on the viewpoint of the participants in the study (Crossan 2003; and Collis and Hussey, 2003). It is also concerned with human purpose and social relations, in addition to human intention and rationality which represents an important element, since all knowledge is intended to be purposeful and is affected by human needs and objectives. Such a criterion is further concerned with the relationship between people on one side, and between people and society on the other side.

3. The third criterion, according to Chua, (1986), is the relationship between theory and the empirical world. It clarifies the role of knowledge in the world of practice and how knowledge may be used to provide the decision maker with appropriate information?

Applying Chua's assumptions to distinguish approaches to accounting research

Characteristics of mainstream (positivist) accounting research

According to Chua (1986) the dominant assumptions associated with mainstream accounting research can be described as follows.

1. Knowledge: in this kind of research theory is independent from observation which depends on accounting practices and which may be used to confirm or disprove a

theory. Such research uses the Hypo-deductive approach to scientific explanation, and focuses on quantitative methods of data collection analysis and in order to achieve generalization.

2. Physical and social reality: in positivist research, empirical reality is objective and external to researchers, and objective reality exists beyond the human mind (Weber, 2004). This means that the researchers are regarded as passive and not seen as the makers of social reality. Such research assumes that societies and organizations are essentially constant, and that "dysfunctional" conflict may be managed and controlled by designing a convenient accounting control system.
3. Relationship between theory and practice: mainstream management accounting research is concerned with *using the most effective means to provide decision maker with accurate information* without any personal judgment from accountants.

Characteristics of interpretive accounting research

According to Chua (1986) the dominant assumptions associated with interpretive accounting research can be described as follows.

1. Knowledge: Interpretive researchers use theory to interpret and explain human intention, where they seek to make sense of human actions by fitting them into a purposeful set of individual aims and social structure of meanings. Their research is based on evaluation via logical consistence, subjective, interpretation, and agreement with participants. In interpretation, management accounting researchers use case studies, participant observations and actors studied to collect data and achieve their research objectives.
2. Physical and social reality: Such research assumes that reality is social and subjectively created, and objectivity is produced through individuals' interaction. In interpretive research, all actions have meanings that are generated from social and historical practices. They assume that human beings are continuously ordering and classifying.
3. Relationship between theory and practice: Interpretive research does not seek to control empirical phenomena. Instead, the purpose of interpretive theory is to *explain* and *understand* the meanings of human actions.

Characteristics of the critical accounting research

According to Chua (1986) the dominant assumptions associated with critical accounting research can be described as follows.

1. Knowledge: the judging of theories in critical accounting research is always temporary and context directed. Critical researchers use historical ethnographic research and case studies to collect data.
2. Physical and social reality: in such research, empirical reality on one hand is characterized by objective and real relations, where objectivity can only be understood and explained through studying historical development and the changes within a totality of relations. On the other hand, it is transformed and reproduced through subjective interpretation. This means that the role of human beings is prevented from full emergence in such research. This kind of research assumes that human intention and rationality are accepted, but have to be critically analysed.
3. Relationship between theory and practices: in critical management accounting research theory has a critical importance, especially the identification and transformation of dominant ideological practices.

Other dimensions to distinguish methodologies of accounting research were suggested by (Laughlin, 1995). This study identified a framework consisting of three dimensions for classifying and distinguishing between methodologies of empirical accounting research. These dimensions are theory, methodology and change. He also divided every dimension into three levels: high, medium and low. Theory is the first dimension and is concerned with the level of theorization in research. According to Laughlin, the two extreme levels of theory can be illustrated as follows:

- High level of theory means that the research is structured with a high level of generality which has been well generated from previous studies; and
- Low level means that generalizations are difficult or impossible and it is inconvenient to derive insights from previous studies.

Methodology is the second dimension and is focused on the level of theorization in the research process itself and how researchers should see the subject of research. According to Laughlin, the two extreme levels of methodology can be illustrated as follows:

- High level of methodology means that the research process is highly theorized and researchers have no essential role rather than the application of a pre-suggested set of management accounting techniques; and

- Low level indicates that researchers have a substantive role and are involved in the research process. They are also encouraged to use their skills to set theoretical rules and procedures.

Change is the third dimension suggested by Laughlin and refers to the view of the researcher concerning changing or maintaining the current situation that is being investigated. According to Laughlin, the two extreme levels of change can be illustrated as follows:

- High level means that researchers in this level believe that society needs to be changed; and
- Low level means that researchers in this level are convinced with the current situation.

Laughlin used his suggested framework to classify management accounting research into three types. (1) high/high/low (2) medium/medium/medium (3) low/low/low. He summarized the features of each research using his suggested framework table 4.1:

Table 4.1 Management Accounting Research

	High/high low[a]	Medium/medium medium	Low/low low[a]
Theory characteristics			
Ontological belief	Generalisable World waiting to be discovered	"Skeletal" generalizations possible	Generalisations may not be there to be discovered
Role of theory	Definable theory with hypotheses to test	"Skeletal" theory with some broad understanding of relationship	ill-defined theory-no prior hypotheses
Methodology characteristics			
Role of observer and human nature belief	Observer independent and irrelevant	Observer important and always part of the process of discovery	Observer important and always part of the process of discovery
Nature of method	Structured, quantitative method	Definable approach but subject to refinement in actual situations, invariably qualitative	Unstructured, ill-defined, qualitative approach
Data sought	Cross-sectional data used usually at one point in time and selectively gathered tied to hypotheses	Longitudinal, case-study based. Heavily descriptive but also analytical	Longitudinal, case-study based. Heavily descriptive
Conclusions derived	Tight conclusions about findings	Reasonably conclusive tied to "skeletal" theory and empirical richness	Ill-defined and inconclusive conclusions but empirically rich in detail
Validity criteria	Statistical inference	Meanings: Researchers + researched	Meanings: Researched
Change characteristics			
	Low emphasis on changing status quo	Medium emphasis open to radical change and maintenance of status quo	Low emphasis on changing status quo

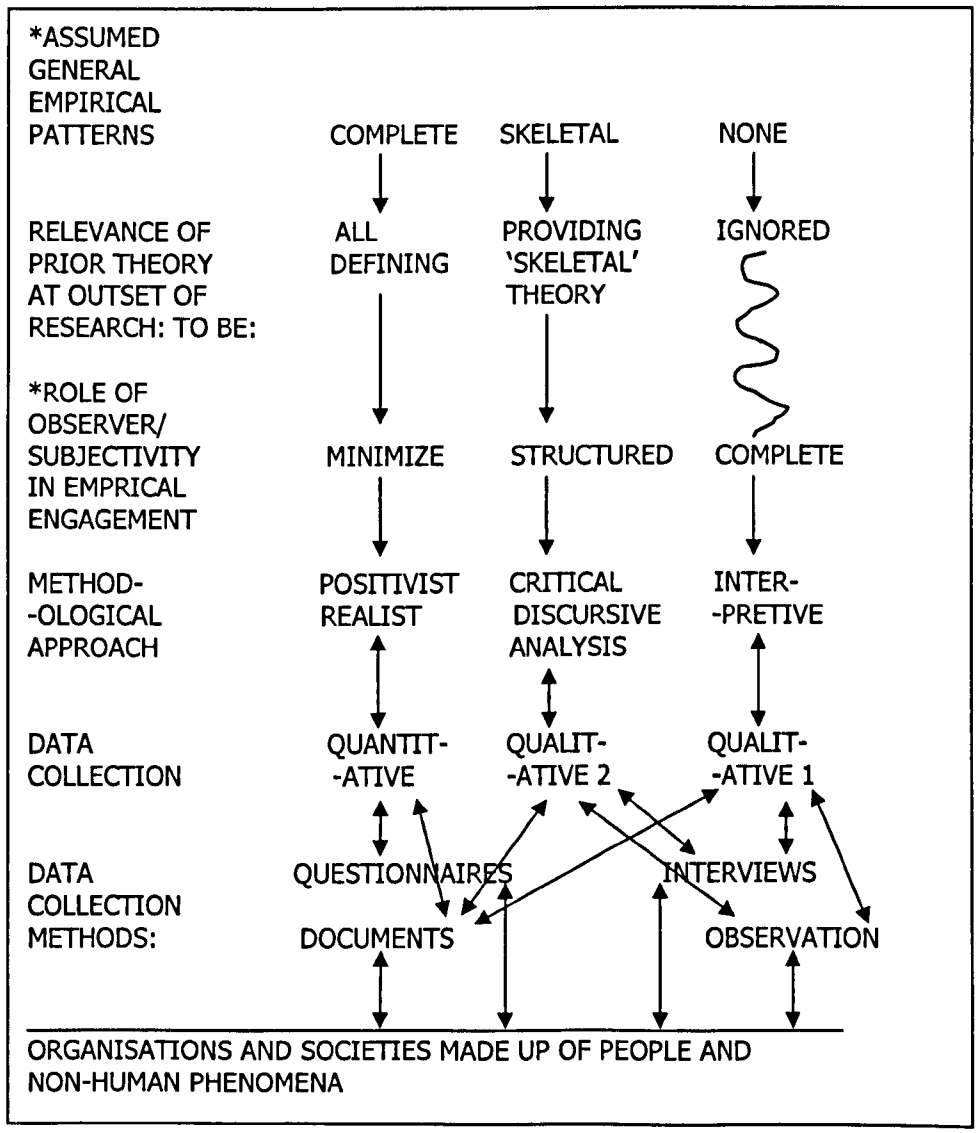
[a]Theory, methodology and change ordering

Source: Laughlin (1995, p.80)

It could be argued that Chua (1986) and Laughlin (1995) suggested the same classification of accounting research that have the same characteristics using different dimensions. It can be seen that the mainstream (positivist) management accounting research is classified as high/high/low, interpretive management accounting research is classified as low/low/low and critical management accounting research classified as medium/medium/medium.

In 2004, Laughlin develops his framework by adding the relationships between theory and methodology on one hand, and between methodology and method on the other hand using arrows. He summarizes these relationships in figure 4.2:

Figure 4.2 Alternative Research Approach Assumptions



Source: Laughlin (2004, p.272)

Where, the upper two levels are the theory dimension and the next four levels are the methodological dimension.

After discussing the development of empirical management accounting research methodologies, and summarizing of the essential features of each type, the current research can be classified as positivist research and according to Laughlin (1995) as a high/ high/ low research project. This research therefore uses a positivist epistemology and methodology view to define profitability drivers and create a new profitability model by reviewing literatures in this area using a hypothetical-deductive approach. In addition, quantitative methods of data collection and analysis are used to empirically examine the hypotheses generated. Moreover, the role of researcher will be passive because the researcher will collect the data and examine relationships using statistical techniques without any personal judgment. This will be discussed in more detail after explanation of the deductive and quantitative approaches used in positivist research.

Positivist accounting research and associated approaches

The deductive approach

Positivist research is associated with the deductive approach (Smith, 2003). According to Casebeer and Jverhoef (1997), deductive research starts with existing theory and tests it in order to obtain evidence regarding pre-determined hypotheses. This is further illustrated by the definition of Hyde (2000), who identifies deductive research as a theory testing process that consists of two steps. (1) Set up theory or generalization. (2) Examine theory to see whether the theory applies to a special case.

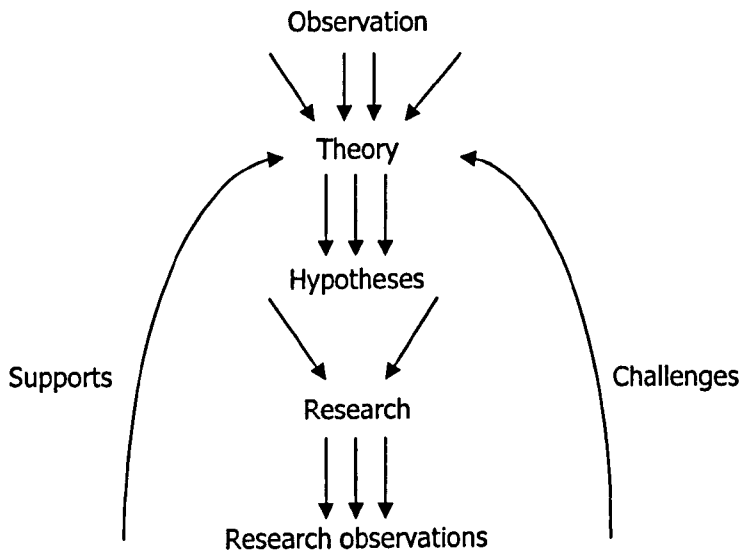
The purposes of the deductive process are illustrated in more depth in the study conducted by Sekaran, (2003), who explain that hypotheses testing and interpreting the results may lead to further development of theory and hypothesis, and further tests and gathering of facts as the basis for subsequent hypothesis testing. It is clear that the last definition focuses on the aim of the deductive process and emphasizes the role of the feedback process in the hypotheses tested.

According to Smith (2003), deductive research depends on theory as the basis to produce specific prediction and it will depend on the selection of the main hypotheses tests employed. It can be seen that this definition focuses on the predictive role in the deductive research in addition to clarifying that the accuracy of this prediction will depend on the hypotheses tests that used, which represents the key point in the success of the deductive research. This is further advocated by Ling (2008), who affirms that

such research is called deductive because it includes deducting or predicting.

It is clear from the above definitions that deductive research is a process that it can be divided into steps. Hayes (2000) summarizes these steps in the following figure:

Figure 4.3 Steps of Deductive Research



Source: Hayes (2000, p.4)

In figure 4.3, Hayes shows that the deductive approach involves testing hypotheses which are used in predicting whether the result will happen if a specific theory is confirmed, in addition to making deductions from the results of these tests. Formulation of theory is the main and first step in the deductive research. Hayes defines theory as "an explanation for a set of observations, which have usually been obtained from other research, but might also have been picked up informally. Theory is used to make a number of predictions about what will or will not happen in a given situation" (p.4).

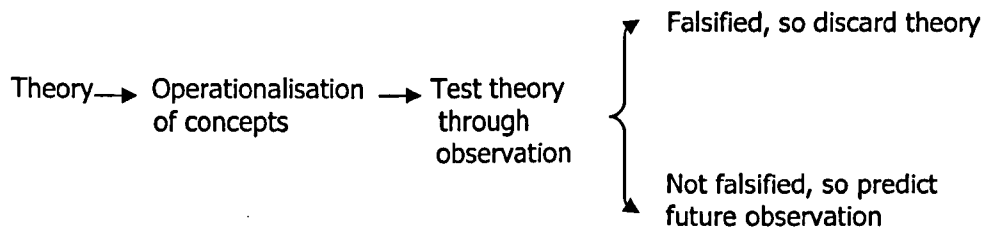
Watts and Zimmerman (1990) illustrated that the positive theories can be explained by using the "if ...then..." propositions which are predictive and explanatory. In accounting research, the aim of theory is to explain and predict accounting practice. The second important step in deductive research is choosing the research process which will be used in testing hypotheses. The following are examples of some of the possible research process that might be employed:

1. Experiment: the aim of this process is to study causal relationships and investigate whether the changes in one variable lead to changes in another variable. It focuses on answering "how" and "why" questions (Hakim, 2000).

2. Survey focuses on answering "who, what, where, how much and how many" questions and is suitable for collecting a large amount of data (Pinsonneault and Kraemer, 1993).
3. Case study is concerned with understanding and analysing the context of a specific phenomenon using various methods of data collection (Robson, 2002).

The final step in deductive research after testing hypotheses is then to introduce some more observation. If the result is successful in predicting theory, it will be used as confirmation and support for the theory. If not, it will represent a challenging of the theory and suggest other explanations and analysis are required. Such a step is considered feedback step, which is further illustrated clearly by Smith (2003), who summarizes the model for the deductive process in figure 4.4:

Figure 4.4 Deductive Process



Source: Smith (2003, p.9)

The current research uses the deductive approach starting with the formulation of theory by creating a profitability model. This is done by reviewing literatures related to profitability drivers and strategic management accounting techniques and also leads to the development of hypotheses related to the proposed profitability model. The second step in this research is to determine the research process which is used to test the derived hypotheses. In this step, survey research is employed to collect a significant amount of data (the aspects associated with this step are justified in the research methods chapter). The final deductive step used in the current study is the evaluation of managers' perceptions related to the influence of the proposed profitability model on profitability to test the hypotheses.

Quantitative approach

Positivist research emphasises quantitative observations (Amaratunga et al., 2002). These are also associated with the deductive approach (Casebeer and Jverhoef, 1997). According to Casebeer and Jverhoef, quantitative research is the numerical analysis of observations that reflects the phenomena in order to describe and explain this

phenomenon. Amaratunga et al. (2002) added that the quantitative approach seeks to distinguish features of elements and focuses on measuring how much and how often. It can be seen that Amaratunga et.al's definition adds another dimension, which is the role of quantitative research in distinguishing between elements.

Chen and Hirschheim (2004) focused on an additional role of quantitative research, which is the explanation of the relationship among factors in the phenomena. These are further explained by Graffikin (2006), who illustrates that the most important step in quantitative research is the identification of variables and determining the causal relationship between them. He also notes that the output of such research can then be generalized to similar situations. Graffikin refers to one of the most important elements in quantitative research, and hence in positivist research, which is the independence of the researcher, where the researcher is external to the data and there is little that can be done to change the data. This leads to maintaining objectivity.

Punch (1998) stated that the final purpose of quantitative research is to discover and understand how and why different variables are related. According to Amaratunga et al. (2002) distinguishing among elements and the explanation of the relationship can be achieved by statistical analysis. Using statistical analysis leads to reducing error and bias, and hence accomplishes objectivity (Saunders, Lewis, and Thornhill, 2009).

Hyde (2000) illustrated how such an approach achieves its role. It is achieved by determining a large and representative sample from the population and measuring the features of that sample in order to accomplish generalization regarding the total population. He illustrates that such generalization is statistical, generated by determining a sample which is used to estimate properties of the population associated with a degree of accuracy.

The use of the quantitative approach in positivist research therefore has several strengths. Graffikin (2006) describes five of them: the researcher is objective in observation; the determination of validity and reliability is more objective than in the qualitative approach; it is accurate and effective in measuring descriptive fields; it focuses on developing hypothesis for subsequent investigation; it is useful for explaining causal and essential laws. Quantitative research can be summarized as the following:

1. It focuses on estimating numerical elements;
2. It focuses on verification and confirmation through using statistical analysis of a

generalizable sample which reflects the whole population; and

3. It focuses on the causal relationship between variables; (Casebeer and Jverhoef, 1997).
4. It focuses on the facts and causes of phenomena (Graffikin, 2006)
5. It generates generalizable outputs (Amaratunga et al., 2002).

The methodological characteristics of the current research as positivist management accounting research

The main aim of this study is to establish an accounting model to manage profitability in order to fulfil the requirements of strategic management accounting. Therefore, the primary research question is "How this model can be developed?".

In order to answer this question, the deductive approach can be used to investigate how such a profitability model can be created. This can be achieved firstly, by reviewing the previous studies in this field and determining the drivers that have the most influence on profitability; and secondly, investigating how they can be managed. This will be achieved by reviewing the literatures to determine which strategic management accounting techniques are most appropriate to manage each identified driver.

As the current study focuses on evaluating the impact of the proposed profitability model on profitability, it uses the quantitative approach through identify the main independent variables which are cost, revenue, asset models and dependent variable which is profitability and to evaluate the managers' perceptions about how these independent variables are related to profitability. The information drawn from the questionnaire is also used to examine the relationships in the individual cost, revenue and assets models. To investigate such causal relationships in both the individual and the profitability models, hypotheses will be developed in the current research, and statistical analysis will be used. If the hypotheses of this study are confirmed, the model will be supported and should go forward for further research. If the hypotheses are rejected, then the proposed profitability model will need to be further redefined and retested.

Research design

Research design can be classified into two main types in relation to the research purpose. These are exploratory and formal research, the later are subdivided into descriptive and explanatory (causal) research (Cooper and Schindler, 2003).

Exploratory research

This is considered initial research that investigates and discovers various relationships between different variables without knowing their end-application. Therefore, such research is conducted without having a predetermined set of relationships to evaluate. This means that the output of such research will be general findings. Exploratory research emphasises the development of different hypotheses for the research problems under investigation. Its emphasis is not testing them (Panneerselvam, 2004; Cooper and Schindler, 2003). The researcher can use such research for the following purposes:

- When there is insufficient or no scientific knowledge about the problems they want to investigate, the researcher explores in order to develop concepts and definitions.
- When the field of the study is considered new, the development of hypotheses may be required.
- When the researcher wants to confirm that doing a specific study in a specific area will be practical.

To achieve such purposes, both quantitative and qualitative techniques may be used. However, most exploratory studies use the qualitative approach (Stebbins, 2001). In this kind of research data are gathered through observation or interviews to understand the phenomenon (Sekaran, 2003). Exploratory research is flexible, where the researchers can change the direction of the study according to the emergence of some pattern related to the phenomenon that explored (Sekaran, 2003).

Formal Research

This research has obvious stated hypotheses or investigated research questions. Such research includes descriptive and explanatory (causal) research.

Descriptive research

Focuses on describing features of specific groups of people, communities, phenomena, situations and outcomes in terms of what is prevalent about size, form and distribution (Paneerselvam, 2004). In addition, it estimates the proportions of population that have these features (Cooper and Schindler, 2003) .The main purpose of such description is to establish a clear picture of the phenomena (Sekaran, 2003). As a result of its focus only on illustrating what has happened or what is happening, it has no control over variables (Kumar, 2005). For this reason, such research represents a means used to achieve the result rather than the result in itself (Sunders et al., 2009). In addition, it is inappropriate to discover the association and the causal relationship among variables.

Explanatory (causal) research

This focuses on understanding, explaining, predicting and controlling the relationship and associations between variables (Cooper and Schindler, 2003). In addition, it is concerned with explaining the differences between variables or groups (Sekaran, 2003). There are three possible relationships of variables that can be used in this type of research as follows (Cooper and Schindler, 2003): *symmetrical relationships are most often found when two variables are alternate indicators of another cause or independent variable and assume that the changes in either variable are due to changes in the other; reciprocal is another kind of relationship which is found when the two variables mutually influence or reinforce each other; most research analysis looks for asymmetrical relationships which are found when the changes in one variable are responsible for changes in another (p.166).*

Punch (1998) showed which types of formal research can be used for the general different research questions as follows:

Table 4.2 Research Types

General question	Type of search
How are the variables distributed?	Descriptive
How are the variables related?	Descriptive-explanatory
Why are the variables distributed and related in this way?	Explanatory

Source: Punch (1998, p.16)

Kumar (2005) states that in practice, most studies use more than one of these in combination to achieve their objectives and to answer their research questions. Therefore, the current study will use two research types. Firstly, because it seeks to create a *new* strategic profitability model, the development of hypotheses and discovery the relationships between the proposed drivers, approaches and management accounting techniques, and profitability may be required, Therefore, the current study employs an exploratory study at the beginning of the research guided by secondary literature produced by other authors to achieve their own objectives (Cooper and Schindler, 2003).

This kind of study is used to review the previous studies related to profitability management models. Such data will help in further defining the research problem and developing hypotheses. In addition to exploring broader ideas, this will help in establishing the suggested profitability model. There are two sources of secondary data: internal and external sources. The current study will focus on external sources, particular indexes and bibliographies. This source includes text books, academic journals, dissertations and theses. This kind of data is used in the current study to provide a wide ranging view to understand the essential profitability drivers. Secondly, in order to understand, explain, predict and control the relationships and associations between variables, the current study will use a formal study, which begins with the hypotheses and uses statistical techniques in order to test them.

CONCLUSION

This chapter concludes that the approach most appropriate to the current research is to employ a positivist view, which is focused on both deductive and quantitative approaches in addition to the use of both exploratory and formal studies, to achieve its objectives to create the profitability model and related research questions.

CHAPTER FIVE: MODEL CREATION

INTRODUCTION

The main purpose of this chapter is to develop the profitability model to fulfil the requirements of strategic management accounting. In order to achieve this purpose, three models of cost, assets, and revenue are developed. Finally, the profitability model is represented by the integration between the cost, assets, and revenue models.

The development of the models is located within the strategic management accounting field. The aim in producing the models is to assist in the successful management of profitability. In addition, in building the relationships within the models, the main focus is on the direct relationships between the proposed variables (strategic management accounting techniques) and profitability in order to manage profitability, not the intervening main drivers (cost, assets, and revenue). The aim is therefore not to provide a detailed guide to the individual management of the drivers used.

In developing the models the focus is on the Egyptian ICT sector at this time. Therefore, the models are clearly bound by time and context. This means that the overall sustainability of the models needs to be considered in further implementations.

Therefore, the current chapter is divided into four sections, the first three sections concern developing the cost, assets, and revenue models. The final section addresses the development of the profitability model.

SECTION ONE. THE COST MODEL

Introduction

The principal purpose of this section is to prepare an strategic management accounting model to manage cost for the purpose of profitability management. To achieve this purpose it is first necessary to determine the most important driver to manage costing for the purpose of profitability management. Secondly, it is also necessary to explain the suggested steps of the proposed technique used in managing cost. These steps include employing the following: customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and identifying cost-value gap and decision-making. This section ends by determining the proposed cost model and hypothesizing relationships in this model.

Determining cost management driver for purposes of strategic profitability management

A number of studies have been analysed to identify the key cost management driver, the most important of which are discussed below.

According to McNair et al.'s (2001a) study, understanding customers and value performance is the first step in cost management practices that lead to profitability and long-term growth. The goal is not to reduce current costs, but rather to redirect resources to the areas that can achieve profitability improvement and customer satisfaction. The same authors confirm their idea in another paper (2001b), which shows that it is necessary to change from cost reduction to profitability improvement. This is achieved through maximizing customer generated value, which means that the creation of value for customers improves profitability (Porter, 1985 and Aaker, 1992). Plaster and Alderman (2006) agree with the previous studies and suggest that companies should concentrate their efforts on profitability growth rather than cost reduction. They suggest that to achieve this, companies should use the outside-in approach, which, according to the study, takes place through adopting the customer value creation approach. This approach is defined by the study as a framework based on the customer to help the company to choose the best growth opportunities through maximizing customer generated value.

To generate this customer value, Al-Nashar (2001) states that it is necessary therefore, to manage the relationship between the value and cost of achieving such value, and to make the customer value the effective force in the companies' continuity and in achieving

profitability. However, Al-Nashar illustrates that under the traditional management accounting system, there is no link between the cost and the value it achieves, which is one of the most important requirements for distinguished business companies at the international level. This is further supported by the study conducted by McNair et al. (2006), which affirmed that understanding the relationship between costs and the value provided by the company to the customer is the basis for the company's ability to achieve profits. Therefore, the cost structure should be associated with the value attributes of the product or the service.

A significant study in this area focused on choosing the essential and main driver for profitability improvement. Christopher (2002b), shows that the essential and main driver for profitability improvement should be represented in "creating customer value". This emphases that there is a direct relationship between the value creation approach, which focuses on the value provided by the company to its customers and the value appropriation represented by the value (profitability) that shareholders obtain from value creation approach (Afuah, 2009). This study also shows that what should be measured for achieving this purpose is value rather than cost. At the present time, success does not result from reducing cost but rather from increasing value.

By analysing the above studies, it can be suggested that the main driver of cost management for purposes of strategic profitability management is represented by 'customer value creation'. Therefore, a cost management model must be developed for purposes of strategic profitability management. This model aims to create value for customers as the main cost driver for profitability management. The proposed technique used in managing cost is adapted from the attribute-based costing approach, which is advanced by Bromwich (1990) and the customer value creation model produced by (McNair et al., 2001, 2006). Within this research this is termed the "customer value-driven cost management technique". Steps for the application of this technique are detailed within the following section.

Customer value-driven cost management technique

This technique represents the measurement level of the proposed cost model, which includes the four suggested steps that could be used to manage cost for the purpose of strategic profitability management. These steps are namely, customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and identifying cost-value gap and decision-making.

Customer value analysis

Bridging the gap between value and cost begins with translating market concepts and putting them in the form of a list of attributes that represent customer preferences McNair et al. (2001b) and that express the factors affecting customer preferences in the market (Green and Srinivasan, 1990). In order to use such attributes in determining customer value, the following steps are followed (Gabre, 2007):

- Identifying product alternatives: for each product there are different alternative attributes.
- Identifying attributes: a customer regards the product as a set of attributes that offer a benefit or a number of benefits that satisfy needs. It is possible to establish the important attributes that the customer desires by asking a number of customers about the main attributes they wish to have available in the product. This can be done by telephone or by mail.
- Determining the availability of the attribute in each alternative from the customer's viewpoint: In this context, different weights can be used, ranging from 1 to 5. The use of percentages to represent the availability of the attribute in each alternative could also be used.
- Determining the degree of importance given by the customer to each attribute: here also the previous weights can be used. It is also possible to use percentages that represent, in total, the figure 1 as a whole number.
- Determining the expected value of each alternative: in this step, it is possible to estimate the degree of importance given by the customer for each attribute value obtained by the customer from each alternative. This value could be calculated in the following equation:

The value obtained by the customer from each alternative =

$$\text{SUM} \left\{ \begin{array}{l} \text{Degree of availability of each attribute of the individual value} \\ + \\ \text{Degree of importance determined by customer for each attribute} \end{array} \right.$$

The above equation can be represented by the following table:

Table 5.1 Expected Customer Value

Product Alternatives	Products Main Attributes							Expected Customer Value
	Attribute 1		Attribute 2		Attribute 3		Attribute N	
	Availability Degree Or Percentage	Importance	Availability Degree Or Percentage	Importance	Availability Degree Or Percentage	Importance		
1								
2								
3								
4								

With the help of table 5.1, the alternative that achieves the highest expected customer value can be chosen.

After that, a new series of steps is undertaken in order to determine the profitability of each attribute with a view to close the gap between cost and value. The alternative must realize value for the customer and value for the company at the same time in order to assure continuous company profitability and customer satisfaction.

Measuring revenue equivalent

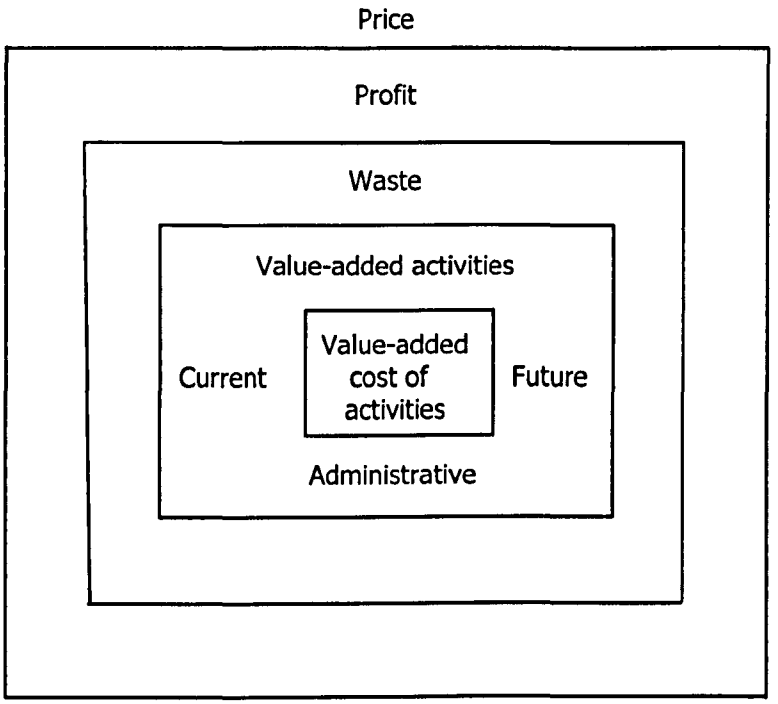
It is suggested that this could be called "value-weighed revenue". The total revenues are distributed over the selected alternative attributes by using the expected customer value (as calculated in the previous step) for each attribute, in order to reach the revenue achieved by each attribute for the company (McNair et al., 2006). The following equation can be used to determine the revenue generated from each attribute taken alone:

Value-weighed revenue for attribute = total revenue x relative weight for expected attribute value

Determining and measuring value-added cost

To determine value-added cost, using the "value creation model" is suggested (McNair et al., 2001b, 2006). This can be represented by the following figure:

Figure 5.1 Value Creation Model



Source: adapted from McNair et al. (2001b, 2006)

It is clear from the above figure that activities and related costs can be classified in accordance with their relation to customer value and their impact on profit into three main classes.

Firstly, waste activities represent cost which is not customer-related, and for which the customer will not pay any money. Therefore, such activities are profit-consuming. Waste is sometimes referred to as a "profit bandit" (McNair et al., 2001b, 2006). Waste represented by two elements:

- Redoing the activity: Activities can be value-adding when done for the first time, but they are non-value-adding when they are done again.
- Excess in doing activities, to the extent that they cost higher than what the customer would pay. This creates further waste.

Secondly, value-adding business activities: These are classified into three types, as shown below:

- Current value-adding business activities: these are a group of activities that are necessary for supporting value-adding activities. The customer will not pay a higher price for performing such activities efficiently (i.e. they have no effect on profit). However, the customer may pay a lower price if such activities are not performed efficiently (this will have a negative effect on profit).
- Future value-adding business activities: these are represented in the future products and services of the company, such as innovation and development. The customer will not pay a price for future products and services (i.e. they have no effect on profit). However, the company is obliged to do so for survival and growth.
- Administrative value-adding business activities: these are the main activities that are necessary for the continuity of work, such as salaries and information technology. The customer will not pay a price for the performance of such activities, and therefore they have no effect on profit.

Thirdly, core of value-adding activities and related costs is in the core of the figure 5.1. It is represented by those activities that realize direct benefit for the customer because they are strongly linked to value attributes. That is, they are determined on the basis of the product's attributes. Only such activities can generate revenues for the company. Therefore, they must be regarded as a profit driver that must be focused on. There is a direct proportion between such activities and profit; each monetary unit spent on improving such activities is a means to improving profitability. In other words, the companies that cannot determine which activities are directly related to value attributes are companies that have an uncertain future.

Value-adding cost is measured according to a number of steps:

1. Identifying activities related to each attribute (Brimson, 1998): the steps and stages of production related to each attribute are identified. The process of identification should be performed carefully because this step has an important effect on the accuracy of cost identification. At this stage, it is possible to use the "activity analysis" technique, which is considered one of the most important techniques used in providing detailed data for a company's operating level. This helps to better understand the activities, how they should be performed, managed and improved, and to what extent they can be changed to be appropriate to the market and competition conditions. It is also possible at this stage to divide activities into: secondary activities at the level of secondary attributes and specifications, and collective activities at the level of main attributes and specifications, in accordance

with nature and conditions of the work.

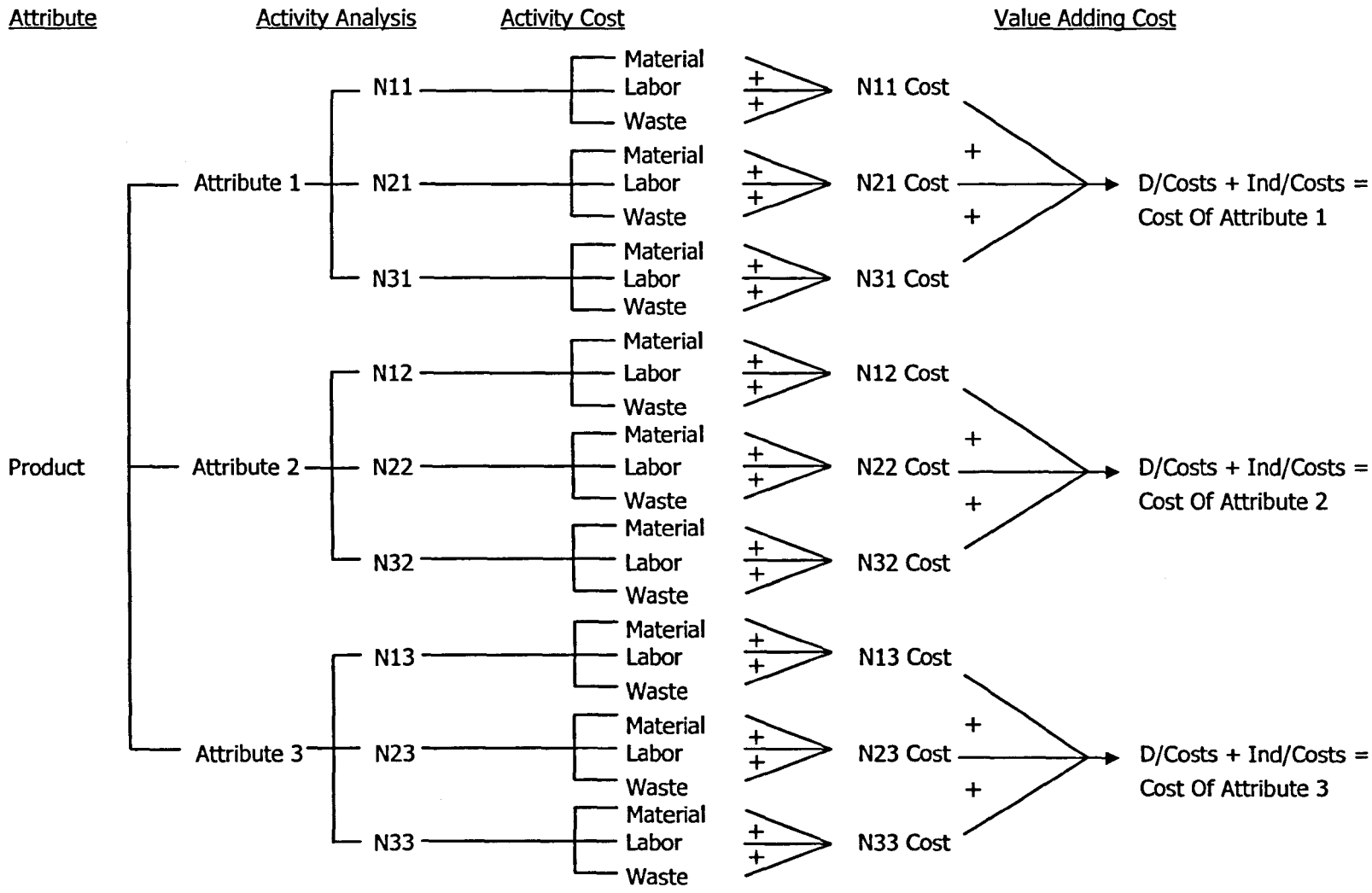
2. Identifying the cost of each activity: activity cost is represented by the proportion of each activity of production factors consumed by the activity and recorded as cost in the general ledger. Therefore, at this stage, production factors that are necessary for the performance of each activity and represented in personnel, equipment, materials, etc., are identified and grouped (Brimson, 1998). They are calculated on the basis of actual performance.
3. Measuring the costs of each attribute (value-adding costs):
4. At this stage the activity costs related to each attribute resulting from the last step are grouped together (Brimson, 1998). The cost of each attribute is represented as follows:

The cost of each attribute =

SUM {
Direct costs for all the activities of each attribute
+
Any indirect costs related to other attributes
}

The above steps can be summarized in figure 5.2:

Figure 5.2 Product Cost Model



Identifying cost-value gap and decision-making

The basis of the company's ability to make profits is to understand the relationship between costs and the value. This is realized through understanding the relationship between what the customer will pay for the product or service, and the cost incurred by the company to supply what the customer wishes in the form of product attributes (McNair et al., 2006). This relationship can be measured by using the "value multiplier" measurement (McNair et al., 2006), which is one of the methods used in comparing value-adding cost with customer preferences. This is done through finding the relation between value-weighted revenue and value-adding cost by using the following equation:

Attribute Value Multiplier = Value-Weighed Revenue ÷ Attribute Value-Added Cost

Source: McNair et al. (2006)

This measurement represents the amount of revenues generated from each attribute for each value-adding cost unit. That is, the attribute achieves x pounds of revenues for each 1 pound of value-adding cost. The ideal ratio for the measurement has been identified as ranging between 2-5 (McNair et al., 2006). The information obtained from the value multiplier measurement are used in determining current and future leveraging factors and determining which activities the company will focus on. This information is also used in coordinating between the company's activities and customer requirements for achieving competitive advantages and maximizing customer-generated value as well as maximizing profitability. This is realized through analysing and interpreting the value multiplier results as follows:

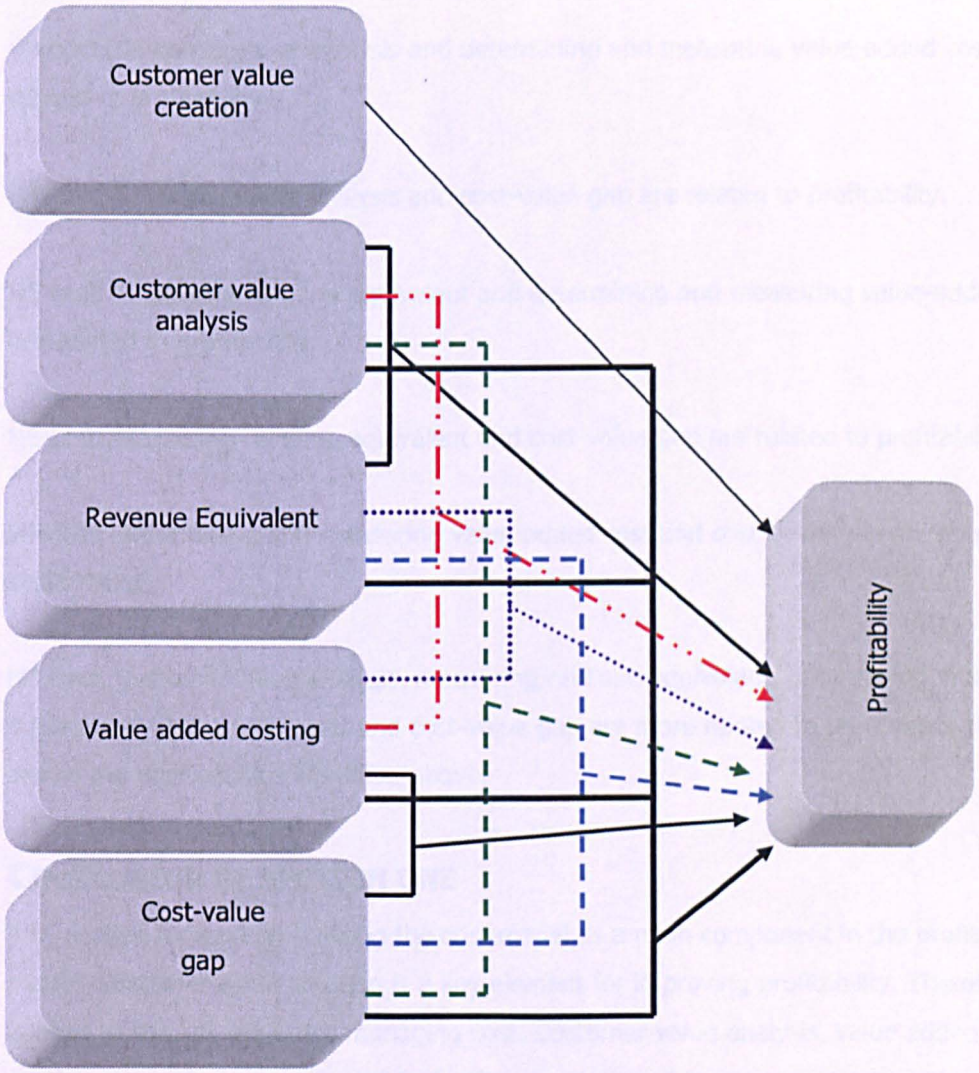
- If multiplier < 2: this means that there is more spending on this attribute, since it generates a revenue less than $2 for each $1 of the cost incurred. In this case the company incurs losses for providing such attribute to the customer.
- If multiplier is within 2-5 range: this range means that the competitive dimension is represented by the cost and that attributes and features do not represent growth leverage.
- If multiplier = 5: this multiplier value refers to achieving a reasonable, appropriate level of profitability.
- If multiplier > 5: this value refers to achieving a big return on invested resources and represents a positive result, provided it is related to customer satisfaction.

This means that a high multiplier which is also related to customer satisfaction is a

competitive advantage. The opposite is also true. A high multiplier with a low rate of customer satisfaction is considered competition weakness.

Figure 5.3 describes the conceptual cost model. The first relationship is between customer value creation as the independent variable and profitability as a dependent variable. The main relationship is between customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, identifying cost-value gap, and decision-making as the independent variables and profitability as the dependent variable.

Figure 5.3.The Proposed Cost Model



The proposed cost model reflects how customer value creation as a main cost driver affects profitability. In addition, such a model reflects how the integration between the proposed variables affects profitability to determine which of the various combinations of "customer value-driven cost management" variables provides the best explanation of

profitability. In essence, it is assumed that the integration between the four variables better predicts the level of profitability than the use of any combination between any variables. Therefore, it is anticipated that the more the proposed cost model containing the four variables is used, the more profitability is achieved. Thus hypotheses related to the cost model can be formulated as follows:

H1 cost: Customer value creation is positively associated with profitability.

H2 cost: Customer value analysis and measuring revenue equivalent are related to profitability.

H3 cost: Customer value analysis and determining and measuring value-added cost are related to profitability.

H4 cost: Customer value analysis and cost-value gap are related to profitability.

H5 cost: Measuring revenue equivalent and determining and measuring value-added cost are related to profitability.

H6 cost: Measuring revenue equivalent and cost-value gap are related to profitability.

H7 cost: Determining and measuring value-added cost and cost-value gap are related to profitability.

H8 cost: Customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and cost-value gap are more related to profitability than any of the relationships identified above.

CONCLUSION OF SECTION ONE

This section focused on building the cost model as a main component in the profitability model. Customer value creation is a key element for improving profitability. Therefore, it is used as the key driver for managing cost. Customer value analysis, value added costing, equivalent revenue and cost-value gap are used together in a coherent model to strategically manage cost from the perspective of customer value. This is expected to improve profitability.

SECTION TWO. ASSETS MODEL

Introduction

There are two main purposes for this section. The first purpose is to review and analyse the literature related to intellectual assets as a key driver, determined by the current study, for managing assets. To achieve this, the following four elements are analysed and reviewed: reasons for the emergence of these assets; the concept, components and characteristics of intellectual assets; their importance and role in the knowledge environment; and finally, their influence on profitability.

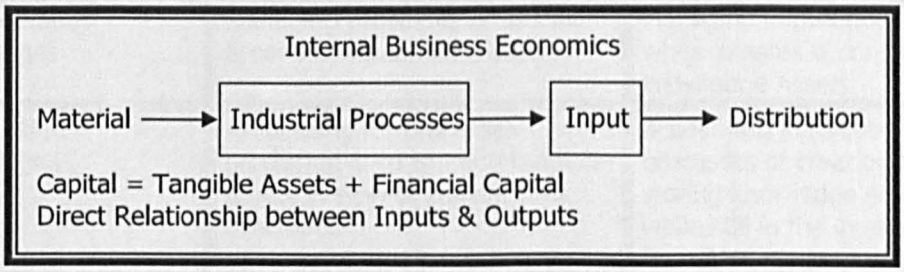
The second purpose, which is reliant on achieving the first, is to propose a model. To prepare this model, first, approaches of value definition for intellectual assets are analysed; after that, the stages of the proposed model are explained, along with the indicators suggested in each stage. This section ends by determining the proposed assets model and hypothesizing relationships in this model.

Intellectual assets: an overview

Reasons for the emergence of intellectual capital or intellectual assets

Intellectual capital has appeared as a result of the movement from internal business economics to a knowledge economy (Metwalli, 2003). He identifies that internal business economics is based on the fact that inputs are represented by the resources used in the industrial processes to create goods for sales; whereas the output is embodied in distribution processes. Capital, according to this model, consists of tangible assets and financial capital. This model is also built on a direct relationship between inputs and outputs. Figure 5.4 demonstrates internal business economics.

Figure 5.4 Internal Business Economics

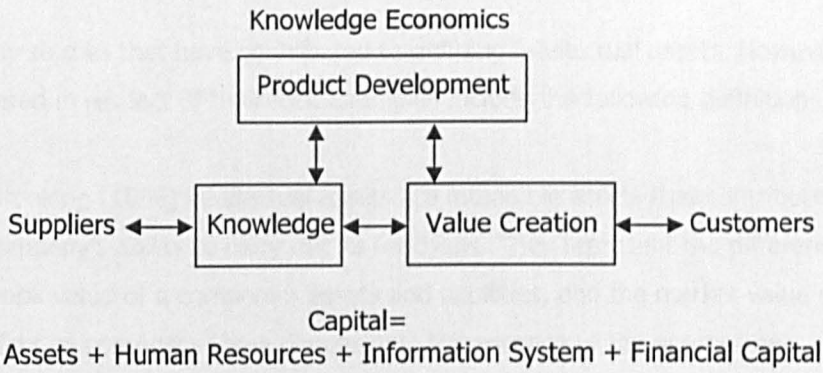


Source: adapted from Metwalli (2003)

On the other hand, knowledge economics is based on the fact that 'inputs' are suppliers, whereas 'operation' is knowledge, value creation, and product development, which all mutually affect each other.

'Output' here is the satisfaction of customers' desires. There is an indirect relationship between inputs and the outputs in this model, as follows:

Figure 5.5.Relationship between Indirect Inputs & Outputs



Source: adapted from Metwalli (2003)

The differences between the environments of the two economics are indicated in table 5.2 (Zaghloul, 2002):

Table 5.2 Features of Industrial and Knowledge Economics

Variables	Industrial economics	Knowledge economics
Resources structure on the level of units	Tangible assets 70% Knowledge assets 30%	Tangible assets 37% Knowledge assets 63%
Management challenges	Managing processes producing & consuming tangible assets	Managing knowledge which creates & consumes knowledge Assets
Accounting challenges	Accounting for processes producing & consuming tangible assets in view of transactions concluded	Accounting in relation to processes of creating & storing knowledge assets while still in the intellectual formation stage

Source: adapted from Zaghloul (2002)

What are intellectual assets?

There is no common definition for intellectual assets in accounting. In the Third International Conference held in Hamilton, Canada in 1999, more than 80 experts worldwide agreed that it was too early to set a definition for intellectual assets (Zaghloul, 2002). This can be attributed to the fact that many of the basic components of intellectual assets are still undefined. In addition, there is clear overlap between intellectual assets elements. Hence, it is difficult to reach a general and specified definition of intellectual assets (Zaghloul, 2002).

There are many studies that have contributed to defining intellectual assets. However, they have differed in respect of their foci. Examples include the following definitions:

According to Brooking (1996) intellectual assets are intangible assets that contribute to enhancing a company's ability to carry out its functions. They represent the difference between the book value of a company's assets and liabilities, and the market value of the same. This definition comprises three dimensions: the essence of the assets, their importance for any company, and how to measure them. This is further affirmed by Dzinkowski (2000), who states that intellectual assets represent the difference between the book and market value of a firm's assets.

Roos and Roos (1997) believe that intellectual assets exist within the company's knowledge, property, experience, technology, relations with customers, in addition to all other skills that enhance the company's sustainable competitiveness. This definition combines two dimensions of intellectual assets. The first is the components of intellectual assets. The second is the importance of intellectual assets and how such importance contributes to enhancing the company's competitiveness (external benefits). This is further affirmed by Marr and Schiuma (2003), who state that intellectual assets are a group of knowledge assets belonging to any company and assisting in sharpening its competitive position. This definition focuses also on the importance of intellectual assets in improving a company's competitiveness. Stewart (1997) also agrees with Roos and Roos' identification of intellectual assets components. He stated that intellectual assets are information, knowledge, intellectual property and experience, which create the wealth of the company. However, Stewart added a key element in his definition, which is the role of intellectual assets in creating wealth for the company (internal benefits). This means that these assets have internal and external benefits.

This position is further supported by Edvinsson's (1997) study, which defined intellectual assets as the intangible assets related to knowledge, property, experience, application, organizational technology, relations with customers, and specialized skills. According to Edvinsson, such assets are characterized by the absence of tangible physical components, as well as the inability to ensure expected benefits in future as it is so hard to forecast their productive life. The inability to foresee productive life arises as these assets do not have a physical lifetime. Moreover, the value of these assets is subject to fluctuation because their anticipated benefits face severe competitiveness on the one hand, and because some of these assets may not have market values on the other hand. This definition not only refers to the components of intellectual assets, but it also adds another dimension - the characteristics of intellectual assets. This new dimension was not addressed in alternative definitions and therefore represents a step forward.

A key definition in this area is proposed by Harrison and Sullivan (2000), who define intellectual assets as the knowledge that can be turned into profit. This definition focuses on the essence of intellectual assets, which are the main cause for generating profit. This point is very important and concurs with the focus of one of this study's research objectives. De Pablos (2003) also agrees with the position represented in Harrison and Sullivan's (2000) work. His definition states that intellectual assets are a group of intangible values that enhances the organizational current and future ability to realize profit. Here, the focus is on the role played by intellectual assets in generating both current *and* future profit. This aspect of the 'potential' of intellectual assets was previously overlooked.

Perhaps one of the most comprehensive definitions is provided by Zaghloul (2002), who explains that intellectual assets are a group of intangible values that can be objectively determined through the difference between the market value of a business organization and its book value. Such assets are classified according to their sub-components (human – organizational – relational) in view of the primary drivers of value. This definition clarified how intellectual capital can be measured and sheds light on the importance of identifying the main intellectual capital drivers of value.

Another important dimension of the definition of intellectual assets is added by Al-Gendy (2005), who states that intellectual assets are a group of intangible knowledge assets that work together with a view to creating added value to any company, and enhancing its competitive position. This definition is particularly important as it stresses the essence of intellectual assets and the necessity of their interaction as being the main cause of creating value.

The role accounting standards play in determining the definition of intellectual assets cannot be neglected. According to International Accounting Standard (1998), intellectual property assets are non-monetary assets that do not have physical components and can be used in production, service, and rent or for other administrative purposes. They are determined and controlled by the company and they are expected to generate future benefits. This standard focuses primarily on the characteristics of intellectual assets. It refers also to the importance of these assets though it does not refer to the nature of the associated benefits.

According to Egyptian Accounting Standard (2002), intellectual assets are those that have a non-monetary nature. They are unidentifiable and do not have physical components. They are retained to be used in production or in supplying commodities and services. They can be rented to others or used for administrative purposes. Such assets are expected to generate the same economic benefits in future, as generated from selling products or services. Cost reduction is another benefit expected to emerge, as well as many other benefits that result from using the company's assets. This standard complies with the international accounting standard in focusing on characteristics of intellectual assets and the importance of such assets in achieving benefits in future. The Egyptian standard is however more comprehensive in its treatment of determining future benefits.

In order to set a general and comprehensive definition of intellectual assets, this study concludes that such a definition should include the concept of intellectual assets and their distinguishing characteristics, components and importance. So, it is essential first to study and analyse the components of intellectual assets and their characteristics in order to reach a more comprehensive definition.

The components of intellectual assets

The components of intellectual assets differ from one study to another since there is no general and specific classification of intellectual assets to date. While some studies have classified components into two primary components and a number of sub-components, other studies have classified them into three or four components. These differences result from the variations in the frameworks adopted for each study. The following are some examples of studies that classified intellectual assets.

Roos and Roos (1997) classified intellectual assets into two categories:
Human capital: This asset includes the employees' hidden knowledge and talents which consist of three main elements:

- Competence: this element represents levels of education, experience, skills and know-how.
- Attitude: this element represents causes and incentives that control employees' behaviours. It also includes the efficiency of higher management in leading the company.
- Agility: this element represents employees' abilities to have a quick response to the business environment.

Structural capital: this element represents the intangible resources a company has and which remain after employees leave work. Consequently, such resources can be the knowledge and information owned by the company regardless of the employees who work in this company. Therefore, the elements of structural capital have market values as they are owned by the company. These elements can be classified into three categories:

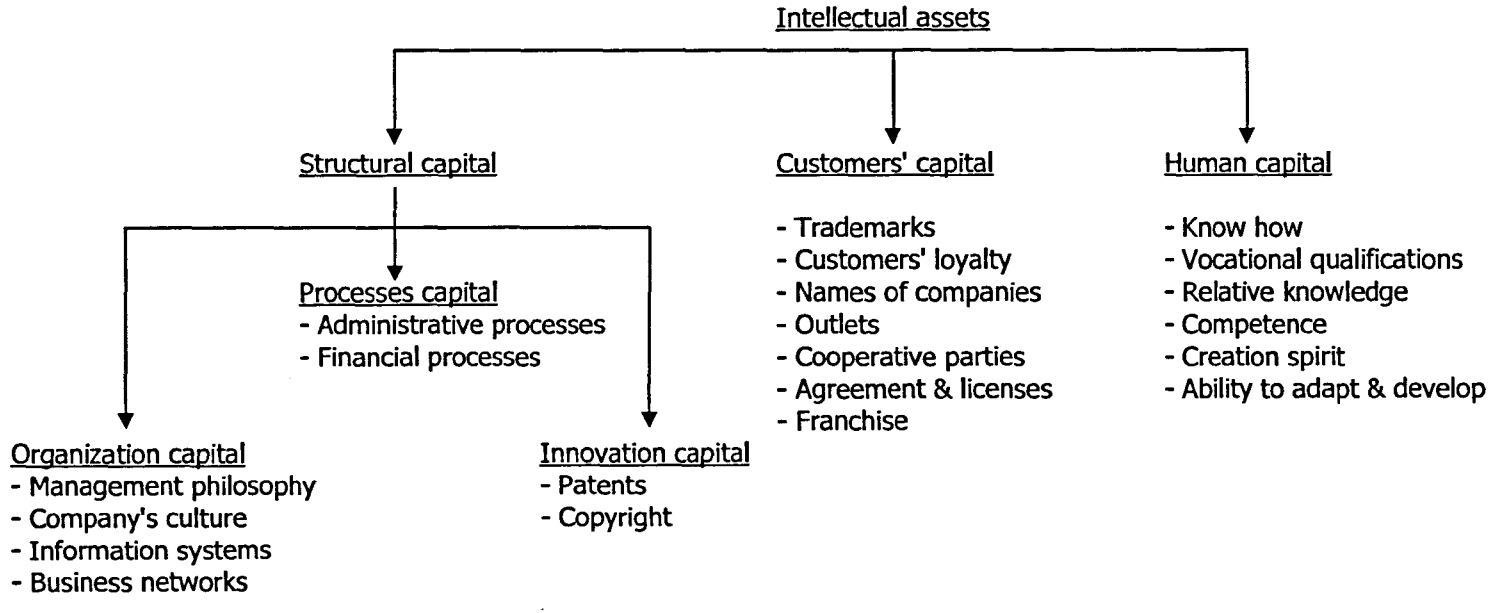
- Relationships: they include all relationships a company may have such as relationships with customers, suppliers, shareholders, government and society.
- Organization: this represents the culture of the company and databases, documents, organizational charts, software as well as knowledge related to a company's processes.
- Renewal and Development: this element includes all future projects a company intends to participate in. This also includes research and development management, new plans and products or new services.

Intellectual assets were divided by Stewart (1997) into three main components:

- Human capital: this component represents the employees' abilities that they use to create and innovate while creating and innovating new products and services or developing existing ones.
- Structural capital: this component represents all knowledge a company owns and which remains and can be developed and other people are invited to participate in.
- Customer capital: this component represents the company's relations with customers who buy products or receive services.

Figure 5.6 shows the sub-categories of this classification system.

Figure 5.6 The Main Components of Intellectual Capital



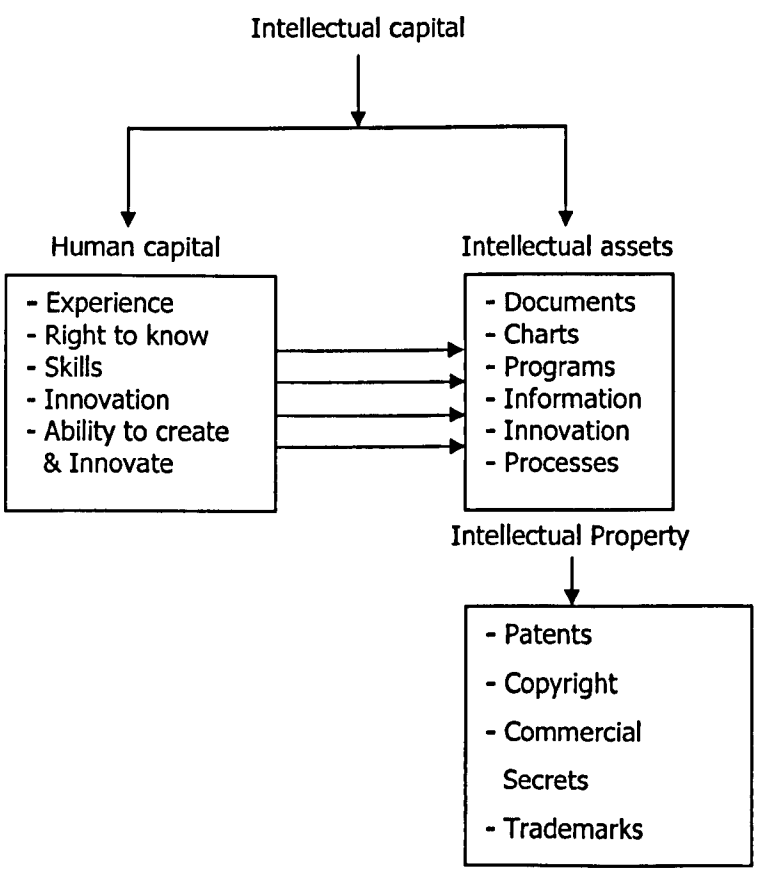
Source: adapted from Stewart (1997)

Similarly, Sveiby (1998) classified intellectual assets into three categories:

- Employees' competences: such competences are results of education and experience. They indicate also the human ability to act properly in different situations.
- Internal structure of the organization: this structure includes intellectual property rights, patents, copyright, trademarks, philosophy of management, culture of organization, research and development, information systems, networks and financial relations.
- External structure: this structure includes customers, customers' loyalties, and channels of distribution, brands, trademarks and licenses.

Shaikh's 2004 classification is similar to Sveiby (1998) as it classified assets into three categories: internal capital, external capital and employees' competence. Sullivan's (2000) study, also classified intellectual assets into three categories that can be summarized in the following figure:

Figure 5.7 Elements of Intellectual Capital



Source: adapted from Sullivan (2000)

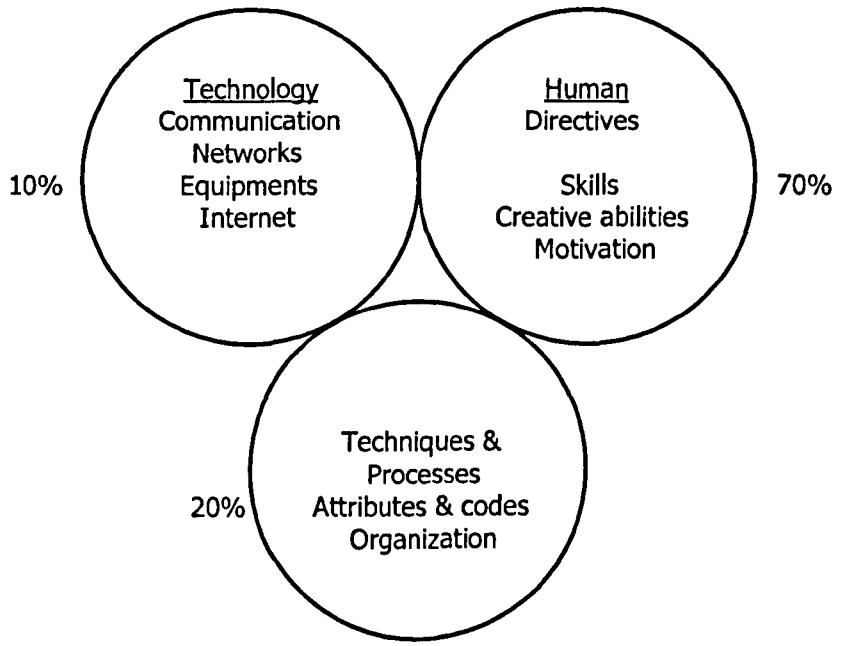
While Sullivan (2000) defines human capital as employees' energies, abilities, skills and experience, he defines intellectual assets as physical descriptions of specific knowledge a company owns and proves its property rights. It is used to produce components of intellectual property such as patents and copyright. The previous figure explains the relationships among the three components of intellectual capital. It clarifies that human capital generates wealth for the company, it results in the second component which is intellectual assets, and the final result is the third component which is intellectual property rights. This leads to the proposition that regardless of its components, this classification explains a fundamental element that none of the other previous studies refer to. This is the presence of reciprocal relationships and interaction among components of intellectual assets.

Two year after Sullivan's study, Canibano, Sanchez, Ayuso, and Dominguez (2002) also classified intellectual assets into three categories:

- Human capital: this category includes all knowledge, skills and information whether they are general or unique. On the general level, they are previous experience, education ability, flexibility among team members and customer satisfaction. On the advanced level, they are individual abilities that help creation, innovation and keeping know-how.
- Relationship capital: this category includes all resources related to external affairs such as relationships with customers, suppliers and research and development partners. The category also covers a part of human and structural capital related to company relations with other stakeholders, such as shareholders and creditors. The relationships among these parties are also represented through customer loyalties and satisfaction. The company's relationships with suppliers and its negotiating ability are also included.
- Structural capital: this capital emerges from the knowledge gained through organizational and cultural procedures and databases. This capital is expressed through organizational flexibility, documentation service, and information systems.

Abuo-Alfotouh (2006) also classified the components of intellectual assets into three categories that can be summarized in figure 5.8:

Figure 5.8 Elements of knowledge



Source: adapted from Abul-Fotouh (2006)

The advantage of the above classification lies in its clarification of the relationships and interrelations among the intellectual assets elements. It is also the only classification that identifies the relative importance of every element. However, previous classifications do not propose relative importance because the degree of importance differs from one industry to another according to its characteristics and requirements.

According to Brooking (1996), intellectual assets can be classified into four categories:

- Market assets: they include intangible issues that enhance presence in market such as brands, customers, outlets and accumulated orders.
- Human assets: they are the assets derived from employees within the company such as accumulated experience, the ability to create and solve problems and indicators of performance in critical times or under stress.
- Intellectual property rights: they are the assets that represent rights originating from thought processes, such as patents, designing rights, commercial secrets and know-how.
- Infrastructural assets: they are the assets that internally empower the organization and determine how it works. Such assets include company culture; methods of risk

assessment; and methods of managing selling power, financial structure, and customer database and information systems.

Edvission (1997) also classified intellectual assets into four categories:

- Human capital: this is related to the human resources of the company and work secrets that can be converted to value.
- Structural capital: this capital is related to a company's infrastructure. It includes physical infrastructure, such as buildings and computers. It includes also intangible infrastructure, such as the history of the company as well as its culture and management.
- Company assets: this is related to structural capital a company uses to create value in its commercial operation such as operation facilities and distribution networks.
- Intellectual property: this is related to intellectual assets a company owns and whose legal protection belongs to the company.

The views of accounting standards related to intellectual assets components can also not be neglected. Components of intellectual assets were described by the FASB (1999), and the standard specification of the elements of intellectual assets within a company was given as:

- Customer and/or market-based assets.
- Contract-based assets.
- Statutory-based assets.
- Technology-based assets.
- Workforce-based assets.
- Corporate organizational and financially-based assets.

Components of intellectual assets are also covered in the Egyptian Accounting Standards (2002). Within these standards, there is the specification of a group of intangible assets such as scientific and technological knowledge, designing and implementing new processes or systems, licenses, property rights, market knowledge, commercial relations, publishing rights, software, patents, copyright, customer lists, right of providing mortgage, import quotas, franchise, relations with customers and suppliers in addition to their loyalty, and marketing rights. The standard differentiates between two objects. These objects are the agreement (or disagreement) of previous items within the definition of intangible assets in terms of the ability to specify and control them, as well

as the presence of future economic benefits. If there is an agreement between the nature of these previous items and the characteristics, they become intangible assets, and are therefore included in intellectual assets, and vice versa.

In view of what has previously been explored, and the analysis of components of intellectual assets, it can be concluded that there is a similarity among the components of previous models in relation to the classification of intellectual assets. In spite of the diversity of classifications, the internal components of these classifications are similar to a great extent. When analysing these studies, it is clear that they agree on three elements that exist in every classification, regardless of their titles. These elements are:

- Human assets: this element ranks first among all elements because of its importance among the components of intellectual assets. Abuo-Alfotouh (2007) confirms this view as he estimates its relative importance as 70% of a company's intellectual assets. This confirms the importance of this item and its fundamental, critical role among components of intellectual assets. Human assets are represented by the knowledge, skills, abilities and experience employees have, whether they are general, such as education and experience, or specific like creativity and the innovation of new products and services introduced for the first time, or developing existing ones. Human assets are those which the company does not own, though they have great importance in the success of the company.
- Structural assets: this element is also called internal capital or infrastructure capital. This element is represented by the knowledge and information a company owns regardless of its employees. Such assets can be organizational and cultural procedures and databases, documentation, application of information technology, financial processes, patents and property rights.
- Relationship assets: some classifications appear to focus only on customers. This does not comply with modern developments in the business environment and strategic management, which require a focus on all external elements related to the value chain. Therefore, those studies that address all external relations are seen to be of more value and appropriate. As a result, relationship assets can be defined as all resources related to external relationships that link the company with external parties such as customers, suppliers, shareholders, government and society.

Characteristics of intellectual assets

While many studies have addressed intellectual assets, they have not discussed the characteristics of intellectual assets, as they have focused only on the components of these assets. The following are studies that have specified the characteristics of intellectual assets.

Edvinsson (1997) stated that the characteristics of intellectual assets are mainly the absence of a tangible physical component, the inability to guarantee future benefits because it is hard to forecast productive life and the absence of a physical lifetime for these assets. Furthermore, their values are unstable due to the international competitiveness may face. However, Dzinkowski (2000) adds that while many intellectual assets are stable, such as patents, others are flexible, for example, human competences and qualifications.

The most important characteristics of intellectual capital that differentiate it from others are defined by Abul-Fotouh (2004) as follows: it is an intangible asset; it is hard to measure accurately; it vanishes quickly; the more it is used, the more it increases; it can be used and utilized in different stages and processes at the same time, and it has a great influence on the organization performance.

According to Zaghloul (2002), the main characteristics of intellectual assets are: they are intangible assets; they have higher degrees of uncertainty; it is difficult to separate some intellectual assets from others; it is difficult to set some of these assets under business control; the objectivity, and they are considered an element of production that enhances the competitive positioning of the company.

Accounting standards have also played an important role in defining many of the characteristics of intellectual assets. The characteristics of intellectual assets according to International Accounting Standards Committee (IAS, 1998) are:

- Identifiable.
- Non-mandatory/Non-financial.
- Without physical substance.

Further, the Accounting Standards Board in its FRS (1997) defined another characteristic, which is the importance of making such assets subject to the control of the organization during periods of legal rights.

In addition to the previously mentioned characteristics, the characteristics of a strategic resource can be added to intellectual assets, since they can be considered a main strategic resource in their own right. Such characteristics can be illustrated by the fact that they are: valuable, scarce, hard to imitate and not replaced by other alternatives. Abuo-Alfotouh (2006) emphasizes that the previous characteristics of strategic resource can be applied to intellectual assets. He explains that:

- They are valuable: it is indicated that the value and price of a human resource lies in the fact that knowledge leads to process and product improvement. This helps the company to sustain and compete and the result is a competitive advantage that cannot be underestimated.
- They are scarce: since they are related to employees' accumulated experience and knowledge of applications. So, they are scarce because they are based on previous experience within the organization, and not within another one.
- They are hard to imitate: knowledge in every organization is exclusive to this organization, and it has a distinctive character which is not gained over a period of time, as well as through the participation of workers groups and shared experience. So, they are different from all other organizations.
- They are hard to replace: they are relative to the special capabilities of groups and shift among employees. Such knowledge cannot be replaced.

After analysing previous studies that have attempted to determine the characteristics of intellectual assets, the most important characteristics can be proposed as follows:

(1) They are intangible assets which do not have physical entity.
(2) They are non-financial assets. So, they cannot be accurately measured.
(3) They are non-obligatory assets.
(4) Their production lives are difficult to forecast.
(5) They do not have physical lives.
(6) They are scarce.
(7) They are difficult to imitate.
(8) They cannot be replaced by any alternatives.
(9) Their values are subject to fluctuation due to the high competition usage benefits faced or because some of these assets do not have market values.
(10) Their values increase over time because of the accumulated experience and information a company owns. In this case, they are different from other tangible assets, which depreciate through time either because of usage or the decrease of their purchasing power.

The relative importance of intellectual assets within a knowledge economy environment

The difference between book value and market value is due to intangible elements a company owns and which add higher value. For instance, the book value of Coca Cola and Microsoft signalled only 4% and 6% respectively of their market values in 1996. This increase is due to intellectual capital, which cannot be expressed in financial statements (Harvey and Lusch, 1999). Thus, intellectual assets become the main motivator of contemporary enterprises' development. The result is a decrease in shares in both physical and financial assets as an important factor of producing goods and services. There is an increase in companies' interests in developing intangible assets, such as research and development and employees' capabilities and previous experience. Existing enterprises now also focus on achieving higher levels of knowledge, information and human abilities rather than physical and financial assets (Daley, 2001). This proposition is further supported by Seetharaman, Sooria, and Saravanan (2002); and Zaghloul (2002), who demonstrate that the current structure of resources consists of intangible assets (63%) as well as tangible and financial assets (37%). This differs from the traditional structure of resources which depends on physical and financial assets (70%) in addition to intangible assets (30%). This reflects an increase of the relative importance of intellectual assets in the modern knowledge economy environment.

The role of intellectual assets in the knowledge economy

Intellectual assets, as Mouritsen (1998) implies, represent the main element which result in a company's success or failure in achieving its multiple objectives in a modern industrial environment. This is further supported by Daley (2001), who studied more than 300 Canadian and 500 American companies and concluded that the managers of these companies believe that intangible assets, such as knowledge and experience, are the main factors of success for these companies. Therefore, intellectual assets have now become the main driver of a company's success or failure. These are affirmed by Kaplan and Norton (2004b), who state that intellectual assets are the main tools applied to create value for shareholders, customers and society as they constitute more than 75 % of the value of the company. This emphasises that intellectual capital become a key strategic value in the knowledge economy (Tayles, Bramley, Adshead, and Farr, 2002).

Intellectual assets are also seen as the main resources and contributions to company profitability. This is position is propounded by Marr, Gray, and Neely (2003), who state that it is important to understand the relationship between these assets and profitability.

A focus on intellectual assets also helps to develop, the strategic position of companies (Harrison and Sullivan, 2000). This development can be achieved through improvement of market share, leadership e.g. innovation and technology, trade-names, brands, trademarks reputation, customer loyalty and satisfaction, cost reduction and productivity improvement. The strategic position can be improved by focusing mainly on the competitive advantages of companies. This is further explained by Abuo-Alfotouh (2006), who states that the well-known competitive advantages such as cost, quality, quick delivery, flexibility and quick response to changes, are not sufficient because of the rapid developments in the international business environment. Thus, new competitive advantages have emerged based on the company's knowledge-ability and creativity, as well as its ability to innovate and provide products that constitute a series of integrated technological developments. Such development is a prominent signall of a knowledge organization. This confirms that intellectual capital has become a key source of competitive advantage, which can be used to improve companies' profitability (Ting and Lean, 2009). In addition, a focus on intellectual assets helps to evaluate the results of investment decisions in relation to physical and financial assets (Eissa, 2007). This is because the success of managing physical and financial assets mainly depends on human and knowledge elements. These elements help to set plans and programmes, whose objectives are to support competitive advantage as, well as satisfying customers' desires and needs.

After presenting many studies and evaluating the concept of intellectual assets and its components, characteristics and importance, the following definition of intellectual assets is proposed:

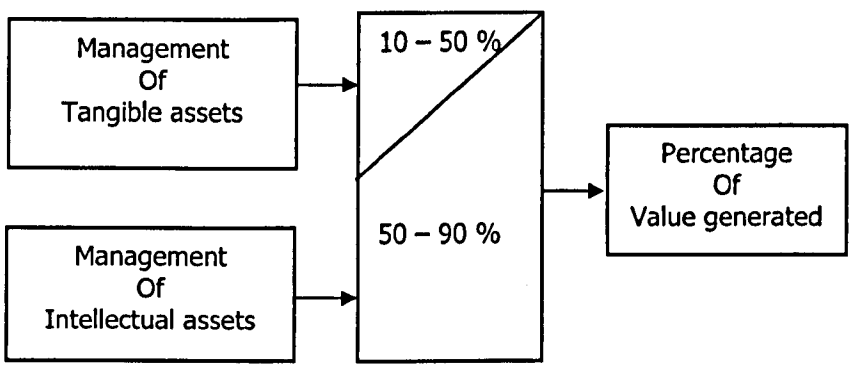
They are a group of knowledge assets whose characteristics differ from financial and tangible assets as they are specifically non-financial, intangible and non-mandatory assets. Such assets are specified objectively through the difference between the market value of business organization and its book value. The components of these assets (human – organizational – relationships) interact together to improve the strategic position of the company, create value, strengthen organizational abilities to generate current and future profits and enhance the company's competitive potential.

The influence of intellectual assets on value and profits and the relationship between them

The influence of intellectual assets on value

Abuo-Alfotouh (2006) states that intellectual assets are considered the main and the fundamental drivers for improving performance and value creation. This is further supported by the study conducted by Luthy (1999), which focused on health service providers. The study concluded that, on an average level, more than 75% of value in health service providers is derived from intellectual assets. This result is further confirmed by Dzinkowski (2000), who examines the influence of intellectual assets on generating value. His study concluded that 50-90% of value created and generated in the companies examined is achieved through the management of intellectual assets and not the management of traditional physical assets. This is indicated by the following figure:

Figure 5.9 Value Generated form Tangible and Intellectual Assets



Source: adapted from Dzinkowski (2002)

According to Starovic and Marr (2003) the failure in understanding the process of value creation and the role intellectual assets play in value creation, results in a series of losses on all levels. On the company level, the result is an inefficient allocation of resources that leads to the company's inability to enhance its potential and value in the future. Starovic and Marr go on to state that intellectual assets are the main factor that controls a jump in profitability. Such a jump in profits surpasses achievements of counterparts which lack input from intellectual assets.

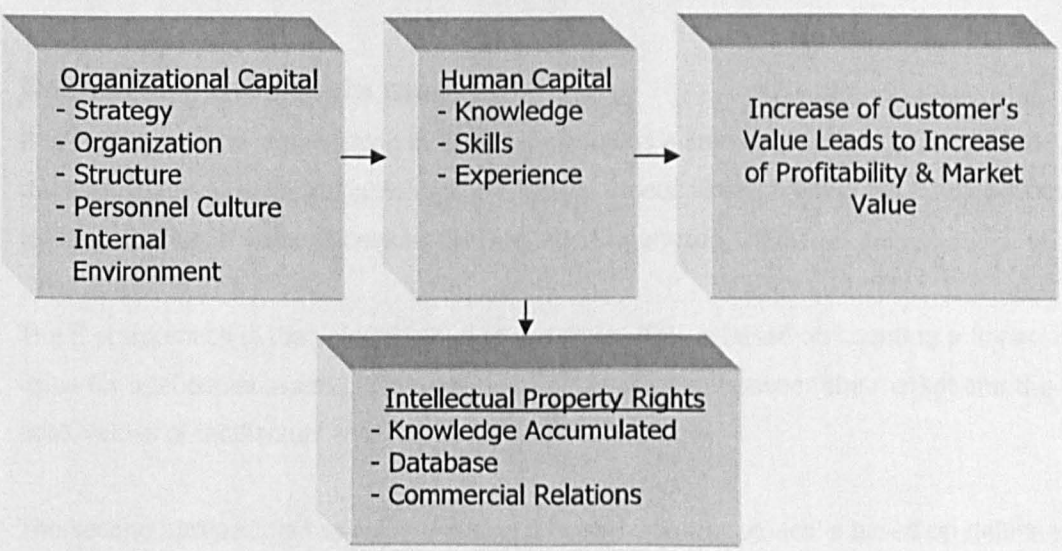
Intellectual assets are the basis of efficiency increase, quality improvement, cost reduction, diversification of products and services such as productive, marketing, administrative and financial services. The result is establishing a competitive advantage and an enhancement of competitive potential of products in local and international

markets. This is further examined by Chen, Cheng and Hwang (2005), who study the contribution of intellectual assets in the financial performance of companies and the possibility of using them as indicators of financial performance in the future. The study investigated 30 Taiwanese companies. The hypotheses of the study are based on studying the relationship between intellectual assets and the financial performance of companies. Financial performance is expressed in terms of return on ownership, ratio of return on assets, growth in net sales, and net value added per employee. The results were all positive in relation to all four models of financial performance. This means that the companies that have higher intellectual assets achieve better results in terms of profitability and revenue growth. The study concluded that intellectual assets play a critical and fundamental role in improving profitability and revenues increase. The relationship between intellectual capital and profitability is also investigated by Belkaoui, (2003); Tan, Plowman, and Hancock, (2007); Makki and Lodhi, (2008); and Muhammad and Ismail, (2009). They all found that there is a positive relationship between intellectual capital and profitability. This suggests that intellectual capital is a key driver in managing profitability.

The influence of intellectual assets on customer value, profitability and the relation between them

Afuah (1998) clarified that elements of intellectual capital should result in an increase in customer value and consequently profitability increase. This can be summarized in figure 5.10:

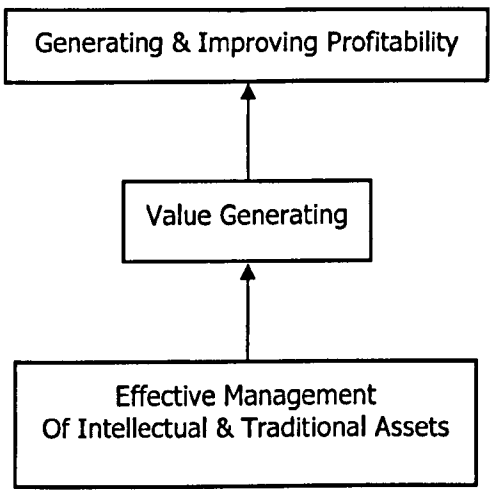
Figure 5.10 Intellectual Assets and Its Relation to Value & Profitability



Source: adapted from Afuah (1998)

This notion is supported by Finch (2006), who illustrates that value is generated through effective management of resources. He states that value generation is a stage that precedes profitability. This means that value generation leads to profitability generation. This can be summarized in figure 5.11:

Figure 5.11 The Relationship between Intellectual Assets Management, Value & Profitability



To sum up, it is apparent that intellectual assets are generally important. They have a special importance to profitability since they are its main and fundamental drivers. Therefore, this study assumes that generated profitability is a function of the way intellectual assets are managed. Here lies the importance of intellectual assets management. The development of such an approach is discussed in next section.

Developing the assets model

It is necessary after determining intellectual capital as a key assets driver, to introduce the approaches to value definition for intellectual assets. There are two main approaches to the definition of value (Boedker, Guthrie, and Cuganesan, 2005).

The first approach is the value realisation approach. This is based on counting a financial value for intellectual assets. It focuses on bridging the gap between the market and the book values of intellectual assets.

The second approach is the value creation approach. This approach is based on defining and identifying the intellectual resources that cause value creation. This involves more than just determining a financial value for the resources. This approach is based on the

assumption that the future financial performance can be predicted by non-financial performance. This approach is concerned with how to create and develop value through identifying value creation sources and studying how they can affect the company's current and future performance. According to Kaplan and Norton (2000; 2004a; and 2004b) the improvement in intellectual capital affected profitability through a chain of cause and effect relationships. This means that the use of value creation approach, which focuses on using non-financial performance in improving financial performance, leads to improved profitability. Therefore, the proposed assets model relies on a value creation approach in building and determining the measurement level of intellectual capital.

The measurement level of the proposed assets model is adapted from studies by Larsen, Bukh, and Mouritsen (1998); Canibano et al. (2002); Fabritius (2003); and Mouritsen, Bukh, and Marr (2004); which focus on the value creation approach. The main purpose of the proposed model is not to determine the financial value of intellectual assets or its different elements, but rather to help in realising the ultimate goal, i.e. achieving profitability. This is done through identifying and defining the main intellectual resources that cause value creation, analysis the current status of them, determining value added intellectual capital activities, and evaluating whether such activities achieve companies goals or not. This can be measured using both financial and non-financial indicators that are expected to affect profitability (Low, 2000; Bollen, Vergauwen, and Schnieders, 2005). Such indicators are adapted from (Kaplan and Norton, 1996, Canibano, Ayuso, Sanchez, Olea, and Escobar, 1999; Liebowitz and Suen, 2000; Phillips and Phillips, 2002; Canibano et al., 2002; De Pablos, 2003; Fabritius, 2003; Metwalli, 2003; Chen, Zhu, and Xie, 2004; Bose, 2004; Mouritsen, Bukh, and Marr, 2004; Abdel-Maksoud, Dugdale, and Luther, 2005; Al-Kheyal, 2005; Al-Gendy, 2005; and Essia, 2007). Therefore, it could be suggested that intellectual capital can be managed using three key stages, namely: analysis and evaluation of current status of intellectual assets; identification of value adding intellectual activities; and, evaluating results.

The measurement level of the proposed assets model

Before explaining the three proposed key stages that are used to manage intellectual capital in the proposed assets model, it is necessary to identify the current or potential intellectual resources that the company needs to create value. Intellectual resources differ from one company to another; there are no fixed, set resources which all companies depend on. However, there are four common resources which most companies depend on (Mouritsen et al., 2004 and Fabritius, 2003). Firstly, employees: this resource includes skills, individual's competences, experience, education, and

incentives. Secondly, customers, this resource includes the mixture of customers, customer and user relations, customer satisfaction and loyalty, customer and user needs, and the extent of cooperation with customers and users regarding product or service development. Thirdly, processes, this resource is represented by the activities related to knowledge or intellectual aspects, including routine processes and procedures, development and creation processes, quality procedures, control processes, and information storage processes. Fourthly, technology, this resource is represented by technological support for the above three resources, including software, internet, and information technology systems; the competence of employees in information technology; and the use of information technology. Each company selects and focuses on those resources that can contribute to the creation of use value, through linking the company's resources with customer needs.

Analysis and evaluation of current status of intellectual assets

This aspect is divided into two main stages. Firstly, identifying and evaluating main drivers. This is represented by the important factors associated with, and directly participating in, the process of value creation and achieving strategic goals. It is necessary to identify the main drivers for each of the main resources. Examples of these drivers are: developing the company's processes, building customer participation, high level training. It can be suggested that it is possible to collect data at this stage through conducting interviews and seminars with heads of departments, directors, and higher management, with the purpose of identifying these drivers at the level of each of the main resources. This stage also focuses on studying how these drivers are reflected in the company's vision and value. It is important to make sure that such drivers participate in the realization of the company's vision and the value creation. At this stage, two questionnaires for collecting information are suggested. The first questionnaire studies the likely effects of the proposed drivers on the company's vision. This questionnaire is designed for higher management. The second questionnaire seeks to examine the likely effects of the proposed drivers on the use value. This questionnaire is prepared for current or potential customers.

Secondly, analysing and designing current resources. This stage aims at determining the availability of the correct configuration of resources that directly participate in the realisation of strategic goals and achieving the effective management of the main drivers of the above-mentioned resources.

This stage is divided into a number of steps, as shown below:

- Identifying the goals and strategies of each resource. This is represented by identifying the company's ambitions, such as modernization and development of customer relations to achieve customer satisfaction, identifying the ambitions of employee training and achieving employee satisfaction, ambitions to modernize and develop information technology in the company, and ambitions to develop the company's operations. In other words, the company's goals are revised with reference to each of the main resources.
- Identifying current actions and practices. At this stage, the current actions related to each of the main resources are identified. For instance, the current actions and practices followed for modernizing and developing customer relations and obtaining customer satisfaction. Similarly, as far as employees are concerned, the current actions and practices followed for training and modernizing employees and achieving employee satisfaction are identified. The same applies to the other main drivers. Data in the above two steps can be collected by referring to the company's internal work.
- Evaluating the current goals related to each main resource, with reference to the extent to which it contributes to value creation and to its effect on the set goals and.
- Evaluating the current actions and practices for each of the main resources, with reference to the extent to which it contributes to value creation and to its effect on the goals and on the proposed performance drivers at the previous stage.

It is proposed that the data related to steps three and four can be collected through conducting seminars and interviews, and preparing questionnaires that discuss the current actions and practices and goals and their reflections on the main drivers as well as on used value. To conclude, this stage is concerned with determining the sufficiency and appropriateness of the current goals for value creation, and, in the case of their insufficiency, whether there is a need for developing more ambitious goals. It is also concerned with whether the current actions and practices are sufficient and appropriate to reach the strategic goals and create value, or need development, or need the introduction or merge of other actions for this purpose. It can be argued that in order to thoroughly analyse and evaluate the current position, it is necessary to set up a set of indicators that help the process of analysis and evaluation at the level of each main resource. Among the indicators proposed to be used at this stage are illustrated in table 5.3 (by way of example and without limitation).

Table 5.3 Proposed Indicators for Analysis and Evaluation of Current Status of Intellectual Assets

Indicators used in the analysis and evaluation of current employee practices:	*Indicators used in the analysis and evaluation of current customer practices:*
• Total number of employees; • Service period; • Distribution of employees; • Average age; • Official education and training; • Staff-turnover; • New recruitment; • recruitment costs; • Distribution by type; • Average number of permanent employees; • Distribution of employees over different tasks; • Percentage of employees holding master's and doctor's degrees; • Percentage of key employees; • Number of directors; • Number of part-time employees.	• Marketing costs; • Names of important customers; • Percentage of new customers in relation to total customer number; • Annual sales for each customer; • Average size of a customer's order; • Current customer turnover; • Percentage each customer represents as a part of company operations; • Number of new products; • Number of competitors' new products; • Distribution of revenues over markets and products; • Rate of product and customer distribution over markets; • Volume of defective production; • Normal delivery time; • Customers with highest rate of turnover; • Change in customer numbers.
Indicators used in the analysis and evaluation of current status of processes:	*Indicators used in the analysis and evaluation of current IT practices:*
• Distribution of employees over processes; • Total operating time; • Current year's production volume; • Current year's production costs; • Repair and re-operation costs; • Number of orders of supply; • Process stopping time; • Investments in research and development; • Process time; • Number of days off; • Number of projects carried out with external participation (explanation of project type, tasks, and sold items).	• The company's IT capacity (total investments in IT); • Number of computers per employee; • Number of internal IT customers; • Number of external IT customers; • Number of services provided through the Internet; • Amount of information and data on the company's site on the Internet; • Number of IT centres or departments; • The ratio of programmers to the number of employees; • Database updating rate.

The following table summarizes the stage of analysis and evaluation of current status of intellectual assets:

Table 5.4 Analysis and Evaluation of Current Status of Intellectual Assets

Intelle--ctual Assets	Performance Main Drivers	Identifying Current Goals	Identifying Current Actions And Practices	Evaluating Current Goals	Evaluating Current Practices	Proposed Indicators for Analysing & Evaluating Current Practices
Intellectual assets resources (Customers, Employees, Processes and Technology	What are the important factors related to intellectual assets resources (customers, employees, processes and technology) which are associated with, and directly contributing to the process of value creation?	What are the company's current ambitions for increasing and developing intellectual assets resources?	What are the current actions and practices related to intellectual assets resources (with the purpose of realising each of the current goals)?	Are the current goals related to intellectual assets resources sufficient or do they need development?	Do the current intellectual assets resources related practices participate in reaching the main drivers and creating value?	What are the appropriate intellectual assets resources' indicators that can help in providing data on the current status and in evaluating the current practices of intellectual assets resources?

Source: adapted from Fabritius (2003)

Identification of value adding intellectual activities

This stage is concerned with the identification of the activities necessary for creating value, which are represented in the company's actions and practices for significantly developing, improving, and increasing its intellectual resources. Examples include developing specific marketing activities for achieving customer loyalty, customer service training activities, forming research and development or software programmers' committees, organizing training programmes in the company's processes, investments in processes, and education activities, etc. Activities may differ from one company to another, or, in the same company, from time to time, even if the performance main drivers are the same.

In order to identify the targeted activities the following alternatives must be studied: introducing new intangible activities, developing current activities, eliminating some or merging some activities with a view to achieving strategic goals. In this respect, it is necessary to observe the relative importance of each activity. Focusing on some of the activities is more important than others since they play a more important role in giving a relative advantage to the company. In order to choose from among the alternatives, the effect of each alternative on the value creation should be studied, in addition, using a number of indicators proposed at this stage for each of the resources. These indicators illustrate in table 5.5.

Table 5.5 Proposed Indicators for Identifying Value Adding Activities

Proposed Indicators for identifying customer-related activities: • Number of customers per employee; • Ratio of marketing costs to income or revenue; • Ratio of administrative costs to marketing costs; • Number of orders delivered in time; • Post-sale services; • Marketing costs per customer; • Ratio of marketing costs to total costs; • Information costs for each customer; • Number of days allocated for exhibitions, customer meetings and training; • Number of pamphlets printed for customers to introduce product to them; • Costs of support per customer per annum; • Costs of service per customer per annum	*Proposed Indicators for identifying employee-related activities:* • Training and teaching costs per employee; • Number of training days per employee; • Employees' participation in setting plans; • Number of employees participating in each task; • Annual costs of internal and external courses; • Costs of new ideas generated by employees; • Number of training or teaching hours.
Proposed Indicators for identifying process-related activities: • Ratio of research and development costs to management costs; • Investments in research and development; • Quality improvement costs; • Throughput rate; • Total throughput time; • Defective production costs; • Total of supply orders delivered by each supplier; • Product development time (the time from the product as an idea till the completion of its development); • Customer response time (the time from customer's order till delivery); • Breakdown time; • Process development time; • Percentage of time used in development; • Total quality application and improvement costs.	*Proposed Indicators for identifying technology-related activities:* • Costs of new capital investment; • Costs for software and computer machines purchase and maintenance; • Research and development costs; • Continuous development of the company's site on the Internet; • The ratio of IT to management costs.

Evaluating results

The general goal for the evaluation stage is to judge the company's effectiveness in intellectual asset management. This is realised through evaluating whether the activities and actions proposed have been applied, as well as evaluating the effects of its application and reflection for each resource. In this respect, a proposed set of indicators can be used in evaluating the results for each of the intellectual resources, as shown below:

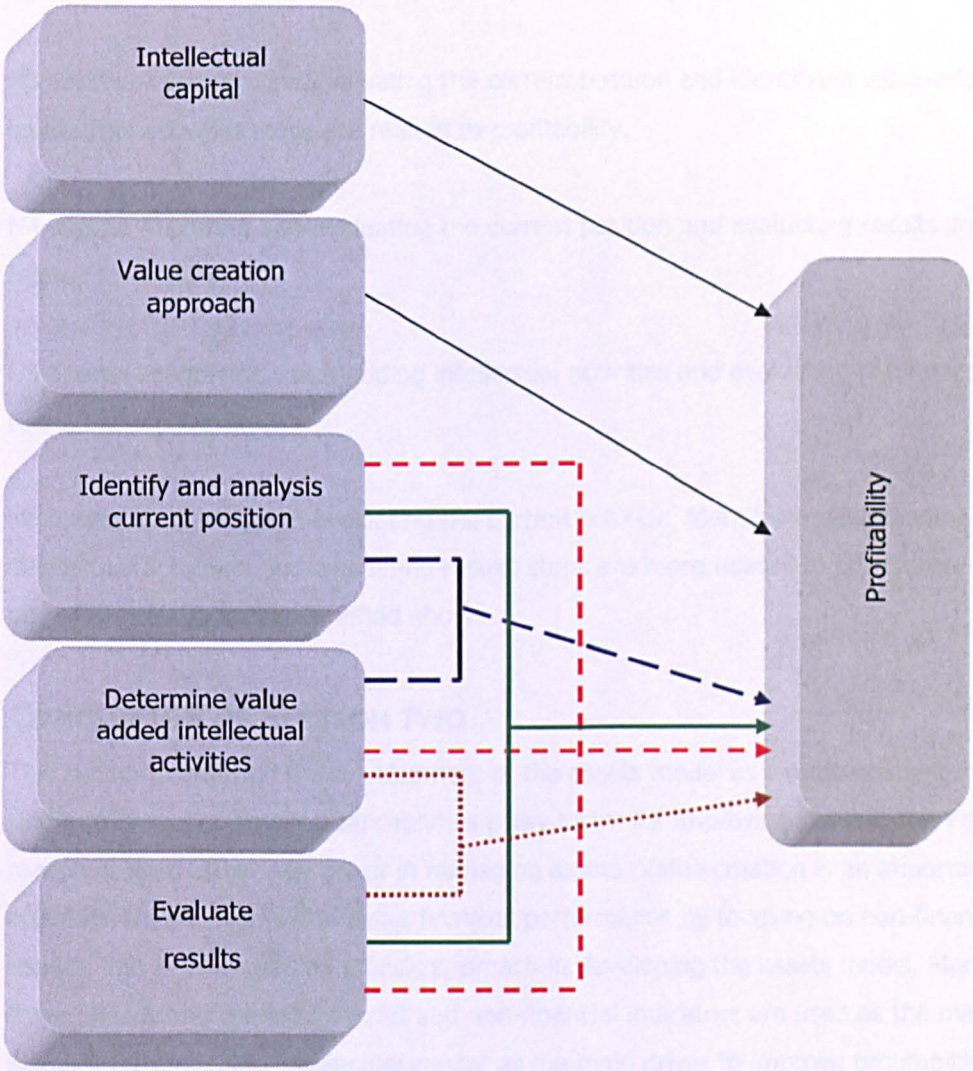
Table 5.6 Proposed Indicators for Evaluating Results

Indicators proposed for evaluating customer-related results:	*Indicators proposed for evaluating employees-related results:*
• Customer satisfaction; • Customer loyalty; • Rate of long-term customers; • Quality rate; • Competitive superiority rate; • Post-sale service development rate; • Decrease in percentage of returned goods; • Current customer turnover rate; • Ratio of lost customer to total customers; • Ratio of new products to total sold goods; • Rate of new customers.	• Employee satisfaction; • Incentive index; • Sick leave; • Added value per employee; • Employee loyalty; • Employees turnover rate; • Employee daily performance rate; • Profit ratio to the number of employees; • Savings resulting from applying employees' suggestions; • Ratio of employees leaving work to total number of employees.
Indicators proposed for evaluating process-related results:	*Indicators proposed for evaluating technology-related results:*
• Error rate; • Waiting time; • Development rate in throughput time; • Development rate in product development time; • Ratio of defective production to total production; • Quality cost rate; • Cost of production unit; • Number of quality standard certificates; • Efficiency of operating cycle; • Complaint index rate.	• Obtaining IT licences; • Technological development rate; • Competences in IT; • Development rate in knowledge and IT; • IT performance development per employee.

Figure 5.12 describes the conceptual assets model. In the first part of the model, the independent variable is intellectual capital as the main assets driver and the dependent variable is profitability. In the second part, the independent variable is the value creation

approach and the dependent variable is profitability. In the measurement level of the model, the independent variables consist of analysing and evaluating the current position, identifying value-adding intellectual activities, and evaluating results; and the dependent variable is described by profitability.

Figure 5.12. The Proposed Assets Model



The proposed assets model reflects how intellectual capital as the main assets driver affects profitability. In addition, it reflects how the value creation approach affects profitability. Furthermore, such a model reflects how the integration between the three proposed steps affects profitability to determine which of the various combinations of the measurement level variables provides best explanation of profitability. In essence, it is assumed that the integration between the three steps better predicts the level of profitability than the use of any combination between any two variables. Therefore, it is

anticipated that the more the proposed assets model containing the three steps is used, the more profitability is achieved. Thus hypotheses related to the assets model can be formulated as follows:

H1 assets: Intellectual capital is positively associated with profitability.

H2 assets: The value creation approach is positively associated with profitability.

H3 assets: Analysing and evaluating the current position and identifying value-adding intellectual activities steps are related to profitability.

H4 assets: Analysing and evaluating the current position and evaluating results steps are related to profitability.

H5 assets: Identifying value-adding intellectual activities and evaluating results steps are related to profitability.

H6 assets: Analysing and evaluating the current position, identifying value-adding intellectual activities, and evaluating results steps are more related to profitability than any of the relationships identified above.

CONCLUSION OF SECTION TWO

This section concerned the development of the assets model as a main element in the profitability model. Intellectual capital is a key factor for improving profitability. For this reason, it used as the key driver in managing assets. Value creation is an important approach that concerns improving financial performance by focusing on non-financial aspect. This is employed as a basic approach in developing the assets model. Moreover, three phases and related financial and non-financial indicators are used as the main element for managing intellectual capital as the main driver to improve profitability.

SECTION THREE. REVENUE MODEL

Introduction

Before explaining the proposed model for managing revenue, it is necessary to distinguish between the general meaning of revenue management in the accounting literature and the specific meaning of this term in the context of this research.

The concept of revenue management in accounting literature:

The term revenue management emerged as an alternative term to yield management (Yeoman and McMahon, 2004). Smith, Leimkuhler, and Darrow, (1992) defined revenue management as the application of information systems and pricing strategies to allocate the right capacity to the right customer at the right place at the right time. This is further supported by Kimes (1999) who explained the meaning of revenue management as: allocating the right capacity to the right customer at the right time with the aim of maximizing the yield of possible revenue. He added that the main goal of this approach is to achieve higher revenue for a given capacity. Yeoman and McMahon (2004) added two dimensions to the previous definitions, which are selling the right product at the right price with the right supply. According to Yeoman and McMahon, in practice yield management has meant setting price depending on predicted demand levels, so that price-sensitive customer who are willing to purchase at off-peak times can do so at favourable price, while price-insensitive customers who want to buy at peak times will be able to do so.

This approach was developed in the service sector, and it is particularly useful to companies constrained by capacity, such as airlines, hotels, cruise lines, and car rental firms (Kimes, 1989a, 1989b). Yeoman and Ingold (1997) summarized the attributes that companies must have to apply this approach in the following:

- Relatively fixed capacity.
- Demand is variable and uncertain.
- A perishable inventory.
- High fixed cost.
- Low variable cost.

On one hand the above meaning of revenue management focuses particularly on managing pricing and demand in the service sector. On the other hand, revenue management in the context of this research focuses particularly on managing customer value i.e. how to maximize customer value using financial and non financial approaches?. Therefore, the main purpose of this chapter is to prepare a model for managing revenue

from the perspective of customer value by studying, analysing and suggesting management accounting techniques for managing customer value.

To achieve this purpose this section analyses and explains the following elements: firstly, it seems to determine the most important driver for managing revenue for the purpose of profitability management. Secondly, it aims to explain and manage the value that the customer obtains from the company using a suggested model for this purpose. Finally, it explains and manages the value that the company obtains from the customer using customer profitability analysis. This section ends by hypothesizing relationships in this model.

Determining the revenue driver for the purpose of profitability management

The relationship between the customer-focus strategy and company profitability

Many studies have focused on the relationship between the customer-focus strategy and company profitability. The following analyses such studies. The main variables that affect the profitability of the company were examined by (Thomas, 1998). One of the findings of this study is that the only variable related to long-term profitability is building customer relationships, rather than the volume of sales or the market share. This is further affirmed by Ahmed (2003), who states that 95% of the profitability of companies is generated by customers with long-term relationships with the companies.

Magdy (2002) stresses on the importance of customer focus for companies in the modern business environment. According to Magdy marketing based on the notion of customer focus has become one of the basics of businesses'. It has major advantages, such as increasing profitability; improving customer satisfaction and loyalty; increasing workers' incentives; and improving and developing the marketing and sales function. Similarly, Brewton and Schiemann (2003) illustrate that customers have become the actual assets of companies, and that they can be considered as important as the products. They stated that it is necessary to change the focus of companies from process-oriented and product-oriented, to a customer-oriented strategy. This leads to improving the financial results of the company, since it helps increase revenues through boosting sales, determining the most profitable customers, and hence increasing the company's profits in general. This is further affirmed by Kim, Suh, and Hwang (2003) who show that shifting to customer focus is one of the most important strategies that is currently used for increasing revenues and profits.

From the above it is shown that there is a direct and essential relationship between customer-focus and improving the company's profitability. Therefore, customer has been chosen as the main driver of revenue management for the purposes of profitability management.

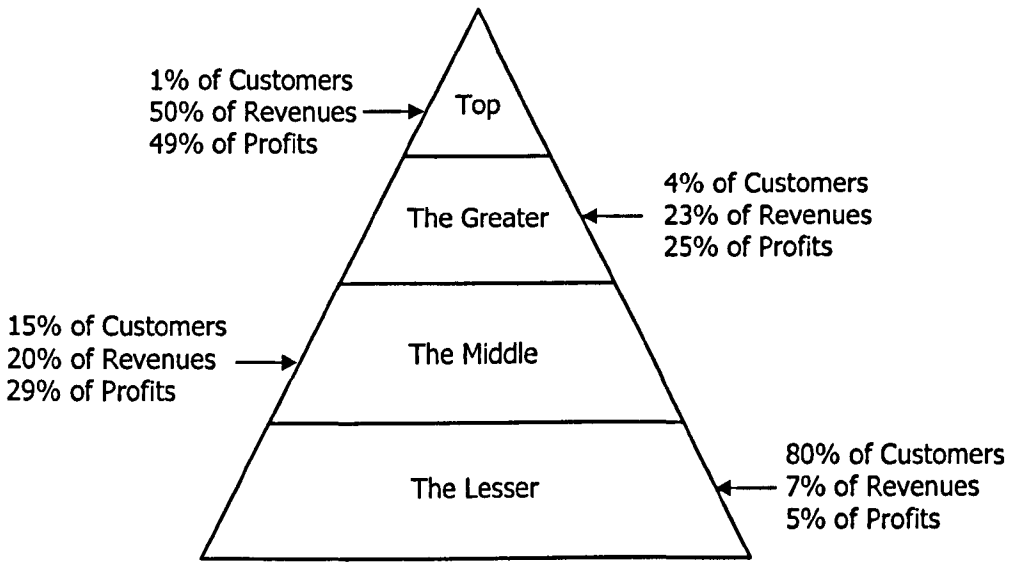
Reasons for preparing a customer-management model

Given the importance of the customer as a main driver for profitability improvement, it is important to develop an accounting model that consists of strategic management accounting techniques for customer management. This is based on a number of reasons highlighted in the following discussion.

Three reasons for using a specific approach for customer relationship management are suggested by Brewton and Schiemann (2003). Firstly, the company looses about 20% of its customers in an average year. Secondly, the cost of acquiring a new customer is much higher than the cost of retaining a current customer. Thirdly, reducing the percentage of customer loss by 5% can increase profit at a rate ranging between 25% and 100%. The third reason was confirmed previously by a study conducted by Reichheld and Sasser (1990), which examined the relationship between profitability increase and reducing customer loss through the analysis of more than 100 companies in 24 service industries. One of the results of the study was that profitability can be raised by a percentage ranging between 25% and 85% by reducing the customer loss rate by 5%. Brewton and Schiemann (2003) state that many studies have indicated that 50% or more of the variations between the average financial performances measured by return on sales are due to the differences in the mechanism of customer relationship management.

A key study in this context has been conducted by Tibergien (2003), which has shown that businesses have an 80-20 rule which states that 80% of a company's profits are generated by dealings with 20% of that company's customers. This means that the remaining percentage, represented by the other 80%, generates losses to the company. This is further supported by the study conducted by Raaij (2005), which has shown that the great majority of customers do not achieve profits, and that only a small proportion of customers contribute to achieving profits. Raaij has represented this idea in his "customer pyramid" as illustrated in figure 5.13.

Figure 5.13 Customer Pyramid



Source: adapted from Raaij (2005)

It could be proposed that these percentages may differ from one company to another and from one industry to another. The percentages are only a general indicator that it is a small proportion of customers that contribute to the generation of the largest proportion of profit, and that the majority of customers generate little profit or a loss. In other words, the majority of customers do not add any value to the company.

It can be concluded from the above that it is necessary to develop effective models for customer management for the purpose of revenue management, and, accordingly, profitability management from a strategic perspective.

Current Approaches to Customer Management

There are two main approaches to customer management which have been the focus of most recent studies and treatments of the subject. These are the customer relationship management approach and the customer value management approach. The following provide a brief account of each approach.

Customer Relationship Management Approach

The customer relationship management approach can be represented in management efforts exerted in the analysis, planning and controlling of the company's relationship with its customers, with a view to attracting and retaining relationships with the more important customers (Kim et al., 2003). The application of this approach requires a

working environment that believes in the philosophy of putting the customer at the top of priorities (Forsy, 2003). It also requires the availability of means of advanced information and communication technology, as well as the combination of processes and technology that seek to understand the company's customers (Kraeuter, Moedritscher, Waiguny, and Mussning, 2007).

The importance of the Customer Relationship Management Approach

There are many proposed advantages that might result from the application of the customer relationship management approach. Kim et al. (2003) showed that the most important advantages are, increasing customer retention and loyalty; increasing customer profitability; creating customer value; and improving product or service quality.

It can be seen from the above that customer relationship management focuses on only one direction, namely, how to manage the value provided by the company to the customer, in addition to improving and developing the company's relationship with the customer. However, this approach does not include how to manage the value provided by the customer to the company, which is proposed, drives growth in profitability. Customer relationship management should be associated with growth in profit as well as searching for approaches that increase the customers' contribution to profits.

Customer Value Management Approach

Advocates of the customer value approach believe that companies must change their orientation from customer relationship management to customer value management (Armour and Mergy, 2003).

The concept of the Customer Value Management Approach

Customer value was described by Armour and Mergy (2003) as similar to a two-way street, where value represents the value provided by the company to the customer and the value provided by the customer to the company. This is further affirmed Howes (2003) in his concept of customer value management, which defined customer value management from two dimensions: the first one is the financial and non-financial value that the customer gets from the company; the second one is the financial and non-financial value that the company gets from its customers within a limited period of time.

The impact of the customer value management approach on profitability

Studies indicate that the application of customer value management has a considerable effect on the company's profitability. Gale (2000) indicated that companies that use the customer value approach achieved return on sales greater than other companies. This is further confirmed by Howes (2003) who noted that the application of this approach is expected to increase companies' profitability at a rate of about 10% per annum. Moreover, Brewton and Schiemann (2003) suggested that the variations between financial performance are due to the difference in mechanisms for managing customer value. This means that customer value is a critical approach for generating profitability (Cokins, 2006). Therefore, the customer value approach is advocated in the revenue model as far as its emphasis on the two dimensions of value is concerned. However, it has drawbacks, represented by the lack of studies on the role of management accounting and the use of management accounting techniques in the management of the two value dimensions.

The measurement level of the revenue model

Customer focus is selected as the main revenue driver in the proposed revenue model. Customer value management is also adopted as the key approach for managing revenue within the revenue model. After determining the key driver and the key approach that have been used in developing revenue model, it is necessary to determine how revenue could be managed from customer value management approach perspective. This is done at the measurement level of the revenue model by determining the appropriate strategic management accounting techniques to manage each value dimension in the suggested approach.

The value that the customer obtains from the company

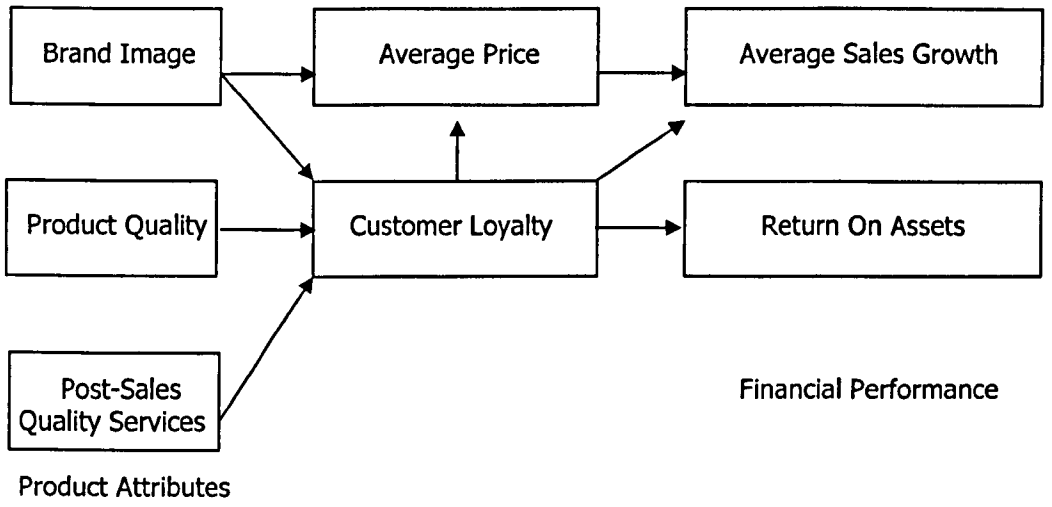
The value that the customer obtains from the company is translated into behavioural results represented mainly in customer satisfaction and loyalty. Therefore, the objective must be to increase customer satisfaction and boost loyalty in order to achieve the customer's value and improve profitability. Customer satisfaction and loyalty have been proposed as sub-drivers in managing revenue for purposes of profitability management. This is further supported by many studies that have examined the relationship between satisfaction and loyalty on the one hand and profitability on the other hand. The following are examples of such studies.

The relationship between customer loyalty and profitability in the banking sector was examined by Gronsted (2000). The study has shown that increasing customer loyalty by 5% results in doubling profitability. This affirms that profitability increases with the increase of customer loyalty.

This is further supported by the study conducted by Kaplan and Norton (2001), which stated that if the company achieves value for its customers, this will necessarily result in their loyalty to the company, and will consequently achieve profitability. According to Reichheld and Sasser (1990); Kaplan and Norton (2001); and Reinartz and Kumar (2002), loyal customers are the most profitable to the company, since they do not attract any marketing costs. In addition, these authors stated that these customers are more ready to pay more money for their trust in the product or the service. They have reached an important conclusion, which is that dealing with loyal customers is the main driver for achieving good financial results; this informs the perspective taken in this research.

This relationship between customer loyalty and profitability has been further developed by the study conducted by Smith and Wright (2004). They examined the relationship between the product attributes represented in the brand image, the quality of the product, and the post-sale services on the one hand, and customer loyalty and financial results on the other hand. The study was applied to pioneering computer manufacturing companies. Smith and Wright concluded that there is a strong relationship between the product attributes and customer loyalty, as well as between customer loyalty and revenue growth and profitability. The increase of customer loyalty results in a rise of the product's average price. Both are associated with the growth of sales. In addition, sales growth and customer loyalty leads to positive results in the average return on investment. The results of Smith and Wright's study can be summarised in figure 5.14.

Figure 5.14 Relationship between Customer Loyalty & Financial Performance



Source: adapted from Smith and Wright (2004)

The Smith and Wright's study is one of the most important studies supporting the selection of loyalty as a sub-driver of profitability management.

A significant study in this area was conducted by Al-Hawwary (2001), which focused on the relationship between customer satisfaction and sales revenue. Al-Hawwary states that customer satisfaction has become a major concern for many companies, since around 70% of the sales of companies are generated by retaining their current customers. This requires conducting research that enables the company to know how to apply a customer satisfaction strategy. It also showed that the company's success in achieving profits is realized through satisfying the customer's needs and requirements. This study suggests that, in order to realize a high level of customer satisfaction and loyalty, it is essential to obtain the appropriate information for judging customer satisfaction and loyalty, and put it into a measurable form. This is further confirmed by Rucci, Kim, and Quinn (1998); and Anderson and Mittal (2000) who empirically investigated the impact of improvement in customer satisfaction on profitability. They concluded that improvement in customer satisfaction leads to increase profitability. It can be concluded that customer satisfaction is a key element that affects profitability (Fornell, Amburg, Morgeson, and Bryant, 2005).

How to manage the value obtained by the customer is adapted from Eissa (2007). He suggests the following steps to manage this value:

1. The goal-setting stage: it is necessary first to set the goals behind customer value management, represented in improving customer satisfaction and loyalty, as well as attracting more customers, in order to achieve the general aim of profitability improvement.
2. The customer-recognition stage: at this stage, data are collected about the customers, including their number, type, and characteristics. In addition, customers' data are analysed with a view to understanding their needs. This requires high technological ability, availability of marketing networks, and making visits and interviews with customers. The responsibility at this stage lies with the company's marketing staff.
3. The customer interaction and attracting new customers stage: this stage aims to maximise communication channels with customers to achieve interaction. Such channels are represented by the use of telephones, electronic mail, visits, and standardization and simplification of payment techniques. It also aims to attract new customers by intensifying marketing campaigns. The responsibility at this stage lies with the sales and marketing staff.
4. The receiving orders and product/service delivery stage: this stage aims to improve the efficiency of operation, reaching a high level of quality, and reducing the product or service delivery time. The responsibility at this stage lies with the production staff.
5. The post-sale service stage: this stage aims to improve the service provided to customers, through reducing the response time for customer inquiries, as well as minimizing making the maintenance and repair services available at all times and as soon as possible. The responsibility at this stage lies with the sales, production, and maintenance staff.
6. The measurement stage: it could be appear that the above stages provide data for judging customer satisfaction and loyalty, which is considered an important indicator for judging the overall profitability of the company. There is no doubt that what is not measurable is not manageable. Therefore, this stage aims at setting indicators and standards for measuring customer satisfaction and loyalty. The responsibility at this stage falls upon the management accountant.

Customer satisfaction

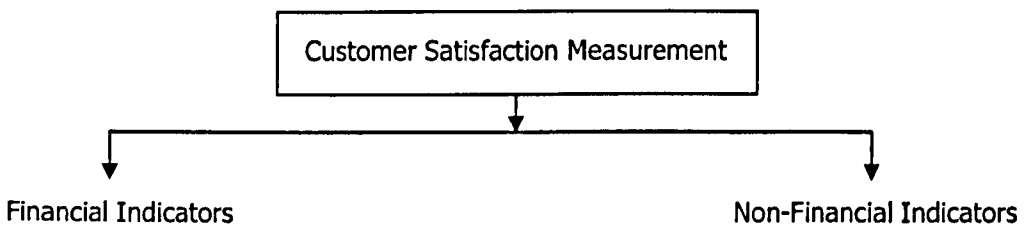
Customer satisfaction can be realized if the customer obtains the following needs (Hassan, 2003):

- A product that performs its functions with the attributes for which the purchase price has been sacrificed;
- A product that is delivered on time;

- A product that is delivered without defects;
- A product that does not fail after a brief period of use;
- A product that does not repeatedly fail during its period of validity.

Therefore, customer satisfaction measurement represents an attempt to define the customer's view of the products and services provided by the company and to show the problems faced by customers when they deal with the company.
Customer satisfaction measurement is proposed based on two main pivots, as shown by the following Figure:

Figure 5.15 Customer Satisfaction Measurement



There are many financial indicators that can be used to judge customer satisfaction, the most significant of which are suggested by Hassan (2003) as follows:

- Repair and replacement costs during the guarantee period;
- Legal liability costs (fines, compensations, penalties, etc.);
- Decrease of sale prices because of bad quality;
- Opportunity cost for lost sales; and
- Total investments spent on customer satisfaction.

There are many non-financial indicators for customer satisfaction measurement. The following are some examples:

- The average time taken to meet customers' orders. In this respect one can depend on the delivery performance measurements, which focus on the "delivery cycle time" (Hassan, 2003).
- The frequency of delayed deliveries. The company's management seeks to reduce this indicator to a zero rate, which reflects a rise in the quality of service provided to customers (Eissa, 2007).
- Rate of delivery time commitment (Hassan, 2003).

- The number of returned units in relation to the total number of sold units during a given period of time (Hassan, 2003).
- The percentage of faulty orders needing to be replaced, with a view to measuring and analysing such orders in relation to the total production orders during a given period of time. The lower this indicator is, the higher the quality, and hence the higher the degree of customer satisfaction (Eissa, 2007).
- The number of repair claims during the period of guarantee in relation to the number of units sold (Hassan, 2003).
- The number of daily inquiries by the customers (Kim et al., 2003).
- The percentage of service level (response to customer inquiries). This is measured by the number of inquiries responded to in relation to the total number of inquiries (Kim et al., 2003).
- The number of customer complaints in relation to the number of sold units and to the total number of customers during a given period of time (Hassan, 2003). Marketing management aims to reduce this number to a minimum to achieve meeting customer requirements as much as possible and hence achieving customer satisfaction.
- The percentage of customer complaints that have been resolved in relation to the total number of customer complaints. The higher this indicator is, the higher the level of service provided for customers, which is in turn, an indicator of customer satisfaction (Eissa, 2007).

Both financial and non-financial indicators are used in the revenue model to measure customer satisfaction for the purposed of profitability management.

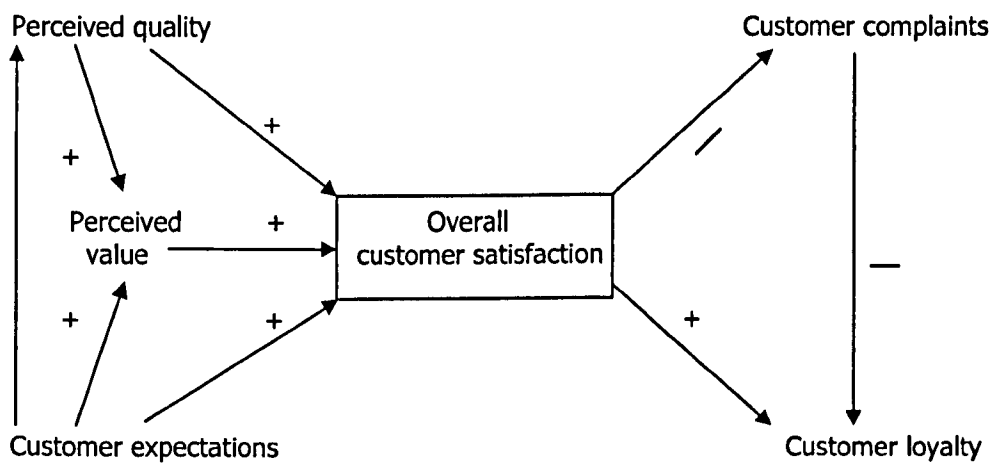
Customer loyalty

This refers to the tendency of current customers to obtain products and services from the same company in the future. Customer loyalty represents the main key to customer retention (Kumar and Shah, 2004). Customer loyalty can be translated into measurements as shown below (Balogu, 2004):

- The change in customer numbers over three years;
- The growth rate of sales resulting from current customers;
- The percentage of sales by current customers;
- The percentage of customers who have stopped dealing with the company.
- Marketing investments in customer loyalty.
- The rate of investments in research and development for current customers.

In this respect, it should be emphasised that there is a strong relation between customer satisfaction and customer loyalty (Heskett, Jones, Sasser, and Schlesinger, 1994; Helgesen, 2006). This is explained by Fornell, Johnson, Anderson, Cha, and Bryant (1996), who proposed an American Customer Satisfaction Index Model, illustrating the most significant drivers affecting customer satisfaction on the one hand, and the relationship between customer satisfaction and customer loyalty on the other. This indicator can be illustrated in figure 5.16.

Figure 5.16 The American Customer Satisfaction Index



Source: Fornell et al. (1996, p.8)

This study found that the increase in customer satisfaction results in reducing customer complaints and hence increasing customer loyalty, i.e. the fewer the complaints, the greater the loyalty. This illustrates the company's success in turning customers who present complaints into satisfied customers.

Managing the Value that the Company Obtains from the Customer

It can be suggested that the value that the company obtains from customers is represented by the profits gained from dealing with such customers. In order to manage this value, there must be a technique for managing and improving the profits gained in this way. In this context, customer profitability analysis is suggested to manage the value obtained by the company from the customer.

The concept of customer profitability analysis

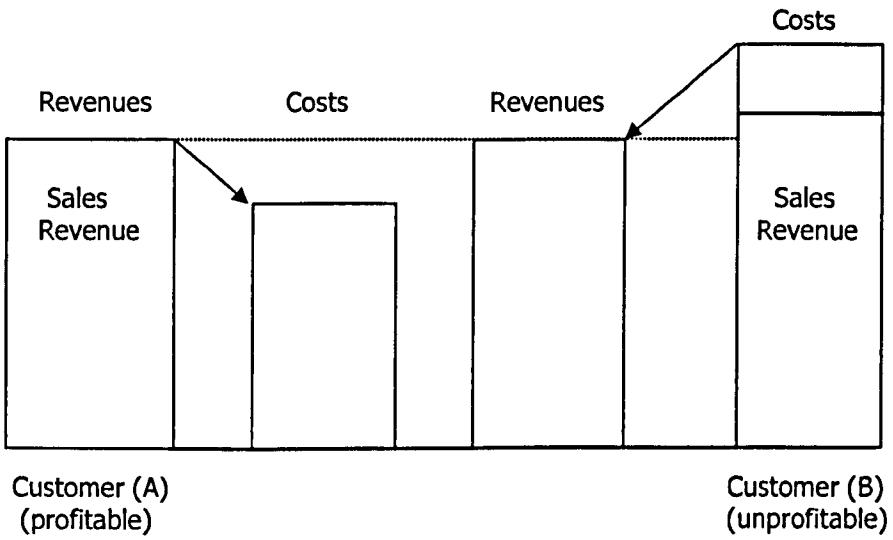
The concept of customer profitability analysis has been discussed in many studies. According to Smith and Dikolli (1995), customer profitability analysis refers to the reporting and analysis of customer revenues and customer costs. This is further developed by the study conducted by Mohamed (1998), which defined customer profitability analysis as the description and recording of the contribution of each customer or group of customers to the company's profit, provided that the contribution to profit represents the difference between the revenues earned from the customer and the total costs related to such customer. This is further supported by Raaij (2005), who viewed customer profitability analysis as the process of revenue and cost distribution for a segment of customers or an individual customer by applying the activity-based costing approach. This definition focuses on the approach suggested for customer profitability analysis, i.e. the activity-based costing approach. Horngren, Dater, and Foster (2006) add a key dimension in their definition which is analysis, and they explain that customer profitability analysis is based on reporting and analysing revenues earned from customers and the cost incurred to earn those. This analysis explains the reasons for income differences among customers, with the result of focusing on the customer who significantly contributes to income.

From the above definitions, it can be concluded that customer profitability analysis is a technique for recording and analysing all the revenues earned from customers, whether at the individual customer level or at the group level, and the costs incurred to earn such revenues, with a view to defining the contribution of each customer, or group of customers in achieving company's profit. This means that profits are calculated at the level of customers rather than products.

The impact of customer profitability analysis on profitability management

This technique provides information that is helpful in determining the reason why some customers may achieve profits for the company while others may not (Mohamed, 1998). This is realized through the cost analysis for each customer or group of customers, which is known as "customer relationship cost". This has been explained by Raaij (2005) in his example of two types of customers, the first symbolized by the letter "A" and the second by the letter "B", who have the same quantity of sales. Customer B, however, has a higher sales cost.

Figure 5.17 Cost and Revenue Analysis of Two Customers



Source: adapted from Raaij (2005)

Figure 5.17 shows that although the two customers have the same quantity of sales, the customer relationship costs make a difference in loss and profit between them.

Information about the profitability of each customer makes it possible for the company to make decisions about improving, cancelling, or adding a certain activity and about the management of those activities that cause customer profitability. It also helps the company to take the right action to turn unprofitable customers into profitable ones. In addition, it helps the company to determine the best strategy for dealing with customers who cause permanent losses to the company and turning non-profitable customers into profitable ones. This results in improving the company's overall profitability.

This technique provides information that is helpful in making pricing decisions, and hence in improving revenue and profitability management (Raaij, 2005).There are three important and effective factors that are related to price which are: discounts, pricing value adding services, and distinguished pricing. The role of the information provided by customer profitability analysis in pricing decisions can be outlined in the following points:

- In the case of lack of information on customer profitability, discount is usually made on the basis of the volume of sales. It is then possible to give the group of customers with a large sales volume a higher discount than the group's customer profitability. On the other hand, the availability of information on customer profitability helps to

make appropriate decisions concerning the discount policy granted to customers (Noone and Griffin, 1997, 1998; and Krakhmal, 2006).

- The information provided by customer profitability helps in developing strategies for distinguished pricing, where customers are divided into profitable customers, break-even level customers and unprofitable customers. Such information can enable the company to set different levels for different categories of customers. In other words, this information allows the categorization of customers into groups between which differences in services, prices, and discounts can be determined.

In order to increase the effectiveness of the customer profitability analysis technique and realize the desired objectives, it is necessary to use the activity-based costing approach (Noone and Griffin, 1997, 1998; and Krakhmal, 2006). This is further confirmed by Lawson, Hatch, Desroches, and Stratton (2010) who evaluate the features of companies that have a successful profitability system. A key finding of their study indicates that these companies use activity- based costing to determine cost and profitability at the customer level. Using an activity-based costing approach in customer profitability analysis offers many advantages, the most important of which are suggested by Mohamed (1998) as follows:

- Measuring the effectiveness of the main processes made by the company, and determining techniques for increasing and improving their efficiency through avoiding wastage.
- Allocating the company's revenues to activities that create value.
- Increasing awareness of costing and the costs specified for the customer.
- Providing a quantitative basis for more accurately measuring product costs and customer profitability analysis.

Customer profitability analysis steps

The following package of steps can be suggested for performing customer profitability analysis.

Firstly, determining the customers who dealt with the company within a certain period of time (Raaij, 2005).

Secondly, classifying customers according to distribution areas, average demand value, or the volume of their purchases (Salem, 2002) as follows:

- Classifying customers in accordance with distribution zones: customers vary according to their areas, with respect to the volume of sales and the kind of products and services provided to them. Therefore, costs vary from one area to the other. As a result, it will be possible to judge whether or not such a zone achieves profits based on the costs of that zone.
- Classifying customers in accordance with the average value of demand: a large proportion of demands come from customers for whom the company incurs costs that exceed the revenues generated by them. Therefore, the company should specify the minimum value of purchase for each demand, with the result of reducing costs and increasing profits.
- Classifying customers according to the volume of their purchases: this classification does not differ from the one above, except that it is based on the number or quantity of the units sold to customers. Therefore, this classification helps recognize which volumes of purchase are the most profitable.

Thirdly, determining the revenues of each customer, or group of customers, according to the selected classification, by tracing as many revenue items as possible. Revenues are calculated by multiplying the number of sold units by (sales price - discount price).

Fourthly, determining customer costs, by using an activity cost approach. In this respect, it should be noted that the activity-based cost approach applied here aims at customer profitability rather than product profitability. This results in variation of cost drivers according to the variation of aims (Smith and Dikolli, 1995). This variation can be illustrated by the following example. With reference to delivery costs, when the objective is to measure customer profitability, the driver will be the distance taken to actually transport the product to the customer. However, when the objective is product profitability, the driver will be the volume or weight irrespective of the place of delivery.

The following is an outline of the steps for determining customer costs using the activity-based costing approach:

- Categorising cost related to customers into different cost pools by using a customer cost hierarchy (Horngren et al., 2005):
    - Customer output-unit-level costs: these include all resources used in activities performed to sell each unit.
    - Customer batch-level costs: these include resources consumed by activities related to a group of units.

- Customer-sustaining costs: resources consumed by activities that support individual customer regardless of the number of units.
- Distribution-channel costs: resources consumed by activities of a specific distribution channel.
- Corporate-sustaining costs: these include the resources consumed by activities that cannot be traced to individual customer or distribution channels such as administration costs.

- Specifying and classifying customer activities. There is no specific classification for customer activities. Smith and Dikolli (1995) classified the activities into four categories. These are, delivery policy (shipping frequencies, freight fleet requirements, distribution), accounting procedures (sales credits, debtor collection support, order processing), inventory carrying (inventory support, distribution support, holding requirements) and purchasing patterns (volume discounts, size of agents' commissions, sales support, service to maintain product distributed by customers). However, Morse, Davis, and Harlgraves (2003) classified customer activities into: advertising and publicity; packaging; freight and transport; delivery of goods to customers; debt collecting; inventory management; customer management; and post-sales service. It can be suggested that the classification of customer activities differ according to the type of product and services and the nature of each industry or service.
- Determining the activities in each cost-hierarchy and identifying the total costs of every activity as follows.
    - The cost drivers for each activity are defined at the individual customer level or the customer group level.
    - Cost drivers units for each activity are defined.
    - The cost allocation rate is calculated by dividing the total activity costs by the total of cost drivers units.
- Identifying the total activity costs for each customer. The activity cost for each customer equals cost drivers units for each activity multiplied by allocation rate. Then, the total costs for customer activities are calculated at the level of each customer.

Fifthly, determining customer-level operating profit. Companies should use a report that illustrates the difference between the revenues generated from each customer and the total costs. The following table can be suggested to report profit of customer:

Table 5.7 Customer Level Operating Profit

Revenues & Costs / Customers	(1) Revenues	(2) Cost of goods sold	(3) Contribution Margin (1) – (2)	(4) Costs at Customer level	(5) Profit of Customer = (3) – (4)
Customer A					
Customer B					
Customer C					
Customer D					

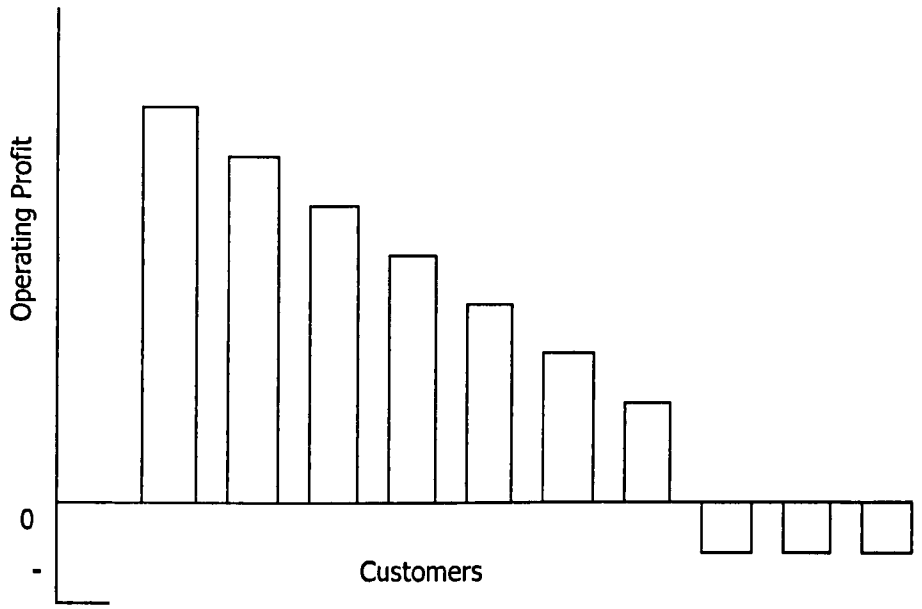
Sixthly, evaluating and decision making. After determining customer level operating profit, companies should summarize the results to evaluate them and make the right decisions. Some companies use a matrix and others using a diagram to do this. Table 5.8 and figure 5.18 are examples for each.

Table 5.8 Matrix Evaluating Customers' Profitability

SALES		
	(1) High Sales High Costs, But Less Than Sales	(2) High Sales Low Costs
	(3) Low Sales High Costs	(4) Low Sales Low Costs
	COSTS	
	(+)	(-)

Source: adapted from Mohamed (1998)

Figure 5.18 Evaluating Customers' Profitability

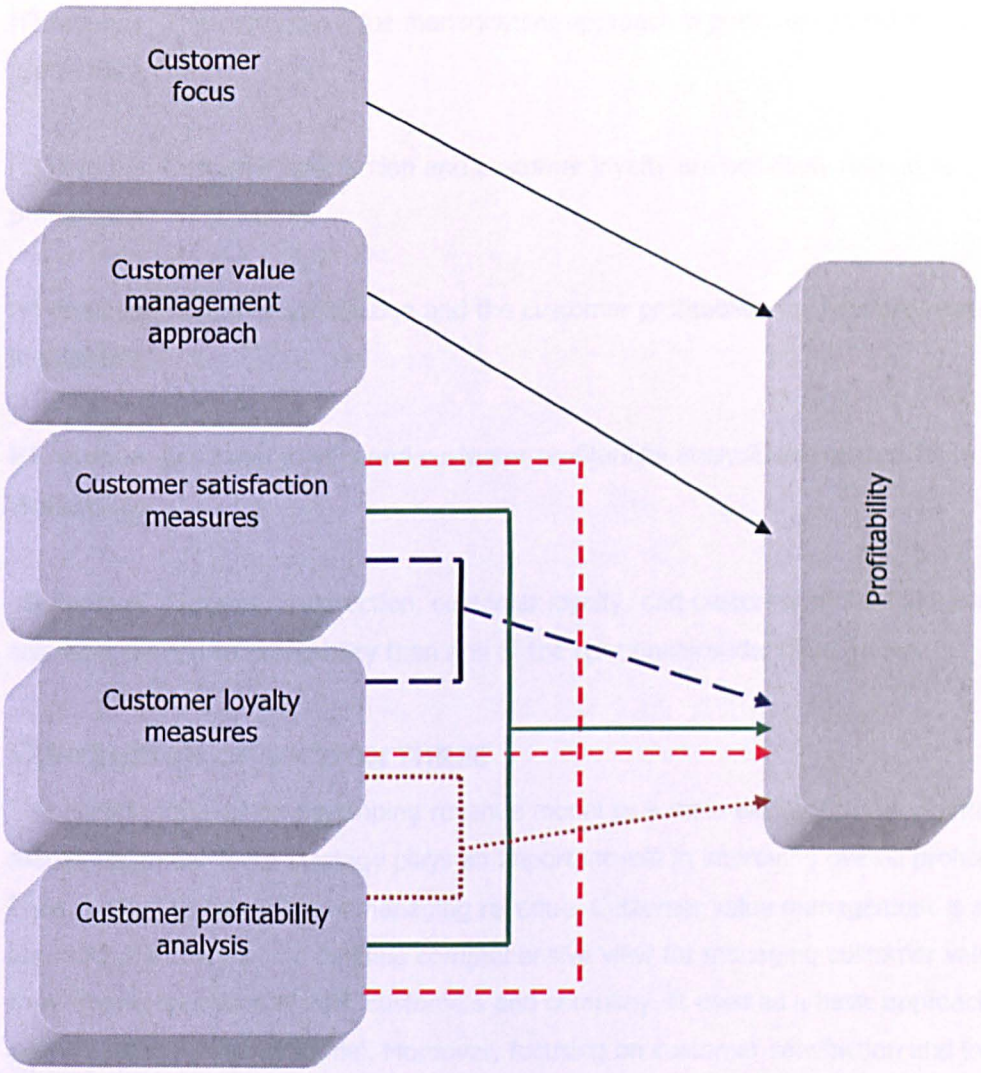


Source: adapted from Horngren et al. (2005)

After preparing a matrix or diagram, it is possible to identify which customers are profitable to the company, which customers cause losses, and which are unprofitable. This enables the company to make decisions about the appropriate strategy for each group of customers, especially for the customers who reduce the company's profits, and unprofitable customers and turn them into profitable ones, with the ultimate aim of increasing the company's total profitability. This affirms the effectiveness of the customer profitability analysis technique in improving the total profitability of the company and managing it by providing information that helps set the appropriate strategy for each group.

Figure 5.19 describes the conceptual revenue model. In the first part of the model, the independent variable is the main driver, which is customer focus and the dependent variable is profitability. In the second part, the independent variable is the customer value management approach and the dependent variable is profitability. At the measurement level of the model, the independent variables consist of customer satisfaction, customer loyalty, and customer profitability analysis and the dependent variable is described by profitability.

Figure 5.19. The Proposed Revenue Model



The proposed revenue model considers how customer focus as the main revenue driver affects profitability. In addition, it reflects how the customer value management approach affects profitability. Furthermore, such a model reflects how the integration between the three proposed variables affects profitability to determine which of the various combinations of the measurement level variables provides best explanation of profitability. In essence, it is assumed that the integration between the three variables better predicts the level of profitability than the use of any combination between any of two variables. Therefore, it is anticipated that the more the proposed revenue model containing the three variables is used, the more profitability is achieved. Thus, hypotheses for the revenue model can be formulated as follows:

H1 revenue: The focus on customer is positively associated with profitability.

H2 revenue: The customer value management approach is positively associated with profitability.

H3 revenue: Customer satisfaction and customer loyalty are positively related to profitability.

H4 revenue: Customer satisfaction and the customer profitability analysis are related to profitability.

H5 revenue: Customer loyalty and customer profitability analysis are related to profitability.

H6 revenue: Customer satisfaction, customer loyalty, and customer profitability analysis are more related to profitability than any of the relationships identified above.

CONCLUSION OF SECTION THREE

This section focused on developing revenue model as a main element in the profitability model. Customer focus strategy plays an important role in improving overall profitability. Thus, it used as the driver in managing revenue. Customer value management is a new approach that focuses on building comprehensive view for managing customer value from the perspectives of both customers and company. It used as a basic approach in developing the revenue model. Moreover, focusing on customer satisfaction and loyalty and evaluating them are very important to both manage the value that customer obtains from the company and to improve its profitability. Customer profitability analysis is also a key technique that can be used in managing customer value and to improve profitability. Therefore, the revenue model focuses on customer satisfaction, customer loyalty, and customer profitability to manage revenue.

SECTION FOUR. DEVELOPING THE STRATEGIC MEASUREMENT PROFITABILITY MODEL

Introduction

The main purpose of this section is to illustrate how the profitability model can be developed by demonstrating its components. This is followed by the formulation of the hypotheses for the comprehensive profitability model.

Components of the proposed profitability model

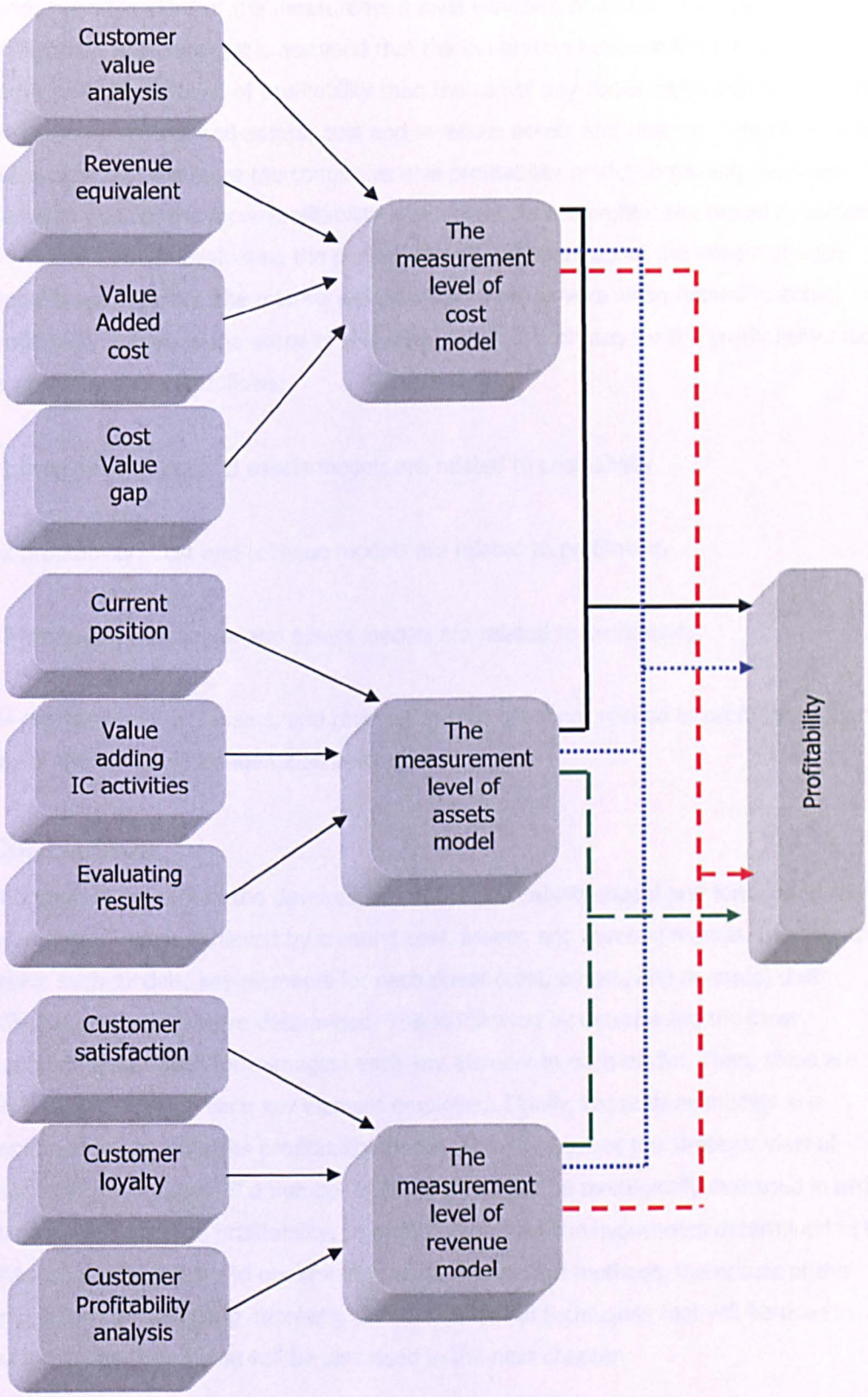
The main objective of the comprehensive model is to manage profitability to fulfil the requirements of strategic management. In order to develop such a model, the measurement level of the cost, assets, and revenue models discussed in the literature review are integrated together in a coherent profitability management model. Since the measurement level of the three proposed models represents the output of these models and the responsibility of measuring these levels is on the management accountant, the profitability model focuses on this level. This means that all the strategic management accounting techniques that used in managing cost, assets, and revenue are also integrated into a coherent model for managing profitability. Therefore, the strategic comprehensive profitability model contains customer value-driven cost management, intellectual capital management (analysing and evaluating the current position of intellectual capital, identifying value-adding intellectual activities, and evaluating results), and customer value management (customer satisfaction, customer loyalty, and customer profitability analysis) techniques.

In view of the above and the literature review, strategic profitability management can be defined as follows:

It is a concept that seeks to truly express, improve, and maximise profitability in a way that fulfils the requirements and objectives of strategic management. This can be achieved by effectively managing the main drivers of profitability, namely revenues, costs and assets, through the use of a number of strategic management accounting techniques that combine together.

Figure 5.20 outlines the conceptual profitability model. The independent variables consist of the measurement level of the proposed cost, assets, and revenue models. The dependent variable is described by profitability.

Figure 5.20. The Proposed Profitability Model



The proposed profitability model reflects how integration between the measurement level of the cost, assets, and revenue models affects profitability to determine which of the various combinations of the measurement level variables provides best explanation of profitability. In essence, it is assumed that the integration between the three drivers better predicts the level of profitability than the use of any combination between any two drivers, such as cost and assets; cost and revenue; assets and revenue. Therefore, it is anticipated that the more the comprehensive profitability model containing the three elements is used, the more profitability is achieved. As the profitability model hypotheses are tested through evaluating the perceptions of managers about the impact of such model on profitability, the relative weight of the three drivers when related to actual profitability is beyond the scope of this study. Thus hypotheses for the profitability model can be formulated as follows:

H1 profitability: Cost and assets models are related to profitability.

H2 profitability: Cost and revenue models are related to profitability.

H3 profitability: Revenue and assets models are related to profitability.

H4 profitability: Cost, assets, and revenue models are more related to profitability than any of the relationships identified above.

CONCLUSION

This chapter concerned the development of the profitability model and formulated related hypotheses. This is achieved by creating cost, assets, and revenue models. In order to create such models, key elements for each driver (cost, assets, and revenue) that affected profitability were determined. This is followed by determining the most appropriate approach for managing each key element in each model. Then, steps are proposed to manage each key element employed. Finally, these three models are combined to generate the profitability model. This emphasises the strategic view of profitability as a result of a number of factors that can be strategically managed in order to effectively manage profitability. In order to examine the hypotheses determined in this chapter, it is necessary to understand the data collection methods, the nature of the population, the sampling approach, and the statistical techniques that will be used in such examination. These will be discussed in the next chapter.

CHAPTER SIX: RESEARCH METHODS

INTRODUCTION

This chapter identifies and determines the most appropriate methods for the quantitative methodology employed in the current study. In order to achieve this, the following elements are discussed: survey research; data collection methods; questionnaire administration and response rate; sampling including methods and procedures; measurement and scales; and finally data analysis techniques and related statistical programs.

SURVEY RESEARCH

Survey research is the main vehicle used in this study. It is a means of collecting data about the characteristics, actions or opinions of a large group of people. It is the best choice of method to answer the research questions about what, how much, how many, and why (Pinsonneault and Kraemer, 1993). Survey research has the following features (Floyd and Fowler, 2002):

- It is a quantitative method, using statistical techniques in order to describe specific aspects of an identified population.
- The main method for data collection is to ask people questions, their answers will be used and analysed by statistical techniques.
- The data is generally collected from a proportion of the target population, known as a sample. Such a sample should be large enough to allow extensive statistical analysis. In such a way the findings can be generalized to the population.

Survey research is the best choice of method to answer the research question of the current study, which is *how* the profitability model can be developed to meet the requirements of strategic management?, as answering such question represents a key concern in survey research (Pinsonneault and Kraemer, 1993). In addition, given the positivist nature of the current research, it focuses on a quantitative method that also represents the main feature of survey work (Floyd and Fowler, 2002).

Pinsonneault and Kraemer (1993) distinguished three types of survey research, namely, exploration, description and explanation.

- An explorative survey focuses on determining the concepts to measure and how to measure them best. It is also used to discover new possibilities and dimensions of

the sample of interest. Such a survey should be used as the primary source for developing concepts rather than using it as an end in itself.

- A descriptive survey focuses on identifying situations, attitudes, and opinions in the population. It is mainly concerned with the description of the distribution or making comparisons between distributions. This type of survey is not designed either to explain the causal theory relationships or to test theory.
- An explanatory survey focuses on testing theory and causal relationships between variables. The main purpose of such research is to investigate the existence of the hypothesized causal relationships and if the existence of such relationships is due to the reasons posited.

The current study employs an explanatory survey as the dominant component, because the principal purposes of the current study are to: firstly, identify the causal relationships between the suggested drivers for cost, revenue and assets respectively and profitability; and then identify the causal relationships between the suggested approaches to managing revenue and assets respectively and profitability. Secondly, identify the causal relationships between the suggested techniques used in managing cost, revenue and assets respectively and profitability. Thirdly, identify the causal relationships between cost, revenue and assets together and profitability.

Hypotheses of the relationships between these variables are formulated though the models developed and are analysed using quantitative data collected via survey research. Data collection methods for the survey research are discussed in the following section.

Chosen data collection methods

There are three types of data collection methods that can be used in survey research, namely, personal interviews, telephone interviews, and self-administered surveys (Cooper and Schindler, 2003).

- Personal interview: here respondents are asked questions by the interviewer in a face-to-face situation. There are three conditions which should be recognised in order to have a successful personal interview (Cooper and Schindler, 2003). These are: (1) the interviewee must have the information required. (2) The interviewee must understand the need to give accurate information. (3) The interviewee should feel sufficiently motivated. Personal interviews have an advantage over telephone interviews and self administered surveys in that there is good cooperation from respondents. Furthermore, they generate large amounts of information compared

with telephone and self-administered surveys. In addition, they are able to probe for answers using follow-up questions and collecting data by observation. On the other hand, personal interviews are costly. Moreover, they require a highly trained interviewer in order to reduce the possibility of bias. They also need a longer period for collecting data; therefore, this method is inappropriate if the researcher is constrained by time.

- Telephone interviews: in this type of survey, members of the target sample are interviewed on the telephone by the interviewer. This method has a lower cost than personal interviews because geographical coverage can be expanded without a dramatic increase in cost. It also helps researchers to complete the data collection process within a short time. However, it is not appropriate for a large number of questions because respondents can only be reached by telephone for a limited period of time each day. Furthermore, it is impossible to contact some members of the sample whose phone numbers are unlisted or those who are unavailable by telephone.
- Self-administered survey: also called self-administered questionnaire. It can be classified into three methods of delivery and collection (Floyd and Fowler, 2002): delivered and collected by mail or fax, delivered and collected by hand, and delivered and collected through the Internet. A main advantage of such a survey is its ability to cover an expanded geographical area without a substantial increase in costs. In addition, complex and long questions can be asked and respondents have time to think about them. Hence, more accurate answers can be given. Furthermore, it is easy to reach respondents who cannot be reached by other survey methods. However, in such a survey it is difficult to control who answers questions. In addition, the interviewer is not present to explain and clarify the questions, so certain questions may be left unanswered. Moreover, a self-administered survey has a low response rate compared with other survey methods; this is because researchers can only rely on an introductory letter and written instructions to motivate respondents to reply (Cooper and Schindler, 2003).

The most appropriate data collection method for the current study is self-administrated questionnaire delivered and collected by hand. This is for several reasons:

- The limitation of time and money available for current study.
- Difficulties related to the Egyptian environment as a developing country that prevents the current study from using other methods, such as: (1) the pressure of time to arrange formal personal interviews or telephone interviews. (2) Mail delay. (3)

Although most of the work is computerized in Egypt, there is not widespread routine use of e-mail as a communication tool.

- The delivered and collected questionnaire method will increase the response rate by approximately 20% compared to postal distribution (Saunders et al., 2009) and the speed of the data collection process is quicker.

SAMPLING METHODS

There are various ways of selecting the sample from the population. Such methods can be divided into two types, namely probability and non-probability sampling (Cooper and Schindler 2003; Key, 1997; and Lie, 2009).

Probability sampling is based on the concept of randomization (Cooper and Schindler, 2003). This means that each member in the target population has a known non-zero probability of being chosen (Birchall, 2009), and hence has an equal chance of being selected from the population (Key, 1997). One of the main advantages of the probability sampling is its ability to provide information about the degree to which the sample differs from the population, namely sample error (Birchall, 2009). Key (1997) affirmed that the computation of the sample error makes it easy to identify to which degree the results can be generalized to the population. However, this method of sampling is more expensive compared to the other types, it takes a long time; and it is relatively complicated (Lie, 2009) and in many cases is not feasible given the lack of an appropriate sampling frame.

There are several types of probability sampling, such as simple random sampling, systematic sampling, stratified sampling, and cluster or multi-stage sampling (Cooper and Schindler, 2003; Birchall, 2009; and Lie, 2009).

- Simple random sampling: in this type, every member of the population has an equal and known chance of being selected from the population. Although it represents an ideal and perfect type of probability sampling, it is difficult to identify every member of the population particularly in a large population.
- Systematic sampling: it is usually used instead of simple random sampling. The target sample size has been computed first. Then every *kth* is selected from a list of population members. Such a type is restricted by the problem of the arrangement of the elements in the list that can emerge and can cause bias.
- Stratified sampling: in this type of sampling, the population can be classified into sub-populations; each of them consists of a number of members who share one or more

common characteristics. Then, random sampling is used to select members in each sub-population or group.

- Cluster or multi-stage sampling: this type is often used when the list of the members within the population is unavailable and hence cannot be selected directly. Thus, the chosen process is achieved through defined stages.

Non-probability sampling is also called non-random sampling. In these methods, cases are selected from the target population in a non-random way (Birchall, 2009). This means that the probability of selecting each member from the total population is unknown. There are several types of non-probability sampling, such as, convenience, judgment, quota, and snowball sampling (Tashakkori and Teddlie, 1998; Key 1997; and Birchall, 2009).

- Convenience sampling: in this type, the members of the sample are selected according to their availability. Thus, members who are ready and available are selected. Although, this type is cheap and quick, how such sampling represents the population and how reliable the results are cannot be known.
- Judgment sampling: the members of the sample are selected according to specific criteria determined by researchers. The determination of such criteria depends on deliberate and judgment efforts without any randomisation. This can be done by focusing on specific groups or area in the sample.
- Quota sampling: a sample can be chosen through two processes: firstly, determination of the stratums and their features; secondly, the use of convenience or judgment sampling to select the required number of cases from each stratum.
- Snowball sampling: can be used when the required characteristics of the sample are rare. In this case, the researcher determines a small number of cases which can reflect the required features and these initial members are used to locate other members. One of the most important drawbacks of such a type is that it is difficult to represent the target population.

Sampling procedures

Identify the population

The current study selects one Egyptian industry sector to apply the suggested model in order to analyse data in more depth. Moreover, due to the difference in features amongst industries, the results may be destroyed, which may lead to inaccuracy in analysis. In addition, the current study is restricted by the limitation of money and time. However, focusing on one industry increases the difficulty of generalizing results. Nevertheless, in

work seeking to test an initial theory it could be suggested that accuracy is more important than the ability to generalize.

Following the huge global developments in communication and information technology (ICT) in the early part of the 21st century, Egypt has also witnessed development in this field. The EMICT (2008), cited that a leading research and information analysis company called RNCOS, stated in its report that the ICT industry in Egypt has emerged as a rapidly growing sector. This report also positions Egypt in the second place in terms of IT industry development amongst all Middle East countries. This is further confirmed in the report published by (BMI, 2007). This stated that the Egyptian ICT sector would achieve a 30% development rate between 2006 and 2011. The evidence of such development is further supported in the reports of the EMICT, (2009), which, showed that the contribution of the ICT sector to real GDP increased from 3.48% in 2007 to 3.98 in 2008.

The influence and role of the Egyptian ICT sector on the national economy

This section explains the role of the Egyptian ICT sector in the development of the Egyptian economy in terms of recent indicators, which reflect the development of its investment, revenues, costs, and numbers of both companies and employees in this sector. These indicators will reflect the positive and the critical role of the ICT sector on the Egyptian economy.

1. **The development of spending on the Egyptian ICT sector.** The EMICT (2008, cited a RNCOS report) showed that such spending has increased by 25% from 2003 to 2007. The majority of ICT spending is on communications $8.6 billion, the rest is made up of $639 million on computer hardware, $199 million on computer software and $375 million on computer services (IT News Africa, 2008). According to this report ICT spending was expected to grow by more than a third in the next three years. The Egyptian Ministry of Communication and Information Technology stated that spending on the ICT sector in 2008 was $9.8 billion and it was expected to rise to $13.5 billion by 2011. Regardless of the specific percentage of spending on the ICT sector, it is clear that such spending is increasing, which reflects the significant role of the ICT sector in the Egyptian economy.

2. **The development of investments in the Egyptian ICT sector.** (BMI), (2007) stated that the Egyptian ICT investment volume would reach $1.306 billion by 2011. According to this report, such investments would cover: (1) PCs, (2) broadband

internet, (3) software industry, (4) and service provision including business outsourcing.

3. **The development in the costs of the Egyptian ICT sector.** Total expenses of operating companies in the ICT sector decreased to EGP5.24 billion during 2008 compared to EGP7.3 billion in 2007, representing an annual decrease of 28% (EMICT, 2009).

4. **The development of revenue in the Egyptian ICT sector.** Total revenue of operating companies in the ICT sector reached EGP10.48 billion in 2008 compared to EGP9.11 billion in 2007, representing an annual growth rate of 15%, which reflects the critical role of the ICT sector in the Egyptian economy (EMICT, 2009).

5. **The development of the number of ICT companies.** The total number of operating companies in the ICT sector was 2983 in 2008, 25.5% higher than the number of such companies in 2007. This number was divided as follows, 79% IT companies, 12.8% IT enabled services, and 8.1% telecommunication companies (EMICT, 2009).

6. **The development in the number of ICT's employees.** The total number of employees in the ICT sector reached 175,100 employees in 2008, compared to 162.500 thousand in 2007, an annual increase of 12,600 employees, an annual growth rate of 7.77% (EMICT, 2009).

The influence of the Egyptian ICT sector on international economies

The Egyptian ICT sector has achieved huge development since 2006 in the outsourcing industry. It was predicted that this industry would accomplish an advanced position in the Middle East and North Africa by 2011 (BMI, 2007). This was affirmed in Egyptian MICT report in 2007, which cited that UK IT week magazine report stated that Egypt was trying to become the India of the Middle East in terms of ICT, as it sought to increase its share of the global outsourcing market. This position would show Egypt as a new growth market, and lead to creating new and profitable opportunities. There are two key studies referring to the role and the position of the Egyptian ICT sector in the outsourcing industry:

1. Marson's study in 2008. This study focuses on the role of the Middle East countries in the outsourcing market. It concludes that Egypt has the strongest and the best

position in the outsourcing market. From its findings, Egypt has achieved this position because it has factors that make it attractive to many European companies. Firstly, it has a relatively young population. Secondly, it has a professional workforce in the ICT field with strong multilingual capabilities. Thirdly, it has the support of the Government for such industry. This study refers to the following two examples of Egyptian Government support, the establishment of a new outsourcing Business Park called "Maadi Investment Park", the goal of this park is to attract companies. For example, a UK-based company called "Spinvox' signed an agreement to establish a business centre in Egypt. Fourthly, the geographical position of Egypt between both Asia and Europe, make it most likely to succeed in the Middle East.

2. 2008 study conducted by Tholons and Khan. This used interviews and surveys from tier one global IT service providers in order to determine the top 50 emerging global outsourcing countries when factors such as labour, investment, and intellectual property laws are considered. It concluded that Egypt was positioned in 7th place, compared to 11th place in 2007. This rise confirmed the development of ICT Egyptian companies in this field.

The reasons for choosing the Egyptian ICT sector for the application of the suggested model

These are divided into two aspects:

1. General reasons: it can be seen from the previous discussion that the ICT sector has become an important sector for both national and international economies, which creates opportunities to increase profitability and enhance the Egyptian economy as a whole. Consequently, there is a need in this sector for the suggested profitability model to help manage profitability.
2. Specific reasons: ICT companies are characterized by vigorous competition, which requires focusing on customers to achieve competitive advantage. The suggested model in the current study focuses mainly on the customer as a driver for managing both cost and revenue. In addition, ICT companies are an excellent setting to understand the features of a knowledge-based economy as they are characterized by extensive dependence on intellectual capital and they lack tangible assets, which is appropriate for the suggested profitability model because it focuses mainly on intellectual capital as a driver in managing assets.

Identification of sample methods in the current study

Due to time and resource restrictions, a judgment sample is used in the current study. The current study focuses only on the ICT members of the Chamber of Information Technology and Communication. The determination of such a sample is justified as follows: firstly, all the members are registered in the Federation of Egyptian Industries and have annual financial reports, in addition to which, they have financial departments and hence have specialists in the accounting field who are more likely to be interested in the current study. Secondly, the Chamber of Information Technology and Communication has a database, which includes detailed information about company profile, profit and loss accounts, ratios and trends, and all site and trading addresses contact details. All of this information makes it easy to contact possible respondent companies, which represents a difficult task in Egypt as a developing country. The sample in the current study is drawn from the Federation of Egyptian Industries' database.

DETERMINATION OF SAMPLE SIZE

There is little previous literature on determining the sample size for non-probability methods. However, attention should be given to reducing the potential statistical bias due to non-probability sampling. Hair, Anderson, Tatham and Black, (1998) stated that bias can affect analytical results when multivariate analysis techniques are used. Consequently, the sample size should be appropriately selected. The bigger the sample size, the more stable the results.

Based on the above discussion, the proposed sample size in the current study is 467 (the total members of the Chamber of Information Technology and Communication in 2008) (FEI, 2008).

The unit of analysis in the current study is the individual organizations. The respondents are financial and senior managers because they are able to comment accurately on the aspects of interest in the questionnaire, since they have expertise in the accounting field.

MEASUREMENT AND SCALES

There is no ideal measurement level; each study determines the measurement level which is the most appropriate for its data. Determination of the level of measurement can be used as a guide to how the data from the variables can be interpreted, and to the most appropriate statistical technique to use. There are four levels of measurement, each

with different features, namely, nominal, ordinal, interval and ratio (Kidder and Judd, 1986; Smith 2003; and Cooper and Schindler, 2003).

- A nominal scale is a level that measures the numerical value by labelling the unique attribute without any ordering of cases. For this level of measurement, few statistical techniques can be used. So researchers should be aware when using this level.
- The ordinal level focuses on measuring the attributes or data in an order that ranges from the bottom to the top. However, the distance between categories cannot be determined.
- The interval level can order and categorise the value. In addition, to distance between values can be measured and interpreted precisely. When using such a level, a variety of statistical techniques can be used.
- A ratio can rank value in an order where the intervals are equal in measurement and have an absolute zero.

In this study, most of the data is collected through the application of five-point Likert type questions (which consist of statements that measure the directions and the dimensions of the attitude toward the specific phenomena) (Smith, 2003) to evaluate whether there is a positive or negative attitude and the strength of such attitude.

Although, Likert scales are strictly ordinal variables, they are often treated as interval because they have a large number of categories (Kidder and Judd, 1986). This is further affirmed by Garson (1998) who, stated that " there is widespread agreement that the greater the number of points on an ordinal scale, the less the likelihood of substantive error of interpretation when using ordinal data for interval procedures" (p2). He added that the use of ordinal data in five-point-Likert scale with interval statistical techniques has become common in social science. This is further explained by McNabb (2002) who explains that the items of the Likert scale are used to rank the case but they are not used as a real measurement, which measures the quantity of a characteristic. In addition, when adding the numbers assigned to response categories for each item, the measurement can then be treated as if it was an interval.

Due to the above reasons, Mac Call (2001) suggests the following practical assumptions to logically view the Likert scale as an intervals scale: *(1) the scale is ordinal in nature; (2) numerical values, assumed on an interval scale, can be assigned to the individual item responses; (3) the numerical values of the items on the scale can be summed to arrive at an overall score or perhaps average score for those items considered as*

addressing the same underlying construct; (4) for those items that have been summed or averaged, a validity analysis has demonstrated that they are associated with the same underlying construct, as well as reliability analysis (p1-2). Given this discussion the use of Likert-type scales is appropriate as is their treatment as either an interval or ordinal level of measurement.

DEVELOPING AND PRE-TESTING THE QUESTIONNAIRE

A theoretical model of strategic profitability was created by reviewing the literature. This model was then used to develop the questionnaire in order to test the proposed model. The objective of this questionnaire is to collect data about the perception of managers related to each variable in the model and their relationships, which can then be used in evaluating the impact of profitability model on profitability. To achieve this objective, the questionnaire is divided into three main sections. Section one concerned the variables of the cost model. As this model suggested five independent variables and two dependent variables (as illustrated in creation model chapter), this section contains seven variables and each variable measured through different items as illustrated in table (6.1).

Table 6.1. Variables and Questionnaire Items of Cost*

Independent variable	Cost driver	Three items
Dependent variable	Profitability from cost driver	Two items
Independent variable	Customer value	Five items
Independent variable	Revenue equivalent	Two items
Independent variable	Value added cost	Five items
Independent variable	Gap	Five items
Dependent variable	Overall profitability	Three items

* the order of variable presentation in the table is a reflection of the order of item presentation in the questionnaire

Section two includes eight variables of the assets model also measured by different items in the questionnaire as illustrated in table (6.2). As there are a huge number of indicators suggested in the literature and these are adapted for use with theoretical assets model, and the questionnaire focuses on the most commonly used indicators in most literature.

Table 6.2. Variables and Questionnaire Items of Assets*

Independent variable	Assets driver	Two items
Dependent variable	Profitability from assets driver	Two items
Independent variable	Value creation approach	Two items
Dependent variable	Profitability from assets approach	One item
Independent variable	Analyzing and evaluating current position of intellectual capital	Twenty six items
Independent variable	Determining value added activities	Twenty one items
Independent variable	Evaluate the results	Twenty two items
Dependent variable	Overall profitability	Three items

* the order of variable presentation in the table is a reflection of the order of item presentation in the questionnaire

Forty items were used to measure the eight revenue variables in the third section of the questionnaire as demonstrated in table (6.3).

Table 6.3. Variables and Questionnaire Items of Revenue*

Independent variable	Revenue driver	One item
Dependent variable	Profitability from revenue driver	Two items
Independent variable	Customer value approach	Two items
Dependent variable	Profitability from revenue approach	Four items
Independent variable	Customer satisfaction	Fifteen items
Independent variable	Customer loyalty	Eight items
Independent variable	Customer profitability analysis	Five items
Dependent variable	Overall profitability	Three items

* the order of variable presentation in the table is a reflection of the order of item presentation in the questionnaire

Care was taken to ensure that questions covered all theoretical constructs contained in the proposed model and that negatively worded items were avoided. In addition, a 5-point Likert-type scale (from (1) not important to (5) very important for some questions and from (1) completely disagree to (5) completely agree in others) was used in most questions.

There are two types of questions that can be used, namely, closed and open questions. Closed questions have a number of alternative answers available for respondents to choose. They can be used for the following purposes (De Vaus, 1996): to gauge whether the respondents have thought about the topic, to focus on a particular field of the research, and in addition, to recognize how strongly an opinion is held. Open questions give respondents the freedom to answer in their own way.

In this research closed question format was deemed the most appropriate type for the length of questionnaire adopted. Furthermore, they can be answered quickly and moreover, they facilitate quantitative data analysis. In addition, due to the pressure of respondents' time and a cultural dislike of such open questions, as they require a detailed answer, closed questions were deemed to be the best choice.

The design of the questionnaire and how the questions are structured within it have a critical influence on response rate (Bourque and Fielder, 1995; De Vaus, 1996; De Vaus, 2002; and Floyd and Fowler, 2002). Floyd and Fowler (2002) state that the main objective of questionnaire layout and format is to make completion by respondents as easy as possible. They further recommend that a questionnaire must appear clear, uncluttered and attractive. De Vaus (1996, 2002) determines six areas that should be considered in relation to the layout and format of the questionnaire. These are: (1) answering procedures; (2) contingency questions; (3) instructions; (4) use of space; (5) order of the questions; and (6) setting up for coding.

As the respondents are Egyptian therefore, the questionnaire format and related questions were designed to fit the Egyptian standards and norms for format, which requires a tabular-formatted design and the use of a sub-numbering system to specify the items of each construct. This format reduces the perceived time consumed completion of the questionnaire, because it appears clear and easy to read. In addition, a combination of clear answering procedures and instructions, space between questions, different font size and font styles, questions deliberately grouped into section and sub-sections are used in questionnaire.

There is strong belief that a long questionnaire will lead to non-response and hence reduce the response rate (Floyd and Fowler, 2002). However, De Vaus (2002) states that there are two trends regarding such thought. Some literature agrees that long questionnaires can lead to a decrease of response rate. In contrast, others believe that long questionnaires can achieve better response rates than short questionnaires, because the latter may appear insufficient to clarify the purpose of the study.
The current study uses the following procedures to reduce the probability of the reduction in response rate that may be produced from using a long questionnaire:

- Careful attention is paid to aspects of survey design such as layout and format of the questionnaire to ensure that it will attract the respondents and encourage them to respond.
- The questionnaire is distributed to people who have special interest in the field of the current study.

Given the respondents special interest in the field of the current study, it is anticipated that the length of questionnaire will not negatively influence the response rate.

As the current study conducted in Egypt, the questionnaire was then translated to Arabic to suit local users. To assure consistency between English and Arabic versions, the questionnaire was translated back into English using a "back translation" approach before being distributed to ensure linguistic and (and most importantly) conceptual equivalence.

The questionnaire was pre-tested (pilot study) and evaluated by six reviewers, two academics familiar with the Egyptian ICT industry, one academic statistician specializing in accounting research and three practitioners. The main purpose of pilot study was to identify any ambiguous wording, and to find out whether respondents had any difficulties in answering questions. Reviewers were asked to test the questionnaire and identify unclear items and suggest changes. Various suggestions and comments to improve the wording and layout were considered. The following are examples:

- Some words needed to be clarified "evaluating results" in assets model and "revenue equivalent" in cost model section.
- They also suggest extending the space between the questions and clear horizontal lines between each item to increase readability.

Changes were made based on the comments and suggestions received from the reviewers. The final versions of questionnaire (both in English and Arabic) are provided in Appendices 1 and 2 respectively.

Improving responses to the hand-delivered questionnaire

The most important issue in a questionnaire is to focus on response rates, because a low response rate may increase bias risk. Moreover, many statistical techniques require a minimum sample size to analyse data accurately (Frohlich, 2002). There is however a lack of literature concerned with the response rate for hand-delivered questionnaires. Saunders et al. (2009) explain the main attributes of questionnaires. It can be concluded from their discussion that hand-delivered questionnaires have similar features to mail questionnaires. Thus the current study argues that hand-delivered questionnaires have the same characteristics as mail questionnaires in terms of response rate and, will apply similar techniques to improve it.

One of the most important findings of the study conducted by Yu and Cooper (1983) is that the average response rates for mail surveys for 93 studies was about 47%. A key study conducted by Chu and Brennan (1990) found that in mail survey a response level between 60% and 80% can be achieved. This is further confirmed by Brennan (1992), who concluded that a response rate of 60% or above can be achieved in mail survey regardless of the topic investigated. Saunders et al. (2009) clarify that hand-delivered questionnaire can achieve response rate from 30% to 50%. Many techniques are suggested in the literature to improve the response rate. Yu and Cooper (1983) reviewed 93 studies on response-building techniques in mail survey. They determined the most important techniques used to improve response rates are as follows:

- Monetary incentives: some studies used monetary incentives either included with the questionnaire, or sent to respondents after a questionnaire had been completed.
- Non-monetary incentives: most studies used non-monetary incentives such as sending pens or pencils with the questionnaire.
- Response facilitators: most studies used preliminary notification procedures such as, focusing on the setup of a cover letter; identifying the sponsors; sending the letter to specific persons; clarifying the deadline date; using follow up letters, which means sending additional letters after the initial questionnaire; and call backs. They further used different methods of appeals to motivate people to reply, such as focusing on the content of the cover letters.

Chu and Brennan (1990) and Fahy (1998) are significant studies focused on employing such techniques in different phases of a survey. They divided a survey into three phases and then explained how different techniques can be used in each stage in order to improve response rate. According to these studies, the following phases can be suggested:

- Construction of questionnaire and covering letter: the researcher should focus on the format, font, and formulation of the pages of the questionnaire; and the setup of the covering letter, which represents the main chance to improve response rate. The latter should explain the purpose of the survey and it should be designed carefully. In addition, it should include the signature of the researcher.
- Before delivery of the questionnaire: the researcher should focus on preliminary notification, which represents an effective method to increase response rates. It can be achieved either by telephone or by letter. A telephone call is more effective than a letter. Such studies indicate that response rate can be increased by about 30% when a telephone call is used.
- After delivery of the questionnaire: the researcher should focus on a follow up process by using follow up letter with another copy of the questionnaire or a phone call to remind the respondent. Fahy (1998) stated that by using these methods, response rates can jump from 18% after first mailing to 59% overall. This is further confirmed by Chu and Brennan (1990), who affirm that response rates can increase by approximately 30% by using a follow up process.

Saunders et al., (2009) also suggest strategies for increasing response rate for mail questionnaire. These strategies require focusing on the following: incentives, length, appearance, delivery, contact, content, origin, and communication.

Response rate strategies employed

467 questionnaires were distributed by hand. After one week, companies which had not replied within the first week were phoned to remind them. After three weeks a reminder letter with another copy of the questionnaire was delivered by hand to companies which had not replied. 277 companies apologized for not completing the questionnaire. Of the completed questionnaires, 80 were completed and collected after the first delivery. 50 were collected after the first follow up process. A further 60 were collected after the second follow up process. A total of 190 completed questionnaires were received.

Response bias

Once all questionnaires were returned a test was conducted to ensure that there was no significant difference between the responses received in the early and late stages of data collection. To enact this, the first and last 60 questionnaire were compared. The figure of 60 was used based on the slightly smaller number of questionnaire received in the second phase and to ensure an equal sample size for comparison. The testing was done through the application of the two sample Kolmogorov-Smirnov test. This is appropriate given the nature of the data, level of measurement and sampling. It also enables all points across the answer distribution to be compared.

The test showed that of the 120 variables there was no significant difference, in all cases except 6. This represents a relative small percentage of the variables and visual examination of the distributions demonstrated that the difference was due to the presence of a few respondents whose answers were consistently higher in relation to these specific variables. These respondents were in the late questionnaire group. Given that they are more likely to be general outliers in terms of these variables than evidencing a consistent response bias over all items, and they were therefore included in the analysis. (See Appendix 6.)

ASSESSMENT OF CONSTRUCT VALIDITY AND RELIABILITY

Construct validity is one of the most important procedures used to evaluate research measure. It refers to the accuracy of a measure (De Vaus, 1996). A valid measure should measure what it is assumed to measure (De Vaus, 1996). There are four key elements of validity, namely, face or consensus validity, convergent validity, discriminate validity, and nomological validity (Hair et al., 1998).

Face or consensus validity focuses on evaluating whether a measure appears "on its face" to measure what it is supposed to measure and if it is a good reflection for the construct. Although such an element is the weakest way for evaluating construct validity, it should always be regarded as a starting step that should be assessed before any theoretical testing.

Convergent validity focuses on evaluating the extent to which items of a construct converge or share a high proportion of variance in common. It is evaluated using three methods as follows:

- Factor loadings to achieve high convergence, standardised factor loading should be greater than .50 and ideally be above .70
- Variance extracted (VE) is the average of the squared factor loading for the construct. A higher variance extracted value demonstrates that the indicators are truly representative of construct. The value of VE should be greater than .50 for a construct.
- Reliability is a kind of construct validity which focuses on the quality, consistency, and overall reliability of the measurement. Any measure can be described as reliable when it achieves the same result on repeated occasions. Internal consistency is the most commonly used measure, it used in one group or occasion to examine the consistency of different indicators or the same construct within that measure. Cronbach Alpha is the most commonly used method to calculate internal consistency. It based on the average inter-item correlation. There is no agreement between literatures regarding the acceptable value of reliability. However, the widely accepted value of reliability is .70 or above which adapted in the current study.

Discriminate validity measures the degree of correlation between two variables that should not be theoretically similar when operationalized by the estimation and comparison between the VE for each construct and squared inter-construct correlation (SIC) for that construct which are required in order to determine the discriminate validity. When VE is greater than SIC, it is an indicator of discriminate validity.

Nomological validity evaluates whether correlation between constructs appear as they are supposed to appear. The evaluation process is achieved by using inter-construct correlation estimates (IC), and by assuring that they are positive and significant. These measures are utilized in this study, and detailed in the following chapter.

DATA ANALYSIS TECHNIQUES USED IN THE CURRENT STUDY

Factor analysis

Factor analysis is a multivariate statistical methods used to identify common underlying variables called factors within a larger set of measure (Hair et al., 1998).

Exploratory factor analysis versus confirmatory factor analysis

Exploratory factor analysis and confirmatory factor analysis are two statistical approaches used to examine the internal reliability of a measure (Kline, 1994). Exploratory factor analysis explores and summarizes the underlying correlation structure for a data set. Confirmatory factor analysis is a set used to confirm the hypotheses or theories by

testing the correlation structure of a data set against the hypothesised structure.

There are mainly four stages in factor analysis (Ocal, Oral, Erdis, and Vural, 2007):

1. Initial solution: the first stage used in factor analysis is test the degree of correlation between the variables. When such correlation is weak, it is not feasible for these variables to have a common factor, and the correlation between these variables is not studied. Two tests are suggested to validate if the remaining variable are factorable. Kaiser-Meyer-Olkin (KMO) and Bartlett's tests of sphericity (BTS). These tests will be explained in more detail in the results chapter.
2. Extracting the factors: there are two methods for extracting factors, namely Principal Component Analysis and Common Factor Analysis. The main purpose of Principal Component Analysis is to derive a relatively small number of components that can account for the variability found in a relatively large number of measures, which is often called data reduction. On the other hand, the main purpose of Common Factor Analysis is to discover the underlying structure or relationships among variables (Hair et al., 1998). Therefore, the choice between the two methods depends on the research question and the objectives of the study. When the research purpose is to determine and identify the factors that are responsible for a set of observed responses, then the Common Factor Analysis will be the best choice. On the other hand, when the research purpose is to reduce the data, Principal Component Analysis is better (Hair et al., 1998, and DeCoster, 1998). The current study uses Common Factor Analysis in order to discover the relationships between variables. The most common methods used in the Common Factor Analysis technique are Maximum Likelihood and the Principal Axis Factoring. Fabrigar, Wegener, MacCallum, and Strahan, (1999) argued that if data are normally distributed, Maximum likelihood is the best choice. In contrast, if the assumption of multivariate normality is violated, they recommended Principal Axis Factoring.
3. Selection of the number of factors retained: the most commonly used technique is recommended by Kaiser (1960), which is called the latent root criterion. In this technique only the factors having latent roots or eigenvalues grater than 1 are considered significant and all factors with eigenvalues less than 1 are considered insignificant. This technique is the default in most statistical software packages (Hair et al., 1998). In the current study, as recommended by Kaiser (1960), factors that have an eigenvalue greater than one are treated as relevant.
4. Rotation of factors: the next decision is rotation methods. The goal of the rotation is to simplify and clarify the data structure and produce more interpretable factors,

while keeping the number of factors and variance extracted from items fixed (Kim and Mueller, 1978). There are two techniques for rotation to choose from (Hair et al., 1998). (1) Orthogonal rotation assumes that the factors are not correlated. Varimax, Quartimax and Equamax are commonly available orthogonal methods of rotation. Varimax is by far the most common choice. (2) Oblique rotation assumes that the factors are correlated; it includes direct oblimin, quartimin, and promax methods. There is no widely preferred method of oblique rotation; all tend to produce similar results (Fabrigar et al., 1999). There is no specific criterion developed to guide the researcher in determining the specific technique. Varimax is the default rotation methods in most statistical programmes. However, the choice between them should be on the basis of the particular need within a given research problem (Hair et al., 1998). Factor analysis was conducted in the current study using Varimax rotation, which rotates the factors while keeping them independent and at right angles to each other and assumes that factors are not correlated.

Ordinal regression technique

Regression techniques such as linear, logistic, and ordinal regression are useful tools to analyse the relationship between multiple independent variables and a dependent variable. They also allow the estimating of the magnitude of the effect of the independent variables on the dependent variable. The choice between these techniques depends on the measurement scale of the dependent variables. Linear regression is the best choice when the dependent variable is measured on a continuous scale, while logistic regression works well for binary or dichotomous dependent variable. When the dependent variable is ordered, an ordinal regression technique should be the best choice (Chen and Hughes, 2004).

Due to the ordinal nature of the dependent variable in the current study, ordinal regression is used within the "SPSS 10" to analyse the relationship between the suggested techniques for managing cost, assets, and revenue and profitability.

Ordinal regression is a statistical technique developed by McCullagh in 1980 and used when response is categorical with ordered outcome. The outcome of the regression model provides predicted probabilities for each level of the response. The major decision involved in building an ordinal regression model is choosing the link function that demonstrates the model's appropriateness. This procedure is explained in the results chapter. Although an ordinal regression model does not assume normality or constant variance, which are required in the other regression techniques, it assumes that the

corresponding regression coefficients were equal across all levels of the categorical dependent variable (Long, 1997). This is called the "assumption of parallel lines". Therefore, the test of parallel lines should be assessed to make appropriate judgments concerning the model adequacy for applying ordinal regression (Long, 1997). This means that if the suggested model does not achieve such assumption, ordinal regression should not be used.

Non parametric statistics used

Non-parametric statistics are statistical techniques used in testing hypotheses and have less restrictive assumptions than parametric tests (Gibbons, 1993). The advantages of non-parametric statistics can be summarized as follows (Gibbons, 1993; Siegel and Castellan, 1998):

- They are distribution free. This means that they do not assume the normal distribution.
- They appropriate to count data and to nominal or ordinal levels of measurement.
- They do not require random samples, they only require the assumption that the samples come from any continuous distribution.

Non parametric statistics are appropriate for the current study, for the following reasons. Firstly, given the judgment sample technique adopted in the current study, the criteria are met through the respondents from the targeted population. Thus, non-parametric tests are more appropriate as they do not require the use of the random sample technique. Secondly, the distribution in the current study is non-normal so, non-parametric tests are the best choice because they are distribution free tests. Finally, the current study uses ordinal scale data with five-point Likert scale that measure respondents degrees of agreement with questionnaire items. Such a scale is not strictly appropriate for analysis by parametric tests.

As a result of the above, non-parametric measure of association, Spearman's rho test is adopted in the current study to examine the strength of the relationships between cost driver and profitability; assets driver and profitability; revenue driver and profitability; assets approach and profitability; and revenue approach and profitability.

CONCLUSION

Due to the quantitative nature of the current research, a hand survey questionnaire with five-point Likert scale is adapted to collect quantitative data related to cost, revenue and assets for the suggested model which will be statistical analysed in order to answer the research question. In addition, a judgment sampling technique was employed and was selected from Egyptian ICT sector based on specific criteria and the sample size is determined regarding the minimum size required by statistical techniques. Furthermore, validity and reliability is used to assess and determine whether the questionnaire measures what it is intended to measure. Factor analysis, a correlation test and Cronbach Alpha test are used to assess the validity and reliability of questionnaire items. After the assessment of the validity and reliability for all the questionnaire items ordinal regression model is used to test the relationships between cost, revenue, assets and profitability. In addition, non-parametric statistics are used to test the research hypotheses and determine whether there are causal relationships between variables.

CHAPTER SEVEN. RESULTS

INTRODUCTION

This chapter aims to investigate the association between suggested cost, assets and revenue drivers, and profitability. Furthermore, it investigates the association between suggested assets and revenue approaches, and profitability. In addition, it seeks to investigate the influence of the suggested costing, assets, and revenue models on profitability. In order to achieve these purposes the following steps are used: (1) testing of reliability of drivers, approaches and related profitability (2) factor analysis (3) Cronbach's Alpha to test the reliability of each factor (4) inter-correlation methods to confirm the reliability of factors (5) non-parametric test to measure associations (6) ordinal regression to investigate the influence of each suggested model on profitability. In addition, the influence of all suggested models together on profitability is tested via ordinal regression.

FACTOR ANALYSIS

The current study uses factor analysis for structure detection purposes in order to examine the underlying relationships between variables.
The use of structural factor analysis involves three steps:

1. Applying two tests to evaluate the suitability of data for structure detection, namely, Kaiser-Meyer-Olkin or KMO and Bartlett's test of sphericity (Pallant, 2005). The KMO test was proposed by Kaiser (1974) and is based on an index that compared correlation and partial correlation coefficients to measure the adequacy of sampling. It takes values between 0 and 1. A high value (close to 1) indicates that factor analysis may be suitable for the data. On the other hand, if the value is less than .50, the result of factor analysis probably will not be very useful. Barrlett's test investigates the hypothesis that the correlation matrix is an identify matrix. This would indicate that variables are unrelated and therefore unsuitable for structure detection. Values less than .05 significance level indicate that factor analysis may be suitable for data.
2. Determining the factor extraction method. The purpose of factor extraction is to determine the factors needed to represent the data. The method to be used in the current study is Common Factor Analysis, which includes several techniques. The appropriate method of Common Factor Analysis depends on the distribution of data (Fabrigar et al., 1999). When the data is normally distributed, the best choice is to

use the Maximum Likelihood technique. On the other hand, if the assumption of multivariate normality is violated, the best choice is to use the Principal Axis Factoring technique. The current study used two tests to investigate normality, namely, skewness and kurtosis, and the one-sample Kolmogorov-Smirnov. Skewness and kurtosis measure how much a distribution varies from the normal. The normal distribution is symmetric and has a skewness value of 0. Kurtosis measures the extent of observation around a central point. The normal distribution has a value of 0. The one-sample Kolmogorov-Smirnov is used to test the null hypothesis that a sample comes from a particular specified normal distribution. A significant result less than .05 means that the distribution is not normal (Howitt and Cramer, 2008).

3. Determining a rotation method to maximize the relationship between variables and factors. The rotation method to be used in the current study is Varimax (as discussed in the previous chapter).

CORRELATION METHODS TO CONFIRM RELIABILITY AND INVESTIGATE ASSOCIATIONS

For any measure of correlation, there are two indicators which should be considered. Firstly, the statistical significance, or the degree of surety, that determines that the correlation analysis is reliable. This must be at least less than .05 or even less than .01 in some cases. This means that, there is a less than 5% or 1% chance of the null hypothesis being accepted. Conversely, it means, if statistical significance is achieved in analysis, then the null hypothesis can be rejected and the study can assume a relationship exists between variables. The second indicator is the value or the size of the correlation coefficient, which indicates the strength of association between variables. Although there is no agreement in the literature regarding the interpretation of strength of association of the correlation coefficient, the difference between most of them is not substantial (Gibbons, 1993 and Hair, Money, and Samouel, 2007). The current study has used the guideline suggested by Hair et al. (2007) for interpreting the strength of association of correlation coefficients. Table 7.1 summarizes the ranges of correlation coefficient and how they are interpreted.

Table 7.1. The Interpretation of Correlation Coefficient's Ranges

Ranges of correlation coefficient	Associations
+ - .91 to + - 1.0	very strong
+ - .71 to + - .90	high
+ - .41 to + - .70	moderate
+ - .21 to + - .40	small but definite relationship
+ - .00 to + - .20	slight, almost negligible

Source: Hair et al. (2007)

ORDINAL REGRESSION

Ordinal regression is adapted in the current study to investigate the relationship between the suggested techniques for cost, assets, revenue and the levels of profitability.

The evaluation of the ordinal regression results

To build the ordinal regression model, the link function should be first chosen. This function determines the transformation type that is applied to the dependent variable. SPSS provides five link functions (Logit, Probit, Negative log-log, complementary log-log, and Cauchit). Theoretically, the choice among them depends on the distribution of the dependent variable as follows (Garson, 2009):

- The Logit function is the default in SPSS, it is recommended when the dependent ordinal variable has relatively equal categories.
- The Probit function is recommended when categories of the dependent variable are normally distributed.
- The negative log-log is recommended when lower categories of the dependent variable are more probable than higher categories.
- The complementary log-log is recommended when higher categories of the dependent variable are more probable than lower categories.
- The Cauchit is recommended when extreme values are present.

In practice, there is a seldom substantive ground to prefer one over another. This means that the choice of link function is often arbitrary (Johnson and Albert, 1999). As a result, it will be worthwhile to try the alternative link functions and choose the link function that achieves the best fit of model to data, and meets the assumption of parallel lines for ordinal dependent variable (Garson, 2009).

Model fitting information table

This table includes the -2 log likelihood values for both the intercept only model and final model with predictors. The difference between the log likelihood can be interpreted as Chi-square distribution statistics. The significant Chi-square statistic (P< .05) indicates a significant improvement over the intercept only model, which suggests that the model gives better prediction (McCullagh and Nelder, 1989)

Goodness of fit table

There are two goodness of fit statistics. They are the Pearson's Chi square statistic and Deviance Chi square. These statistics test whether the observed data are inconsistent with the fitted model. A well fitting model is non-significant according to these tests, which means that the data and model prediction are similar.

Pseudo R-square table

These measures assess the overall goodness of fit of the ordinal regression model. There are three measures which are analogous to R-squared in ordinal least regression. None of them have the same interpretation as R-squared (percent of variance explained) and should not be reported in those terms. Instead, all should be taken as additional measures of model effect size. The model with the largest R square statistic is the best according to these measures (Garson, 2009). The three measures are Cox and Snell's R square (1989) which is a well known generalization of the usual measure designed to apply when Maximum Likelihood estimation is used. However, with an ordinal dependent variable, it has a theoretical maximum value of less than 1.0. For this reason, Nagelkerke, (1991) proposed a modification that allows the index to take values in the full zero to one range. McFadden's R square (1973) is another version based on the Log Likelihood Kernel for the intercept only model and the full estimated model.

Test of parallel lines assumption table

This table can help assess whether the assumption that the parameters are the same for all categories is reasonable. It compares the estimated model with one set of coefficients for all categories to a model with a separate set of coefficient for each category. The assumption will not be violated if the finding is non-significant. This means that there is no significant difference between the models, where the regression lines are constrained to be parallel for each level of the ordinal dependent variable (Garson, 2009).

CALCULATING RESPONSE RATE

The following formula is used to calculate the response rates (De Vaus, 2002).

Response rate = number returned/ number of sample - (ineligible + unreachable) * 100

As the questionnaire is delivered and collected by hand, there are no ineligible or unreachable items. The response rate for the current study is 190/467 which equals approximately 41%. This response rate of the current study is analogous to the findings of Yu and Cooper's study (1983), which reviewed the response rates for 93 studies and found that the average was 47%. It is suggested that difference in response rate may be due to the difference between countries and related problems.

SECTION ONE. FINDINGS OF COST VARIABLES

It is important to determine the distribution of data before applying correlation test and factor analysis because choosing the appropriate methods depends on the type of the distribution. Consequently, two normality tests were adopted in the current study: (1) skewness and kurtosis to measure how much a distribution varies from normal. They found that if a value differs from 0, this means that the distribution is not normal. (2) One-sample Kolomogorov-Smirnov test, a significant result less than .05 means that the distribution is not normal. The skewness and kurtosis for all cost items differs from zero (see appendix 3). This means that the distribution is not normal. This is further confirmed by the result of the Kolmogorov-Smirnov test which indicates that all cost items have a significance level less than .05. This confirms that the distribution of all cost items is not normal (see appendix 3).

The reliability of cost driver and related profitability variables

The reliability Alpha of the customer value creation variable as the proposed cost driver is .89. The current study has adopted Spearman's correlation in this context because of the non-normal distribution of cost items and the ordinal nature of the cost variables (Gibbons, 1993). It has been used to further test internal consistency and to confirm the reliability of items included in this variable. The result of Spearman's correlation indicates that the three items are significant at .001 level and the correlation coefficient ranges from .719 to .730, which reflects a high correlation between items.

Table 7.2. Reliability of Customer Value Creation

No	Statements	Cronbach's Alpha if item deleted	Spearman's Correlation	
			1	2
1	The main reason for the company's success at the present time is the increase of customer value.	.84		
2	Customer value creation is the main way to improve company's profitability.	.85	.73	
3	The link between the cost and the customer value is the effective force in achieving profitability.	.84	.73	.72

It can be seen from the above table that the value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted because none has an Alpha coefficient higher than the overall reliability of this variable.

The reliability of the profitability that generated from cost driver. This variable is measured by two items, therefore the variable is reasonably reliable. The current study uses Spearman's correlation to confirm the reliability of such a variable. The result of using this test indicates that the correlation between the two items is significant at .001 level, with a moderate correlation coefficient of .70.

Factor analysis and reliability test for proposed technique variables

Structural factor analysis is applied to the variables of the cost model. Common Factor Analysis is used. Due to the non-normality of cost items, the current study adopted Principal Axis Factoring as the extraction method.

Before proceeding to examine the underlying relationships of cost model variables, Kaiser- Meyer- Olkin and Bartlett's tests were used to determine the appropriateness of Principal Axis Factoring. The Kaiser- Meyer-Olkin (KMO) measure of sampling adequacy indicated that the seventeen item sampling was adequate for structure factor analysis, with KMO measure = .80, which can be described as "meritorious" (Hair et al., 1998). In addition, the significance level for Barlett's test is 0.00 (less than .05). Such results

indicate that the data for the proposed cost management technique is appropriate for factor analysis (using Principal Axis Factoring and Varimax rotation method).

Among the seventeen item included in analysis, fifteen items have communality values ranging from .4 to .7 (from lower to moderate), which are common magnitudes in social science (Velicer and Fava, 1998). On the other hand, two items have communality values less than .4, which means that they do not fit well with a factor solution and should be dropped from the analysis (Velicer and Fava, 1998). In addition, most of the items have a factor loading greater than .69, indicating a strong correlation between items and the factor they belong to. Furthermore, all items are loaded highly on only one factor and are not split loaded on another factor above .32 (Tabachnick and Fidell, 2001). Principal Axis Factoring with Varimax provides a four factor solution with eigenvalues of 1.0 or above are extracted, and the seventeen items which are retained under the four factors explain 61 % of the variance in the data set. The first factor accounts for 20% of the variance, the second for 18%, the third for 18%, and the fourth for 5%. None of the remaining factors is significant.

As mentioned above, two items should be dropped from the analysis, in order to confirm that, analysis of reliability Alpha if items are deleted is computed for factor two and factor three which included such items.

Factor two included item nine (C4.4), which should be dropped. The overall reliability coefficient for factor two including the five items is 90%. Table (7.3) shows Alpha if item nine deleted from factor two.

Table 7.3. Confirming the Dropping of Item Nine from the Analysis

No	Statements	Cronbach's Alpha If item deleted
6	Measuring value added cost requires determining the activities which added direct benefit to customer.	.87
7	Value that customer gets from product's attributes is the main factor to determine the value adding activities.	.88
8	Determining value adding activities provides suitable information for identifying the aspects of profitability improvement.	.87
9	The activity analysis technique provides details about the activities which add direct benefit to the customer.	.92
10	The activity based-costing is the best technique for measuring the costs of each attribute.	.87

It can be seen from the above table that if item nine (C4.4) is deleted from the analysis, overall reliability will be increased from .90 to .92.

Factor three, included item fourteen (C6.3) which should be dropped. The overall reliability coefficient for factor three including all five items is 87%. Table (7.4) shows Alpha if item fourteen is deleted from factor three.

Table 7.4. Confirming the Dropping of Item Fourteen from the Analysis

No	Statements	Cronbach's Alpa If item deleted
11	Identifying the gap between the value based revenue and the attribute based cost	.83
12	Determining the aspects of improving current and future profitability.	.81
13	Identifying the activities that company will focus on.	.83
14	Identifying the expenditure level for each attribute.	.88
15	Identifying the competitive advantage.	.85

It can be seen from the above table that if item fourteen (C6.3) is deleted from the analysis, overall reliability will be increased from .87 to .88.

Thus, items nine and fourteen were dropped from factors two, and three respectively. A new factor analysis was run for the remaining fifteen items.

All fifteen items included in the analysis have communality values ranged from .4 to .7, which are common magnitudes in social science (Velicer and Fava, 1998). In addition, most factor loadings are greater than .69 which is "very significant" and indicates a strong correlation between items and the factor they belong to (Hair et al., 1998). Furthermore, all items are loaded highly on only one factor and are not split loaded on another factor above .32 (Tabachnick and Fidell, 2001). Principal Axis Factoring with Varimax suggests four factor solution, with eigenvalues of 1.0 or above are extracted and fifteen items are retained under the four factor which explain 65% of the variance in the data set (compared to 61% before dropping the two items). The first factor for 21% of the variance, the account for 20%, the third accounts for 18%, and the fourth for 6%. None of the remaining factors is significant.

For reliability analysis, Cronbach's alpha is calculated to test reliability and internal consistency for each factor. The result indicates that the Alpha coefficient for all factors is above 87% which is higher than the standard estimates of .70 (Howitt and Cramer, 2008). In addition, the Spearman inter-correlation for the four factors is significant at the .001 level.

The factors are labelled according to the commonality of items loading on each factor and are as follows: customer value analysis, value added costing, cost-value gap, and revenue generated from customer value.

Table 7.5. The Results of Factor Analysis for Proposed Cost Technique Items

Factors	Loading	Eigen Value	Variance Explained	Reliability Analysis
Factor 1: customer value analysis		3.6	21%	.89**
- Identifying the alternative attributes for each product.	.69			
- Identifying attributes which offer benefits for customer.	.79			
- Determining the availability of the attribute in each alternative from the customer's viewpoint.	.79			
- Determining the importance given by the customer for each attribute.	.88			
- Determining the expected value of each alternative by using the last two steps.	.78			
Factor 2: value added- costing		3.2	20%	.92**
- Measuring value added cost requires determining the activities which added direct benefit to customer.	.89			
- Value that customer gets from product's attributes is the main factor to determine the value adding activities.	.85			
- Determining value adding activities provides suitable information for identifying the aspects of profitability improvement.	.87			
- The activity based-costing is the best technique for measuring the costs of each attribute.	.83			
Factor 3: cost-value gap		2.9	18%	.88**
- Identifying the gap between the values based revenue and the attribute based cost.	.75			
- Determining the aspects of improving current and future profitability.	.86			
- Identifying the activities that company will focus on.	.76			
- Identifying the competitive advantage.	.65			
Factor 4: revenue generated from customer value.		1.3	6%	.27*
- The link between revenue and customer value provides with valuable information for profitability management	.78			
- It is important for managing profitability to determine the revenue generated from each attribute	.50			
Total variance explained	.65%			

* Spearman's correlation ** Reliability Alpha

Factor one, related to customer value analysis, and explained 21% of variance with an eigenvalue of 3.6. This factor is composed of five items as follows: "identifying the alternative attributes for each product"; "identifying attributes which provide the customer with benefits"; "determining the availability of the attribute in each alternative from the customer's viewpoint"; "determining the importance given by the customer for each attribute"; and "determining the expected value of each alternative by using the last two items". The reliability alpha of this factor is .89. To further examine internal consistency, the reliability of this factor is confirmed by the Spearman's inter-correlation of items included. They are all significant at .001 level. Moreover, the total correlation for all items is between .50 and .70 which means that there is a moderate correlation between them (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of items would increase the reliability if they were deleted, because none has an Alpha coefficient higher than the overall reliability for this factor. This suggests that all items are positively contributing to overall reliability.

Table 7.6. Confirming the Reliability of the Customer Value Analysis Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation			
			1	2	3	4
1	Identifying the alternative attributes for each product.	.65				
2	Identifying attributes which offer benefits for customer.	.73	.59			
3	Determining the availability of the attribute in each alternative from the customer's viewpoint.	.58	.57	.58		
4	Determining the importance given by the customer for each attribute.	.70	.57	.64		
5	Determining the expected value of each alternative by using the last two steps.	.58	.51	.63	.60	.70

Factor two related to the value added-costing, explained 20% of variance with an eigenvalue of 3.2. This factor is composed of four items (see table 7.7). The reliability alpha of this factor is .92. To further examine internal consistency, the reliability of this factor is confirmed by the Spearman inter-correlation. They are all significant at .001 level. Moreover, the total correlation for all items is between .68 and .83 which means that there is a high correlation between most of items (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of items would increase the reliability if they were deleted. This suggests that all items positively contribute to overall reliability.

Table 7.7. Confirming the Reliability of Value Add Costing Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
6	Measuring value added cost requires determining the activities which added .direct benefit to customer	.89			
7	Value that customer gets from product's attributes is the main factor to determine the value adding activities.	.89	.83		
8	Determining value adding activities provides suitable information for identifying the .aspects of profitability improvement	.89	.75	.70	
10	The activity based-costing is the best technique for measuring the costs of each attribute	.90	.69	.69	.80

Factor three, related to the cost-value gap, it explained 18% of variance with an eigenvalue of 2.94. This factor is composed of four items (see table 7.8).
The reliability alpha is .88. The Spearman inter-correlation of items included in this factor is significant at the .001 level. The total correlation for all items is between .57 and .76 meaning that there is moderate correlation between most of items. The value in the column labelled "Alpha if items were deleted" indicates that none of items would increase the reliability if they are deleted. This suggests all items positively contribute to reliability.

Table 7.8. Confirming the Reliability of the Cost-Value Gap Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
11	Identifying the gap between the value based revenue and the attribute based cost	.84			
12	Determining the aspects of improving current and future profitability	.81	.73		
13	Identifying the activities that company will focus on	.83	.67	.76	
15	Identifying the competitive advantage	.86	.55	.61	.57

Factor four, related to revenue generated from customer value, it explained 6% of variance with an eigenvalue of 1.3. This factor is composed of two items: "the link between revenue and customer value provides valuable information for profitability management", and "it is important for managing profitability to determine the revenue generated from each attribute". Even with only two items, the factor is reasonably

reliable, as confirmed by Spearman inter-correlation of .27, which is statistically positive and significant at .001 level.

Hypothesis tests related to the cost model

(The formal rejection/acceptance of each hypothesis is detailed in the discussion chapter.)

Association between a proposed cost driver and profitability

A Spearman's correlation is adopted to test the association between a cost driver and profitability. The result of this test indicates that a statistically significant correlation at .001 level exists between customer value creation as a proposed cost driver and profitability, with a high positive correlation coefficient of .81. Such a result suggests that focusing on customer value creation in managing cost positively affects the profitability results.

Multivariate analysis is not necessary for testing the relationship between a proposed cost driver and profitability because only one independent variable is investigated and significantly associated with profitability. Therefore, regression would not have added any value without additional variables to enter into the model.

Relationship between suggested cost management technique and profitability, using ordinal regression

As the main purpose of this aspect is to examine if the combination of the four variables "customer value analysis (CVA)","revenue generated from customer value (RE)", "value added costing (VAC) " and "cost-value gap (GAP)", provides the best model to predict and improves profitability, ordinal regression is run for all combinations of the four variables (CVA with RE, CVA with VAC, CVA with GAP, RE with VAC, RE with GAP, GAP with VAC, and CVA with RE with VAC with GAP). This enables the best combination of variables, which meets the proportional odds assumption, fits data well, significantly predicts profitability and produces the highest pseudo R square statistics to be identified. The dependent variable is categorized into the following three levels:

Slight improvement in profitability (5%) = category 1
Moderate improvement in profitability 10% = category 2
High improvement in profitability 15% = category 3

The frequency of the dependent variable is described in table (7.9)

Table 7.9. Frequency of the Dependent Variable

Levels of Dependent Variable	Frequency	Percent
1.0	44	23
2.0	77	41
3.0	69	36
Total	190	100

In building ordinal regression models for cost variables, the five link functions provided by the SPSS were tried. Although a complementary log-log function seems to be the best choice because the higher categories of the dependent variable (levels two and three) are more probable than lower, as illustrated in the above table, the Logit function is the only link function that achieves a better fit of models to the data and meets the assumption of parallel lines of an ordinal dependent variable (Johnson and Albert, 1999).

Findings of ordinal regression models

Table 7.10. Test of Parallel Lines

Combination of Variables	Chi Square	d.f	Sig.
CVA with RE	2.6	2	.28
CVA with GAP	2.4	2	.30
CVA with VAC	4.8	2	.09
RE with VAC	3.4	2	.18
RE with GAP	5.1	2	.77
GAP with VAC	5.0	2	.67
CVA, RE, VAC, and GAP	6.8	4	.14

The test of parallel lines showed that the assumption of the ordinal regression model is not violated for all models, indicating that the relative effect of predictor variables is consistent across all levels of profitability. Such a result means that ordinal regression can be run for these models.

Table 7.11. Model Fitting Information

Combination of Variables	Link Function	Chi Square	d.f	Sig.
CVA with RE	Logit	30.0	2	.00
CVA with GAP	Logit	35.1	2	.00
CVA with VAC	Logit	86.9	2	.00
RE with VAC	Logit	73.9	2	.00
RE with GAP	Logit	23.3	2	.00
GAP with VAC	Logit	81.1	2	.00
CVA, RE, VAC, and GAP	Logit	129.6	4	.00

It can be seen from table (7.11) that all models are fit well to the data, showing the predictors added significant value to models.

Table 7.12. Goodness of Fit

Combination of Variables		Chi Square	d.f	Sig.
CVA with RE	Pearson Deviance	106.1 98.2	104 104	.42 .64
CVA with GAP	Pearson Deviance	178.0 178.4	188 188	.69 .68
CVA with VAC	Pearson Deviance	163.0 167.5	214 214	1.0 1.0
RE with VAC	Pearson Deviance	97.4 99.0	106 106	.71 .67
RE with GAP	Pearson Deviance	94.8 97.3	96 96	.51 .44
GAP with VAC	Pearson Deviance	158.1 164.9	180 180	.878 .78
CVA, RE, VAC, and GAP	Pearson Deviance	391.5 241.5	358 358	.11 1.0

Table (7.12) shows that for all combinations of variables models, the data fits the models in that the expected and observed value did not significantly differ as evidenced by Pearson chi-square and by deviance of chi-square statistics.

Table 7.13. Pseudo R-Squares

Combination of Variables	R-squares Measures	Values
CVA with RE	Cox and Snell Nagelkerke Mc fadden	.23 .27 .12
CVA with GAP	Cox and Snell Nagelkerke Mc fadden	.28 .31 .15
CVA with VAC	Cox and Snell Nagelkerke Mc fadden	.56 .63 .38
RE with VAC	Cox and Snell Nagelkerke Mc fadden	.51 .57 .32
RE with GAP	Cox and Snell Nagelkerke Mc fadden	.18 .21 .09
GAP with VAC	Cox and Snell Nagelkerke Mc fadden	.53 .60 .35
CVA, RE, VAC and GAP	Cox and Snell Nagelkerke Mc fadden	.77 .87 .86

The analysis of the R-square measures for all models indicates that there are higher correlation between predictors and profitability for CVA with VAC, RE with VAC, and GAP with VAC compared with the models for CVA with RE, CVA with GAP, and RE with GAP. In addition, the model with CVA, RE, VAC, and GAP is the best model because its predictors are most strongly associated with the profitability. It can be concluded that profitability is best predicted by the model containing "customer value analysis (CVA)", "revenue generated from customer value (RE)", "value added costing (VAC)" and "cost-value gap (GAP)" together (see table 7.13).

Table 7.14. Parameter Estimates

Variables	Estimate	Wald	d.f	Sig.
CVA	.93	19.2	1	.00
RE	.80	11.3	1	.001
CVA	.98	20.8	1	.00
GAP	.84	15.3	1	.00
CVA	1.1	22.2	1	.00
VAC	1.8	51.3	1	.00
RE	.85	11.2	1	.001
VAC	1.6	50.2	1	.00
RE	.75	10.1	1	.001
GAP	.76	12.5	1	.00
GAP	.96	17.1	1	.00
VAC	1.7	52.9	1	.00
CVA	1.4	30.0	1	.00
RE	1.1	16.7	1	.00
CVA	2.1	56.1	1	.00
GAP	1.2	22.6	1	.00

Table (7.14) shows that all predictors in the seven models are significant in predicting profitability. In addition, all regression coefficients in all models have positive values, which means that for a one unit increase in each predictor variable, the profitability level is expected to change to a higher level by its respective regression coefficient, while other variables in the model are held constant.

SECTION TWO. FINDINGS OF ASSETS VARIABLES

It is again important to firstly determine the distribution of data before applying correlation test and factor analysis.

The results of the skewness and kurtosis tests for all asset items differ from zero which means that the distribution is not normal (see appendix 4). This is further affirmed by the result of Kolmogorov-Smirnov test which indicates that all asset items have a significance level of less than .05 which confirms that the distribution of all asset items is not normal (see appendix 4).

The reliability of asset driver, asset approaches and related profitability variables

Spearman's correlation test was adopted to confirm the reliability of asset items as again the normality of the distribution of asset items was rejected and because the ordinal nature of asset variables (Gibbons, 1993).

- The reliability of intellectual assets variable as the asset driver. This variable is measured by two items. Therefore, the variable is assumed to be reasonably reliable. The result of a Spearman's correlation test indicates that the relationship between the two items is significant at .001 level, with a moderate correlation coefficient of .40.
- The reliability of the profitability generated from asset driver variable. This variable is also measured by two items. The result of a Spearman's correlation test indicates that there is a statistical significant relationship at .001 level, with a moderate correlation coefficient of .67.
- The reliability of intellectual assets management as the asset approach variable. This variable is again measured by two items. The result of a Spearman's correlation test indicates that the relationship between the two items is significant at .001 level, with a high correlation coefficient of .71.

Factor analysis and reliability for proposed technique variables

For the variables of assets model, structural factor analysis is applied at each stage (current position of intellectual assets, value adding intellectual assets activities, evaluating the effectiveness in managing intellectual assets). Common Factor Analysis is used. Due to the non-normality of asset items, Principal Axis Factoring as an extraction method is used.

Factor analysis for analysing and evaluating the current position of intellectual assets.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, indicated that the twenty six sampling items are adequate for structural factor analysis, with a KMO measure = .91 which can be described as "meritorious" (Hair et al., 1998). In addition, the significant level for Bartlett's test is 0.00 (less than .05). Such results indicate that this data is appropriate for factor analysis (with Principal Axis Factoring and Varimax rotation.
All twenty six items included in the analysis have communality values ranging from .4 to .8, which again are common in social science (Velicer and Fava, 1998). In addition, all

twenty six items have a factor loading above .62 which is "very significant" and indicates a strong correlation between items and the factor they belong to. Furthermore, all items are loaded highly on only one factor and are not split loaded on another factor above .32 (Tabachnick and Fidell, 2001). Principal Axis Factoring with Varimax suggests that four factors with eigenvalues of 1.0 or above are extracted and 26 items are retained under the four factors explaining 64% of the variance in the data set. The first factor explains f34% of the variance, the second for 14%, the third for 13%, and the fourth accounts for 3%. None of the remaining factors are significant.

Cronbach's alpha is calculated to test reliability and internal consistency for each factor. The result indicates that the Alpha coefficient for all factors is above 87% which is higher than the standard estimates of .70 (Howitt and Cramer, 2008). In addition, the spearman's inter-correlation for the four factors is significant at the .001 level.
The factors are labelled according to the commonality of items loading on each factor as follows: employees, customer, technology, and process (see table 7.15).

Table 7.15 The Results of Factor Analysis for "Analysing and Evaluating the Current Position of Intellectual Assets"

Factors	Loading	Eigen Value	Variance Explained	Reliability Analysis
Factor 1: employees		9.4	34%	.94
- Total number of employees.	.74			
- Average number of permanent employees.	.81			
- Number of part-time employees.	.83			
-Number of directors.	.79			
- Service period.	.87			
- Average age.	.66			
- New recruitment.	.90			
- Staff-turnover.	.85			
- Recruitment costs.	.83			
Factor 2: customer		3.8	14%	.88
- Annual sales for each customer.	.80			
- Change of customers.	.63			
- Average size of customer's order.	.82			
- Marketing costs.	.71			
- Estimated delivery time.	.87			
- Volume of defective production.	.67			
Factor 3:technology		3.8	13%	.90
- Total investment in IT.	.82			
- Number of IT departments.	.89			
- Number of computers.	.78			
- Number of services provided through the Internet.	.92			
- Amount of information and data on the company's site on the Internet.	.66			
Factor 4: Process		1.2	3%	.87
- Total production time.	.71			
- Current year's production volume.	.78			
- Current year's production costs.	.70			
- Number of orders of supply.	.62			
- Processes stopping time.	.70			
- Repair and re-operation costs.	.66			
Total variance explained	64%			

Factor one, relates to indicators concerning employees, it explained 34 % of variance with an eigenvalue of 9.4.This factor is composed of nine (see table 7.16). The reliability alpha of this factor is .94. To further examine internal consistency, the reliability of this factor is confirmed by spearman's inter-correlation of items included in this factor. They are all significant at .001 level. Moreover, the total correlation for all items is ranged between .40 and .84 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability

if they are deleted because none has an Alpha coefficient higher than the overall reliability for this factor. These results suggest that all items positively contribute to overall reliability.

Table 7.16. Confirming the Reliability of Employees Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation							
			1	2	3	4	5	6	7	8
1	Total number of employees	.94								
2	Average number of permanent employees	.93	.58							
3	Number of part-time employees	.93	.66	.64						
4	Number of directors	.94	.59	.65	.79					
5	Service period	.93	.68	.71	.74					
6	Average age.	.94	.40	.61	.53	.69	.63			
7	New recruitment	.93	.66	.75	72	.51	.81	.70		
8	Staff-turnover	.93	.62	.70	.64	.69	.73	.59	.84	
9	Recruitment costs	.94	.63	.64	.67	.57	.70	.54	.70	.70

Factor two, relates to indicators concerning the customer, it explained 14% of variance with an eigenvalue of 3.4.This factor is composed of six items (see table 7.17). The reliability alpha of this factor is .88. the spearman inter-correlation of items included in this factor was conducted. All are significant at .001 level. The total correlation for all items is ranged between .42 and .80 which means that the correlation between items is ranged from a moderate to a high (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.17. Confirming the Reliability of Customer Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
10	Annual sales for each customer	.86					
11	Change of customers	.88	.42				
12	Average size of customer's order	.85	.71	.49			
13	Marketing costs	.87	.52	.54	.53		
14	Estimated delivery time	.85	.74	.51	.80	.60	
15	Volume of defective production	.87	.56	.51	.46	.54	.53

Factor three, relates to indicators related to technology, it explained 13% of variance with an eigenvalue of 3.6.This factor is composed of five items (see table 7.18). The reliability alpha of this factor is .90. To further examine the internal consistency, the reliability of this factor is confirmed by Spearman's inter-correlation of items. They are all significant at .001 level. Moreover, the total correlation for all items is ranged between .45 and .81 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if deleted. This suggests that all items positively contribute to overall reliability.

Table 7.18. Confirming the Reliability of Technology Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation			
			1	2	3	4
16	Total investment in IT	.88				
17	Number of IT departments	.87	.74			
18	Number of computers	.89	.66	.71		
19	Number of services provided through the Internet	.86	.73	.81	.74	
20	Amount of information and data on the company's site on the Internet	.90	.55	.59	.45	.64

Factor four, related to indicators of process, it explained 3% of variance with an eigenvalue of 1.2.This factor is composed of six items (see table 7.19). The reliability alpha of this factor is .88. To further examine the internal consistency, Spearman's inter-correlation of items was conducted. They are all significant at .001 level, and the total correlation for all items is ranged between .45 and .74 which means that the correlation between items is ranged from a moderate to a high correlation. The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. Again results suggest that all items positively contribute to overall reliability.

Table 7.19. Confirming the Reliability of Process Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
21	Total production time	.85					
22	Current year's production volume	.84	.65				
23	Current year's production costs	.85	.62	.74			
24	Number of orders of supply	.86	.50	.57	.53		
25	Processes stopping time	.86	.60	.53	.52	.48	
26	Repair and re-operation costs	.87	.45	.53	.48	.51	.47

Factor analysis for determining value adding intellectual activities

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated that the twenty one items are adequate for structural factor analysis, with KMO measure = .80 which can be described as "meritorious". In addition, the significance level for Bartlett's test is 0.00 (less than .05). Such results indicate that the data relates to "determining value adding intellectual activities" is appropriate for factor analysis. Eleven items from twenty one included in the analysis have communality values ranged from .4 to .7 (from lower to moderate), which are common magnitudes in social science (Velicer and Fava, 1998). Seven items have communality values above .7 which represents high communality. On the other hand, three items have communality values less than .4, which means that they do not fit well with the factor solution and should be dropped. In addition, most of the items have a factor loading above .60 which is "very significant" and indicates a strong correlation between items and factor they belong to. Furthermore, all items are loaded

highly on only one factor and are not split loaded. Principal Axis Factoring with Varimax provides a four factors solution, eigenvalues of 1.0 or above, and twenty one items are retained under the four factors which explain 61% of the variance in the data set. The first factor explained 22% of the variance, the second 14%, the third 13%, and the fourth accounts for 12%. None of the remaining factors is significant.

As mentioned above, three items should be dropped from the analysis, in order to confirm this, the analysis of reliability Alpha if items are deleted is computed for factors including such items.

Factor one, included item five (A4.1.5), which should be dropped. The overall reliability coefficient for factor one including the five items is 86%. Table (7.20) shows "Alpha if items deleted for each item".

Table 7.20. Confirming the Dropping of Item Five from the Analysis

No	Statements	Cronbach's Alpha if Item deleted
1	Training and teaching expenses per employee.	.83
2	Number of training days per employee.	.80
3	Number of training hours.	.82
4	Costs of new idea generated by employees.	.84
5	Number of employees participating in each task.	.87

It can be seen from the above table that if item five (A4.1.5) is deleted from the analysis, overall reliability will be increased from .86 to .87.

Factor two, included item ten (A4.2.5) which should be dropped. The overall reliability coefficient for factor two including the 5 items is 75%. Table (7.21) shows Alpha if items deleted for each item included in factor two.

Table 7.21. Confirming the Dropping of Item Ten from the Analysis

No	Statements	Cronbach's Alpha if item deleted
6	Ratio of marketing costs to total costs.	.72
7	Ratio of marketing costs to total income.	.65
8	Marketing costs for each customer.	.70
9	Number of orders delivered in-time.	.59
10	Number of days allocated for exhibitions, customer meetings, and training.	.82

It can be seen from table (7.21) that if item 10 (A4.2.5) is deleted from the analysis, overall reliability will be increased from .75 to .82.

Factor four, included item twenty (A4.4.3) which should be dropped, the overall reliability coefficient for factor four including all four items is 88%. Table (7.22) shows Alpha if items deleted.

Table 7.22 Confirming the Dropping of Item Twenty from the Analysis

No	Statements	Cronbach's Alpha if item deleted
18	Costs of new capital investment.	.82
19	Costs for software and computer purchase and maintenance.	.80
20	Research and development costs.	.93
21	The ratio of IT costs to administration costs.	.80

It can be seen from Table (7.22) that if item twenty (A4.4.3) is deleted from the analysis, overall reliability will be increased from .88 to .93.

Thus items five, ten, and twenty are dropped from the analysis. A new factor analysis is conducted for the remaining eighteen items.

Of eighteen items included in analysis, nine items have communality values ranging from .4 to .7. The remaining nine items included in the analysis have communality values ranging from .7 to .9, which represents a high communality (Velicer and Fava, 1998). In

addition, all eighteen items have a factor loading above .60 which is "very significant" and indicate a strong correlation between items and the factor they belong to. Furthermore, all items loaded highly on only one factor and are not split loaded. Principal Axis Factoring with Varimax suggests that four factors with eigenvalues of 1.0 or above are extracted and eighteen items are retained under the four factors which explain 68% of the variance in the data set (compared to 61% before dropping the three items). The first factor explains 27% of the variance, the second for 14%, the third for 14%, and the fourth for 13%. None of the remaining factors is significant.

For reliability analysis, Cronbach's alpha is calculated to test reliability and internal consistency for each factor. The result indicates that the Alpha coefficient for all factors is above 80% which is higher than the standard estimates of .70 (Howitt and Cramer, 2008). In addition, the Spearman inter-correlation for the four factors is significant at the .001 level.

The factors are labelled as before according to the commonality of items loading on each factor as follows: process, employees, technology, and customer (see table 7.23).

Table 7.23. The Results of Factor Analysis for Value Adding Intellectual activities

Factors	Loading	Eigen Value	Variance Explained	Reliability Analysis
Factor 1: employees		3.0	14%	.87
- Training and teaching expenses per employee.	.77			
- Number of training days per employee	.92			
- Number of training hours.	.84			
- Costs of new idea generated by employees.	.64			
Factor 2: customer		2.0	13%	.81
- Ratio of marketing costs to total costs.	.66			
- Ratio of marketing costs to total income.	.75			
- Marketing costs for each customer.	.62			
- Number of orders delivered in-time.	.98			
Factor 3: process		5.0	27%	.93
- Product development time	.77			
- Customer response time	.74			
- Breakdown time.	.87			
-Defective production costs.	.84			
-Quality improvement costs.	.89			
- Investment in research and development.	.66			
- Percentage of time used in development.	.89			
Factor 4: technology		2.0	14%	.94
- Costs of new capital investment.	.85			
- Costs for software and computer purchase and maintenance.	.96			
- The ratio of IT costs to administration costs.	.92			
Total variance explained	68%			

Factor one related to indicators concerning employees, explained 14% of variance with an eigenvalue of 3. This factor is composed of four items (see table 7.24). The reliability alpha of this factor is .87. To further examine the internal consistency, the reliability of this factor is confirmed by the Spearman's inter-correlation of items included in this factor. They are all significant at .001 level. Moreover, the total correlation for all items is ranged between .53 and .87 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results again suggest that all items positively contribute to overall reliability.

Table 7.24. Confirming the Reliability of Employees Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
1	Training and teaching expenses per employee.	.84			
2	Number of training days per employee.	.79	.70		
3	Number of training hours.	.81	.66	.78	
4	Costs of new idea generated by employees.	.87	.49	.62	.53

Factor two related to indicators concerning the customer, it explained 13% of variance with an eigenvalue of 2.This factor is composed of four items (see table 7.25). The reliability alpha of this factor is .81. To further examine the internal consistency, the reliability of this factor is confirmed by Spearman inter-correlation of items. They are all significant at .001 level. The total correlation for all items is ranged between .49 and .78 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.25. Confirming the Reliability of Customer Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
6	Ratio of marketing costs to total costs.	.78			
7	Ratio of marketing costs to total income.	.76	.49		
8	Marketing costs for each customer.	.79	.31	.53	
9	Number of orders delivered in-time.	.70	.70	.70	.60

Factor three related to indicators of process, it explained 27% of variance with an eigenvalue of 5. This factor is composed of seven items (see table 7.26). The reliability alpha of this factor is .93. To further examine the internal consistency, the reliability of this factor is confirmed by the Spearman's inter-correlation of items included. They are all significant at .001 level. Moreover, the total correlation for all items is ranged between .53 and .85 which means that the correlation between items is ranged from a moderate

to a high correlation (Hair et. al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.26. Confirming the Reliability of Process Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation					
			1	2	3	4	5	6
11	Product development time.	.92						
12	Customer response time	.92	.53					
13	Breakdown time.	.91	.69	.62				
14	Defective production costs.	.91	.66	.61	.85			
15	Quality improvement costs.	.91	.68	.70	.76	.72		
16	Investment in research and development.	.93	.49	.54	.53	.54	.59	
17	Percentage of time used in development.	.91	.71	.67	.73	.71	.81	.64

Factor four related to indicators related to technology, it explained 14% of variance with an eigenvalue of 2. This factor is composed of three items (see table 7.27). The reliability alpha of this factor is .94. To further examine the internal consistency, the reliability of this factor is confirmed by the spearman inter-correlation of items included in this factor. They are all significant at .001 level. The total correlation for all items is ranged between .78 and .94 which means that the correlation between items is ranged from a high to a very high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.27. Confirming the Reliability of Technology Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation	
			1	2
18	Costs of new capital investment.	.94		
19	Costs for software and computer purchase and maintenance.	.87	.82	
21	The ratio of IT costs to administration costs.	.90	.78	.90

Factor analysis for evaluating the effectiveness of managing intellectual assets

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, indicated that the twenty one sampling items are adequate for factor analysis, with KMO measure = .83 which can be described as "meritorious" (Hair et al., 1998). In addition, the significant level for Bartlett's test is 0.00 (less than .05). Such results indicate that the data concerning the evaluating the effectiveness of managing intellectual assets is appropriate for using factor analysis.

From twenty one items included in the analysis, eleven items have communality values ranging from .4 to .7 which are common magnitudes in social science (Velicer and Fava, 1998). 10 items have communality values above .7 which represent high communality (Velicer and Fava, 1998). In addition, all twenty one items have a factor loading above .60 which is "very significant" and indicating a strong correlation between items and the factor they belong to (Hair et al., 1998). Furthermore, all items are loaded highly on only one factor. Principal Axis Factoring with Varimax gives four factors solution with eigenvalues of 1.0 or above and the twenty one items are retained under the four factors which explain 69.5% of the variance in the data set. The first factor explains 22.5% of the variance, the second for 19%, the third for 14%, and the fourth for 14%. None of the remaining factors is significant.

For reliability analysis, Cronbach's alpha is calculated to test reliability and internal consistency for each factor. The result indicates that the Alpha coefficient for all factor is above 90% which is higher than the standard estimates of .70 (Howitt and Cramer, 2008). In addition, the Spearman's inter-correlation for the four factors is significant at the .001 level.

The factors are labelled according to the commonality of items loading on each factor as follows: customer, process, employees, and technology (see table (7.28).

Table 7.28. The Results of Factor Analysis for "Evaluating Effectiveness of Managing Intellectual Assets"

Factors	Loading	Eigen Value	Variance Explained	Reliability Analysis
Factor 1: customer		5.5	22.5%	.93
- Customer satisfaction.	.77			
- Customer loyalty.	.83			
- Number of long-term customers.	.86			
- Post-sales service development rate.	.79			
- Decrease in percentage of returned goods.	.81			
- Current customer turnover rate.	.82			
- Number of new customers.	.79			
Factor 2: process		4.6	19%	.92
- Error rate.	.63			
- Ratio of defective production to total production	.89			
- Cost of production unit.	.79			
- Development rate in throughput time.	.91			
- Development rate in product development time.	.83			
- Waiting time.	.77			
Factor 3: employees		3.8	14%	.90
- Employees turnover rate.	.79			
- Development rate in employee's daily performance.	.60			
- Ratio of employees leaving work to total number of employees.	.93			
- Employees' loyalty.	.91			
Factor 4: Technology		1.7	14%	.90
- Technological development rate.	.81			
- IT performance development per employee.	.76			
- Obtaining IT licenses.	.86			
- Development rate in knowledge of IT.	.84			
Total variance explained	69.5%			

Factor one related to indicators concerning the customer, it explained 22.5% of variance with an eigenvalue of 5.5. This factor is composed of seven items (see table 7.29).

The reliability alpha of this factor is .93. To further examine the internal consistency, the reliability of this factor is confirmed by Spearman inter-correlation. They are all significant

at .001 level. The total correlation for all items is ranged between .55 and .94 which means that the correlation between items is ranged from a moderate to a very high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.29. Confirming the Reliability of Customer Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation					
			1	2	3	4	5	6
1	Customer satisfaction.	.92						
2	Customer loyalty.	.91	.59					
3	Number of long-term customers.	.91	.72	.84				
4	Post-sales service development rate.	.92	.55	.60	.58			
5	Decrease in percentage of returned goods.	.92	.56	.63	.62	.94		
6	Current customer turnover rate.	.91	.75	.73	.75	.56	.58	
7	Number of new customers.	.92	.60	.65	.68	.65	.62	.67

Factor two related to indicators concerning process, it explained 19% of variance with an eigenvalue of 4.6.This factor is composed of six items (see table 7.30). The reliability alpha of this factor is .92. To further examine the internal consistency, the reliability of this factor is confirmed by spearman's inter- correlation. They are all significant at .001 level. The total correlation for all items is ranged between .47 and .81 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results again suggest that all items positively contribute to overall reliability.

Table 7.30. Confirming the Reliability of Process Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
8	Error rate.	.92					
9	Ratio of defective production to total production.	.89	.59				
10	Cost of production unit.	.90	.54	.72			
11	Development rate in throughput time.	.89	.64	.81	.71		
12	Development rate in product development time.	.90	.52	.76	.68	.77	
13	Waiting time.	.91	.47	.67	.62	.69	.69

Factor three related to indicators concerning employees, it explained 14% of variance with an eigenvalue of 3.8.This factor is composed of four items (see table 7.31). The reliability alpha of this factor is .90. To further examine the internal consistency, the reliability of this factor is confirmed by spearman's inter-correlation. The total correlation for all items is ranged between .51 and .90 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results also suggest that all items positively contribute to overall reliability.

Table 7.31. Confirming the Reliability of Employees Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
14	Employee's turnover rate.	.87			
15	Development rate in employee's daily performance.	.90	.51		
16	Ratio of employees leaving work to total number of employees.	.83	.82	.57	
17	Employees' loyalty.	.84	.78	.59	.90

Factor four relates to indicators of technology, it explains 14% of variance with an eigenvalue of 1.7. This factor is composed of four items (see table 7.32). The reliability alpha of this factor is .90. To further examine the internal consistency, the reliability of

this factor is confirmed by Spearman inter-correlation. All items are significant at .001 level. The total correlation for all items is ranged between .61 and .87 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.32. Confirming the Reliability of Technology Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation		
			1	2	3
18	Technological development rate.	.88			
19	IT performance development per employee.	.89	.61		
20	Obtaining IT licenses.	.87	.83	.65	
21	Development rate in knowledge of IT.	.87	.66	.87	.72

Hypothesis tests related to the assets model

(The formal rejection/acceptance of each hypothesis is detailed in the discussion chapter.)

Relationships between proposed assets driver and profitability, and asset approach and profitability

A spearman's test of association is adopted to test the association between assets driver and profitability, and assets approach and profitability

- The association between intellectual assets as a main asset driver and profitability. The result of Spearman correlation indicates a significant correlation at the .001 level of significance exists between intellectual assets and profitability, with a moderate positive correlation coefficient of .53. Such a result suggests that intellectual assets are moderately associated with profitability.
- The association between intellectual assets management approach and profitability. The result of Spearman's correlation indicates that significant correlation at the .001 level of significance exists between intellectual assets management approach and profitability, with a moderate positive correlation coefficient of .45. Such a result

suggests that intellectual assets management approach is moderately associated with profitability.

Multivariate analysis is not necessary to test the relationship between a proposed asset driver and profitability, and asset approach and profitability because only one independent variable is investigated and significantly associated with profitability. Therefore regression will not have added any value without additional variables entering the model.

Table 7.33. The Association of the Proposed Assets Driver and Profitability, and Proposed Assets Approach and Profitability

Variables	Correlation Coefficient	P-value	Conclusion
Intellectual assets driver	053	.00	Moderate positive association
Intellectual assets management approach	.45	.00	Moderate positive association

Relationship between proposed assets management technique and profitability, using ordinal regression

As the main purpose of this aspect is to investigate if the combination of the three variables "analysing and evaluating the current position of intellectual assets (CIC)", "determining value-adding intellectual assets (VIC)", and "evaluating the effectiveness of managing intellectual assets(MIC)", is the best model that predicts and improves profitability. Ordinal regression is run for the various combinations of the three variables (CIC and VIC, CIC and MIC, MIC and VIC, CIC, MIC and VIC) to find the best combination of variables, which meets the proportional odds assumption, fits the data well, significantly predicts profitability and produces the highest pseudo R square statistics.

The dependent variable is categorized into the following three levels:

Slight improvement in profitability (5%) = category 1
Moderate improvement in profitability 10% = category 2
High improvement in profitability 15% = category 3

The following table describes the frequency of the dependent variable.

Table 7.34. Frequency of the Dependent Variable

Levels of Dependent Variable	Frequency	Percent
1.0	38	20
2.0	81	42
3.0	71	37
Total	190	100

In building ordinal regression models for the assets variables, the five link functions provided by the SPSS program were tried. Although complementary log-log function seems to be the best choice because of the higher categories of the dependent variable (levels two and three) are more probable than lower as illustrates in table (7.34), logit and negative log-log functions are the only two link functions that achieve better fit of models with the data and meet the assumption of parallel lines of an ordinal dependent variable (Johnson and Albert, 1999).

Findings of ordinal regression models

Table 7.35. Test of Parallel Lines

Combination of Variables	Chi Square	d.f	Sig.
CIC and VIC	1.19	2	.55
CIC and MIC	.4	2	.82
MIC and VIC	1.85	2	.34
CIC, VIC and MIC	2.73	3	.44

The test of parallel lines showed that this assumption is not violated for all models, indicating that the relative effect of predictor variables is consistent across all levels of profitability. Such a result means that ordinal regression can be run for these models.

Table 7.36. Model Fitting Information

Combination of Variables	Link Function	Chi Square	d.f	Sig.
CIC and VIC	Negative log-log	224.2	2	.00
CIC and MIC	Logit	53.7	2	.00
MIC and VIC	Logit	204.5	2	.00
CIC, VIC, and MIC	Negative log-log	248.0	3	.00

It can be seen from the above table that all models are fit well to the data, showing the predictors added significant value to models.

Table 7.37. Goodness of Fit

Combination of Variables		Chi Square	d.f	Sig.
CIC and VIC	Pearson Deviance	220.0 173.0	374 374	1.0 1.0
CIC and MIC	Pearson Deviance	379.0 246.0	374 374	.41 .84
MIC and VIC	Pearson Deviance	326.7 197.1	376 376	1.0 1.0
CIC, VIC, and MIC	Pearson Deviance	239.0 152.0	375 375	1.0 1.0

The above table shows that for all combinations of the data fit the models, in that the expected and observed value did not significantly differ as evidenced by Pearson chi-square and by deviance chi-square statistics.

Table 7.38. Pseudo R-Squares

Combination of Variables	R-squares Measures	Values
CIC and VIC	Cox and Snell Nagelkerke Mc fadden	.69 .79 .56
CIC and MIC	Cox and Snell Nagelkerke Mc fadden	.25 .28 .13
MIC and VIC	Cox and Snell Nagelkerke Mc fadden	.66 .75 .59
CIC, VIC, and MIC	Cox and Snell Nagelkerke Mc fadden	.73 .83 .62

The analysis of the R-square measures for all models indicates that there are higher correlations between predictors and profitability for the CIC and VIC, MIC and VIC and IC, VIC, and MIC models compared with the CIC and MIC model. In addition, the CIC, VIC, and MIC model is the best because its predictors are most strongly associated with the profitability. It can be concluded that profitability is better predicted by the model containing "analysis and evaluating the current position of intellectual assets (CIC)", "determining value adding intellectual assets (VIC)", and "evaluating the effectiveness of managing intellectual assets (MIC)" together.

Table 7.39. Parameter Estimates

Variables	Estimate	Wald	d.f	Sig.
CIC	2.0	30.0	1	.00
VIC	7.3	73.0	1	.00
CIC	1.12	11.3	1	.001
MIC	2.3	36.7	1	.00
MIC	2.18	18.4	1	.00
VIC	8.75	69.8	1	.00
CIC	2.2	31.2	1	.00
VIC	7.9	63.0	1	.00
MIC	1.6	20.0	1	.00

Table (7.39) shows that all predictors in the four models are significant in predicting profitability. In addition, all regression coefficients in all models have positive values, which means that for a one unit increase in each predictor variable, the profitability level is expected to change to a higher level by its respective regression coefficient, while other variables in the model are held constant.

SECTION THREE. FINDINGS OF REVENUE VARIABLES

It is important to determine the distribution of data before applying correlation test and factor analysis. The skewness and kurtosis test result for all revenue items differs from zero which means that the distribution is not normal (see appendix 5). This is further affirmed by the result of the one-sample Kolmogorov-Smirnov test which indicates that all revenue items have a significance level of less than .05 which confirms that the distribution of all revenue items is not normal (see appendix 5).

The reliability of proposed revenue driver, revenue approaches respectively and profitability variables

A Spearman correlation test was adopted to confirm the reliability of revenue items because of the non normality of the distribution of revenue items and the ordinal nature of revenue variables (Gibbons, 1993).

- The reliability of a customer variable as a revenue driver. This variable is measured by two items. Therefore, the variable is assumed to be reasonably reliable. The result of a Spearman correlation test indicates that the relationship between the two items is significant at .001 level, with a high correlation coefficient of .73.

- The reliability of the customer satisfaction variable as a revenue management approach. This variable is also measured by two items. The result of a Spearman correlation test indicates that there is a statistical significant relationship at .001 level, with a moderate correlation coefficient of .68.
- The reliability of a customer loyalty variable as a revenue management approach. This variable is measured by two items. The result of a Spearman correlation test indicates that the relationship between the two items is significant at .001 level, with a moderate correlation coefficient of .64.
- The reliability of the profitability variable generated from customer satisfaction and customer loyalty approaches. This variable is also measured by two items. The result of a Spearman correlation test indicates that, there is a statistical significant relationship at .001 level, with a moderate correlation coefficient of .40.

Factor analysis for the proposed techniques variables

Structural factor analysis was applied for variables of the proposed revenue technique. Common Factor Analysis was used. Choosing the appropriate method of Common Factor Analysis depends on the distribution of the data (Fabrigar et al., 1999). Due to the non-normality of revenue' items, Principal Axis Factoring was used as an extraction method.

The Kaiser- Meyer-Olkin (KMO) measure of sampling adequacy indicated that the twenty six sampling items are adequate for structural factor analysis, with KMO measure = .7. In addition, the significance level for Bartlett's test is 0.00 (less than .05). Such results indicate that the data for customer satisfaction, customer loyalty, and customer profitability analysis variables is appropriate for using factor analysis.

Fourteen items from twenty six included in the analysis have communality values ranging from .4 to .7 (from lower to moderate), which are common magnitudes in social science (Velicer and Fava, 1998). Nine items have communality values above .7 which represent high communality. On the other hand, three items have communality values less than .4, which means that they do not fit well with factor solution and should be dropped from the analysis (Velicer and Fava, 1998). In addition, most of items have a factor loading above .49. Furthermore, all items are loaded highly on only one factor and are not split loaded. Principal Axis Factoring with Varimax provided a four factor solution with eigenvalues of 1.0 or above and 26 items are retained under the four factors which explain 60% of the variance in the data set. The first factor explains 16% of the variance, the second for 16%, the third accounts for 16%, and the fourth for 12%. None of the remaining factors are significant.

As mentioned above three items should be dropped from the analysis, in order to confirm that the analysis of reliability Alpha if items are deleted is computed for factor three which included such items.

Factor three included item thirteen, fourteen, and nineteen which should be dropped. The overall reliability coefficient for factor three including the 9 items is 86%.Table (7.40) shows Alpha if item thirteen is deleted from factor three.

Table 7.40. Confirming the Dropping of Item Thirteen from the Analysis

No	Statements	Cronbach's Alpha if Item deleted
13	The average time taken for meeting the customer's order.	.87
14	The frequency of delayed deliveries.	.85
15	Rate of (in-time delivery).	.84
16	The number of returned units to the total number of units sold.	.82
17	The percentage of re-operated orders to the total production orders.	.85
18	The number of repair claims during the period of guarantee.	.83
19	The number of daily inquires by customers.	.85
20	The number of customer complaints to the total number of customers.	.84
21	The ratio of customer complaints that have been solved to the total number of customer complaints.	.83

It can be seen from the above table that if item thirteen (R3.2.1) is deleted from the analysis, overall reliability is increased from .86 to .87.

Table (7.41) shows Alpha if item fourteen deleted from factor three.

Table 7.41. Confirming the Dropping of Item Fourteen from the Analysis

No	Statements	Cronbach's Alpha if item deleted
14	The frequency of delayed deliveries.	.88
15	Rate of (in-time delivery.	.85
16	The number of returned units to the total number of units sold.	.83
17	The percentage of re-operated orders to the total production orders.	.86
18	The number of repair claims during the period of guarantee.	.84
19	The number of daily inquires by customers.	.87
20	The number of customer complaints to the total number of customers.	.85
20	The ratio of customer complaints that have been solved to the total number of customer complaints.	.85

It can be seen from the above table that if item fourteen (R3.2.2) is deleted from the analysis, overall reliability will be increased from .87 to .88.

Table (7.42) shows Alpha if item nineteen is deleted from factor three.

Table 7.42. Confirming the Dropping of Item Nineteen from the Analysis

No	Statements	Cronbach's Alpha if item deleted
15	Rate of (in-time delivery.	.85
16	The number of returned units to the total number of units sold.	.84
17	The percentage of re-operated orders to the total production orders.	.86
18	The number of repair claims during the period of guarantee.	.84
19	The number of daily inquires by customers.	.89
20	The number of customer complaints to the total number of customers.	.84
21	The ratio of customer complaints that have been solved to the total number of customer complaints.	.84

It can be seen from the above table that if item nineteen (R3.2.7) is deleted from the analysis, overall reliability will be increased from .88 to .89

Thus items thirteen, fourteen, and nineteen are dropped from factor three. A New factor analysis was conducted for the remaining 23 items.

Among twenty three items included in the analysis, nine items have communality values ranged from .4 to .7, which are common magnitudes in social science (Velicer and Fava, 1998). The remaining fourteen items included in the analysis have communality values above .7, which represents a high communality (Velicer and Fava, 1998). In addition, all twenty three items have a factor loading above .70 which is "very significant" and indicates a strong correlation between items and factor they belong to. Furthermore, all items loaded on only one factor and are not split loaded. Principal Axis Factoring with Varimax suggests that four factors with eigenvalues of 1.0 or above are extracted and twenty three items are retained under the four factors which explain 66% of the variance in the data set (compared to 60% before dropping the three items). The first factor explains 18.5% of the variance, the second for 18.5%, the third for 16%, and the fourth for 13%. None of the remaining factors is significant.

For reliability analysis, Cronbach's alpha is calculated to test reliability and internal consistency for each factor. The result indicates that the Alpha coefficient for all factor is above 85% which is higher than the standard estimates of .70 (Howitt and Cramer, 2008). In addition, the Spearman's inter-correlation for the four factors is significant at the .001 level.

The factors are labelled according to the commonality of items loading on each factor and they are labelled as follows: financial indicators of customer satisfaction, customer loyalty, non-financial indicators of customer satisfaction, and customer profitability analysis (see table 7.43).

Table 7.43. The Results of Factor Analysis for Revenue

Factors	Loading	Eigen Value	Variance Explained	Reliability Analysis
Factor 1: financial indicator of customer satisfaction		4.8	18.5%	.93
- Repair and replacement costs during the guarantee period.	.84			
- Legal liability costs	.85			
- The ratio of marketing costs to total sales.	.85			
- Decrease of sale prices because of bad quality.	.83			
- Opportunity cost of lost sales.	.89			
- Total investment on customer satisfaction.	.72			
Factor 2: customer loyalty		4.3	18.5%	.93
- The ratio of frequency of sales to current customers.	.85			
- The percentage of customers who have stopped dealing with the company.	.87			
- The growth rate of sales for current customers.	.87			
- The number of customers over a specific period.	.74			
- Marketing investments in customer loyalty.	.88			
- Rate of investment in research and development for current customers.	.76			
Factor 3: the non-financial indicators of customer satisfaction		4.0	16%	.89
- Rate of (in-time delivery).	.83			
- The number of returned units to the total number of units sold.	.79			
- The percentage of re-operated orders to the total production orders.	.68			
- The number of repair claims during the period of guarantee.	.80			
- The number of customer complaints to the total number of customers	.77			
- The ratio of customer complaints that have been solved to the total number of customer complaints.	.78			
Factor 4: customer profitability analysis		3.2	13	.87
- Improvement and managing profitability.	.78			
- Decision making for eliminating or improving or adding specific activities.	.76			
- Managing the activities that increase customer profitability.	.73			

- Making the decisions to turn non-profitable customers into profitable ones. - Activity-based costing to provide accurate information to measure the costs on the customer level.	.81 .73			
Total explained variance	66%			

Factor one related to the financial indicators of customer satisfaction, it explained 18.5% of variance with an eigenvalue of 4.8. This factor is composed of six items (see table 7.44).

The reliability alpha of this factor is .93. To further examine the internal consistency, the reliability of this factor is confirmed by Spearman's inter-correlation of items included in this factor. They are all significant at .001 level. The total correlation for all items ranged between .60 and .85 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.44. Confirming the Reliability of the Financial Indicators for Customer Satisfaction Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
1	Repair and replacement costs during the guarantee period	.91					
2	Legal liability costs	.91	.75				
3	The ratio of marketing costs to total sales.	.92	.72	.70			
4	Decrease of sale prices because of bad quality.	.91	.70	.71	.74		
5	Opportunity cost of lost sales	.91	.75	.76	.76	.74	
6	Total investment on customer satisfaction	.93	.85	.64	.62	.60	.63

Factor two related to the indicators of customer loyalty, it explained 18.5% of variance with an eigenvalue of 4.3. This factor is composed of six items (see table 7.45). The reliability alpha of this factor is .93. To further examine the internal consistency, the

reliability of this factor is confirmed by Spearman's inter-correlation of items included in this factor. They are all significant at .001 level. The total correlation for all items is ranged between .62 and .80 which means that the correlation between items is ranged from a moderate to a high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. Again these results suggest that all items positively contribute to overall reliability.

Table 7.45. Confirming the Reliability of Customer Loyalty Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
7	The ratio of frequency of sales to current customers	.91					
8	The percentage of customers who have stopped dealing with the company	.91	.77				
9	The growth rate of sales for current customers	.91	.77	.75			
10	The number of customers over a specific period.	.92	.62	.63	.63		
11	Marketing investments in customer loyalty.	.91	.74	.77	.80	.66	
12	Rate of investment in research and development for current customers	.92	.63	.66	.65	.62	.66

Factor three is related to the non financial indicators for customer satisfaction, it explained 16% of variance with an eigenvalue of 4. This factor is composed of six items (see table 7.46). The reliability alpha of this factor is .89. To further examine the internal consistency, the reliability of this factor is confirmed by Spearman's inter-correlation of items included in this factor. They are all significant at .001 level. The total correlation for all items ranged between .40 and .81 which means that the correlation is ranged from moderate to high correlation (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if they are deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.46. Confirming the Reliability of the Non-Financial Indicators for Customer Satisfaction Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation				
			1	2	3	4	5
15	Rate of (in-time delivery).	.87					
16	The number of returned units to the total number of units sold	.87	.74				
17	The percentage of re-operated orders to the total production orders	.88	.51	.40			
18	The number of repair claims during the period of guarantee	.87	.86	.78	.42		
20	The number of customer complaints to the total number of customers	.86	.54	.63	.61	.52	
21	The ratio of customer complaints that have been solved to the total number of customer complaints	.85	.51	.53	.81	.50	.75

Factor four is related to customer profitability analysis, it explained 13% of variance with an eigenvalue of 3.2. This factor is composed of five items (see table 7.47).
The reliability alpha is .87. The spearman's inter-correlation of all items included in this factor is significant at .001 level. The total correlation for all items is ranged between .55 and .63 which means that all items are moderately correlated (Hair et al., 2007). The value in the column labelled "Alpha if items are deleted" indicates that none of the items would increase the reliability if deleted. These results suggest that all items positively contribute to overall reliability.

Table 7.47. Confirming the Reliability of Customer Profitability Analysis Factor

No	Statements	Cronbach's Alpha if item deleted	Spearman Correlation			
			1	2	3	4
22	Improvement and managing profitability.	.84				
23	Decision making for eliminating or improving or adding specific activities	.85	.61			
24	Managing the activities that increase customer profitability.	.85	.54	.56		
25	Making the decisions to turn non-profitable customers into profitable ones	.84	.63	.61	.62	
26	Activity-based costing to provide accurate information to measure the costs on the customer level.	.85	.61	.55	.55	.59

Hypothesis tests related to the revenue model

(The formal rejection/acceptance of each hypothesis is detailed in the discussion chapter.)

Association between a proposed revenue driver and profitability, and a proposed revenue approaches and profitability

A Spearman test of association is adopted to test the association between revenue driver and profitability, revenue approaches and profitability (see table 7.48).

- The association between customer as a main revenue driver and profitability. The result of Spearman correlation indicates that significant correlation at the .001 level of significance exists between the focus on customer and profitability, with a moderate positive correlation coefficient of .50. Such a result suggests that the focus on customer is moderately and directly associated with profitability.
- The association between the customer satisfaction and profitability. The result of Spearman correlation indicates that significant correlation at the .001 level of significance exists between the customer satisfaction and profitability, with a moderate positive correlation coefficient of .40. Such a result again suggests that the customer satisfaction is moderately and directly associated with profitability.
- The association between customer loyalty and profitability. The result of Spearman correlation indicates that significant correlation at the .001 level of significance exists between customer loyalty and profitability, with a moderate positive correlation coefficient of .48. Such a result again suggests that the customer loyalty is moderately and directly associated with profitability.

- The association between customer profitability analysis and profitability. The result of Spearman correlation indicates that significant correlation at the .001 level of significance exists between the customer profitability analysis and profitability, with a moderate positive correlation coefficient of .45. Such a result also suggests that the customer profitability analysis is moderately and directly associated with profitability.

Multivariate analysis is not necessary to test the relationship between a proposed revenue driver and profitability, and revenue approach respectively and profitability because only one independent variable is investigated and significantly associated with profitability in each case. Therefore, regression will not have added any value without additional variables entering the model.

Table 7.48. The Association of Revenue Driver with Profitability, and Revenue Approaches with Profitability

Variables	Correlation Coefficient	P-value	Conclusion
Customer driver	.50	.00	Moderate positive association
Customer satisfaction	.40	.00	Moderate positive association
Customer loyalty	.48	.00	Moderate positive association
Customer profitability analysis	.45	.00	Moderate positive association

Relationship between suggested revenue management technique and profitability, using ordinal regression

The main purpose of this section is to examine if the combination of the three variables "customer satisfaction (CS)," customer loyalty (CL)", and "customer value analysis (CPA)" will be the best model to predict and improve profitability. Ordinal regression will be run for all paired combinations of the three variables and finally all three together (CS with CL, CS with CPA, CPA with CL, and CS with CL with CPA) to find the best combination of variables, which meets the proportional odds assumption, fits data well, significantly predicts profitability, and produces the highest pseudo R-square statistics.

The dependent variable is categorized into the following three levels:

Slight improvement in profitability (5%) = category 1
Moderate improvement in profitability 10% = category 2
High improvement in profitability 15% = category 3

The following table describes the frequency of the dependent variable

Table 7.49. Frequency of the Dependent Variable

Levels of Dependent Variable	Frequency	Percent
1.0	37	19
2.0	87	46
3.0	66	35
Total	190	100

In building ordinal regression models for revenue variables, the five link functions provided by the SPSS program were tried. Although the complementary log-log function would seem to be the best choice because the higher categories of the dependent variable (levels two and three) are more probable than the lower as illustrated in the above table, the negative log-log function is the only link function that achieves a better fit of model data and meets the assumption of parallel lines of an ordinal dependent variable (Johnson and Albert, 1999).

Findings of ordinal regression models

Table 7.50. Test of Parallel Lines

Combination of Variables	Chi-Square	d.f	Sig.
CS with CL	3.07	2	.21
CS with CPA	3.04	2	.21
CL with CPA	3.00	2	.23
CS with CL with CPA	3.70	3	.30

The test of parallel lines showed that this assumption is not violated for all models, indicating that the relative effect of predictor variables is consistent across all levels of profitability. Such a result means that ordinal regression can be run for all of these models.

Table 7.51. Model Fitting Information

Combination of Variables	Link Function	Chi-Square	d.f	Sig.
CS with CL	Negative log-log	89.2	2	.00
CS with CPA	Negative log-log	188.35	2	.00
CL with CPA	Negative log-log	130.2	2	.00
CS with CL with CPA	Negative log-log	215.2	3	.00

It can be seen from the above table that all models are fit well to the data, showing the predictors added significant value to models.

Table 7.52. Goodness of Fit

Combination of Variables		Chi-Square	d.f	Sig.
CS with CL	Pearson Deviance	301.4 251.5	304 304	.53 .98
CS with CPA	Pearson Deviance	275.7 255.4	272 272	.87 1.0
CL with CPA	Pearson Deviance	293.7 159.0	206 206	.85 1.0
CS with CL with CPA	Pearson Deviance	240.0 181.34	369 369	1.0 1.0

The above table shows that for all combinations of variable models the data fits the models in that the expected and observed value did not significantly differ as evidenced by Pearson chi-square and by deviance chi-square statistics.

Table 7.53. Pseudo R-Squares

Combination of Variables	R-squares Measures	Values
CS with CL	Cox and Snell Nagelkerke Mc fadden	.38 .43 .23
CS with CPA	Cox and Snell Nagelkerke Mc fadden	.63 .72 .48
CL with CPA	Cox and Snell Nagelkerke Mc fadden	.50 .57 .33
CS with CL with CPA	Cox and Snell Nagelkerke Mc fadden	.68 .77 .54

The analysis of the R-square measures for all models indicates that there is a higher correlation between predictors and profitability for the CS with CPA model compared with

the CS with CL and CL with CPA models. In addition, the model with CS, CL and CPA is the best model because its predictors are strongly associated with the profitability. It can be concluded that profitability is better predicted by the model containing "customer satisfaction (CS)", "customer loyalty (CL)", and "customer value analysis (CPA)" together.

Table 7.54. Parameter Estimates

Variables	Estimate	Wald	d.f	Sig.
CS	1.64	47.9	1	.00
CL	.67	24.7	1	.00
CS	1.74	41.5	1	.00
CPA	2.0	67.4	1	.00
CPA	1.8	72.2	1	.00
CL	.64	21.1	1	.00
CS	1.8	41.1	1	.00
CL	.80	24.5	1	.00
CPA	2.1	62.1	1	.00

Table (7.54) shows that all predictors in the four models are significant in predicting profitability. In addition, all regression coefficients in all models have a positive value, which means that for a one unit increase in each predictor variable, the profitability level is expected to change to a higher level by its respective regression coefficient, while other variables in the model are held constant.

SECTION FOUR. HYPOTHESIS TEST RELATED TO THE COMPREHENSIVE PROFITABILITY MODEL

(The formal rejection/acceptance of each hypothesis is detailed in the discussion chapter.)

Relationship between proposed profitability management models and overall profitability, using ordinal regression

The main purpose of this section is to investigate if the combination of the three proposed models (the "cost model", the" asset model", and the "revenue model") together will best predict overall profitability. Ordinal regression will be run for the various combinations of the three models (cost model with asset model, cost model with revenue model, asset model with revenue model, and cost model, asset model and revenue model) to find the best combination, which meets the proportional odds

assumption, fits data well, significantly predicts profitability and produces the highest pseudo R square statistics.

A new dependent variable is created to represent overall profitability. Such creation is done using the following steps: (1) multiplying dependent variables for cost model by asset model and by revenue model in order to obtain a wide range that will be useful in categorizing such variable. (2) ranging the results and categorizing them into three equal levels as follows:

- From 1 to 9 a slight improvement in profitability (5%) = category 0
- From 9 to 18 a moderate improvement in profitability (10%) = category 1
- From 18 to 27 a high improvement in profitability (15%) = category 2

The following table describes the frequency of the dependent variable:

Table 7.55. Frequency of the Dependent Variable

Levels of Dependent Variable	Frequency	Percent
0	100	52
1	64	34
2	26	14
Total	190	100

In building ordinal regression models for profitability, the five link functions provided by SPSS were tried. Although negative log-log function seems to be the best choice because of the lower categories of the dependent variable as illustrated in the above table, not only negative log-log function is used, but also Logit link function as it achieves better fit and meets the assumption of parallel lines of an ordinal dependent variable (Johnson and Albert, 1999).

Findings of ordinal regression models

Table 7.56. Test of Parallel Lines

Combination of Variables	Chi-Square	d.f	Sig.
CVA, RE, VAC, GAP, CIC, VIC, MIC	11.4	7	.12
CVA, RE, VAC, GAP, CS, CL, CPA	10.2	7	.18
CS, CL, CPA, CIC, VIC, MIC	2.8	6	.83
CS, CPA, CIC, VIC, MIC, CVA, RE, VAC, GAP, CL	17.0	10	.075

The test of parallel lines showed that the assumption of the ordinal regression model is not violated for all models, indicating the relative effect of predictor variables is consistent across all levels of profitability. Such a result means that ordinal regression can be run for all of these models.

Table 7.57. Model Fitting Information

Combination of Variables	Link Function	Chi-Square	d.f	Sig.
CVA, RE, VAC, GAP, CIC, VIC, MIC	Logit	146.0	7	.00
CVA, RE, VAC, GAP, CS, CL, CPA	Logit	142.1	7	.00
CS, CL, CPA, CIC, VIC, MIC	Logit	154.2	6	.00
CS, CPA, CIC, VIC, MIC, CVA RE, VAC, GAP, CL	Negative log-log	207.5	10	.00

It can be seen from the above table that all models are fit well to the data, showing the predictors added significant value to models.

Table 7.58. Goodness of Fit

Combination of Variables		Chi Square	d.f	Sig.
CVA, RE, VAC, GAP, CIC, VIC, MIC	Pearson Deviance	237.4 224.7	371 371	1.0 1.0
CVA, RE, VAC, GAP, CS, CL, CPA	Pearson Deviance	306.5 228.9	371 371	1.0 1.0
CS, CL, CPA, CIC, VIC, MIC	Pearson Deviance	240.7 216.8	372 372	1.0 1.0
CS, CPA, CIC, VIC, MIC, CVA, RE, VAC, GAP, CL	Pearson Deviance	174.9 163.5	368 368	1.0 1.0

The above table shows that for all combinations of variable models, the data in that the expected and observed value did not significantly differ as evidenced by Pearson chi-square and by deviance chi-square statistics.

Table 7.59. Pseudo R-Squares

Combination of Variables	R-squares Measures	Values
CVA, RE, VAC, GAP, CIC, VIC, MIC	Cox and Snell Nagelkerke Mc fadden	.54 .63 .39
CVA, RE, VAC, GAP, CS, CL, CPA	Cox and Snell Nagelkerke Mc fadden	.53 .61 .38
CS, CL, CPA, CIC, VIC, MIC	Cox and Snell Nagelkerke Mc fadden	.56 .65 .42
CS, CPA, CIC, VIC, MIC, CVA, RE, VAC, GAP, CL	Cox and Snell Nagelkerke Mc fadden	.67 .78 .56

The analysis of the R-square measures for all models indicates that correlations between predictors and profitability for models of cost and assets, cost and revenue, and assets and revenue are quite similar. This means that the three proposed model have the same size effect on profitability. In addition, the final model which contains cost, assets and revenue is the best model because its predictors are strongly associated with the profitability. It can be concluded that profitability is better predicted by the model containing "cost management technique", "assets management technique" "revenue management technique" together.

Table 7.60. Parameter Estimates

Variables	Estimate	Wald	d.f	Sig.
CVA	.89	12.0	1	.001
RE	1.0	9.5	1	.002
VAC	1.8	35.0	1	.000
GAP	.57	4.8	1	.028
CIC	1.7	14.7	1	.000
VIC	4.0	37.6	1	.000
MIC	.63	2.0	1	.148
CVA	1.3	22.9	1	.000
RE	.76	5.5	1	.018
VAC	1.4	20.0	1	.000
GAP	.02	.07	1	.79
CS	2.6	21.7	1	.000
CL	1.0	19.9	1	.000
CPA	1.4	18.4	1	.000
CS	2.9	28.8	1	.000
CL	.44	3.0	1	.082
CPA	1.5	23.9	1	.000
CIC	1.9	19.1	1	.000
VIC	3.2	22.7	1	.000
MIC	1.1	5.7	1	.017
CS	1.6	12.6	1	.00
CPA	1.8	35.8	1	.00
CIC	.98	7.5	1	.006
VIC	2.9	24.4	1	.00
MIC	1.1	9.4	1	.002
CVA	1.1	23.4	1	.00
RE	.70	6.6	1	.010
VAC	1.5	26.7	1	.00
GAP	.38	3.5	1	.006
CL	.60	8.1	1	.004

Table (7.60) shows that all predictors in the four models are significant in predicting profitability except MIC in the first model where x^2 =2.0, p =.148, GAP in the second model where x^2 = .07, p = .79, CL in the third model where x^2 =3.0 p= .082. These variables do not have statistically significant effect on profitability. In contrast, these variables have statistically significant effect on profitability in the overall model. In addition, all regression coefficients in all models have positive values which mean that for a one unit increase in each predictor variable, the profitability level is expected to change to a higher level by its respective regression coefficient, while other variables in the model are held constant.

CONCLUSION

This chapter was concerned with investigating relationships in the proposed models by using non-parametric tests and ordinal regression techniques. The non-parametric tests indicated that there is a positive association between each proposed driver in cost, assets, and revenue models, and profitability. It also indicated that there is a positive association between each proposed approach in assets and revenue model, and profitability. Moreover, the results of the ordinal regression technique suggested that, the coherent cost model containing "customer value analysis", "revenue generated from customer value", "value added costing" and "gap in value" variables together is the best model as its predictors are strongly associated with profitability. In addition, the assets model containing "analysis and evaluating the current position of intellectual assets", "determining value adding intellectual assets", and "evaluating the effectiveness of managing intellectual assets" together is the best model because its predictors are strongly associated with the profitability. It also suggested that the revenue model containing "customer satisfaction", "customer loyalty", and "customer value analysis" together is the best model as its predictors are strongly associated with the profitability. Finally, the main result of the ordinal regression indicated that the profitability model which contains cost, assets and revenue models is the best model because its predictors are strongly associated with the profitability. How these results can be interpreted in relation to the literature is considered in the next chapter.

CHAPTER EIGHT. DISCUSSION

INTRODUCTION

This chapter begins with a review of the research objectives together with a discussion of the major findings and the results of hypothesis tests. In addition, these findings are discussed in relation to the outcomes of previous studies. Then, the strategic dimensions used in developing the proposed profitability model and the strategic information generated by the model, in addition to the role of the management accountant in developing it, are considered in relation to extant literature.

DISCUSSION OF FINDINGS IN RELATION TO PREVIOUS STUDIES

The current study aims to develop a comprehensive model for managing profitability to fulfil the requirements of strategic management. Cost, assets and revenue are the three drivers for the profitability model. In order to achieve this purpose, the current study designed three models to manage the three individual drivers of profitability. These become the comprehensive model for managing profitability.

DISCUSSION OF FINDINGS OF THE COST MODEL

The purpose of this model is to manage costing for the purpose of profitability management. In order to achieve this purpose, customer value creation was suggested as the main driver to manage costing and the relationship between customer value and profitability was hypothesized, as illustrated in previous chapter. Moreover, the current research suggests the use of a customer value-cost management technique for managing customer value. This technique was adapted from the attribute-based costing approach, which was advanced by Bromwich (1990) and the customer value creation model produced by McNair et al. (2001, 2006). The proposed cost management technique consisted of four steps: (1) applying customer value analysis; (2) determining and measuring value added costing; (3) measuring revenue equivalent; and (4) identifying the cost-value gap and then decision making. The current study hypothesis's examines the relationship between all combinations of the four proposed steps and profitability in order to identify the best model for predicting a higher level of profitability.

A quantitative analysis of data obtained reveals that there is a positive association between the use of customer value creation and profitability. This means that the more the customer value creation approach is used, the more profitability is achieved by the company. Therefore, the hypothesis (H1 cost) that customer value creation is positively

associated with profitability can be accepted. Customer value creation focuses on understanding customers' needs and values. Companies that manage this driver effectively improve their profitability. Conversely, ineffectively managing this driver may cause loss or reduced profits. Companies that aim to increase their profitability should determine the growth opportunities that maximize customer value. In addition, they might redirect resources to the area that meets customer needs and maximizes customer value (McNair et al., 2001a, 2001b). As a result of the importance of customer value creation in improving profitability, companies that successfully manage costs should shift their objective from reducing costs to increasing customer value. In addition, they should seek to effectively manage the relationship between cost and value rather than simply manage costs

One noteworthy finding of this study, which has not been discussed in previous work, is that integration between the four steps in the proposed cost model is related to profitability, and that each step in the comprehensive cost model is significant in predicting profitability. Although all combinations predict a higher level of profitability, the best model is that which contains all four steps together, as its predictors are most strongly associated with the profitability. This result emphasizes that integration between the four variables achieves better profitability than the alternative models that contained any combination of any two variables. Therefore, the hypothesis (H8 cost) that integration between the four steps is more related to profitability than any of the relationships can be accepted. Companies that effectively manage costing from the strategic perspective should focus on analysing customer value, value added costing, revenues generated from customers , and managing the gap between the value of the customer and their cost together in a coherent model as it will improve profitability.

The current findings indicate that the model providing the second highest level of association is the customer value analysis and value added costing model. Therefore, the hypothesis (H3 cost) that integration between customer value analysis and value added costing is related to profitability can be accepted. This means that companies should focus mainly on customer value analysis and value added costing to effectively manage costing for the purpose of improving profitability.

Customer value analysis focuses on identifying customer preferences and benefits obtained from products. In order to analyse customer value, companies should identify product alternative, and the attributes of each product, which give customer benefits and increase satisfaction. Furthermore, companies should determine the availability of

attributes in each alternative from the customer's viewpoint and weight them in order to determine the degree of importance given by customers to each attribute. Finally, the alternative that achieves the highest expected customer value may be chosen. It can be seen that customer value analysis represents a critical strategic variable in the proposed cost model as it focuses directly on customer need. Thus, companies that aim to improve profitability should carefully analyse customer value before they consider measuring or determining costs.

Value added costing is another key element in the proposed model. In order to manage costs effectively activities should be classified according to their relationship with customer value and to determining the influence of such activities on profitability. Focusing on this element enables companies to determine activities that create value for customer and effectively manage them to improve profitability. As each monetary unit spent on improving such activities leads to improving profitability. The activity based costing approach should be used to identify activities related to each attribute and assign overhead costs to product attributes in order to compute the cost of each attribute. Using such an approach will help to better understand activities, how they should be performed, managed, improved and to what extent they can be changed to fulfil customer needs and hence improve profitability.

The findings of this study also suggest that the "value added costing and the gap between the cost and value" model provides the third highest level of association with profitability. Therefore, the hypothesis (H7 cost) that integration between value-added costing and the cost-value gap is related to profitability can be accepted. This finding emphasizes the importance of determine value added costing from the customer perspective and the gap between cost and value in managing cost. As such a combination between those variable improve companies' profitability.

The cost-value gap is another key variable that companies should focus on in order to successfully manage costing. This variable is concerned with comparing value adding costing with revenue (McNair et al., 2006). This can be achieved by computing the gap between value-weighted revenue and value adding costing. Focusing on such variable may enable companies to identify the current and the future leveraging factors and activities that companies should used to achieve competitive advantage and improved profitability.

The findings of the quantitative analysis indicate that the fourth highest level of association is provided by the "value added costing and revenue equivalent" model. Therefore, the hypothesis (H5 cost) that integration between value-added costing and revenue equivalent is related to profitability can be accepted. Revenue equivalent is a key variable in the proposed cost model. Thus companies that aim to improve profitability should compute revenue equivalent, which focuses on the distribution of revenues over the selected alternative attributes by using the expected customer value for each attribute (McNair et al., 2006).

Although the previous sub-models predicted profitability and strongly associated with profitability, the other sub-models of customer value added and gap, customer value added and revenue equivalent and gap and revenue equivalent also predict profitability but provide lower associations with profitability compared with other model. Therefore, hypotheses (H4, H2, H6 cost) that such combinations are related to profitability can be also accepted.

Discussion of findings of the assets model

The purpose of this model is to manage assets for the purpose of profitability management. In order to achieve this, intellectual capital was suggested as the main driver that affected profitability. As mentioned in the literature review, intellectual capital was managed from the perspective of the value creation approach. In addition, three phases were proposed in the current study to manage intellectual capital from the perspective of the value creation approach. These phases are: (1) analysing and evaluating the current status of intellectual resources and activities; (2) identifying value added intellectual activities; (3) evaluating the results. Several indicators were adapted from previous studies and used in managing each proposed phase.

The quantitative analysis indicates that intellectual capital used in managing assets, as a main driver, is positively associated with profitability. Therefore, the hypothesis (H1 assets) that intellectual capital is positively associated with profitability can be accepted. This means that the more intellectual capital is focused upon, the more profitability is achieved for companies. Thus, companies that aim to strategically managing assets should focus on intellectual capital as the main and fundamental driver that directly leads to profit generation.

This finding supports the previous findings of Belkaoui (2003); Tan et al. (2007); Makki and Lodhi (2008); and Muhammad and Ismail (2009) who all empirically investigated the relationship between intellectual capital described by monetary measures and company performance. They found a similar result in that there is a positive and significant relationship between intellectual capital and profitability. In addition, they concluded that companies that focus on intellectual capital achieve superior financial performance. These studies measure intellectual capital using value added intellectual coefficient and measure financial performance according to such factors as return on equity, return on assets, earnings per share, annual share returns and net profit. In addition, they examined such a relationship using different statistical techniques such as partial least square and multiple regression. Moreover, they were conducted in different countries, such as the United States of America, Singapore, and Pakistan. Although, such studies generate similar results to this research, the current study used non-monetary measures, was conducted in the Egyptian ICT sector, used survey methods to collected data and ordinal regression method is adopted to analyse the data. This makes the current study one of the most important in Egypt. Therefore, whilst there is commonality in relation to the constructs identified, this study has strengthened these by providing an element of triangulation through different measures, examination in a new context and though an additional form of analysis.

Intellectual assets are a group of knowledge assets whose features differ from financial and tangible assets as they are non-financial, intangible assets. The elements of these assets interact together to improve strategic position, create value and increase companies' abilities to generate current and future profits. Due to the shift from internal business economics to knowledge economics, companies should focus on intellectual capital given its increase in relative importance from 30% in industrial economics to 63% in knowledge economics (Zaghloul, 2002). In addition, it represents the principal element that results in a companies' success or failure in achieving their objectives in a modern knowledge economy. Companies' should focus on intellectual capital as a main driver in managing assets.

A key finding of this study indicates that the use of a value creation approach in managing intellectual capital affects profitability. Therefore, the hypothesis (H2 assets) that the value creation approach is positively associated profitability can be accepted. This means that the more value creation approach is focused, the more profitability is achieved for companies. Thus, companies that need to effectively manage intellectual capital should use this approach to improve profitability.

This finding supports previous research that explained how intellectual capital leads to profitability using a value creation approach (Kaplan and Norton, 2000; 2004a; and 2004b). They explained the cause and effect relations between intangible assets and economic performance and showed how intangible assets are converted into a tangible outcome represented by financial performance. They found that the improvement in intangible assets affected financial performance through chains of cause and effect relationship. Such studies did not however explain how a value creation approach can work. They focused on different variables and a different model from the current study.

A value creation approach is a key variable in the assets model. It is concerned with identifying and defining the intellectual capital resources that create value, explaining how they combine together to create value or how they can be developed to create value and evaluating whether such developments achieve the desired ultimate goal. The most important assumption for this approach is that future financial performance can be predicted by non-financial performance. Therefore, such an approach represents the fundamental proposition for establishing the assets model.

Furthermore, one interesting finding from this study, which has not been highlighted in other research, is that each phase in the comprehensive model as well as the proposed comprehensive assets model that contains the three suggested phases and related indicators, associated with profitability and are significant in predicting profitability. Although all combinations predict a higher level of profitability, the best model is the model that contains the three phases together, as its predictors are most strongly associated with profitability. Therefore, the hypothesis (H6 assets) that integration between the three phases is more related to profitability than any of the relationships can be accepted. This result emphasizes that the integration between the three variables should achieve better profitability than the alternative models that contain only a combination of any two variables. This means that companies that strategically mange assets should manage the three phases of analysing and evaluating the current status of intellectual resources and activities, identifying proposed intellectual activities and evaluating results in a coherent model in order to improve their profitability.

There is consistency between the finding of the assets model related to the positive influence of the proposed intellectual indicators on profitability and the previous studies that empirically investigated the relationship between the use of intellectual capital indicators and profitability (Low, 2000; Chen et al., 2004; and Bollen et al., 2005). However, these previous studies used different intellectual capital components such as

human capital, structural capital, innovation capital, and customer capital and used different indicators which have not been used by the current model. In addition, they examined the relationship between these components and profitability using different statistical methods such as multiple regression analysis and the path analysis. Moreover, they were conducted in different sectors and different countries from the current study.

The findings indicate that the model that contains "analysing and evaluating the current position of intellectual capital" and "determining value adding intellectual capital" provides the second highest level of association with profitability. Therefore, the hypothesis (H3 assets) that integration between these variables is related to profitability can be accepted. This means that companies that aim at effectively managing assets should mainly focus on these two phases.

Analysing and evaluating the current position is critical and initial variable in the assets model. It concerns analysing current practices and evaluating them to determine whether they are sufficient and appropriate to achieve strategic goals and create value. Companies should use the output of this phase in making decisions about how they can increase the efficiency and effectiveness of their current intellectual capital activities. Management accountants play an important role in developing appropriate financial and non-financial indicators for each element of intellectual capital that could help management in analysing and evaluating current intellectual activities.

Identifying value added intellectual activities is another key variable in the assets model. This concerns proposing the target activities necessary for creating value and achieving strategic goals. Companies should use the output of the previous phases in order to choose the best alternative that may be representative in producing new intangible activities, developing current activities or eliminating some of them if inappropriate. The alternatives should be evaluated in light of their impact on value creation and strategic goals. Management accountants also play an important role in developing appropriate financial and non-financial indicators for each element of intellectual capital that could help management in identifying value added intellectual activities.

The findings of this study reveal that the third model to achieve a high correlation between its variables and profitability is that of "identifying value added intellectual activities" and "evaluating the effectiveness of managing intellectual capital". Therefore, the hypothesis (H5 assets) that integration between these variables is related to profitability can be accepted.

The evaluation of results is a significant function in management accounting that provides management with information about the actual results compared with plan and enables the use of this information in making decisions to close this gap. In the assets model, the purpose of evaluating the effectiveness of managing intellectual capital is to assess whether the proposed activities have been applied and the influence of this application on each intellectual capital element. The management accountant also develops financial and non-financial indicators which could be used to evaluate the effectiveness of managing intellectual capital.

Although, the findings of the current study also suggest that the model containing "evaluating effectiveness of managing intellectual capital" and "analysing and evaluating the current position" predicts profitability, it provides a lower association with profitability compared with other combinations. Therefore, the hypothesis (H4 assets) that integration between these two variables is related to profitability can be also accepted.

Discussion of findings of the revenue model

The purpose of this model is to manage revenue for the purpose of profitability management. In order to achieve this, customer focus is suggested as the main driver for managing revenue for profitability management. Moreover, the current study relied on a customer value management approach in developing its revenue model. In order to manage customer value, integration between customer satisfaction (measured by indicators); customer loyalty (measured by indicators); and customer profitability analysis is suggested to develop the proposed revenue model.

A key finding of this study indicates that the focus on customers is positively associated with profitability. This means that the more a customer is used, the more profitability is achieved. These results emphasize that companies that aim at improving profitability should focus on customers in managing revenue. Therefore, the hypothesis (H1 revenue) that there is a positive association between customer focus strategy and profitability can be accepted.

This finding supports previous work of Magdy (2002) and Kim et al. (2003) related to the positive relationship between customer focus and profitability. In addition, this finding is further confirmed the view of Brewton and Schiemann (2003), who stated that improvement in financial results requires changing the focus of companies from process and product to a customer-oriented strategy. Thus, companies should change their focus from internal process, function and goals to a broader and external view, represented in

customer focus, in order to improve profitability. This new focus will generate new goals that will require new models in order to achieve such a goal. Therefore, customer focus represents a fundamental variable that leads to the construction of a strategic model for managing revenue.

A significant finding of the current study suggests that the focus on customer value management approach is positively associated with profitability. This means that the more a customer value creation approach is used, the more profitability is achieved. Therefore, the hypothesis (H2 revenue) that there is a positive association between customer value approach and profitability can be accepted.

This supports Gale's (2000) findings regarding to the influence of customer value on profitability. He found that companies that focus on customer value achieved return on sales three times greater than other companies that do not. This further supports the finding of Brewton and Schiemann (2003), who noted that about 50% of the variations between average financial performance are due to the difference in the mechanism of managing customer value. Similarly, Howes (2003) found that the application of a customer value management approach is expected to increase companies' profitability at a rate of about 10% per annum. This finding is also confirmed by Cokins (2006) who indicated that the profit growth for companies is generated from the analysis of customer value, which represents the main driver for enhancing profitability. It can be seen that most of previous studies focus on investigating the influence of customer value on profitability use financial and actual data in their methodology. Conversely, the current study was conducted using a questionnaire instrument to collect non-financial data and examine the relationship between such variables, which has not been addressed in previous studies.

The customer value management approach is a fundamental variable that the revenue model constructed on. Such an approach is concerned with two sides of value, one is the value provided by the company to the customers, and the other is the value provided by the customer to the company. Companies that aim at strategically managing their revenue should focus on a customer value approach. Companies that effectively mange customer value should apply appropriate techniques for managing both sides of value. As focusing on the value that customer obtains from the company may increase customer satisfaction and loyalty. In addition, focusing on the value that a company obtains from customers leads to improved profitability. Thus, using such an approach in the revenue model could achieve a balance between the internal and external aspects and illustrate

how companies can achieve their internal goals represented in profitability, by focusing on external dimensions represented in customers.

Furthermore, one interesting current finding, which has not been discussed in previous work, is that the proposed comprehensive model for managing revenue, which included customer satisfaction; customer loyalty; and customer profitability analysis are associated with profitability and each variable is significant in predicting profitability. Although all combinations predict a higher level of profitability, the best model is that containing all three variables as its variables are most strongly associated with the profitability. Therefore, the hypothesis (H6 revenue) that integration between all three variables is more related to profitability than any of the relationships can be accepted. This result emphasizes that integration between the above three variables achieves better profitability predictions than the alternative models that contained any combination of any two variables. Moreover, companies that strategically mange revenue should establish a coherent model that contains customer satisfaction, customer loyalty and customer profitability analysis, in order to improve their profitability. As the proposed revenue model is new, there is a lack of the literature that has investigated the significance of the relationship between all the above variables in the revenue model, and profitability.

The findings of this study also reveal that the second model which achieved a high correlation between variables and profitability is that of "customer satisfaction" and "customer profitability analysis". Therefore, the hypothesis (H4 revenue) that the integration between customer satisfaction and customer profitability analysis is related to profitability can be accepted. This result emphasises that companies that strategically manage their revenue should focus mainly on the use of customer satisfaction and customer profitability analysis to improve profitability as they represent a fundamental combination in the revenue model.

There is a lack of literature that empirically investigates the influence of the integration between customer satisfaction and customer profitability analysis on companies' profitability. However, there are studies that empirically examine the relationship between each variable and profitability. The finding of this study support previous work including that of Rucci et al. (1998), who found that a 4% improvement in customer satisfaction generated more that $200 million in revenues in companies, which confirms a strong and positive relationship between customer satisfaction and profitability. Anderson and Mittal (2000) found a similar result in that a 1% increase in customer satisfaction,

described by non-financial measures, led to a 2.37% increase in return on investment. This finding is also in-line with a study conducted by Fornell et al. (2005), which found a direct link between customer satisfaction and the improvement of financial results.

Customer satisfaction is a key variable that affects profitability in the revenue model. Anderson, Fornell and Lehmann (1994) explained why customer satisfaction affected profitability. The following are the most important reasons (1) satisfied customers are more willing to pay for benefits; (2) the higher customer satisfaction, the lower the costs of transactions in the future. This is because companies that have higher customer retention do not need to spend more money to acquire new customers; (3) satisfied customers are willing to buy more frequently and in greater volume; (4) providing products and services that satisfy customers should increase profitability by reducing failure costs. Companies that aim at effectively managing customer satisfaction should develop measurement systems that include financial and non-financial indicators. Such indicators should reflect and evaluate customers' view of products and services (i.e their attributes, quality, and price) and problems that customer faced as a result of dealing with company.

Customer profitability analysis is another initial element in the revenue model. It concerns recording and analysing all the revenues earned from customers and the costs incurred to earn such revenue in order to determine the contribution of each customer in achieving profitability. This technique provides companies with strategic information that can be used in enhancing profitability, which is discussed in next section. Companies that effectively manage revenue should use an activity based costing approach with customer profitability analysis in order to enhance profitability. This is supported in the work of Noone and Griffin (1997, 1998) and Krakhmal (2006) who used activity based costing with customer profitability analysis to manage yield and improve financial performance in the hotel sector. They found that the use of customer profitability analysis with activity based costing in the hotel sector provides management with information about the revenue, costs, and profit of each customer. This enables hotels to determine the amount of profitability generated from each customer and to use the information to determine the maximum discount or service that the hotel can offer. In so doing, the management can evaluate their customers. Using activity based costing can increase the effectiveness of customer profitability analysis because it enables companies to avoid waste by identifying the main processes and improving their efficiency, allocating revenue to activities that create value and increase and measure the costs for each customer (Mohamed, 1998).

This study also finds that the third model to achieve a high correlation between variables and profitability is that of customer loyalty and customer profitability analysis. Therefore, the hypothesis (H5 revenue) that integration between customer loyalty and customer profitability analysis is related to profitability can be accepted.

There is the lack of the literature that empirically examined the impact of the integration between customer loyalty and customer profitability analysis on companies' profitability. However, the relationship between each variable and profitability are empirically examined by previous studies. The findings of the current study that relate to the positive influence of customer loyalty on profitability are supported by the previous findings of Reichheld and Sasser (1990) who noted that a 5% increase in customer loyalty leads to an improvement in a company's profitability of 100%. Similarly, it supports the finding of Gransted (2000) who examined the relationship between customer loyalty and profitability in the banking sector, and found that an increase in customer loyalty of about 5% leads to a doubling of profitability. It can be concluded that the most important thing is to recognize that there is a positive relationship between customer loyalty and profitability regardless of the numerical amount of such a relationship (which may vary according to different factors, such as the population and the methodology that used in each study).

Customer loyalty is considered to be one of the most important drivers that improves profitability in the revenue model. It indicates the tendency of current customers to buy companies' product and services in the future. According to Reichheld and Sasser (1990); Kaplan and Norton (2001); and Reinartz and Kumar (2002) loyal customers are the most profitable because they do not need any marketing costs, there is a reduction in operating costs for loyal customers, they can pay more money for their trust in the product or services and loyal customers become repeat buyers.

The results of the current study also suggest that there is a correlation between integration of customer satisfaction and customer loyalty and profitability. However, such integration achieved the lowest correlation with profitability compared with the other models. Thus, the hypothesis (H3 revenue) that the integration between the above variables is related to profitability can be accepted. This finding supports the work of Heskett et al. (1994), and Helgesen (2006) who investigated the relationship between customer satisfaction and customer loyalty (measured by non-financial indicators) on one hand; and profitability measured by return on assets on the other hand. Such investigations adopted different statistical techniques such as correlation and regression

analysis. They found that there is a positive correlation between customer loyalty and profitability and a positive correlation between customer satisfaction and customer loyalty. These findings suggested that the more satisfied and loyal a customer tends to be, the higher the obtained profitability.

Discussion of findings of the profitability model

The purpose of this model is to manage overall profitability in order to fulfil the requirements of strategic management. This requires dealing with profitability as a result of a number of drivers by understanding how each driver affects profitability and how these drivers are managed by using appropriate strategic management accounting techniques in order to manage overall profitability. In order to achieve this purpose, costs, assets, and revenue are used together as the main drivers for managing profitability from a comprehensive perspective for the purpose of strategic management accounting. Moreover, the current study investigated the influence of the integration between the proposed cost model, the proposed assets model, and the proposed revenue model (discussed in previous sections in the current chapter) on overall profitability.

A major finding of this study reveals that all the proposed strategic management accounting techniques used in managing costs, assets, and revenue are significant in predicting profitability in the comprehensive model. This means that each proposed technique used in managing costs or assets or revenue affect the overall profitability in the comprehensive model. Furthermore, the most important findings in the current study that has not been investigated in previous studies is that the proposed comprehensive model for managing profitability (which included the measurement levels of the cost, the assets, and revenue models) predicted a higher level of profitability and its predictors are most strongly associated with the profitability. This result emphasizes that integration between the above three variables better predicts profitability than the alternative models, which contain any combinations of any other two variables. This means that integration between the three proposed variables improves profitability. Therefore, the hypothesis (H4 profitability) that integration between the three models is more related to profitability than any of the relationships can be accepted. Thus, profitability should be managed from a comprehensive perspective, which takes into account the most important drivers that may affect profitability, and manages them using appropriate techniques.

There is a lack of literature related to identifying profitability drivers and explaining how these drivers should be managed from a comprehensive strategic perspective. The findings of the current study support Stapleton et al's. (2002) work in that there is a positive relationship between sales, expenditure, and assets, and the return on wealth. Their study indentified three profitability drivers (sales, expenditure, and assets) and examined their influence on return on wealth as a measure of profitability. Although this previous study concluded that companies aiming to improve profitability should manage the three drivers, it did not clarify how they could be managed, which represents one of the most important contributions of the current study.

The strategic profitability model concerns managing cost, assets and revenue. Companies seeking to effectively manage cost should determine the most important factor that affects profitability which is representative in customer value creation. In addition, they should use the most appropriate cost technique that affects customer value, which is named customer value-cost management. Moreover, in order to manage assets effectively for improving profitability, the key element that affects profitability should be determined. This element is intellectual capital as it plays an important role in improving profitability. In addition, companies should focus on the key intellectual resources that contribute in creating value and develop financial and non-financial indicators to manage current resources, value added activities and the evaluation of the effectiveness of such resources. Furthermore, companies that manage revenue for the purpose of managing profitability should focus on customers as the most important element that affects profitability. In addition, they should effectively manage the value that customers' obtain from the company which is representative in customer satisfaction and customer loyalty, using the appropriate financial and non-financial indicators. Also, value that companies obtain from customers should be managed using the customer profitability analysis technique.

The construction of such a coherent model could provide management with strategic information that could be used to improve profitability, as discussed in the next section.

A significant result of this study suggests that there is a slight variation between the three combinations of models (revenue and assets, revenue and cost and cost, and assets) related to the correlation between their variables and profitability. Therefore, the hypotheses (H1, H2, H3 profitability) that each form of integration of these models is related to profitability can be accepted. This emphasizes that all combinations have the same effect on profitability and all of them have the same importance for managing

profitability. Such a finding confirms that companies seeking to effectively and strategically managing profitability should focus on the three drivers together and manage them via a coherent model.

As mentioned before, the traditional profitability system is inappropriate for strategic management accounting because it focuses mainly on a single dimension, which is the dimension of cost in managing profitability. In addition, it focuses on efficiency alone which means" doing things right" and fast by reducing costs in the right way by using one of the cost accounting techniques. In order to solve this problem, the current study proposed a profitability model to fulfil the requirements of strategic management accounting and provide management with strategic information that could be used in the decision making process.

Thus, the main purpose of this following section is to discuss how the proposed profitability model fulfils the requirements of strategic management accounting. In addition, it also seeks to discuss the role of management accountants in a strategic management accounting environment. This is then followed by a discussion of their role in applying the proposed profitability model.

DISCUSSION OF THE STRATEGIC DIMENSION IN THE PROPOSED PROFITABILITY MODEL

The principal purpose of this section is to show how the proposed profitability model and its dimensions fulfil the requirements of strategic management accounting.

A key strategic dimension, which the proposed profitability model focuses on, is an effectiveness approach. This approach concerns 'doing the right things' that maximize results (Helmrich, 1989). As mentioned in the literature review 90% of a company's added values are generated by increasing effectiveness (Hosking, 1993). The proposed model adapted such an approach by changing the focus from the concept of cost management to a broader and more inclusive concept of profitability management by focusing on the three key drivers of profitability cost, assets and revenue. This leads to view profitability as the result of a number of factors that may maximize results and increases effectiveness. Focusing on effectiveness as a key strategic dimension in developing the profitability model could provide information required to determine where companies make profit and redirect resources to places that lead to improved profitability through clearly determining profit drivers.

Furthermore, the proposed profitability model focuses on creating value for customers as a significant element of strategic management accounting. This is consistent with Roslender et al. (1998), who illustrated that strategic management accounting concerns the customer and product, which makes strategic management accounting "market-oriented". In addition, the influence of this strategic dimension on profitability is compatible with Porter (1985) and Aaker (1992), who indicated that the creation of competitively superior value for customer leads to improved profitability.

Moreover, a critical strategic dimension for the proposed profitability model is its focuses on a balance of financial and non- financial information in managing profitability. For instance, it uses both forms of information in managing revenue where it adopted customer profitability technique as a financial measure and adopted financial and non-financial indicators for managing customer satisfaction and customer loyalty. In addition, it used both measures in managing intellectual capital resources. Such a focus is consistent with Roslender et al. (1998); Brouthers and Roozen (1999); and Yazdifar (2003), who confirmed that the use of non-financial information is an important element in strategic management accounting.

Finally, the proposed profitability model emphasized both internal and external environments by using strategic management accounting techniques that focus on both dimensions. It does so by adapting an attribute-based costing and value creation model that focuses on the customer as an external element and the internal activities in managing cost. In addition, it used customer profitability analysis, which focuses on external element represented in customer and internal element represented in cost, and customer satisfaction and customer loyalty in managing revenue. It also adapted intellectual capital indicators to mange intellectual capital resources that contain both internal (process, technology and employee) and external (customer) resources.

It can be concluded from the above that the proposed profitability model is based on different strategic dimensions, which means it can be used as an important strategic tool for managing profitability in the strategic management accounting context.

The strategic information generated by the proposed model and its role in decision making process

Strategic cost information

Traditionally, product cost has focused on the manufacturing costs of a product's material, labour and overhead without reference to the attributes of the product (features, functions, benefits) that create value for customers (Narver and Slater, 1990). As mentioned previously, one of the key strategic dimensions in the proposed model is its focus on customers' needs and creating value for them. In order to realize this dimension, the cost model employed a new cost management technique which was adapted from the attribute based costing and value creation model in order to consider the strategic management of cost. In the proposed cost model customers can be viewed as not only generators of the revenue for the company but also as the driver for cost management. This represents a recent perspective consistent with the information required by strategic management accounting. The main objective of the proposed cost management technique is to cost benefits that products provide for customers, which represent the ultimate cost drivers. In addition, it seeks to manage cost in order to offer the cheapest product or service for customer to obtain the desired bundle of attributes and try to close the gap between value that customer obtained and the cost of product in the company. This leads to improved profitability.

The proposed cost management technique provides management with strategic information that may be crucial to the decision making process. It provides external information around whether the product in the form of "a bundle of attributes" offered by a company at a given price, is viewed more favourably by customers than a competitor's product. Furthermore, it provides management with key strategic information about the relationship between internal activities and customer value and how such relationships affect profit. This kind of information enables managers to take action to reduce or eliminate activities that are not related to the customer and consume profit. In addition, such information will help managers to be more aware how they budget the necessary activities that are required to achieve business but for which the customer will not pay for the performance of such activities. Furthermore, it can provide management with information about the key activities that achieve direct benefit for customers and improve profit. The availability of such information should help managers to make decisions about how the company can improve such activities in order to create value for customers and how the company should manage such activities in order to offer competitive prices and hence improve profitability.

It can be concluded that the proposed cost technique provides management with strategic information that can be used to close the gap between costs and the customer value. Such information can be used to determine the best strategic alternative that closes this gap and hence meets customer needs, which leads to an increase in competitive advantage and improves profitability.

Strategic assets information

The proposed assets model focuses on intellectual capital as a strategic element for strategic assets management. This is consistent with Harrison and Sullivan (2000) who stated that the focus on intellectual capital leads to the development of a strategic position because it represents a competitive element. In addition it affected value where, more than 75% of the value in service providers is due to intellectual capital (Luthy, 1999). Similarly, Dzinkowski (2000) stated that from 50% to 90% of the value created in companies is achieved by intellectual capital not by physical assets. This is also consistent with Kaplan and Norton (2004b), who indicated that the main tool for creating value for stakeholders is intellectual capital and they found that it achieved more than 75% of companies' value.

The value creation approach that is employed in the proposed assets model to manage intellectual capital is another key strategic dimension. As explored in the literature review, this approach is based in defining and identifying intellectual resources that cause value creation. This is consistent with Tayles et al. (2002), who stated that defining and quantifying the role and the impact of intellectual capital becomes the real strategic value. Furthermore, Starovic and Marr (2003) illustrated that if companies failed in recognizing the role of intellectual capital in the value creation process, a series of losses on all levels may result.

The strategic perspective of the value creation approach used in managing intellectual capital is based on using the non-financial performance to achieve the future financial performance .In addition, it is concerned with how to create and develop value through identifying value creation sources (Boedker et al., 2005).

The proposed assets model is based on balancing between financial and non-financial measures to manage intellectual capital. This can provide management with strategic information that may be crucial in the decision making process. For example, these measures can provide management with information about the main intellectual resources that a company has and their role in creating value and achieving strategic

goals. The availability of such information could help management to analyse and evaluate the current status of their intellectual resources. Furthermore, they introduce information about the value adding intellectual activities. This information can be obtained by the identification of activities necessary for creating value, which are represented in the company's actions and practices for significantly improving and increasing its intellectual capital resources. The availability of such information could help management to understand where they can focus their efforts in order to achieve a strategic position and hence improve profitability. Moreover, they produce information that can help management in evaluating the company's effectiveness in managing intellectual capital. This information can be used in evaluating whether proposed activities and actions have been applied and evaluating the effects of such application and its reflection on each resource and on the strategic goals. The availability of such information could help management in making decisions about how they can manage their intellectual capital, adding, improving or eliminating specific resources as may be required to improve the strategic position of the company.

Strategic revenue information

The proposed revenue model focused on the customer as a key strategic dimension in managing revenue. This is consistent with Tibergien (2003), and Raaij (2005), who illustrated that companies have an 80-20 rule, which states that 80 % of a company's profitability is generated by 20% of its customers. This means that the great majority of customers do not achieve profitability and that only a small proportion contributes to achieving profitability. This confirms the importance of focusing on customers and managing them in order to achieve a strategic position. The proposed revenue model managed customers from both financial and non-financial perspectives, which represents a key strategic dimension in the proposed model as mentioned before.

Customer profitability analysis technique is used to manage customer from a financial perspective. It provides management with strategic information which may be crucial in the decision making process. The information generated from it can be used in determining various strategies for increasing revenue from existing customers, such as: up-selling. In addition, such information can be used in managing pricing elements (discounts, the price of value added services and discrimination pricing) by determining pricing strategies through directing the right resources to the right customers and providing information on sources of profitable business.
Furthermore, customer profitability analysis provides information that can help management to determine strategic position. This can be achieved by classifying

customers in accordance with their profitability into profitable, breakeven and unprofitable. Such classification can enable managers to understand why some customers are more profitable than others. In addition, it can help managers to study the reasons why some customers are unprofitable or achieve losses. This kind of information should help managers in making decisions about how unprofitable customer can be turned into profitable ones, how companies can improve the profitability of profitable customer and how losses of other customers can be reduced. These may be achieved by improving, adding or cancelling a specific activity and managing those activities that may cause customer profitability. It can be concluded that companies can use the information produced by customer profitability analysis technique to develop different strategies for different customer groups in order to improve overall profitability.

Customer profitability analysis is adopted in the revenue model to describe the financial relationship between the company and its customers. Customer satisfaction measurement is also adopted in the proposed revenue model in order to define the customer's view of the products and services provided by the company and to show problems faced by customers when they deal with the company. Both financial and non-financial indicators are used to evaluate customer satisfaction. Such indicators provide management with information about the average time for meeting customer orders, quality of service provided to customer, delivery time, and service level which enable management to evaluate customer satisfaction and hence determine the best strategy in dealing with customers in order to increase their satisfaction. Furthermore, customer loyalty measurement is adopted. It used financial and non-financial indicators to evaluate the loyalty of customer. This information can help managers to develop alternative strategies to improve customer loyalty, such as adding new services or new attributes or functions in the product. In addition, it includes indicators to evaluate the improvement in customer loyalty which represents a feedback process.

The strategic management accountants and their role in developing the proposed profitability model

There is a strong relationship between strategic management accounting and other functions in the company. This means that strategic management accounting should move beyond the accounting function (Dixon and Smith, 1993). This issue necessitated that consideration is also given to the role that the management accountants play. Therefore, there is also a need to extend the discussion here to begin to consider their potential role in driving forward such changes.

The role of strategic management accountants should "extend beyond their usual areas and co-operate much more with general management, corporate strategists, marketing, and product development" (Bromwich and Bhimani, 1994, p130). Strategic management accountants should be responsible for collecting, analysing and reporting the information about company, competitors, and markets or any other key members in the strategic management process. This shifts the role of the management accountant from conventional financial evaluation to a broader strategic analysis (Bromwich and Bhimani, 1989; and Clarke and Tagoes, 2002). According to Clarke and Tagoes, (2002) *The challenge posed by strategic management accountant will move management away from being only functional scorekeepers to become more involved with some of the following tasks:*

- *Assessment of general economic and technological factors facing the firm and industry*
- *Analysis the strengths and weakness of both the firm and its competitors*
- *Designing an internal system to identify value and non value adding activities*
- *Conducting customer profitability analysis*
- *Identification and measurement of critical success factors and related performance indicators* (p.12).

It could be argued that there are no specific tasks that strategic management accountants should achieve. These tasks could vary according to strategic management accounting techniques used by companies. Due to the changing role of strategic management accountants, specific training programmes are needed to develop their technical skills in how they can use the tools of strategic management accounting (Dixon and Smith, 1993). Furthermore, due to the interaction between strategic management accounting and other functions within the company, the social skills of management accountants should be developed in order to increase their communication effectiveness (Dixon and Smith, 1993).

A successful implementation of the strategic profitability model requires a multi-functional team, where management accountants work closely with marketing, operations management, product development and general management employees. This is consistent with the new role of strategic management accountant as mentioned before. The critical role of the management accountant in applying the proposed profitability model can be described as follows:

- Development of an internal system to identify the activities and divided them into three categories (waste activities, value adding business activities, core value adding activities), in order to focus on the core value adding activities, which directly affect customers.
- Costing various product attributes and monitoring the performance of such attributes over time and reporting these costs regularly.
- Identification of the key intellectual capital resources that create value and achieve strategic goals
- Determination of key activities that significantly affect intellectual capital
- Designing measurement systems that contain both financial and non-financial indicators to manage intellectual capital elements.
- The use of the activity based costing technique in determining and reporting costs at the customer level.
- Conducting customer profitability analysis technique.
- Designing measurement systems to evaluate customer satisfaction and customer loyalty using financial and non-financial indicators.

It can be concluded that the successfully implementation of the proposed profitability model depends mainly on strategic management accountants. This emphasises the importance of providing them with training to develop their strategic skills.

CHAPTER NINE: CONCLUSIONS

INTRODUCTION

This chapter begins with a review of the objectives of the research, the methods utilized to achieve them, and the major findings. This is followed by a discussion of the contributions of this research to the management accounting literature. Then, the limitations of this research are noted and the chapter concludes with some thoughts on future research.

Research overview

One of the most important requirements of strategic management accounting is to change its focus from the concept of cost management to a broader and more inclusive concept of profitability management. This requires dealing with profitability as the result of a number of drivers, understanding how all drivers affect profitability, and managing them by using a set of appropriate strategic management accounting techniques.
On one hand, most previous studies have concentrated on one driver for managing profitability. However, there is limited previous research that has focused on two drivers in managing profitability. There has also been a lack of attention paid by researchers to studying the integration between the most important drivers that affect profitability. Furthermore, there has also been a lack of attention given by researchers to the management of each driver using strategic management accounting techniques. Therefore, the main aim of this study was to develop a comprehensive profitability model to fulfil the requirements of strategic management. This aim was supported by the following four objectives:

1. To investigate the extent to which the proposed cost model predicts the level of profitability.
2. To examine the extent to which the proposed assets model predicts the level of profitability.
3. To evaluate the extent to which the proposed revenue model predicts the level of profitability.
4. To asses if integration between cost, assets, and revenue models predicts the level of profitability more effectively than any other combinations.

In order to establish to what degree the objectives have been met in the present study, the main discussion is divided two parts. The first part is concerned with developing the

cost, assets and revenue models. To develop the cost model customer value creation was suggested as the most important driver to manage costing for the purpose of profitability management. Then, customer value-cost management technique was suggested to manage customer value creation. This technique was adapted from the attribute-based costing approach advanced by Bromwich (1990) and the customer value creation model produced by (McNair et al., 2001, 2006). Finally, the relationships between all combinations of its steps (customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and identifying cost-value gap and decision-making) and profitability were hypothesized.

To develop the assets model intellectual capital was suggested as the main driver for managing assets as it represents a key element in knowledge economics. Value creation was also suggested as a principal approach, which is concerned focusing on intellectual capital resources that create value and improving their performance to achieve value creation and strategic goals. Three phases and related indicators were proposed to manage intellectual capital from the value creation perspectives. These phases were analysing and evaluating the current status of intellectual resources and activities, identifying value added intellectual activities and evaluating results. Finally, relationships between all combinations of the three phases and profitability were hypothesized.

To develop the revenue model customer focus strategy was suggested as the fundamental driver for managing revenue. Customer value management was also suggested as a main approach to customer management the. This approach concerns two sides of value, the value that customer obtains from the company and the value that company obtains from the customer. This study proposed the use of customer satisfaction indicators and customer loyalty indicators in order to manage the value that customer obtains from the company. In addition, it proposed customer profitability analysis technique to manage the value that company obtains from its customers. Finally, relationships between all combinations of the three techniques and profitability were hypothesized.

The comprehensive profitability model consisted of the combination of the measurement level of the previous three proposed models, which can be used in managing profitability in order to fulfil the requirements of the strategic management. In addition, relationships between all combinations of the cost, assets, and revenue models and profitability were hypothesized.

The second part of the present study was concerned with investigating all relationships within each individual model and between all three models and profitability.

The Egyptian communication and information technology sector was selected as a basis for the empirical investigation of this study. A judgment sample was employed given the need to obtain data from qualified respondents. A self-administrated questionnaire delivered and collected by hand was used to collect the data to examine the hypothesized relationships. A total of 190 valid responses were used for quantitative analysis.

Before the investigation of relationships in the proposed model, the present study used factor analysis to examine the internal reliability of a measure. Cronbach Alpha was also used to confirm internal consistency.

In order to examine the hypotheses, the present study adopted non-parametric measures of association, in particular Spearman's rho, is used to examine the strength of relationships between the proposed driver in each model and profitability and between the proposed approach in each model and profitability. Due to the ordinal nature of the dependent variable in the current study, ordinal regression technique was also used to examine relationships between each combination and profitability in each model. In addition, this was also used to examine relationships between all combinations of the cost, assets and revenue models and profitability in order to identify the best model that predicts profitability.

The most important results from the cost model indicated that the focus on customer value creation in managing cost was positively associated with profitability. In addition, it showed that the integration between the four steps in the proposed cost model was associated with profitability. Furthermore, it suggested that the best model was the model contains the four steps, as it predicted a higher level of profitability and its variables were most strongly associated with the profitability.

The quantitative analysis of the assets model also showed key results. It indicated that the focus on intellectual capital as a main driver in managing assets is appropriate as it was positively associated with profitability. Furthermore, using a value creation approach perspective in managing intellectual capital was also positively associated with profitability. One of the most important results of the assets model was that the integration between the three proposed phases and related indicators were associated

with profitability. Moreover, it suggested that the best model was that containing all three phases as it predicted a higher level of profitability and its variables were most strongly associated with the profitability.

The statistical analysis of the revenue model showed also interesting results. It indicated that using the customer focus strategy as a main driver in managing revenue was positively associated with profitability. Furthermore, using a value management approach perspective in managing customers is also positively associated with profitability. One of the most important results of the revenue model was that the integration between the three proposed techniques used in managing customer value was associated with profitability. Moreover, it suggested that the best model was the model that contains the three techniques together as it predicted a higher level of profitability and its variables were most strongly associated with the profitability.

The quantitative analysis of the comprehensive profitability model provided the most significant results for the present study. It indicated that all proposed strategic management accounting techniques used in managing costs, assets, and revenue are significant in predicting profitability in the comprehensive model. Moreover, a key result was that the comprehensive profitability model (which included the cost, assets, and the revenue models) was the best model in predicting a higher level of profitability.

It can be concluded that the research aim and associated objectives have been successfully met. Furthermore, the empirical results of the study have supported all hypotheses.

CONTRIBUTION

This thesis makes a number of distinct contributions to management accounting literature. The major contribution of this thesis is the proposition of a new comprehensive model for managing profitability to fulfil the requirements of strategic management accounting. This model focuses on managing together the most important drivers of profitability (cost, assets, and revenue) which has not been addressed in the existing literature. This achieved the effectiveness principle of strategic management accounting by changing the focus from the concept of cost management to a broader and more inclusive concept of profitability management. In addition, it provides management with strategic information to determine the opportunities of improving profitability by managing cost, assets and revenue rather than cost alone.

Furthermore, the current study proposed a single model for managing each driver. Firstly, it developed a new cost model to manage costing for the purpose of managing profitability. This model highlights the important role that customer value creation plays in managing cost as the main profitability generator in strategic management accounting. In addition, such a model was the first to combine the perspective of attribute costing and value creation model into a coherent model. Such a combination explains the relationship between the cost of activities and customer value and how such relationship can be managed in order to improve profitability. Another significant contribution that has not been conducted by previous researches is to examine the relationship between all combinations of the four proposed steps in the cost model and profitability to determine the best cost model in predicting profitability.

Secondly, the present study also developed a new asset model for managing assets for the purpose of profitability management from the strategic perspective. Such a model identifies the critical role that intellectual capital plays in managing assets and its influence on profitability based on theory and findings of previous studies. Furthermore, the current study integrated the three stages of analysing and evaluating the current position of intellectual capital, determining the value adding intellectual capital activities, and evaluating the company's effectiveness in managing intellectual assets into a coherent model to manage assets for the purpose of profitability management, which also have not been addressed in the existing literature. Such a combination explains how intellectual capital resources should be managed to close the gap between the current intellectual capital resources and the intellectual resources required creating value, and hence improving profitability.

This model was the first to determine financial and non-financial indicators for managing intellectual capital in each proposed stage according to their compatibility to each stage. Another significant contribution of this thesis is the investigation of the relationship between all combinations of three proposed phases used in managing assets and profitability to determine the best assets model in predicting profitability, which has not been considered by previous researchers.

Thirdly, this thesis developed a new model to manage revenue for the purpose of profitability management from the strategic perspective. This model highlights the significant roles that customer focus strategy and the value management approach play in managing revenue and enhancing profitability based on theory and findings of previous studies. In addition, the revenue model was the first to integrate customer

satisfaction measured by financial and non financial indicators, customer loyalty measured by financial and non financial indicators, and customer profitability analysis using an activity-based costing approach, into a coherent model to manage revenue. Such integration explains how customer satisfaction and customer loyalty can be managed to create value for the customer. In addition, how the value that a company obtains from its customers, represented in customer profitability, can be managed to improve profitability is also considered. A significant contribution that has not been addressed by previous research is to examine the relationship between all combinations of the three proposed techniques in the revenue model and profitability to determine the best revenue model in predicting profitability.

One of the other most significant contributions of this thesis is the examination of the effect of the integration between the three proposed models for cost, assets, and revenue on profitability, which has not been addressed in the existing literature. Such examination is required to determine the best profitability model. Moreover, a key contribution is that the present study was conducted in the Egyptian communication and information technology (ICT) sector. Such a sector is growing rapidly and witnesses vigorous competition. This emphasizes the importance of focusing on customers to achieve competitive advantages and create opportunities to increase profitability. In addition, it is characterized by extensive dependence on intellectual capital. As the first study of its kind, this work will significantly contribute in managing the profitability of the Egyptian ICT sector.

LIMITATIONS OF THE RESEARCH

As with any research project, this study has several limitations - for instance, the limitation of the generalization of the findings of this study. This study was conducted only in a single country and in a single sector that of the Egyptian ICT sector, whilst this is one of the most appropriate sectors for the proposed profitability model because it is characterized by extensive dependence on intellectual capital and it focuses on customers to achieve competitive advantage, such a focus could be viewed as a limitation. The findings of this study are influenced by the particular nature and characteristics of Egypt and the Egyptian ICT sector. Therefore, the generalization of findings beyond the Egyptian ICT sector should be made with caution. In evaluating the model the nature of the drivers must also be considered – what was appropriate here may well not work well for sectors with other characteristics.

Another limitation is that the use of judgment sampling in the current study may increase the risk of producing bias and inefficient parameter estimates, which should be taken into consideration (Guo and Hussey, 2004). However, judgment sampling is the best choice in the current study for reasons related to the availability of data and to ensure access to qualified respondents in Egyptian ICT sector.

Although, the current study examined mainly the impact of the integration between the cost, the assets, and the revenue models on profitability. It does not investigate the interrelationship and the overlap either between cost, assets and revenue models or between the proposed techniques that are used in managing each model.

As illustrated in the literature review, the proposed profitability model focused mainly on customers in managing costs and revenue as the represent a key driver in the strategic management accounting literatures. However, competitors are another key element in strategic management accounting that has not been investigated by the current study.

SUGGESTIONS FOR FUTURE RESEARCH

This thesis concludes here with some suggestions for future research. The present study examined the relationship between the three profitability drivers (cost, assets, and revenue) and profitability. However, according to the DuPont model, which focused on three components, namely net profit margin, assets turnover, and equity multiplier (assets/ {total assets - total liabilities}), liabilities might influence profitability (Kennon, 2009). Thus, additional research is needed to develop liabilities model to manage liabilities from a strategic perspective. Furthermore, how the liabilities model influence profitability is an issue worthy of further research efforts.

Further work is also needed to examine the impact of the integration between cost, assets, revenue, and liabilities on profitability. Another fruitful and interesting area for future research is to examine the strength of interrelationships and overlap amongst proposed techniques used in managing each driver such as the examination of the interrelationship between customer satisfaction, customer loyalty, and customer profitability analysis in the revenue model to determine how these three variables are connected to each other and the relative importance of each variable in the revenue model.

In addition, the strength of interrelationships and overlap amongst the cost, assets, and revenue models should be examined using appropriate statistical methods such as the

path analysis and structural equation modeling to determine the relationship between the three constructs on one hand and between the three constructs and profitability on the other hand. Using such statistical techniques would also help to determine the weighting of each driver when related to profitability. Moreover, the influence of the integration between the cost, assets, and revenue models in the service sector is an issue worthy of future research efforts particularly given its focus on human capital.

The current study found that a customer focused strategy used in managing costs and revenue strongly affected profitability. However, further examination of the influence of competitor focused strategy and related strategic management accounting techniques such as strategic cost analysis and target costing on profitability might be required as another significant driver in strategic management accounting.

The influence of using other strategic management accounting techniques in managing each driver such as, process based costing and value based management techniques on profitability is another interesting area for future research. Additional effort is needed to develop other indicators for managing intellectual capital, customer satisfaction and customer loyalty in order to explore their relationship with profitability. More empirical work is also needed to examine the relationship between each construct and profitability using actual financial data which will support the reliability of the findings from this study. This can be achieved by applying each proposed strategic management technique used in managing costs, assets, and revenues. Then, collecting actual financial data from this application to investigate the financial impact of such techniques on profitability.

Furthermore, other research methods such as case study could be used by further research to explore the proposed relationship between each construct and profitability and between all constructs and profitability. Although the ordinal regression analysis is the best choice within the present study to examine relationships as the dependent variable is ordinal, other empirical studies can be conducted by using binary or multinomial logistic regression if the dependent variable is binary or categorical to examine these relationships.

Moreover, developing generalization of the findings of this study is another fruitful and interesting area for future research. This can be achieved by conducting further empirical research to explore the relationship between each construct and profitability and between all constructs and profitability across a broad range of Egyptian industries and a broad range of different countries to validate these initial findings and to establish the extent of generalization possible.

It can be concluded that the models presented here, and their initial testing, present a rich range of future research opportunities, which will hopefully help to further develop strategic profitability management and cement its centrality in supporting good strategic decision-making and improving profitability.

REFERENCES

Aaker, D. (1995). *Strategic Market Management.* New York: John Wiley and Sons.

Abdel-Maksoud, A., Dugdale, D., & Luther, R. (2005). Non-Financial Performance Management in Manufacturing Companies. *The British Accounting Review, 37*(3), 261-297.

Abuo-Alfutouh, S. (2004). *The Strategic Management Accounting for Supporting the Management in the Competitive Environment* (1st ed.). Al Mansoura: Dar Al Asdekaa.

Abuo-Alfutouh, S. (2006). *The Strategic Management Accounting for Supporting the Management in the Competitive Environment* (2nd ed.). Al Mansoura: Dar Al Asdekaa.

Abuo-Alfutouh, S. (2007). *The Strategic Management Accounting for Supporting the Management in the Competitive Environment* (3rd ed.). Al Mansoura: Dar Al Asdekaa.

Afuah, A. (1998). *Competitive Advantage from Intellectual Capital: the Case of Cholesterol Ethical Drugs.* Paper presented at the Interdisciplinary Committee on Organizational Studies (ICOS), University of Michigan.

Afuah, A. (2009). *Strategic Innovation- New Game Strategies for Competitive Advantage.* Abingdon: Routlege.

Ahmed, N. (2003). A Proposed Framework for Customer Relationship Management in Service Sector. *Journal of Commerce and Economic, 3,* 600-640.

Al-Gendy, N. (2005). A Proposed Model for Measuring and Evaluating the Intellectual Capital. *Journal of Accounting, Management, and Insurance 65,* 120-155.

Al-Hawwary, M. (2001). Customer Loyalty (Limitations, Importance, and the Requirements of Managerial Practices). *Journal of Financial and Commercial Studies, 1,* 337-386.

Al-Kheyal, T. (2005). The Importance of Intellectual Capital Accounting and its Impacts on the Effectiveness of Accounting Information. *Journal of Commerce for Scientific Research, 5*(2), 331-370.

Al-Nashar, T. (2001). A Proposed Framework for Integrating Process Based Costing and Attribute Based Costing Techniques. *Journal of Faculty of Commerce for Scientific Research, 2,* 20-70.

Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and Qualitative Research in the Built Environment: Application of "Mixed" Research Approach. *Work Study, 51*(1), 17-31.

Anderson, E., Fornell, C., & Lehmann, D. (1994). Customer Satisfaction, Market Share, and Profitability: Findings from Sweden. *Journal of Marketing, 58*(3), 53-66.

Anderson, E., & Mittal, V. (2000). Strengthening the Satisfaction- Profit Chain. *Journal of Service Research, 3*(2), 107-120.

Arabi, M. (1999). A Proposed Framework for Re-Engineering the Management Accounting to Fulfill the Requirements of Strategic Management in Industrial Sector- An Empirical Study. *Journal of Commerce and Economic, 2,* 100-150.

Armour, E., & Mergy, L. (2003). To Grow Profitability: Manage Customer Value, Not Customer Relationships. *Journal of Bank Cost & Management Accounting, 16*(2), 53-61.
Ashour, A. (1995). The Strategic Position for Costs and Value Chain Framework: A Case Study. *Accounting, 1*, 2-150.

Awad, M. (2004). *Strategic Management*: Without Publisher.

Balogu, A. (2004). *The Balanced Scorecard Approach for Measuring C.R.M and Logistic Performance of a G.S.M Company.* Paper presented at the International Logistics Congress.

Belkaoui, R. (2003). Intellectual Capital and Firm Performance of US Multinational Firms'. *Journal of Intellectual Capital, 4*(2), 215-226.

Birchall, J. (2009). Sampling and Samples. Retrieved 17/5/2009, from http://www.marketresearchworld.net/index.php?option=com_content&task=view&id=23&Itemid=1

BMI. (2007). *Business Monitor International: Egypt's ICT Investment Volume to Reach $1.3 bn by 2011*: The British Business Monitor International (BMI).

Boedker, C., Guthrie, J., & Cuganesan, S. (2005). An Integrated Framework for Visualising Intellectual Capital. *Journal of Intellectual Capital 6*(4), 510-528.

Bollen, L., Vergauwen, P., & Schnieders, S. (2005). Linking Intellectual Capital and Intellectual Property to Company Performance. *Management Decision, 43*(9), 1161-1185.

Bose, R. (2004). Knowledge Management Metrics. *Industrial Management &Data Systems, 104*(6), 457-468.

Bourque, L., & Fielder, E. (1995). *How to Conduct Self-Administered and Mail Surveys.* London: SAGE publications.

Brands, K. (1999, Feb.). Learning to Manage Profitability – Not Just Costs. *Management Accounting, 33*(5), 88-88.

Brausch, J. (1994, Nov). Beyond ABC: Targeting Costing for Profit Enhancement. *Management Accounting, 76*(5), 45-50.

Brennan, M. (1992). Techniques for Improving Mail Survey Response Rates. *Marketing Bulletin, 3*, 24-37.

Brewton, J., & Schiemann, W. (2003, Jan. / Feb). Measurement: the Missing Ingredient into Day's CRM Strategies. *Journal of Cost Management, 17*(1), 5-14.

Brimson, J. (1998). Feature Costing Beyond ABC. *Journal of Cost Management, Jan. / Feb.*, 6-12.

Bromwich, M. (1988). Managerial Accounting Definition and Scope – From a Managerial View. *Management Accounting, 66*(8), 26-27.

Bromwich, M. (1990). The Case for Strategic Management Accounting: the Role of Accounting Information for Strategy in Competitive Markets. *Accounting, Organizations, and Society, 15*(1/2), 27-46.

Bromwich, M., & Bhimani, A. (1989). *Evaluation Not Management Accounting Revolution.* London: C.I.M.A Publications.

Bromwich, M., & Bhimani, A. (1994). *Management Accounting: Pathways to Progress.* London: CIMA.

Brooking, A. (1996). *Intellectual Capital: Core Assets for the Third Millennium Enterprise.* London: Thomas Business Press.

Brouthers, K., & Roozen, F. (1999). Is It Time to Start Thinking about Strategic Accounting? *Long Range Planning, 32*(3), 311-322.

Canibano, L., Ayuso, M., Sanchez, P., olea, M., & Escobar, C. (1999). *Measuring Intangibles: Discussion of Selected Indicators.* Paper presented at the International Symposium Measuring and Reporting Intellectual Capital: Experience, Issues and Prospects, OECD, Amsterdam.

Canibano, L., Sanchez, P., Ayuso, M., & Dominguez, C. (2002 ,Jan). Guidelines for Managing and Reporting on Intangibles. Retrieved 15/12/2007, from http://www.uam.es/docencia/degin/Papers%20Budapest/Professor/Paloma%20Sanchez/Paloma_full_paper.doc

Casebeer, A., & Jverhoef, M. (1997). Combining Qualitative and Quantitative Research Methods: Considering the Possibilities for Enhancing the Study of Chronic Diseases. *Chronic Diseases in Canada, 18*(3), 298-318.

Chen, C., & Hughes, H. (2004). Using Ordinal Regression Model to Analyse Student Satisfaction Questionnaires. *Institutional Research Applications, 1*(26), 1-13.

Chen, J., Zhu, Z., & Xie, H. (2004). Measuring Intellectual Capital: A New Model and Empirical Study. *Journal of Intellectual Capital, 5*(1), 195-212.

Chen, M., Cheng, S., & Hwang, y. (2005). An Empirical Investigation of the Relationship between Intellectual Capital and Firms Market Value and Financial Performance. *Journal of Intellectual Capital, 6*(2), 159-177.

Chen, W., & Hirschheim, R. (2004). A Paradigmatic and Methodological Examination of Information Systems Research From 1991 to 2001. *Information Systems Journal, 14*(3), 197-235.

Christopher, B. (2002a, July / Aug.). New Ideas for Cost and Profit Management. *Journal of Cost Management, 16*(4), 41-45.

Christopher, B. (2002b, Nov. /Dec.). From Cost Management to Profit Management. *Journal of Cost Management, 16*(6), 42-46.

Chu, I., & Brennan, M. (1990). The Effectiveness of Some Techniques for Improving Mail Survey Response Rates- A meta Analysis. *Marketing Bulletin, 1*, 13-18.

Chua, F. (1986). Radical Developments in Accounting Thought. *The Accounting Review, LXI*(4), 601-632.

CIMA. (2000). *Management Accounting Official Terminology.* London: CIMA.

Clarke, P. (1995). The Old and the New In Management Accounting. *Management Accounting, 73*(6), 46-49.

Clarke, P., & Tagoe, N. (2002). Strategic Management Accounting- Do We Need It? *Accountancy Ireland, 34*(6), 10-11.

Cokins, G. (2006). Measuring Customer Value: How BPM Supports Better Marketing Decisions. *Business Performance Management, Feb*, 13-18.

Collis, J., & Hussey, R. (2003). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students* (2nd ed.). London: Macmillan Press ltd.

Cooper, D., & Schindler, P. (2003). *Business Research Methods* (8th ed.). Irwin: Mc Graw-Hill.

Cooper, R. (1995). *When Lean Enterprises Collide- Competing through Confrontation.* United States of America: Harvard Business School Press.

Cox, D., & Snell, E. (1989). *Analysis of Binary Data* (2nd ed.). London: Chapman& Hall.

Crossan, F. (2003). Research Philosophy Towards an Understanding. *Nurse Researcher, 11*(1), 46-56.

Daley, J. (2001). The Intangible Economy and Australia. *Australian Journal of Management, 26*(2), 3-19.

David, F. (1997). *Strategic Management* (6th ed.). New Jersey: Prentice Hall International.

Decoster, J. (1998). Overview of Factor Analysis. Retrieved 15/09/2009, from http://www.stat-help.com/notes.html

De Pablos, P. (2002). Evidence of Intellectual Capital Measurement from Asia, Europe, and the Middle East. *Journal of Intellectual Capital, 3*(3), 287-303.

De pablos, P. (2003). Intellectual Capital Reporting in Spain: A Comparative View. *Journal of Intellectual Capital, 4*(1), 61-81.

Dess, G., & Lumpkin, G. (2003). *Strategic Management Creating Competitive Advantage.* Irwin: McGraw-Hill.

De Vaus, D. (1996). *Surveys in Social Research* (4th ed.). Australia: Allen & Unwin.

De Vaus, D. (2002). *Survey in Social Research* (5th ed.). Australia: Allen& Unwin.

Dixon, R., & Smith, D. (1993). Strategic Management Accounting. *Omega, 21*(6), 605-623.

Drury, C. (1998). *Costing: An Introduction* (4th ed.). London: International Thomson Publishing

Drury, C. (2008). *Management and Cost Accounting* (7th ed.). United Kingdom: South-Western Cengage Learning.

Dzinkowski, R. (2000). The Measurement and Management of Intellectual Capital: An Introduction. *Management Accounting, 78*(2), 32-36.

EAS. (2002). Accounting for Intangible Assets (Vol. 23, pp. 352-379). Cairo: Egyptian Accounting Standard.

Edvinsson, L. (1997). Developing Intellectual Capital at Skandia. *Long Range Planning, 30*(3), 266-373.

Eldenburg, L., & Wolcott, S. (2004). *Cost management-Measuring, Monitoring and Motivating Performance*. New York: Johan Wiley and Sons.
EMICT. (2008). *ICT Industry, A Rapidly Growing* Egyptian Ministry of Communications and Information Technology.

EMICT. (2009). *Information and Communications Technology Indicators Bulletin*: Ministry of Communications and Information Technology.

Essia, H. (2001). A proposed Framework for Applying the Target Costing Technique- A Comparative Study with Japanese Industries. *Journal of Commerce and Economic, 2*, 70-90.

Essia, H. (2007). *New Trends in Management Accounting*: Without publisher

Fabrigar, L., Wegener, D., MacCallum, R., & Strahan, E. (1999). Evaluating the Use of Exploratory Factor Analysis in Psychological Research. *Psychological Methods, 4*(3), 272-299.

Fabritius, J. (2003). Intellectual Capital Statements-the New Guideline. Retrieved June, 2005, from http://research.asb.dk/ws/fbspretriere/216/guideline_uk.pdf

Fahy, J. (1998). Improving Response Rates in Cross-Cultural Mail Surveys. *Industrial Marketing Management, 27*, 495-468.

FASB. (1999). Business Combinations and Intangible Assets (Vol. 201–A): Financial Accounting Standards Board.

Fathy, A. (2002). *Strategic Management (Concepts and Models)*. Cairo: Al Dar Algameia.

FEI. (2008). *Achievement*. Cairo: Federation of Egyptian industries.

Felleeg, A. (2001). The Reflection of Company's strategy on costs system. *Journal of Financial and Commercial Studies, 2*, 50-78.

Finch, B. (2006). *Operations Now – Profitability, Processes, Performance* (2nd ed.). New York: McGraw-Hill.

Floyd, J., & Fowler, J. (2002). *Survey Research Methods* (3rd ed.). London: SAGE publications.

Fontaine, J. (2004, May). .Profit Driver Management. *CMA Management, 78*(3), 16-19.

Fornell, C., Amburg, D., Morgeson, F., & Bryant, B. (2005). *The American Customer Satisfaction Index at 10 Years*: Ann Arbor: The Stephen M.Ross School of Business.

Fornell, C., Johnson, M., Anderson, E., Cha, J., & Bryant, B. (1996). The American Customer Satisfaction Index: Nature, Purpose and Findings. *Journal of Marketing, 60*(4), 7-18.

Forsy, T. (2003). Putting the Customer at the Heart of Your C.R.M Program. Retrieved 12/5/2008, from http://www.crm.forum.com

Frohlich, M. (2002). Techniques for Improving Response Rates in OM Survey Research. *Journal of Operations Management, 20*, 53-62.

FRS. (1997). Goodwill and Intangible Assets. London: Accounting Standards Board.

Gabre, M. (2007). *Strategic Management: A New Approach.* Cairo: Dar Almarref.
Gale, B. (2000). Trends in Customer Satisfaction, Loyalty, and Value. Retrieved 20/10/2009, from www.mria-arim.ca/montreal/pdf/DrGalpaper

Garson, D. (1998). Data Levels and Measurement. Retrieved 18/5/2009, from http://faculty.chass.ncsu.edu/garson/pa765/datalevl.htm

Garson, D. (2009). Ordinal Regression. Retrieved 10/8/2009, from http://faculty.chass.ncsu.edu/garson/pa765/ordinalreg

Gibbons, J. (1993). *Nonparametric Measures of Association.* London: SAGE.

Graffikin, M. (2006). The Critique of Accounting Theory. *University of Wollongong* Retrieved 15/3/2009, from http://vo.uow.edu.au/accfinwp

Green, P., & Srinivasan, V. (1990). Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice. *Journal of Marketing, 54*(4), 3-20.

Gronsted, A. (2000). *The Customer Century.* London: Rout Ledge.

Guo, S., & Hussey, D. (2004). Non-Probability Sampling in Social Work Research: Dilemmas, Consequences, and Strategies. *Journal of Social Service Research, 30*(3), 1-18.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). *Multivariate Data Analysis* (5th ed.). New Jersey: Prentice Hall.

Hair, J., Money, A., & Samouel, P. (2007). *Research Methods for Business.* West Sussex: Johan Wiley& Sons.

Hakim, C. (2000). *Research Design: Successful Designs for Social and Economic Research* (2nd ed.). London: Routlege.

Harrison, S., & Sullivan, P. (2000). Profiting from Intellectual Capital: Learning from Leading Companies. *Journal of Intellectual Capital 1*(1), 33-46.

Harvey, M., & Lusch, R. (1999, Feb.). Balancing the Intellectual Capital Books: Intangible Liabilities. *European Management Journal, 17*(1), 85-92.

Hassan, A. (2003). *The advanced management accounting.* Cairo: Al Dar Algameiya.

Hayes, N. (2000). Doing Psychological Research Gathering and Analysis Data. Retrieved 15-03, 2009, from http://www.openup.co.uk

Healy, M., & Perry, C. (2000). Comprehensive Criteria to Judge Validity and Reliability of Qualitative Research within the Realism Paradigm. *Qualitative Market Research: An International Journal, 3*(3), 118-126.

Helgesen, O. (2006). Are Loyal Customers Profitable? Customer Satisfaction, Customer Loyalty and Customer Profitability at Individual Level. *Journal of Marketing Management, 22*(3,4), 245-266.

Helmrich, K. (1989, May). From Cost Control to Profitability Management. *Management Services, 33*(5), 14-19.

Hemi, M. (1998, Dec.). Measuring the Effect of Customer Satisfaction on Profitability: A Challenging Role for Management Accountants. *The National Public Accounting, 43*(10), 8-13.

Heskett, J., Jones, T., Sasser, E., & Schlesinger, L. (1994). putting the service- profit chain to work. *Harvard Business Review, March/April*, 105-111.

Hill, C., & Jones, G. (2008). *Strategic Management an Integrated Approach* (9th ed.). USA: South Western Cengage Learning.

Hitt, M., Ireland, D., & Hoskisson, R. (2007). *Strategic Management-Competitiveness and Globalization* (5th ed.). USA: South Western Cengage Learning.

Hooks, J. (2002). *Accountability in the Retail and Distribution Sectors of the New-zealand Electricity Industry.* Unpublished Doctoral thesis, University of Waikato, New-zealand

Hoque, Z. (2003). *Strategic Management Accounting-Concepts, Processes and Issues* (2nd ed.). Australia: Pearson- Prentice Hall.

Hoque, Z. (2006). *Methodological Issues in Accounting Research: Theories and Methods.* London: Spiramus Press ltd.

Horngren, C., Bhimani, A., Dater, S., & Foster, G. (2005). *Management and Cost Accounting* (3rd ed.). New Jersy Prentice Hall.

Horngren, C., Dater, S., & Foster, G. (2006). *Cost Accounting: A Managerial Emphasis* (10th ed.). New Jersey USA: Prentice Hall.

Hosking, G. (1993, Sep. / Oct.). Strategic Management of Costs. *Planning Review, 21*(5), 51-55.

Howes, K. (2003). Customer Value Management and Development in Europe. Retrieved 15/8/2007, from www.edgardunn.com

Howitt, D., & Cramer, D. (2008). *Introduction to SPSS in Psychology for Version 16 and Earlier* (4th ed.). Essex: Pearson Education Limited.

Hyde, K. (2000). Recognising Deductive Process in Qualitative Research. *Qualitative Market Research: An International Journal, 3*(2), 82-89.

IAS. (1998). Intangible Assets (Vol. 38). London: International Accounting Standards Committee.

IMA. (1983). *Management Accounting Terminology.* Montvale: IMA.

ITIDA. (2008). *Developing IT in Egypt*: Information Technology Industry Agency: ITIDA.

ITNA. (2008). Egypt to Increase ICT Spending. Retrieved 9/9/2009, from http://www.itnewsafrica.com/?p=1058

ITNA. (2008). Egypt to Increase ICT Spending. Retrieved 9/9/2009, from http://www.itnewsafrica.com/?p=1058

Jay, B., & William, S. (2006). *Strategic Management and Competitive Advantage Concepts and Cases.* New Jersey: Prentice Hall.

Johan, T., & Frank, M. (2005). *Strategic Management Awareness and Change* (5th ed.). London: Thomson Learning.

Johnson, T., & Kaplan, R. (1991). *Relevance Lost the Rise and Fall of Management Accounting.* Boston: Harvard Business School Press.

Johson, V., & Albert, J. (1999). *Statistics for Social Science and Public Policy: Ordinal Data Modeling.* New York: Springer.

Kaiser, H. (1960). The Application of the Electronic Computer to Factor Analysis. *Educational and Psychological Measurement, 20,* 141-151.

Kaiser, H. (1974). An Index of Factorial Simplicity. *Psychometrics, 39,* 31-36.

Kaplan, R., & Norton, D. (1996). Linking the Balanced Scorecard Strategy. *California Management Review, 39*(1), 53-79.

Kaplan, R., & Norton, D. (2001). Transforming the Balanced Scorecard from Performance Measurement to Strategic Management *Accounting Horizons, 15*(1), 87-81-84.

Kaplan, R. S., & Norton, D. P. (2000). Having Trouble With your Strategy? Then Map It. *Harvard Business Review, September/October,* 167-176.

Kaplan, R. S., & Norton, D. P. (2004a). How Strategy Maps Frame an Organization's Objectives. *Financial Executive, Mar/Apr 20*(2), 40-45.

Kaplan, R. S., & Norton, D. P. (2004b). The Strategy Map: Guide to Aligning Intangible Assets. *Strategy and Leadership, 32*(5), 10-17.

Kennedy, M., & King, A. (2004, Mar.). Using Customer Relationship Management to Increase Profits. *Strategic Finance, 85*(9), 37-42.

Kennon, J. (2009). Analysing an Income Statement. Retrieved 10/11/2009, from http://beginnersinvest.about.com/od/financialratio/a/aa040505

Key, J. (1997). Sampling. Retrieved 17-05, 2009, from http://www.okstate.edu/ag/aged...5980a/5980

Kidder, L., & Judd, C. (1986). *Research Methods in Social Relations* (5th ed.). New York: Rinehart and Winston.

Kim, J., & Mueller, C. (1978). *Factor Analysis-Statistical Methods and Practical Issues.* London: Sage publications.

Kim, J., Suh, E., & Hwang, H. (2003). A Module for Evaluating the Effectiveness of C.R.M Using the Balanced Scorecard. Retrieved 10/4/2007, from http://ideias.online.pt/pdf/IOP_EvaluatingCRM_scorecard

Kimes, S. (1989a). The Basics of Yield Management. *Cornell Hotel and Restaurant Administration Quarterly, 30*(3), 14-19.

Kimes, S. (1989b). Yield Management: A Tool for Capacity-Constrained Service Firms. *Journal of Operations Management, 8*(4), 348-363.

Kimes, S. (1999). Implementation of Restaurant Revenue Management: A Five-Step Approach. *Cornell Hotel and Restaurant Administration Quarterly, 40*(3), 15-22.

Kjaergaard, I. (2003). Constructing a Knowledge Based: Identify Experience from Working with Intellectual Capital Statements. *Corporate Reputation on Review, 6*(3), 266-275.

Kline, P. (1994). *An Easy Guide to Factor Analysis.* London: Routledge.

Kraeuter, S., Moedritscher, G., Waiguny, M., & Mussning, W. (2007). Performance Monitoring of CRM Initiatives. Retrieved 15/5/ 2008, from http://doi.ieeecomputersociety.org/10.1109/HICSS.2007.433

Krakhmal, V. (2006). Customer Profitability Accounting in the Context of Hotels. In P. Harris & M. Mongiello (Eds.), *Accounting and Financial Management: Developments in the International Hospitality Industry* (pp. 118-210). Oxford: Butterworth Heinemann.

Kumar, R. (2005). *Research Methodology: A Step-by-Step guide for Beginners* (2nd ed.). London: SAGE.

Kumar, V., & Shah, D. (2004). Building and Sustaining Profitable Customer Loyalty for the 21st Century. *Journal of Retailing, 80*(4), 317-329.

Larsen, H., Bukh, P., & Mouritsen, J. (1999). Intellectual Capital Statements and Knowledge Management: Measuring, Reporting, Acting. *Australian Accountant Review, 9*(3), 15-26.

Larsen, H., Bukh, P., & Mouritsen, J. (2001). Constructing Intellectual Capital Statements. *Scandinavian Journal of Management, 17*, 87-108.

Laughlin, R. (1995). Empirical Research in Accounting: Alternative Approaches and a Case for "Middle-Rang" Thinking. *Journal of Accounting, Auditing& Accountability, 8*(1), 63-87.

Laughlin, R. (2004). Putting the Record Straight: a Critique of Methodology Choices and the Construction of Facts: Some Implications from the Sociology of Knowledge. *Critical Perspective on Accounting, 15*, 261-277.

Lawson, R., Hatch, T., Desroches, D., & Stratton, W. (2010). Who Can Win with a Cost and Profitability System? *Journal of Corporate Accounting and Finance, 21*(3), 53-60.

Lei, D., & Pitts, R. (2002). *Strategic Management Building and Sustaining Competitive Advantage.* Canada: Thomson South-Western.

Lenhardt, P. (2004). Uncover Hidden Profit Potential: Develop Activity and Profit Profiles, Part 1. *Cost Management, 18*(6), 40-47.

Lenhardt, P. (2005). Uncover Hidden Profit Potential: Develop Activity and Profit Profiles, Part 2. *Cost Management, 19*(1), 38-47.

Lie, K. Sampling Methods. Retrieved 17/5/2009, 2009, from http://www.qmu.ac.uk/psych/RTrek/study_notes/web/sn4.htm

Liebowitz, J., & Suen, C. (2000). Developing Knowledge Management Metrics for Measuring Intellectual Capital. *Journal of Intellectual Capital, 1*(1), 54-67.

Ling, R. (2008). Framing and Testing Hypotheses: Defining, Methodology, Undertaking Data Collection, Analysing Results. Retrieved 6/6/2009, from http://arts.monash.edu.au/research/graduate-research/current-students/seminars/making-topic-workable-ling.pdf

Loeb, M. (1994, Spet.). "Where Leaders Come From". *Fortune, 130*(6), 241-243.

Long, J. (1997). *Regression Models for Categorical and Limited Dependent Variables.* United States of America: Sage Publication, inc.

Louis, O., & Elain, W. (2001). Profitability Management. Retrieved 23/4/2008, from http://www.peoplesoft.com/media/en/

Low, J. (2000). The Value Creation Index. *Journal of Intellectual Capital, 1*(3), 252-262.

Lucey, T. (2003). *Management Accounting* (5th ed.). London: Continuum.

Lumpkin, G., & Dess, G. (2003). *Strategic Management Creating Competitive Advantage.* Irwin: McGraw-Hill.

Luo, Y. (2004). *Coopetition in International Business.* North America: Copenhagen business school.

Luthy, D. (1999). *Intellectual Capital and Its Measurement.* Paper presented at the Asian Pacific Interdisciplinary Research in Accounting (APIRA), Osaka.

MaCall, C. (2001, November). *An Empirical Examination of the Likert Scale: Some Assumptions, Development, and Cautions.* Paper presented at the CERA conference South LakeTahoe, CA, Embassy Suites hotel south lake tahoe.

Magdy, N. (2002). Customer Relationship Management and Related Variables in Banking Sector. *Journal of Financial and Commercial Studies, 3*(100-130).

Makki, M., & Lodhi, S. (2008). Impact of Intellectual Capital Efficiency on Profitability: A Case Study of LSE 25 Companies. *The Lahore Journal of Economics, 13*(2), 81-98.

Marr, B., Gray, D., & Neely, A. (2003). Why Do Firms Measure Their Intellectual Capital? *Journal of Intellectual Capital, 4*(4), 441-454.

Marr, B., & Schiuma, G. (2003). Business Performance Measurement-Past, Present, and Future. *Management Decision, 41*(8), 680-687.

Marson, T. (2008). *Can Middle Eastern Countries Fulfill the "Eastern" Promise?*: Yankee Group report.

McCullagh, P. (1980). Regression Models for Ordinal Data. *Journal of Royal Statistical Society, B42*, 109-142.

McCullagh, P., & Nelder, J. (1989). *Generalized Linear Models.* New York: Chapman &Hall.

McFadden, D. (1973). *Conditional Logit Analysis of Qualitative Choices Behavior in Zarembka.* New York: John Wiley.

McNabb, D. (2002). *Research Methods in Public Administration and Nonprofit Management.* London: M.E Sharpe.

McNair, C., Polutnik, L., & Silvi, R. (2001a). Cost Management and Value Creation: the Missing Link. *The European Accounting Review, 10*(1), 33-50.

McNair, C., Polutnik, L., & Silvi, R. (2001b). Customer Value: A New Kind of Cost Management. *The Journal of Corporate Accounting & Finance, 12*(3), 9-14.

McNair, C., Polutnik, L., & Silvi, R. (2006). Customer-Driven Lean Cost Management. *Cost Management (November/December),* 9-21.

Metwalli, T. (2003). A Descriptive Model for Measuring the Intellectual Capital Performance Using the Balanced Scorecard-Knowledge Perspective. *The Scientific Journal for Commerce and Finance, 1,* 250-301.

MICT. (2007). *Egypt is "India of the Middle East for IT Outsourcing".* Ministry of communications and information technology.

Mintzberg, H. (1987). Crafting Strategy. *Harvard business review, 64,* 66-75.

Mohamed, S. (1998). Developing Accounting Techniques and Tools to Provide Management with the Information Required for Determining and Analysing the Customer Profitability. *The Scientific Journal of Commerce and Finance, 2,* 600-630.

Morgan, G., & Smircich, L. (1980). The case for qualitative research. *Academy of management review, 5*(4), 491-500.

Morse, W., Davis, J., & Harlgraves, A. (2003). *Management Accounting a Strategic Approach.* South Western: Thomson

Mouritsen, J. (1998). Driving Growth: Economic Value Added Versus Intellectual Capital. *Management Accounting Research, 9*(4), 461-483.

Mouritsen, J., Bukh, P., & Marr, B. (2004). Reporting on Intellectual Capital: Why, What, and How? *Measuring Business Excellence, 8*(1), 46-54.

Muhammad, N., & Ismail, M. (2009). Intellectual Efficiency and Firm's Performance: Study on Malaysian Financial Sectors. *International Journal of Economics and Finance, 1*(2), 206-212.

Nagelkerke, N. (1991). A Note on a General Definition of Coefficient of Determination. *Biometrika, 78*(3), 691-692.

Narver, J., & Slater, S. (1990). The Effect of a Market Orientation on Business Profitability. *Journal of Marketing, 54*(4), 20-35.

Noone, B., & Griffin, P. (1997). Enhancing yield Management with Customer Profitability Analysis. *International Journal of Contemporary Hospitality Management, 9*(2), 75-79.

Noone, B., & Griffin, P. (1998). Development an Activity Based Customer Profitability System for Yield Management. *Progress Tourism and Hospitality Research, 4,* 279-292.

Norton, A. (2007). *Integrated Management* (1st ed.). Oxford UK: CIMA.

Ocal, E., Oral, E., Erdis, E., & Vural, G. (2007). Industry Financial Ratios Application of Factor Analysis in Turkish Construction Industry. *Building and Environment, 42*(1), 385-392.

Pallant, J. (2005). *SPSS Survival Manual: a Step by Step Guide to Data Analysis Using SPSS Version 12* (2nd ed.). Berkshire UK: Open university Press.

Panneerselvam, R. (2004). *Research Methodology.* New Delhi: Prentice-Hall of India.

Phillips, J., & Phillips, P. (2002). *In Action: Measuring Intellectual Capital.* Chicago: ASTD Press.

Pinsonneault, A., & Kraemer, K. (1993). Survey Research Methodology in Management Information Systems: An Assessment. *Journal of Management Information Systems, 10*(2), 75-105.

Plaster, G., & Alderman, J. (2006). Point Of View Customer Value Creation: A Platform For Profitable Growth. Retrieved 13/05/2008, from http://www.scribd.com/doc/7227346/Customer-Value-Creation

Porter, M. (1980). *Competitive Strategy: Techniques for Analysing Industries and Competitors* (Free Press ed.). New York.

Porter, M. (1985). *Competitive Advantage Creating and Superior Performance.* London: Collier Macmillan.

Porter, M. (1998). *The Competitive Advantage of Nations with a New Introduction* London: Collier Macmillan.

Punch, K. (1998). *Survey Research the Basics.* London: SAGE Publication.

Raaij, E. (2005). The Strategic Value of Customer Profitability Analysis. *Marketing Intelligence & Planning, 23*(4/5), 372-381.

Reichheld, F., & Sasser, E. (1990). Zero Defections: Quality Comes to Services. *Harvard Business Review, Sept/ Oct*, 106-111.

Reinartz, W., & Kumar, V. (2002). The Mismanagement of Customer Loyalty. *Harvard Business Review, July*, 86- 94.

Robson, C. (2002). *Real World Research: A resource for Social Scientists and Practitioner* (2nd ed.). Oxford: Blackwell.

Roos, G., & Roos, J. (1997). Measuring Your Company's Intellectual Performance. *Long Range Planning, 30*(3), 413-426.

Roslender, R. (1995). Accounting for Strategic Positioning: Responding to the Crisis in Management Accounting. *British Journal of Management, 6*, 12.

Roslender, R., & Hart, S. (2003). In Search of Strategic Management Accounting: Theoretical and Field Study Perspectives. *Management Accounting Research, 14*(3), 255-279.

Roslender, R., Hart, S., & Ghosh, J. (1998). Strategic Management Accounting: Refocusing the Agenda. *Management Accounting, 76*(11), 44-46.

Rucci, A., Kim, S., & Quinn, R. (1998). The Employee-Customer-Profit Chain at Sears. *Harvard Business Review, Jan/Feb*, 83-97.

Ryan, B., Scapens, R., & Theobald, M. (2002). *Research Method and Methodology in Finance and Accounting* (2nd ed.). London: Thomson.

Salem, A. (2002). How to Mange Customer- A Case Study *The Scientific Journal of Commerce and Finance, 2*, 310-340.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students.* Essex-England: Prentice Hall.

Scapens, R. (2006). Understanding Management Accounting Practices: A Personal Journey. *The British Accounting Review, 38*(1), 1-30.

Seetharaman, A., Sooria, H., & Saravanan, A. (2002). Intellectual Capital Accounting and Reporting In Knowledge Economy. *Journal of Intellectual Capital, 3*(2), 128-149.

Sekaran, U. (2003). *Research Methods for Business: A Skill building approach* (4th ed.). New York: Johan Wiley & Sons, Inc.

Shaheen, A. (2003). A Proposed Approach for Accounting Measurement for Intellectual Capital-Applied in Medicine Sector. *Scientific Journal of Commerce and Economic, 3*, 760-800.

Shaikh, J. (2004, Mar.). Measuring and Reporting of Intellectual Capital Performance Analysis. *The Journal of American Academy of Business, 4*(1/2), 439- 448.

Shank, J. (1989). Strategic Cost Management: New Win, or Just New Bottles? *Journal of Management Accounting Research, 1*, 47-65.

Shank, J., & Govindarajan, V. (1992). Strategic Cost Management: The Value Chain Perspective. *Journal of Management Accounting Research 4*, 179-197.

Siegel, S., & Castellan, J. (1998). *Nonparametric Statistics for Behavioral Sciences* (2nd ed.). New York: McGraw-Hill.

Silverman, D. (2006). *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction* (3rd ed.). London: SAGE Publications.

Simmonds, K. (1981). Strategic Management Accounting. *Management Accounting, 59*, 26-29.

Simmonds, K. (1982). Strategic Management Accounting for Pricing: A Case Example, . *Accounting and Business Research, 12*(47), 206-214.

Smith, B., Leimkuhler, J., & Darrow, R. (1992). Yield Management at American Airline. *Interfaces, 22*, 8-31.

Smith, M. (2000). Strategic Management Accounting: The Public Sector Challenge. *Management Accounting, 78*(1), 40-43.

Smith, M. (2003). *Research Methods in Accounting.* London: SAGE publications.

Smith, M., & Dikolli, S. (1995). Customer Profitability Analysis: An Activity Based Costing Approach. *Managerial Auditing Journal, 10*(7), 3-7.

Smith, R., & Wright, W. (2004). Determinants of Customer Loyalty and Financial Performance. *Journal of Management Accounting Research, 16*(1), 183-205.

Stapleton, D., Hanna, J., Yagla, S., Johnson, J., & Markussen, D. (2002). Measuring Logistics Performance Using the Strategic Profit Model. *International Journal of Logistics Management, 13*(1), 89-108.

Starovic, D., & Marr, B. (2003). *Understanding Corporate Value: Managing and Reporting Intellectual Capital* Chartered Institute of Management Accountants and Cranfield School of Management UK.

Stebbins, R. (2001). *Exploratory Research in the Social Sciences.* Thousand Oaks, CA: SAGE Publications.

Stewart, T. (1997). *Intellectual Capital.* London: Nicholas Brealy Publishing.

Sullivan, P. (2000). *Value-Driven Intellectual Capital: How to Convert Intangible Corporate Assets into Market Value.* New York: Johan Wiley and Sons.

Sveiby, K. (1998). Intellectual Capital: Thinking Ahead. *Australian CPA, June*, 18-22.

Tabachnick, B., & Fidell, L. (2001). *Using Multivariate Statistics* (4th ed.). Boston: Allyn and Bacon.

Tan, H., Plowman, D., & Hancock, P. (2007). Intellectual Capital and Financial Returns of Companies. *Journal of Intellectual Capital, 8*(1), 76-95.

Tashakkori, A., & Teddlie, C. (1998). *Mixed Methodology Combining Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage publications.

Tayles, M., Bramley, A., Adshead, N., & Farr, J. (2002). Dealing with the Management of Intellectual Capital: the Potential Role of Strategic Management Accounting. *Accounting, Auditing and Accountability Journal, 15*(2), 251-267.

Tholons, A., & Khan, I. (2008). *Top 50 Emerging Global Outsourcing Countries*: Global Services.

Thomas, L. (1998). Agents Must Commit to Customer Retention. *National Underwriter* Retrieved 29/3/2008, from http://www.highbeam.com/doc/1G1-53056268.html

Tibergien, M. (2003). How the Best Survive. *CPA Wealth Provider, Apr.*, 14-20.

Ting, I., & Lean, H. (2009). Intellectual Capital Performance of Financial Institutions in Malaysia. *journal of Intellectual Capital, 10*(4), 588-599.

Velicer, W., & Fava, J. (1998). Effects of Variable and Subject Sampling on Factor Pattern Recovery. *Psychological Methods, 3*(2), 231-251.

Walters, D. (2004). New Economy-New Business Models-New approaches. *International Journal of Physical Distribution& Logistics Management, 34*(3/4), 219-229.

Watts, R., & Zimmerman, J. (1990). Positivist Accounting Theory: A Ten Year Perspective. *The Accounting Review, 65*(1), 131-156.

Weber, R. (2004). The Rhetoric of Positivism Versus Interpretivism a Personal View. *MIS Quarterly, 28*(1), iii-xii.

Woodlock, P., Kos, A., Sockel, M., & Falk, L. (2001, Jan. / Mar.). Corporate Resource and Risk Management. *.Ohio CPA Journal, 60*(1), 55-58.

Yazdifar, H. (2003, Mar. /Apr.). Management Accounting In the Twenty First Century Firm: A Strategic View. *Strategic Change, 12*(2), 109-113.

Yeoman, I., & Ingold, A. (1997). *Yield Management Strategies for the Service Industries.* London: Cassel Wellington House.

Yeoman, I., & McMahon, U. (2004). *Revenue Management and Pricing-Case Studies and Applications.* London: Thomson Learning.

Yu, J., & Cooper, H. (1983). A Quantitative Review of Research Design Effects on Response Rates to Questionnaires. *Journal of Marketing Research, XX Feb*, 36-44.

Zaghloul, G. (2002). A Proposed Framework for Measuring Intellectual Capital in the Knowledge Environment. *Journal of Faculty of Commerce for Scientific Research, 2*, 320-350.

Zaki, M. (2002). A Proposed Framework for Strategic Management Accounting. *Journal of Cost Accounting, 2*, 67-90.

Zeghal, D., & Maaloul, A. (2010). Analysing Value Added as an Indicator of Intellectual Capital and its Consequences on Company Performance. *journal of Intellectual Capital, 11*(1), 39-60.

APPENDIX 1: ENGLISH LANGUAGE VERSION OF THE FINAL QUESTIONNAIRE (WITH COVER LETTER)

UNIVERSITY OF GLOUCESTERSHIRE
at Cheltenham and Gloucester

Mrs. Abeer Mohamed
PhD Program, Gloucestershire Business School
The Park,
Cheltenham,
GL50 2RH

Dear Sir/Madam,

The researcher is preparing PHD research in accounting entitled "A Proposed Accounting Model For Strategic Profitability Management" An Empirical Study.

This research aims to prepare a model for Managing Profitability suitable for Strategic Management. This model consists of three main elements (Costs, Revenue, Assets) together. A number of techniques are suggested to manage each element for the purpose of managing overall company's profitability.

To achieve this aim, the questionnaire has been prepared to obtain your evaluation of the effectiveness of the proposed model in managing profitability from the perspective of your practical experience.

So, I would like you to read the questionnaire and answer the questions carefully
As your answers will be valuable for this research and its results, I assure you that the data you indicate will be confidential and will be used for the purpose of this study only. Also, this data will be analysed at a group level and both personal and company data will remain anonymous.

Thank You in advance
Abeer A. A. Mohamed
Ph.D. student

Dr. Tracy Jones
Dissertation supervisor
Senior Lecture in accounting

Phillipa Ward
Dissertation supervisor
Director of Studies - Research Degrees

Please tick (√) the box which expresses your opinion

Section (1)

Strategic cost management

C1	First Question: Determine a suitable measurement for your agreement on choosing the main driver for cost management for the purposes of profitability management.	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
1/1	The cost management at the present time doesn't focus only on cost.					
1/2	The understanding of customers' needs represents the main and the first step in cost management.					
1/3	The main reason for the company's success at the present time is the increase of customer value.					
1/4	Customer value creation is the main way to improve company's profitability.					
1/5	The link between the cost and the customer value is the effective force in achieving profitability.					

C2	Second Question: Determine the importance of each of the following steps in customer value analysis.	Not Important	Limited Importance	Quite Important	Important	Very Important
		(1)	(2)	(3)	(4)	(5)
2/1	Identifying the alternative attributes for each product.					
2/2	Identifying attributes which offer benefits for customer.					
2/3	Determining the availability of the attribute in each alternative from the customer's viewpoint.					
2/4	Determining the importance given by the customer for each attribute.					
2/5	Determining the expected value of each alternative by using the last two steps.					

A3	Fourth Question: On your estimation, what is the importance of each of the following indicators in analyzing and evaluating the current position of intellectual assets.	Not important	Limited importance	Quite important	Important	Very important
		(1)	(2)	(3)	(4)	(5)
3/1	The link between revenue and customer value provides with valuable information for profitability management					
3/2	It is important for managing profitability to determine the revenue generated from each attribute					
C4	Fourth Question: Determine a suitable measurement of your agreement on how to measure value added cost from customer viewpoint					
4/1	Measuring value added cost requires determining the activities which added direct benefit to customer.					
4/2	Value that customer gets from product's attributes is the main factor to determine the value adding activities.					
4/3	Determining value adding activities provides suitable information for identifying the aspects of profitability improvement.					
4/4	The activity analysis technique provides details about the activities which add direct benefit to the customer.					
4/5	The activity based-costing is the best technique for measuring the costs of each attribute.					
C5	Fifth Question: Determine the importance of identify gap in value as a cost management step for the purpose of profitability management.					
5/1	Identifying the gap between the value based revenue and the attribute based cost.					

C6	Sixth Question: Determine how identifying the gap between value-based revenue and value-based costing provides information which can be used in the following:	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
6/1	Determining the aspects of improving current and future profitability.					
6/2	Identifying the activities that company will focus on.					
6/3	Identifying the expenditure level for each attribute.					
6/4	Identifying the competitive advantage.					

C7	Seventh Question: On your estimation, managing cost from the perspective of customer value will increase profitability by which percentage.

5% ☐

10% ☐

15% ☐

Other: . . . . . .

Section (2)

Strategic Asset Management

A1	First Question: Determine a suitable measurement for your agreement on choosing the main driver for asset management for the purposes of profitability management.	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
1/1	The majority of a company's value is generated from intellectual assets management.					
1/2	The contribution of intellectual asset at the present time is increased.					
1/3	Intellectual assets are the main factor that control a jump in profitability.					
1/4	The contribution of tangible and financial asset as important elements for producing goods and services at the present time is reduced.					
A2	Second Question: Determine your agreement on the proposed approach used in setting up the proposed model for managing intellectual assets.					
2/1	The purpose of managing intellectual assets at the present time is not to determine their financial value only.					
2/2	The main purpose of managing intellectual assets is defining and identifying the intellectual resources that cause value creation.					
2/3	Preparing a strategy for managing intellectual assets that is value creation-focused will lead to improvement in profitability.					

A3	Fourth Question: On your estimation, what is the importance of each of the following indicators in analyzing and evaluating the current position of intellectual assets.	Not important	Limited importance	Quite important	Important	Very important
		(1)	(2)	(3)	(4)	(5)
3/1	***Employees***					
3/1/1	Total number of employees.					
3/1/2	Average number of permanent employees.					
3/1/3	Number of part-time employees.					
3/1/4	Number of directors.					
3/1/5	Service period.					
3/1/6	Average age.					
3/1/7	New recruitment.					

3/1/8	Staff-turnover.					
3/1/9	Recruitment costs.					
3/2	***Customers***					
3/2/1	Annual sales for each customer.					
3/2/2	Change of customers.					
3/2/3	Average size of customer's order.					
3/2/4	Marketing costs.					
3/2/5	Estimated delivery time.					
3/2/6	Volume of defective production.					
3/3	***Processes***					
3/3/1	Total production time.					
3/3/2	Current year's production volume.					
3/3/3	Current year's production costs.					
3/3/4	Number of orders of supply.					
3/3/5	Processes stopping time.					
3/3/6	Repair and re-operation costs.					
3/4	***Technology***					
3/4/1	Total investment in IT.					
3/4/2	Number of IT departments.					
3/4/3	Number of computers.					
3/4/4	Number of services provided through the Internet.					
3/4/5	Amount of information and data on the company's site on the Internet.					
A4	Fifth Question: On your estimation, what is the importance of each of the following indicators in determining value adding intellectual activities.					
4/1	***Employees***					
4/1/1	Training and teaching expenses per employee.					
4/1/2	Number of training days per employee.					
4/1/3	Number of training hours.					
4/1/4	Costs of new idea generated by employees.					
4/1/5	Number of employees participating in each task.					
4/2	***Customers***					
4/2/1	Ratio of marketing costs to total costs.					
4/2/2	Ratio of marketing costs to total income.					
4/2/3	Marketing costs for each customer.					
4/2/4	Number of orders delivered in-time.					
4/2/5	Number of days allocated for exhibitions, customer meetings, and training.					
4/3	***Processes***					
4/3/1	Product development time (the time from the product as an idea till the completion of its development).					
4/3/2	Customer response time (the time from customer's order till delivery).					
4/3/3	Breakdown time.					
4/3/4	Defective production costs.					
4/3/5	Quality improvement costs.					
4/3/6	Investment in research and development.					
4/3/7	Percentage of time used in development.					
4/4	***Technology***					
4/4/1	Costs of new capital investment.					
4/4/2	Costs for software and computer purchase and					

	maintenance.					
4/4/3	Research and development costs.					
4/4/4	The ratio of IT costs to administration costs.					
A5	Sixth Question: On your estimation, what is the importance of each of the following indicators in evaluating the company's effectiveness in managing intellectual assists.					
5/1	***Customers***					
5/1/1	Customer satisfaction.					
5/1/2	Customer loyalty.					
5/1/3	Number of long-term customers.					
5/1/4	Post-sales service development rate.					
5/1/5	Decrease in percentage of returned goods.					
5/1/6	Current customer turnover rate.					
5/1/7	Number of new customers.					
5/2	***Employees***					
5/2/1	Employees turnover rate.					
5/2/2	Development rate in employees daily performance.					
5/2/3	Ratio of employees leaving work to total number of employees.					
5/2/4	Employees' loyalty.					
5/3	***Processes***					
5/3/1	Error rate.					
5/3/2	Ratio of defective production to total production.					
5/3/3	Cost of production unit.					
5/3/4	Development rate in throughput time.					
5/3/5	Development rate in product development time.					
5/3/6	Waiting time.					
5/4	***Technology***					
5/4/1	Technological development rate.					
5/4/2	IT performance development per employee.					
5/4/3	Obtaining IT licenses.					
5/4/4	Development rate in knowledge of IT.					

A6	Seventh Question: On your estimation, managing the intellectual value-adding assets will increase profitability by which percentage.

5% ☐

10% ☐

15% ☐

Other: . . . . . .

Section (3)

Strategic revenue management

R1	First Question: Determine a suitable measurement for your agreement on choosing the main driver for revenue management for the purposes of profitability management.	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
1/1	Focus on customer is one of the most important strategies that is currently used to increase profitability.					
1/2	Focus on customer is the main factor that currently used to manage revenue.					
1/3	Companies' financial performances depending on how companies manage their customer relations.					

R2	Third Question: Determine a suitable measurement for choosing the most influential factor for managing the value that a customer gets from a company.	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
2/1	Satisfaction and loyalty are reflected in the value that a customer gets from a company.					
2/2	The increase in customer satisfaction leads to increase profitability.					
2/3	The increase in customer satisfaction enhances revenue					
2/4	Loyal customers can pay a higher price because they trust the product.					
2/5	An increase in customer loyalty results in a rise of profitability.					
2/6	Customer satisfaction and loyalty are the main drivers to manage the value that a customer gets from a company.					

R3	Fourth Question: On your estimation, what is the importance of each indicator of each of the following indicators in managing customer satisfaction.	Not important	Limited importance	Quite important	Important	Very important
		(1)	(2)	(3)	(4)	(5)
3/1	***Financial Indicators***					
3/1/1	Repair and replacement costs during the guarantee period.					
3/1/2	Legal liability costs (Fines, Compensation, Penalties).					
3/1/3	The ratio of marketing costs to total sales.					
3/1/4	Decrease of sale prices because of bad quality.					
3/1/5	Opportunity cost of lost sales.					
3/1/6	Total investment on customer satisfaction.					
3/2	***Non-Financial Indicators***					
3/2/1	The average time taken for meeting the customer's order.					
3/2/2	The frequency of delayed deliveries.					
3/2/3	Rate of (in-time delivery).					
3/2/4	The number of returned units to the total number of units sold.					
3/2/5	The percentage of re-operated orders to the total production orders.					
3/2/6	The number of repair claims during the period of guarantee.					
3/2/7	The number of daily inquires by customers.					
3/2/8	The number of customer complaints to the total number of customers.					
3/2/9	The ratio of customer complaints that have been solved to the total number of customer complaints.					
R4	Fifth Question: On your estimation, what is the importance of each of the following indicators in managing customer loyalty.					
4/1	The ratio of frequency of sales to current customers.					
4/2	The percentage of customers who have stopped dealing with the company.					
4/3	The growth rate of sales for current customers.					
4/4	The number of customers over a specific period.					
4/5	Marketing investments in customer loyalty.					
4/6	Rate of investment in research and development for current customers.					

R5	Sixth Question: Determine a suitable measurement for agreeing on the value that a company gets from a customer.	Completely disagree	Disagree	Partly agree	Agree	Completely agree
		(1)	(2)	(3)	(4)	(5)
5/1	The profit reflects the value that a company gets from a customer.					
5/2	Measuring profit on a customer level is one of the best methods for managing profitability.					
R6	Seventh Question: Determine a suitable measurement for using customer profitability analysis techniques to provide information on the following:					
6/1	Improvement and managing profitability					
6/2	Decision making for eliminating or improving or adding specific activities.					
6/3	Managing the activities that increase customer profitability.					
6/4	Making the decisions to turn non-profitable customers into profitable ones.					
6/5	Activity-based costing to provide accurate information to measure the costs on the customer level.					

R7	Eighth Question: On your estimation, managing revenue in the perspective of customer value management will increase profitability by which percentage.

5% ☐

10% ☐

15% ☐

Other: . . . . . .

APPENDIX 2: ARABIC LANGUAGE VERSION OF THE FINAL QUESTIONNAIRE

برجاء التكرم بوضع علامة (√) في المربع الذي يعبر عن رأي سيادتكم

القسم الأول

الإدارة الإستراتيجية للتكلفة

C1	السؤال الأول :- حدد مقياس مناسب لموافقتك على اختيار المسبب الرئيسي لإدارة التكلفة لأغراض إدارة الربحية	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
1/1	لا يعتمد نجاح الشركات في الوقت الحالي على تخفيض التكلفة فقط					
1/2	يعد فهم احتياجات العملاء خطوة أولى ورئيسية في إدارة التكلفة					
1/3	يرجع السبب الرئيسي في نجاح الشركات في الوقت الحالي إلى زيادة قيمة العميل					
1/4	يتمثل السبب الجوهري لتحسين ربحية الشركة في إنشاء قيمة للعميل					
1/5	إن الربط بين التكلفة والقيمة التي يحصل عليها العميل هي أساس قدرة الشركة على تحقيق أرباح					

C2	السؤال الثاني :- حدد درجة أهمية كل خطوة من الخطوات التالية في تحليل القيمة التي يحصل عليها العميل من الشركة	هام جدا	هام	متوسط الأهمية	محدود الأهمية	عديم الأهمية
		(5)	(4)	(3)	(2)	(1)
2/1	تحديد مواصفات البدائل المختلفة للمنتج الواحد					
2/2	تحديد المواصفات التي تحقق منفعة للعميل					
2/3	تحديد مدى توافر المواصفة في كل بديل من وجهة نظر العميل					
2/4	تحديد درجة أهمية كل مواصفة من وجهة نظر العميل					
2/5	تحديد القيمة المتوقعة من كل بديل بمعلومة درجة الأهمية التي يحددها العميل للمواصفة ودرجة توافر المواصفة من وجهة نظر العميل					

C3	السؤال الثالث :- حدد مدى موافقتك على تحديد الإيرادات وفقا للمدخل المقترح	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
3/1	إن الربط بين الإيراد والقيمة التي يحصل عليها العميل من المنتج توفر معلومات تفيد في إدارة الربحية					
3/2	تحديد الإيراد المتولد من كل مواصفة من مواصفات المنتج على حده					
C4	السؤال الرابع :- حدد من وجهة نظرك مقياس مناسب لموافقتك على كيفية قياس التكلفة المضيفة للقيمة من وجهة نظر العميل					
4/1	يتطلب قياس التكلفة التي تضيف قيمة للعميل تحديد الأنشطة التي تحقق منفعة مباشرة للعميل					
4/2	تمثل القيمة التي يحصل عليها العميل من مواصفات المنتج المحدد الرئيسي للأنشطة التي تحقق منفعة مباشرة للعميل					
4/3	إن تحديد الأنشطة التي تحقق منفعة مباشرة للعميل يوفر معلومات تفيد في تحديد مجالات تحسين الربحية					
4/4	يوفر أسلوب تحليل الأنشطة بيانات تفصيلية عن الأنشطة التي تحقق منفعة مباشرة للعميل					
4/5	إن أسلوب تحديد التكلفة على أساس النشاط هو أنسب أسلوب لقياس تكلفة كل مواصفة من مواصفات المنتج					

C5	السؤال الخامس :- حدد درجة أهمية تحديد الفجوة واتخاذ القرار كخطوة من خطوات إدارة التكلفة لأغراض إدارة الربحية	هام جدا	هام	متوسط الأهمية	محدود الأهمية	عديم الأهمية
		(5)	(4)	(3)	(2)	(1)
5/1	تحديد الفجوة بين الإيراد المحسوب على أساس القيمة التي يحصل عليها العميل وبين التكلفة المحسوبة على أساس مواصفات المنتج					

C6	السؤال السادس:- حدد مدى موافقتك على أن تحديد الفجوة بين الإيراد على أساس القيمة والتكلفة على أساس القيمة توفر معلومات تفيد فيما يلي:-	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
6/1	مجالات تحسين الربحية الحالية والمستقبلية					
6/2	تحديد الأنشطة التي سوف تركز عليها الشركة					
6/3	تحديد مستوى الإنفاق على كل مواصفة					
6/4	إن أسلوب تحديد التكلفة على أساس النشاط هو أنسب أسلوب لقياس تكلفة كل مواصفة من مواصفات المنتج					

C7	السؤال السابع :- إن إدارة التكلفة من منظور القيمة التي يحصل عليها العميل تؤدي في تقديرك إلى زيادة الربحية بأي من النسب التالية :-

☐ %5

☐ %10

☐ %15

نسبة أخرى ، اذكرها: .....

القسم الثاني
الإدارة الإستراتيجية للأصول

A1	السؤال الأول :- حدد مقياس مناسب لموافقتك على اختيار المسبب الرئيسي لإدارة الأصول لأغراض إدارة الربحية	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
1/1	تتولد النسبة العظمى من قيمة الشركة من إدارة الأصول الفكرية					
1/2	إزدياد أهمية الأصول الفكرية في الوقت الحالي					
1/3	الأصول الفكرية هي العامل المتحكم والرئيسي في تحقيق طفرة في الأرباح					
1/4	إنخفاض مساهمة الأصول المادية والمالية كعامل هام في إنتاج السلع والخدمات					
A2	السؤال الثاني :- حدد مدى موافقتك على المدخل المقترح استخدامه في إعداد النموذج المقترح لإدارة الأصول الفكرية					
2/1	تدار الأصول الفكرية ليس بهدف تحديد قيمة نقدية فقط					
2/2	تدار الأصول الفكرية بهدف تحديد وتعريف الأصول الفكرية التي تسبب إنشاء قيمة للعملاء والمساهمين					
2/3	إعداد إستراتيجية لإدارة الأصول الفكرية تركز على إنشاء قيمه للعملاء يؤدي إلى تحسين الربحية					

A3	السؤال الرابع :- ما هو في تقديرك درجة أهمية كل مؤشر من المؤشرات التالية في تحليل وتقييم الوضع الحالي للأصول الفكرية	هام جدا	هام	متوسط الأهمية	محدود الأهمية	عديم الأهمية
		(5)	(4)	(3)	(2)	(1)
3/1	**العاملين**					
3/1/1	إجمالي عدد العاملين					
3/1/2	متوسط عدد العاملين الدائمين					
3/1/3	عدد العاملين الذين يعملون جزء من الوقت					
3/1/4	عدد المدراء					
3/1/5	مدة الخدمة					
3/1/6	متوسط الأعمار					
3/1/7	التعيينات الجديدة					
3/1/8	معدل تسرب العاملين من أعمالهم					
3/1/9	تكاليف التعيين					
3/2	**العملاء**					
3/2/1	المبيعات السنوية لكل عميل					
3/2/2	عدد العملاء					
3/2/3	متوسط حجم العميل					

3/2/4	تكاليف التسويق					
3/2/5	الوقت الافتراضي للتسليم					
3/2/6	حجم الإنتاج المعيب					
3/3	**العمليات**					
3/3/1	الزمن الكي للتشغيل					
3/3/2	حجم الإنتاج للعام الحالي					
3/3/3	تكاليف الإنتاج للعام الحالي					
3/3/4	عدد أوامر التوريد					
3/3/5	وقت التوقف عن العمليات					
3/3/6	تكاليف الإصلاح وإعادة التشغيل					
3/4	**التكنولوجيا**					
3/4/1	إجمالي استثمارات الشركة في تكنولوجيا المعلومات					
3/4/2	عدد مراكز أو أقسام تكنولوجيا المعلومات في الشركة					
3/4/3	عدد الأجهزة					
3/4/4	عدد الخدمات المقدمة عن طريق شبكة المعلومات الدولية (الإنترنت)					
3/4/5	كمية المعلومات الموجودة على موقع الشركة بشبكة المعلومات الدولية (الإنترنت)					
A4	السؤال الخامس :- ما هو في تقديرك درجة أهمية كل مؤشر من المؤشرات التالية في تحديد الأنشطة الفكرية المضيفة للقيمة					
4/1	**العاملين**					
4/1/1	نفقات التدريب والتعليم لكل موظف					
4/1/2	عدد أيام التدريب لكل موظف					
4/1/3	عدد ساعات التدريب					
4/1/4	تكاليف الأفكار الجديدة المتولدة من العاملين					
4/1/5	عدد الموظفين المشاركين في كل مهمة					
4/2	**العملاء**					
4/2/1	نسبة تكاليف التسويق إلى إجمالي التكاليف					
4/2/2	نسبة تكاليف التسويق إلى إجمالي الدخل					
4/2/3	تكاليف التسويق لكل عميل					
4/2/4	عدد الطلبات التي تم تسليمها في موعدها					
4/2/5	عدد أيام العروض والاجتماعات واللقاءات وتدريب العملاء					
4/3	**العمليات**					
4/3/1	زمن تطوير المنتج (الوقت من مرحلة المنتج كفكرة حتى استكمال تطويره)					
4/3/2	زمن الاستجابة للعميل (طول الفترة منذ استلام طلب العميل حتى التسليم)					
4/3/3	وقت الأعطال					
4/3/4	تكلفة الإنتاج المعيب					
4/3/5	تكاليف تحسين الجودة					
4/3/6	الاستثمارات في البحوث والتطوير					
4/3/7	نسبة الوقت المستخدم في التطوير					
4/4	**التكنولوجيا**					
4/4/1	تكاليف الإضافات الرأسمالية الجديدة					
4/4/2	تكاليف شراء وصيانة البرمجيات وأجهزة الحاسب					

	الآلي					
4/4/3	تكاليف البحوث والتطوير					
4/4/4	نسبة تكاليف تكنولوجيا المعلومات إلى التكاليف الإدارية					
A5	السؤال السادس :- ما هو في تقديرك درجة أهمية كل مؤشر من المؤشرات التالية في الحكم على فاعلية الشركة في إدارة الأصول الفكرية					
5/1	**العملاء**					
5/1/1	رضاء العملاء					
5/1/2	ولاء العملاء					
5/1/3	نسبة العملاء طويلي الأجل					
5/1/4	معدل التطور في خدمات ما بعد البيع					
5/1/5	انخفاض نسبة المرتجات					
5/1/6	معدل دوران العملاء الحاليين					
5/1/7	نسبة العملاء الجدد					
5/2	**العاملين**					
5/2/1	معدل دوران العاملين					
5/2/2	معدل التطور للأداء اليومي للعاملين					
5/2/3	عدد العاملين الذين تركوا العمل بالنسبة لإجمالي عدد العاملين					
5/2/4	ولاء الموظفين					
5/3	**العمليات**					
5/3/1	معدل الأخطاء					
5/3/2	معدل المعيب إلى إجمالي الإنتاج					
5/3/3	تكلفة الوحدة المنتجة					
5/3/4	معدل التطور في وقت الإنجاز					
5/3/5	معدل التطور في وقت تطوير المنتج					
5/3/6	وقت الانتظار					
5/4	**التكنولوجيا**					
5/4/1	معدل التطور التكنولوجي					
5/4/2	التطور في الأداء لكل موظف					
5/4/3	الرخص التي تم الحصول عليها في مجال تكنولوجيا المعلومات					
5/4/4	التطور في المعرفة والإلمام بتكنولوجيا المعلومات					

A6	السؤال السابع :- إن إدارة الأصول الفكرية المضيفة للقيمة تؤدي في تقديرك إلى زيادة الربحية بأي من النسب التالية :-

%5 ☐

%10 ☐

%15 ☐

نسبة أخرى ، اذكرها: .....

القسم الثالث
الإدارة الإستراتيجية للإيرادات

R1	السؤال الأول :- حدد مقياس مناسب لموافقتك على اختيار المسبب الرئيسي لإدارة الإيرادات لأغراض إدارة الربحية	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
1/1	يعد التركيز على العميل من أهم الإستراتيجيات الحالية لزيادة الربحية					
1/2	يعد التركيز على العميل العامل الرئيسي في أداره الإيرادات					
1/3	يعتمد الأداء المالي للشركات على الكيفية التي تدار بها علاقة الشركة بالعملاء					
R2	السؤال الثالث :- حدد مقياس مناسب يعبر عن موافقتك على اختيار العامل الأكثر تأثيرا لإدارة القيمة التي يحصل عليها العميل من الشركة					
2/1	يعكس رضاء وولاء العميل القيمة التي يحصل عليها العميل من الشركة					
2/2	تؤدي زيادة رضاء العميل إلى زيادة الربحية					
2/3	تؤدي زيادة رضاء العميل إلى زيادة الإيرادات					
2/4	العملاء ذوي الولاء لديهم استعداد لدفع سعر أعلى لثقتهم في المنتج					
2/5	كلما زاد ولاء العميل كلما زادت الربحية					
2/6	يعتبر رضاء وولاء العميل هو المحرك الرئيسي لإدارة القيمة التي يحصل عليها العميل من الشركة					

R3	السؤال الرابع :- ما هو في تقديرك درجة أهمية كل مؤشر من المؤشرات التالية في إدارة رضاء العميل	هام جدا	هام	متوسط الأهمية	محدود الأهمية	عديم الأهمية
		(5)	(4)	(3)	(2)	(1)
3/1	**المؤشرات المالية**					
3/1/1	تكاليف الإصلاح والاستبدال أثناء فترة الضمان					
3/1/2	تكاليف المسئولية القانونية (الغرامات ، التعويضات والجزاءات)					
3/1/3	تكاليف التسويق إلى إجمالي المبيعات					
3/1/4	انخفاض سعر البيع نظرا لسوء الجودة					
3/1/5	تكلفة الفرصة البديلة للمبيعات المفقودة					
3/1/6	إجمالي الاستثمارات المنفقة على رضاء العميل					
3/2	**المؤشرات غير المالية**					
3/2/1	متوسط الوقت الزمني لتلبية طلب العميل					

3/2/2	عدد مرات التسليم المتأخر					
3/2/3	نسبة الالتزام بمواعيد التسليم					
3/2/4	عدد الوحدات المرتجعة كنسبة من العدد الكلي للوحدات المباعة					
3/2/5	نسبة الأوامر المعاد تشغيلها إلى إجمالي عدد أوامر الإنتاج					
3/2/6	عدد مطالبات الإصلاح خلال فترة الضمان					
3/2/7	عدد الاستفسارات اليومية للعميل					
3/2/8	عدد شكاوى العملاء إلى اجمالى عدد العملاء					
3/2/9	نسبة شكاوى العملاء التي تم حلها إلى اجمالى عدد الشكاوى					
R4	السؤال الخامس :- ما هو في تقديرك درجة أهمية كل مؤشر من المؤشرات التالية في إدارة ولاء العميل					
4/1	النسبة المحتملة لتكرار المبيعات للعملاء الحاليين					
4/2	نسبة العملاء الذين تركوا التعامل مع الشركة					
4/2	نسبة النمو في المبيعات الناتجة عن العملاء الحاليين					
4/4	عدد العملاء على مدار فترة زمنية معينة					
4/5	الاستثمارات التسويقية المنفقة على ولاء العميل					
4/6	نسبة الاستثمارات في البحوث والتطوير للعملاء الحاليين					

R5	السؤال السادس :- حدد من وجهة نظرك مقياس مناسب لموافقتك على ماهية القيمة التي تحصل عليها الشركة من العميل	موافق تماما	موافق	لحد ما	غير موافق	غير موافق تماما
		(5)	(4)	(3)	(2)	(1)
5/1	تعكس الأرباح القيمة التي تحصل عليها الشركة من العملاء					
5/2	إن حساب الربح على مستوى العملاء يعد من أفضل الطرق المستخدمة لإدارة الربحية					
R6	السؤال السابع :- حدد مدى موافقتك على استخدام أسلوب تحليل الربحية على مستوى العملاء في توفير معلومات تستخدم فيما يلي:					
6/1	تحسين وإدارة الربحية					
6/2	اتخاذ القرارات بشأن إلغاء أو تحسين أو إضافة نشاط معين					
6/3	إدارة الأنشطة التي تزيد من ربحية العميل					
6/4	اتخاذ الإجراءات اللازمة لتحويل العملاء غير المربحين إلى عملاء مربحين					
6/5	يوفر مدخل التكلفة على أساس النشاط معلومات دقيقة تفيد في تحديد التكاليف على مستوى العملاء					

R7	السؤال الثامن :- إن إدارة الإيرادات من منظور مدخل إدارة قيمة العميل تؤدي في تقديرك إلى زيادة الربحية بأي من النسب التالية :-

☐ %5

☐ %10

☐ %15

نسبة أخرى ، اذكرها: .....

APPENDIX 3: SKEWNESS, KURTOSIS & ONE SAMPLE KS TEST FOR ALL COST ITEMS

The distribution of all cost items

Cost Items	Skewness	Kurtosis	K-S	
			Statistic	Significant
1	-.42	.23	3.74	.00
2	-.33	-.19	3.26	.00
3	-.55	-.12	3.21	.00
4	-.81	1.17	3.79	.00
5	-.33	-.09	3.35	.00
6	-.66	1.08	3.77	.00
7	-.49	.51	3.69	.00
8	-.21	-.56	2.78	.00
9	-.23	-.13	2.90	.00
10	-.15	-.41	3.07	.00
11	-.50	-.78	3.90	.00
12	-.87	-.93	5.27	.00
13	-.46	-.02	3.25	.00
14	-.55	.17	3.87	.00
15	-.47	.06	4.10	.00
16	-.69	1.45	4.51	.00
17	-.48	.32	3.82	.00
18	-.45	-.03	3.32	.00
19	-.15	-.77	3.27	.00
20	-.07	-.44	3.43	.00
21	-.27	.05	3.68	.00
22	-.17	-.30	3.78	.00

APPENDIX 4: SKEWNESS, KURTOSIS & ONE SAMPLE KS TEST FOR ALL ASSERTS ITEMS

The distribution of all assets items

Asset Items	Skewness	Kurtosis	Kolmogorov	
			Statistic	Significant
1	.25	-.62	4.34	.00
2	.48	-1.09	3.95	.00
3	-.66	-.03	4.02	.00
4	-1.79	2.72	4.82	.00
5	-.02	-1.18	3.09	.00
6	-.52	-.35	3.43	.00
7	-.99	.50	4.13	.00
8	.11	-.55	3.31	.00
9	-.38	-.48	3.64	.00
10	-.04	-.44	2.84	.00
11	-.50	-.19	3.92	.00
12	-.21	-.33	2.97	.00
13	-.79	1.65	4.18	.00
14	-.04	-.46	2.75	.00
15	.15	-.75	2.68	.00
16	.11	-.11	4.19	.00
17	-.49	-.12	3.25	.00
18	-.19	-.01	3.49	.00
19	-.25	-.50	3.63	.00
20	-.23	-.30	3.78	.00
21	-.25	-.70	3.22	.00
22	-.46	.22	3.85	.00
23	-.31	.07	3.50	.00
24	.13	-.01	3.89	.00
25	.27	-.01	4.05	.00
26	-.17	-.43	3.63	.00

27	-.05	-.25	3.64	.00
28	-.22	-.07	3.25	.00
29	-.68	.10	4.19	.00
30	-.48	-.06	3.79	.00
31	-.51	-.09	3.69	.00
32	-.60	.22	3.77	.00
33	-.86	1.62	4.48	.00
34	-.57	.12	3.39	.00
35	-.11	-.87	3.04	.00
36	-.02	-.57	3.18	.00
37	-.25	-.28	3.82	.00
38	-.27	.38	3.48	.00
39	.05	-.66	3.99	.00
40	-.06	-.04	4.70	.00
41	-1.34	.35	5.83	.00
42	-.16	-1.49	3.48	.00
43	-1.06	.32	3.43	.00
44	-.16	-.63	3.35	.00
45	-.65	-.24	3.71	.00
46	-.28	-.44	3.03	.00
47	-.60	-.05	3.98	.00
48	-.37	-.32	3.68	.00
49	-.58	.73	4.20	.00
50	-.46	-.10	3.58	.00
51	-.31	-.38	3.37	.00
52	-.41	-.18	4.27	.00
53	-.40	.37	3.20	.00
54	-.35	-.20	4.12	.00
55	.05	-.23	4.24	.00
56	-.20	.08	4.48	.00
57	-.16	.07	4.83	.00
58	-.42	.18	4.17	.00
59	-.47	.39	4.31	.00

60	-.25	.03	4.52	.00
61	-.35	-.02	4.09	.00
62	-.31	-.38	3.37	.00
63	-.53	.51	4.81	.00
64	-.41	-.18	4.27	.00
65	-.35	-.20	4.12	.00
66	-.57	.72	4.21	.00
67	-.37	-.34	3.69	.00
68	-.58	-.12	3.95	.00
69	-.45	-.13	3.59	.00
70	-.40	-.37	3.52	.00
71	-.05	-.21	4.05	.00
72	.23	-.47	3.68	.00
73	-.17	-.15	4.74	.00
74	.03	-.43	3.22	.00
75	-.02	-.19	4.22	.00

APPENDIX 5: SKEWNESS, KURTOSIS & ONE SAMPLE KS TEST FOR ALL REVENUE ITEMS

The distribution of all revenue items

Revenue Items	Skewness	Kurtosis	Kolmogorov	
			Statistic	Significant
1	-.12	-2.00	4.92	.00
2	.02	-2.02	4.73	.00
3	-.56	-.62	4.19	.00
4	-.33	-1.41	3.81	.00
5	-1.25	.14	4.71	.00
6	-1.04	-.26	3.98	.00
7	.15	-1.51	3.45	.00
8	-.09	-1.25	2.94	.00
9	-.30	-1.55	4.01	.00
10	-.44	.18	3.66	.00
11	-.36	-.19	3.23	.00
12	-.54	-.20	3.11	.00
13	-.81	1.04	3.65	.00
14	-.37	-.05	3.42	.00
15	-.63	.88	3.68	.00
16	-.62	-1.63	5.74	.00
17	-.63	-.72	4.29	.00
18	-.85	-.31	4.86	.00
19	-.37	-1.52	4.17	.00
20	-1.21	.53	4.25	.00
21	-.67	-.42	3.19	.00
22	-.30	-1.16	3.41	.00
23	-.49	-.12	4.08	.00
24	-1.75	2.30	4.64	.00
25	-.56	-.17	3.38	.00

26	-.17	.40	3.77	.00
27	-.31	-.28	3.32	.00
28	-.69	.89	3.81	.00
29	-.51	.43	3.80	.00
30	-.06	-.87	2.97	.00
31	-.68	-.85	3.41	.00
32	1.70	2.05	6.45	.00
33	-.55	1.01	4.14	.00
34	-.56	-.10	3.54	.00
35	-.75	.49	3.83	.00
36	-.44	.07	3.53	.00
37	-.47	.50	3.43	.00

APPENDIX 6: RESPONSE BIAS TEST

Variables	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
c1.1	1577.500	3407.500	-1.296	.195
c1.2	1763.000	3593.000	-.210	.834
c1.3	1580.000	3410.000	-1.217	.224
c1.4	1678.000	3508.000	-.694	.488
c1.5	1777.500	3607.500	-.128	.898
c2.1	1623.500	3453.500	-1.052	.293
c2.2	1555.500	3385.500	-1.423	.155
c2.3	1737.000	3567.000	-.348	.728
c2.4	1723.500	3553.500	-.427	.669
c2.5	1603.000	3433.000	-1.104	.269
c3.1	1763.000	3593.000	-.213	.831
c3.2	1365.000	3195.000	-2.634	.008
c4.1	1794.500	3624.500	-.030	.976
c4.2	1681.000	3511.000	-.677	.498
c4.3	1735.500	3565.500	-.364	.716
c4.5	1670.500	3500.500	-.729	.466
c5.1	1712.500	3542.500	-.488	.626
c6.1	1748.000	3578.000	-.295	.768
c6.2	1647.500	3477.500	-.866	.386
c6.4	1441.000	3271.000	-2.083	.037
a1.1	1783.000	3613.000	-.100	.920
a1.2	1677.500	3507.500	-.699	.485
a1.3	1557.000	3387.000	-1.420	.156
a1.4	1683.000	3513.000	-.708	.479
a2.1	1611.000	3441.000	-1.064	.287
a2.2	1575.500	3405.500	-1.276	.202
a2.3	1515.000	3345.000	-1.584	.113
a3.1.1	1591.500	3421.500	-1.158	.247
a3.1.2	1770.000	3600.000	-.166	.868
a3.1.3	1719.500	3549.500	-.445	.657
a3.1.4	1760.000	3590.000	-.222	.824
a3.1.5	1703.500	3533.500	-.539	.590
a3.1.6	1734.000	3564.000	-.378	.706
a3.1.7	1700.500	3530.500	-.549	.583
a3.1.8	1797.000	3627.000	-.017	.987
a3.1.9	1628.500	3458.500	-1.011	.312
a3.2.1	1590.000	3420.000	-1.164	.244
a3.2.3	1712.500	3542.500	-.487	.626
a3.2.4	1617.000	3447.000	-1.043	.297
a3.2.5	1740.000	3570.000	-.336	.737
a3.3.1	1688.000	3518.000	-.629	.530
a3.3.2	1745.000	3575.000	-.319	.750
a3.3.3	1692.000	3522.000	-.617	.538
a3.3.5	1658.000	3488.000	-.815	.415
a3.4.1	1742.500	3572.500	-.332	.740

a3.4.2	1747.500	3577.500	-.296	.768
a3.4.3	1477.500	3307.500	-1.805	.071
a3.4.4	1767.500	3597.500	-.182	.856
a4.1.1	1478.500	3308.500	-1.789	.074
a4.1.2	1687.500	3517.500	-.629	.529
a4.1.3	1757.000	3587.000	-.239	.811
a4.1.4	1745.000	3575.000	-.312	.755
a4.2.1	1718.000	3548.000	-.472	.637
a4.2.2	1647.000	3477.000	-.996	.319
a4.2.4	1742.500	3572.500	-.316	.752
a4.3.1	1713.000	3543.000	-.488	.626
a4.3.2	1602.000	3432.000	-1.120	.263
a4.3.3	1622.000	3452.000	-.986	.324
a4.3.4	1522.000	3352.000	-1.586	.113
a4.3.5	1601.500	3431.500	-1.123	.261
a4.3.7	1733.000	3563.000	-.381	.703
a4.4.1	1780.500	3610.500	-.110	.913
a4.4.2	1733.500	3563.500	-.385	.700
a4.4.4	1707.500	3537.500	-.532	.594
a5.1.1	1581.000	3411.000	-1.292	.196
a5.1.2	1647.000	3477.000	-.892	.373
a5.1.3	1567.000	3397.000	-1.400	.161
a5.1.4	1693.500	3523.500	-.621	.535
a5.1.5	1715.000	3545.000	-.502	.615
a5.1.6	1676.500	3506.500	-.727	.467
a5.1.7	1610.500	3380.500	-.604	.546
a5.2.1	1780.500	3610.500	-.110	.913
a5.2.3	1733.500	3563.500	-.385	.700
a5.2.4	1707.500	3537.500	-.532	.594
a5.3.2	1748.000	3578.000	-.290	.772
a5.3.3	1675.500	3505.500	-.700	.484
a5.3.4	1727.000	3557.000	-.406	.684
a5.3.5	1562.000	3392.000	-1.319	.187
a5.3.6	1471.000	3301.000	-1.929	.054
a5.4.1	1498.500	3328.500	-1.721	.085
a5.4.2	1798.500	3628.500	-.009	.993
a5.4.3	1497.000	3327.000	-1.699	.089
a5.4.4	1726.000	3556.000	-.443	.658
r1.1	1740.000	3570.000	-.364	.716
r1.2	1590.000	3420.000	-1.273	.203
r1.3	1704.000	3534.000	-.564	.573
r2.1	1727.000	3557.000	-.413	.680
r2.2	1769.500	3599.500	-.177	.859
r2.3	1467.000	3297.000	-1.877	.060
r2.4	1708.500	3538.500	-.514	.607
r2.5	1694.500	3524.500	-.589	.556
r2.6	1737.000	3567.000	-.356	.722
r3.1.1	1699.000	3529.000	-.568	.570
r3.1.2	1661.500	3491.500	-.774	.439
r3.1.3	1690.500	3520.500	-.609	.542
r3.1.4	1747.000	3577.000	-.298	.765

r3.1.5	1722.000	3552.000	-.436	.663
r3.1.6	1780.500	3610.500	-.111	.911
r3.2.3	1799.500	3629.500	-.003	.998
r3.2.4	1568.000	3398.000	-1.305	.192
r3.2.5	1605.000	3435.000	-1.093	.274
r3.2.6	1529.000	3359.000	-1.501	.133
r3.2.8	1453.000	3283.000	-1.990	.047
r3.2.9	1531.500	3361.500	-1.582	.114
r4.1	1402.000	3232.000	-2.201	.028
r4.2	1515.500	3345.500	-1.587	.112
r4.3	1418.000	3248.000	-2.129	.033
r4.4	1378.000	3208.000	-2.441	.015
r4.5	1372.500	3202.500	-2.423	.015
r4.6	1618.000	3448.000	-1.007	.314
r5.1	1632.500	3462.500	-.913	.361
r5.2	1786.000	3616.000	-.100	.920
r6.1	303.000	2133.000	-8.315	.000
r6.2	193.500	2023.500	-8.976	.000
r6.3	223.000	2053.000	-8.734	.000
r6.4	196.500	2026.500	-8.876	.000
r6.5	332.000	2162.000	-8.124	.000
p_c	1777.000	3607.000	-.130	.897
p_a	1729.500	3559.500	-.407	.684
p_r	269.500	2099.500	-8.564	.000