STRATEGIC ROLE OF INFORMATION TECHNOLOGY TOWARDS BUILDING COMPETITIVE ADVANTAGE

STUDY IN YEMEN (SOUTHERN REGION)

HAMAD SALMEN SAEED BANALZWAA

OTHMAN YEOP ABDULLAH

GRADUATE SCHOOL OF BUSINESS

UNIVERSITI UTARA MALAYSIA

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STUDY IN YEMEN (SOUTHERN REGION)

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BY

HAMAD SALMEN SAEED BANALZWAA

803884

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ABSTRACT

This study empirically examines the strategic role of information technology towards building organization's competitive advantage, in particular, the main objective of this study is to report the association of productivity efficiency, innovation, customer-supplier relationship, and database marketing with organization's competitive advantage. This study is a summary- based investigation focusing on southern region 0f Yemen. The sample of this study compromises of 130 usable questionnaires.

The findings of this study indicate that there is positive relationship between information technology and competitive advantage. This address problems and barriers encountered in the application of information technology as medium to build competitive advantage among organizations in Yemen (Southern Region). It is certainly enables scholars and practitioners to make better decision.

DEDICATION

This dissertation is dedicated with love and gratitude to my beloved father, **SALMEN**, and my mother **NADIA**, who have provided undying love, support and encouragement. They are my strength, dreams, courage and determination to move through the final stages of this process. My dream came true due to their love and sacrifices.

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INTRODUCTION

1.1 Introduction

The field of strategic management focuses on understanding sources sustainable competitive advantages for firms (Porter, 1980; 1985; Rumelt, R.P., Schendel, D., & Teece, D.J., 1991, Barney, 2001; Priem & Butler, 2001). A variety of factors have been shown to have an important impact on the ability of firms to obtain sustainable competitive advantage, including the relative cost position of a firm (Porter, 1980), a firm's ability to differentiate its products (Johannessen & Olsen, 2003; Caves and Williamson, 1985; Porter, 1980), and the ability of firms to cooperate in strategic alliances (Kogut, 1988).

IT has also been mentioned for its possible role in creating competitive advantages for firms (Tabb, L., 2006; Barney, 1991; Clemons, 1986; 1991; Clemons and Kimbrough, 1986; Clemons and Row 1987; 1991a; Feeny, 1988; Feeny and Ives, 1990). Many organizations in most industries have little choice but to implement some form of information technology in order to remain both innovative and remain on the cutting edge of competitive advantage (Porter, 2001). IT is firmly grounded in the business as competitive impact and alignment needs of IT (Ward & Peppard, 2002).

1.2 IT Based of Productivity Efficiency

Productive efficiency (also known as technical efficiency) occurs when the economy is utilizing all of its resources efficiently, producing most output from least input (Standish, 2010). Today we live in a world of remarkable change in Information Technology (IT). Business firms face a variety of opportunities to implement new IT-enabled initiatives; many of which have at least a theoretical potential to increase productivity and profitability of their business. However, little evidence on value of investment in IT has provided clear pay-off. Indeed, Shin, Dow and Grover (2001) argue that the results of studies relating IT investments and organizational performance in the last 10 years have been equivocal. These contradictory perspectives have been attributed primarily to the inadequacies of productivity measurement as well as time lags due to an IT "learning effect" or a time consuming period of complementary organization changes (Brynjolfsson & Hit, 2003). Meanwhile others have argued that many of the intangible benefits of IT have not been appropriately measured. Each of these explanations provides information about the issues related to IT investment value and will be explore in this short review (Stewart, Coulson & Wilson, 2007).

1.3 IT Based of Innovation

Business innovation involves a wide spectrum of original concepts, which include development of new ways of doing business, new business models, business application of technology and communications, new management techniques, environmental efficiency, new forms of stakeholder participation, telecommunication, transport and finance.

Innovation has been another important IT complement proposed by the literature. It mainly based on various theoretical arguments and case studies, which combination with IT (IT-enabled innovation) has the potential to generate competitive advantages and result in superior performance. Innovation can be defined as the search for, the discovery and development of new technologies, new products and/or services, new processes and new organizational structures (Carneiro, 2000). For long time, there has been extensive theoretical argumentation concerning the capabilities of IT to drive significant innovations in business processes, products and services of firms, and through them could result big improvements on business performance (Bresnahan T, Brynjolfsson E, & Hitt LM., 2002; Bresnahan & Trajtenberg, 1995; Brynjolfsson & Hitt, 2000; Colomo-Palacios R, García-Crespo A, Soto-Acosta P, Ruano-Mayoral M & Jimenez-Lopez D., 2010; Davenport, 1993; Gunasekaran & Nath, 1997; Hammer, 1990).

Especially for e-business, there has been considerable literature arguing that it enables and drives significant transformations in business models, value propositions, products, and services of firms and also their internal processes and structures, which can offer substantial benefits (Amit & Zott, 2001; Tavlaki & Loukis, 2005; Timmers, 1998; Zwass, 2003; Wu & Hisa, 2004 and 2008). However, the above arguments and

expectations have not been sufficiently investigated empirically using large sample size of organizations.

1.4 IT Based of Customer-Supplier Relationships

In the early times of information technology, computers were basically used stand-alone. They were not linked to any other systems within the organizations or spanning organizational boundaries. All data needed to be fed into the computer manually, by either typing it in or using storage devices like punch cards or magnetic tapes. Ricky, Thomas & Hans (2004) believes today, with the evolved opportunities of networking, usually computers within a particular organization are linked within a computer network. In today's global digital economy, organizations compete, based on cost, quality, delivery time, and flexibility in order to capture market share and to survive. To continue growing, organizations need to develop their own core competencies and design superior supply chains by strengthening partnerships with suppliers, retailers, distributors, and customers (Kotler & Keller, 2005). In other words, providing meaningful products or services to customers in the context of a technology driven competitive business environment is important to the success of supply chains (Bowersox, Closs, & Stank, 2000).

1.5 IT Based of Database Marketing

A database is a collection of data that you can search through in a systematic way to maintain and retrieve information. Following the concept of Stan Rapp and Tom Collins, the relationship marketing, is a maxi – marketing, which has main purpose such as maximization and creating a long term relationship by selecting, contacting, activating and holding on to the consumers and to the best clients of the service providing enterprise. The need for creating a personal relationship with the clients has imposed the one-to-one marketing concept, which is based on the following principles: up to date database, a dialog with each client, differentiating the clients according to needs and values, and customized services (Luigi, 2009).

1.6 Problem Statement

A competitive strategy is a broad-based formula for how a business is going to compete, what its goals should be, and what plans and policies will be required to carry out those goals (Porter, 1985). Through its competitive strategy an organization seeks a competitive advantage in an industry—an advantage over competitors in some measure such as cost, quality, or speed. Competitive advantage is at the core of a firm's success or failure (Porter and Millar, 1985, and Porter, 1996); such advantage seeks to lead to control the market and to secure larger-than-average profits. IT could help a business or an organization to establish competitive advantage.

Despite a strong theoretical is support on the relationship between IT and Customer-Supplier relationship, Innovation, Productive efficiency and Database marketing in building competitive advantages. Generally, very little studies have been done in examining in the relationship between information Technology (IT) and productivity

efficiency, innovation, customer-supplier relationship, and database marketing towards competitive advantage.

1.7 Research Questions

This paper is designed to answer the following questions:

1) What is the relationship between IT and Competitive Advantage?
2) Is there a relationship between the productive efficiency and the improve efficiency?
3) Is there a relationship between the innovation and creating a new business Opportunities?
4) Is there a relationship between the Customer-Supplier Relationships and the Customer Retention in relation to quality?
5) Is there a relationship between the database marketing and the market share?

1.8 Research Objectives

The overall objectives of this study are to know to what extent use IT could enable organization to build competitive advantage.

Specifically, the present paper aims to achieve the following objectives:

1) To identify the relationship between productive efficiency could build competitive advantages.

2) To identify the relationship between innovations could build competitive advantages.

3) To identify the relationship between customer-supplier relationships towards build competitive advantages.

4) To identify the relationship between database marketing could help organizations to build competitive advantages.

1.9 Significance of the Study

The importance of the study could be articulated in the following context, especially for theoretical contribution and managerial contribution.

1.9.1 Theoretical Contribution

The role of IT is to help organizations to build competitive Advantages. For that, this paper is based IT provides competitive advantages is good for organizations and addresses the question of what factors could affect the strategic of the organization, towards the competitive advantages.

The findings of this study hope to give new insights to researchers about build competitive advantages. The findings will also provide them knowledge about how to use IT in the business or the organization to establish competitive advantage. More importantly, the results of this study should benefit the researchers by providing them more perspectives and ideas the nature of the variables focused in this study. It is also

hoped that the findings would build theories based on research outcome and generate new framework and hypotheses on create competitive advantage by IT.

1.9.2 Managerial Contribution

The findings of this study would benefit the policy maker and organization administrators overall, because the data generated would enable them to understand better the phenomenon of how managers put strategic planning, make decisions and achieve competitive advantage.

While information technology has made great contributions to the businesses or the organizations, until recently these contributions have been confined to narrow, transaction processing areas. Much work needs to be done in broadening the impact of systems on professional and managerial life.

In the area of interpersonal roles, information technology is extremely limited and makes only indirect contributions, acting largely as a communications aid in some of the newer office automation and communication-oriented applications. IT would make much larger contribution in the field of informational roles; large-scale IT systems, office systems, and professional workstations, which would enhance managers' presentation this should information are significant. Meanwhile, in the area of Competitive advantages, only recently have decision support systems and microcomputer-based systems begun to make important contributions.

1.10 Theoretical Framework

FIGURE 1.1 Research Framework (A)

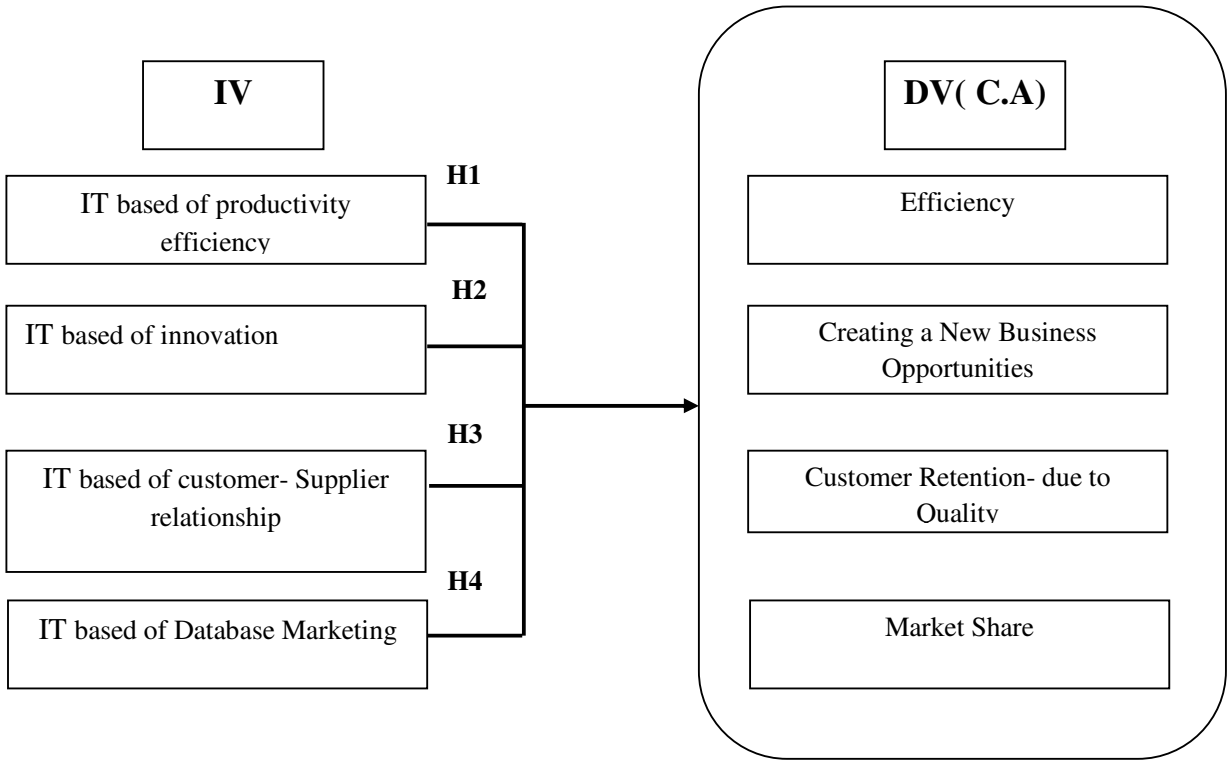
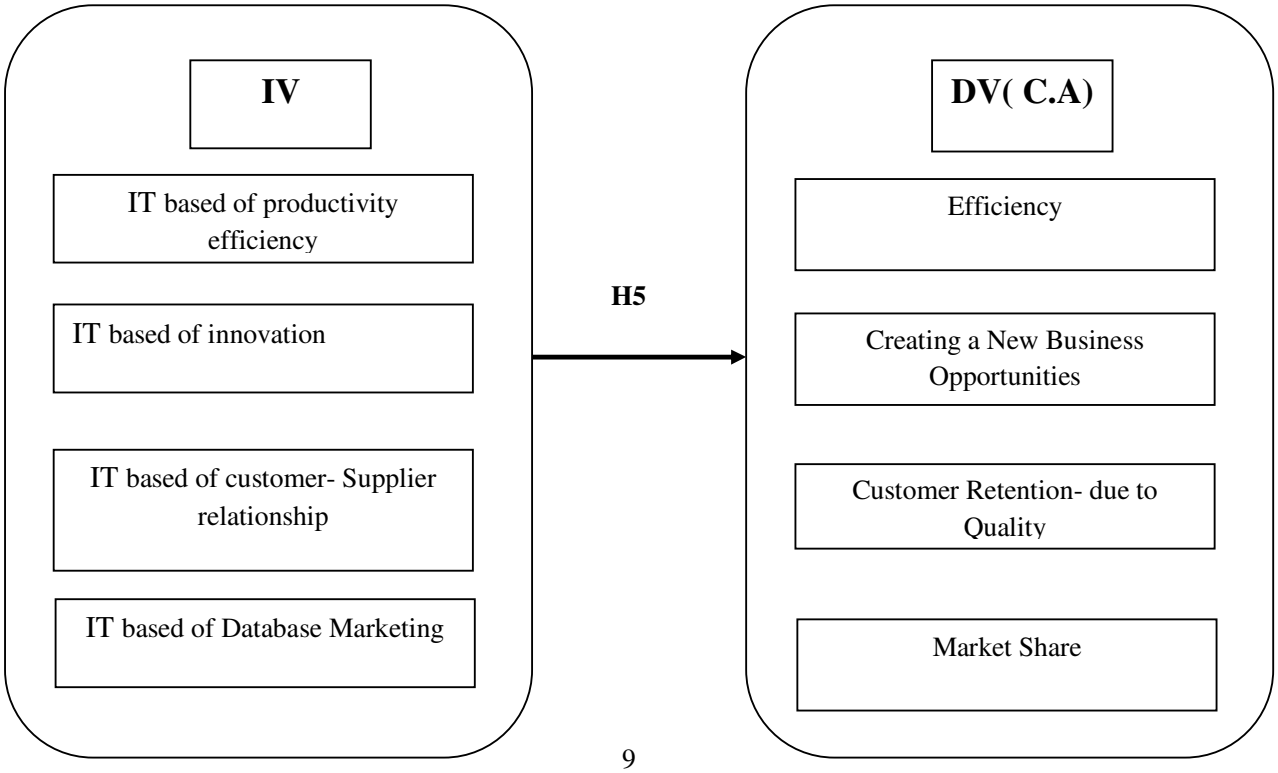


FIGURE 1.2 Research Framework (B)



This frame works focus on the relation between IT based to build competitive advantage to the organization through those factors, and how it effect to build these competitive advantages.

1.11 Organization of Research Project:

This study is structured into five chapters. Chapter I present the background and theoretical framework of the study, problem statement, objective of the study, research question, significant of the study, and Organization of research project. The literature review in chapter II addresses the definition competitive Advantages, information Technology (IT) and how to use it to establish competitive advantage. Chapter III explains the research methodology applied. Chapter IV contains the finding, discussion and implication. Chapter V contains the summary, conclusion and recommendation.

1.12 Summary

This chapter introduces the current study. Section 1.1 highlights the background for this research. Section 1.2 reviews IT based productivity efficiency. Section 1.3 highlights IT based innovation. Section 1.4 describes IT based customer-supplier relationship. Section 1.5 introduces IT based database marketing. Section 1.6 discusses the problem statement of this research. Section 1.7 highlights the research objectives of this study. Section 1.8 outlines the research questions of this study. Section 1.9 discusses the significant of this study. Section 1.10 outlines the research frameworks. Finally, section 1.11 shows the organization of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the researcher deals with some previous studies on the subject, which highlight competitive advantages (C.A) and its relationship with Information Technology (IT). The focus is to clarify the importance of competitive advantages that built through Information Technology, especially on productivity efficiency, innovation, customer-supplier relationships, and database design.

2.2 Competitive Advantage (C.A)

A competitive advantage exists when a firm has a product or service that is perceived by its target market customers as better than its competitors are. Unfortunately, entrepreneurs are often confronted with two myths surrounding the creation of a competitive advantage. One is that most good business opportunities are already gone. The other is that small firms cannot compete well with big companies.

Must organizations respond to the structure of its industry by choosing a competitive strategy. Porter suggested five forces model and the model of four competitive strategies shown in Figure (2.1) as tools for organizations to compete competitively. According to Porter, an organization can engage in one of these four fundamental competitive strategies. An organization can opt for cost leader, or differentiation.

Further, they can employ the focus on cost or focus on differentiation strategy across an industry by on particular segment of an industry.

Figure 2.1: Porter's Four Competitive Strategies

	Cost	**Differentiation**
Industry- wide	Lowest cost across the industry	Better product/ services across the industry
Focus	Lowest cost within an industry segment	Better product/ services within an industry segment

The field of strategic management focuses on understanding sources of sustained competitive advantages for firms (Barney, 2001; Priem & Butler, 2001 Porter, 1980; 1985; Rumelt, et al., 1991). A variety of factors have been shown to have an important impact on the ability of firms to obtain sustainable competitive advantage, including the relative cost position of a firm (Porter, 1980), a firm's ability to differentiate its products (Caves and Williamson, 1985; Porter, 1980), and the ability of firms to cooperate in strategic alliances (Kogut, 1988). Information technology (IT) has also been mentioned for its possible role in creating sustainable competitive advantages for firms (Talebnejad, (2008); Barney, 1991; Clemons, 1986; 1991; Clemons and Kimbrough, 1986; Clemons and Row 1987; 1991a; Feeny, 1988; Feeny and Ives, 1990). While the assertion that IT might be able to create sustainable competitive advantage for firms is provocative, work in this area is relatively

underdeveloped, both empirically and theoretically (Justin & Mike, 2004; Jarvenpaa and Ives, 1990). Research on IT and competitive advantage has emphasized "describing how, rather than systematically why" IT can lead to such an advantage (Reich and Benbasat, 1990).

2.3 IT and Competitive Advantage

2.3.1 The value of IT

Traditionally, most research in strategic IT has focused on the ability of IT to add economic value to a firm by either reducing a firm's costs or differentiating its products or services (see Mansfield & Fourie, 2004; Bakos and Treacy, 1986; McFarlan, 1984; Porter and Millar, 1985; Wiseman, 1988). For example, when Wal-Mart adopted its purchase/inventory/distribution system, it was able to reduce its inventory costs (Attaran, 2007; Ghemawat, 1986; Huey, 1989; Stalk, et al., 1992). On the other hand, General Electric has been able to differentiate its service support from its competitors by means of its answer center technology (Benjamin, et al., 1984; Porter and Millar, 1985), and Otis Elevator similarly has differentiated its service operations through its Otisline system (Balaguer, 1990; McFarlan & Stoddard, 1986; Ankolekar, 2005). In all these cases, the judicious use of IT either reduced these firms' costs of operations or increased their revenues by differentiating their products or services, are in valuable.

There is little doubt that, in a wide variety of circumstances, IT can add value to a firm. However, IT adding value to a firm-by reducing costs and/or increasing revenues- is not the same as IT being a source of sustainable competitive advantage for a firm. For example, when Wal-Mart adopted its purchase/inventory/distribution

system, it gained competitive advantage over its closest rival, K-Mart. However, K-Mart has not remained as it was as it developed similar system of its own (Steven, 1992). To the extent that K-Mart is able to implement its system and apply it like Wal-Mart has, then the Wal-Mart's system was a source of temporary, only on not sustainable to remain of competitive advantage (Barney, 1994). Put another way, Wal-Mart's purchase/inventory/distribution system would have been valuable, but value, per se, is a necessary but not sufficient condition in building competitive advantage.

An organization is said to have sustainable competitive advantage when it is implementing a strategy not simultaneously implemented by competing firms and when other firms face significant disadvantages in acquiring the resources necessary to implement this strategy. A firm experiences competitive parity when it is implementing a valuable strategy being simultaneously implemented by several competing firms. A firm is at a competitive disadvantage when it is implementing a strategy that is not valuable, i.e., a strategy that does not reduce its costs or increase its revenues.

2.3.2 The Create-Capture-Keep Paradigm

Henson & Humphrey (2009) argued several authors have gone beyond examining the value of IT in reducing a firm's costs and/or increasing its revenues to suggest ways that IT can be a source of sustained competitive advantage. Perhaps the most important of these efforts began with Clemons (1986) and focuses on the role of IT-based customer switching costs as a source of sustainable competitive advantage for firms selling IT applications. This set of ideas has come to be known as the "create-

capture-keep" paradigm (Clemons & Kimbrough, 1986; Clemons & Row, 1987, 1991b; Feeny & Ives, 1990, Griffiths, 2004).

Switching costs are created when customers make investments that are specific to a particular supplier of IT. 1- The investments might include the cost of employee technical training to use supplier's unique IT, management experience working with a particular supplier's sales and support staff, and familiarity with a particular supplier's business policies and procedures. All these investments can be very valuable for firms in their acquisition of IT, as long as they continue purchasing IT from the same supplier. However, these investments have little or no value in facilitating IT purchases from other suppliers.

A principle argument in this line of reasoning is that the creation of significant customer switching costs in the acquisition of IT creates an economic opportunity for IT suppliers (Clemons, 1986; Clemons & Kimbrough, 1986; Clemons & Row, 1987, 1991b; Kim, Kliger, & Vale, 2001). Once these switching costs are created, IT suppliers can increase the price, reduce the level of service, or in other ways extract additional value out of their relationships with their "captured" customers. As long as the cost to customers of switching suppliers is less than the extra," value that is being extracted from this relationship by a supplier, customers will continue purchasing IT from that supplier. Prescriptively, this argument suggests that IT suppliers should attempt to create unique IT that requires specific investments by customers, to be used by customers. When customers begin using this IT, they become "captured" by their switching costs. Given these switching costs, suppliers are able to "keep customers despite the extra value suppliers are able to extract from their relationship with their captured customers. Examples of firms that have attempted to use IT switching costs in this manner include Baxter Healthcare, (Vitale & Konsynski, 1991; Venkatraman

& Short, 1992; Farrell & Klemperer (2007), and various airline reservation systems (Copeland & McKenney, 1988). While the "create-capture-keep" paradigm has received some support in the literature, it has also been the object of significant criticism (Hopper, 1990; Malone et al., 1989; Wiseman, 1988). There are at least three reasons why this "create-capture-keep" approach is unlikely to be a source of sustained competitive advantage for IT suppliers (Klein, et al., 1978).

First, customers will usually be able to anticipate the risk of being captured by an IT supplier if investments specific to that supplier are made. Typically, customers will only be willing to make these kinds of specific investments if they receive some form of guarantee that a supplying firm will not take unfair advantage of these investments. For example, the effort to avoid significant switching costs has led many hardware firms to insist on second sources for key hardware components. Rather than designing an entire hardware system around a component supplied by a single firm, these firms insist that suppliers license other firms to act as second suppliers. Second: sources have the effect of reducing a customer's switching costs, and they act as a credible guarantee against suppliers exploiting customers. If switching costs were a significant problem in IT, a similar second-source strategy could be used.

If guarantees cannot be made in a credible way, then customers will attempt to avoid the creation of significant switching costs by pursuing alternative technologies or perhaps by developing their own technologies. For example, many travel agencies have found that using a particular airline's "back-end" IT applications (i.e., accounting services, travel reporting) can create significant switching costs and ties them to the reservation system of that airline. Rosenbluth Travel decided to develop its own back-end IT applications, thereby enhancing its ability to interact with several different

reservation systems (Clemons, 1986; Feeny & Ives, 1990; Johnston & Vitale, 1988; McFarlan, 1984).

Whether customers neutralize the threat of switching costs by receiving guarantees up front or by seeking alternative IT suppliers, the effect of these actions will be to reduce the ability of IT suppliers to extract extra value from their relationships with captured" customers. In an important sense, these customers are not really captured, even if specific investments are made. In this context, the existence of switching costs will not be a source of competitive advantage for a firm selling IT.

Second, IT suppliers that do exploit their customer's switching costs will often gain a reputation for being untrustworthy. The effects of this type of reputation can be devastating. While firms may gain large profits from their currently captured customers, they will be unable to attract future customers. The value of opportunities lost because of a reputation for exploiting captured customers can be much larger than the value extracted from those captured customers. In this setting, rational suppliers will not find it in their best interest to exploit their captured customers, despite the existence of significant customer switching costs. For this reason, significant customer switching costs cannot be a source of competitive advantage for a firm supplying IT.

Third, the number of options for customers to obtain IT has increased over time. Perhaps the only way that customer switching costs could be a source of competitive advantage for an organization selling. The IT in question is absolutely unique, if it is absolutely essential to a customer's business operations, if there are currently no other suppliers of the IT, and if it is very unlikely that there will be any additional suppliers of the IT in the near future. This near monopoly situation may have existed during

some periods of time for some IT, especially in the 1960s and early 1970s. However, changes in technology, the emergence of various standards, and the development of intelligent distributed systems have made it virtually impossible for IT firms to enjoy this situation and thus, have further undermined the ability of the "create-capture-keep" paradigm to be a source of competitive advantage for IT firms.

Many of the firms that used create-capture keep" in the past have had to change their IT strategies. For example, Baxter Healthcare previously used a proprietary communication standard. This standard required Baxter customers to make highly specific IT investments (Dunning, 1988, 2000). However, in 1988, Baxter was forced by market pressures to adopt the ANSI X.12 standard for electronic data interchange, thus reducing the need for its customers to make specific investments in its ASAP system (Venkatraman & Short, 1992; Vitale & Konsynski, 1991). In a similar way, SABRE and Apollo previously required customers to utilize "black boxes" with fixed functionality for connection to their systems. Now, these systems allow connections through intelligent workstations that have local programming capabilities (Clemons & Row, 1991b; Hopper, 1990, Modern, 2001). The use of these intelligent workstations makes it easier for travel agencies to convert data from one airline system to another, thus facilitating the ability of agencies to change systems at will.

For these reasons, some authors have concluded, "Companies that try to lock-in customers may lose them instead" (Malone, et al., 1989), and "It is increasingly difficult, if not downright impossible, for... [IT] to bind customers to products" (Hopper, 1990). Thus, the search for IT-based sources of competitive advantage must look beyond the create-capture-keep" paradigm.

2.3.3 The Resource-Based Perspective

In recent years, many studies on the status, evolution, and/or trends of the resource-based view (RBV) have been published (Barney, 2001a, 2001b; Mahoney, 2001; Makadok, 2001; Priem & Butler, 2001; Phelan & Lewin, 2000; Hoskisson, Hitt, Wan, & Yiu., 1999; Williamson, 1999). One of the most recent studies (Acedo, Barroso & Galan, 2006), adopting the bibliometric methodology (Zitt & Bassecoulard, 1996; Ahlgren, Jarneving, & Rousseau, 2003), analyzes the so called resource-based theory (RBT) s heterogeneity and identifies three main trends coexisting within it: the resource-based view (RBV) (e.g., Barney, 1991 & Wernerfelt, 1984), including some representative works of the dynamic capability perspective (Pisano, & Shuen, 1997), the knowledge-based view (KBV) (e.g., Kogut & Zander, 1992 & Grant, 1996a) and the relational view (RV) (e.g., Dyer, 1996).

Another approach to understanding the relationship between IT and sustained competitive advantage has recently emerged (Clemons, 1991; Clemons and Row, 1991a). In this approach, the ability to use IT to leverage the fundamental resource advantages of firms enables IT to be a potential source of sustained competitive advantage. Fundamental to this paradigm is the resource-based view of the firm, which is used throughout this paper to explain IT is link to sustained competitive advantage. This approach is explained in detail in the next section.

2.3.4 A Resource-Based Model of Competitive Advantage

The impact of resource heterogeneity and immobility on competitive advantage can be organized into the model presented (Barney, 1991; 1994) see figure (2.2).

Mata, (1995) believe this model is organized with reference to a set of three questions about a firm's resources and capabilities. The first question is: Does a particular resource or capability add value to a firm, i.e., does its exploitation reduce a firm's cost below and/or increase its revenues above what would have been the case if these resources or capabilities were not exploited? As suggested previously, resource value is a necessary but not sufficient condition for competitive advantage. Firms that possess resources or capabilities that are not valuable will gain a competitive disadvantage from exploiting these resources. On the other hand, firms with valuable resources and capabilities may gain at least competitive parity from exploiting these resources.

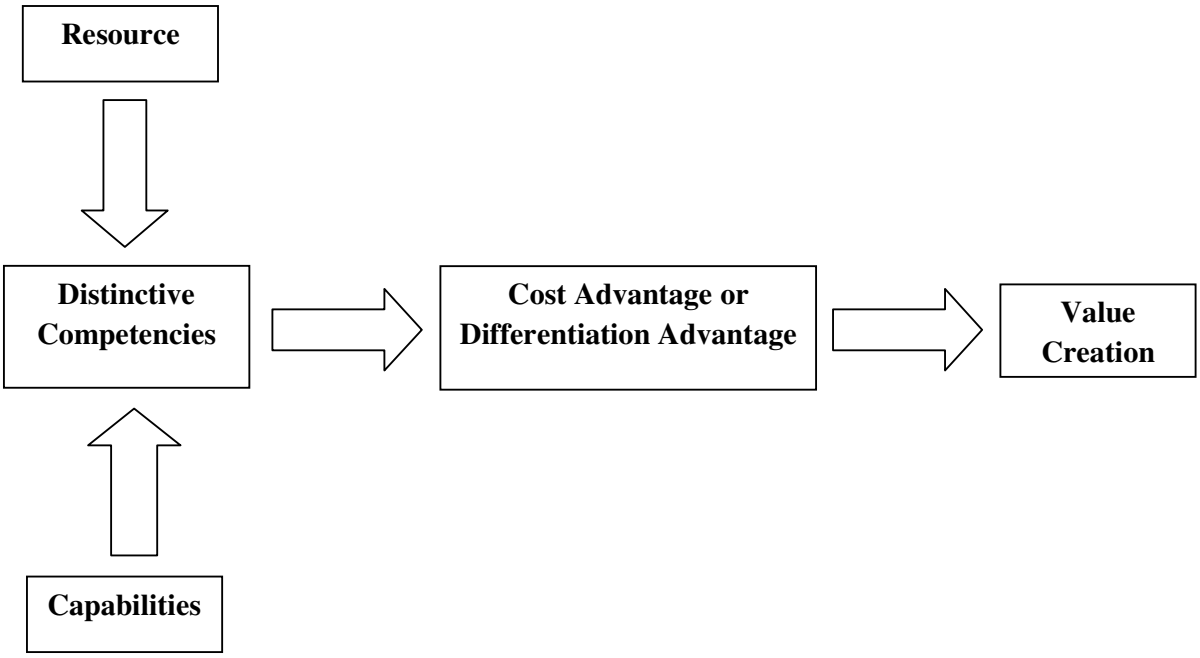
The second question is: Is a particular resource or capability heterogeneously distributed across competing firms? Obviously, resources and capabilities possessed by many competing firms cannot be a source of competitive advantage for any of them, although they will be a source of at least competitive parity. On the other hand, if a resource or capability is valuable and heterogeneously distributed across competing firms, then that resource or capability will be a source of at least a temporary competitive advantage for firms that possess that resource.

The final question in this model is: Is a resource or capability imperfectly mobile? If firms without a valuable resource are at no disadvantage in acquiring, developing, and using it compared to firms that already possess this resource, then it will only be a source of temporary competitive advantage for the firms that originally controlled it.

On the other hand, when a resource or capability is immobile, then firms without this resource face significant challenges in acquiring, developing, and using it. This resource or capability may then be a source of sustained competitive advantage for firms that control it. A resource or capability may be immobile for any of the reasons mentioned previously, i.e., the role of history, causal ambiguity, and/or social complexity.

Applying the Resource Based View to Attributes of IT Armed with the model presented. It is now possible to examine the ability of IT to generate sustained competitive advantages for firms. A review of the IT literature indicates that five specific attributes of IT have been suggested, so far, as possible sources of sustained competitive advantage for firms. The first of these, customer switching costs, has already been discussed and shown not to be a source of sustained competitive advantage in all but the most unusual circumstances (i.e., when a firm currently is, and is likely to remain, a monopoly supplier of IT that is absolutely essential to the business activities of customers). The other four attributes of IT that have been suggested as possible sources of sustained competitive advantage-access to capital, proprietary technology, technical IT skills, and managerial IT skills-are discussed below. While these five attributes of IT have all been suggested as possible sources of sustained competitive advantage in the IT literature, they certainly do not represent a comprehensive list of all the attributes of IT that might be sources of sustained competitive advantage. Future work will need to address the competitive implications of these other attributes of IT, using the model presented in.

Figure (2.2): A model of competitive advantage



Resource: jbdon website

Although there is recognition that knowledge is a key business asset, organizations are still in the early stages of understanding the implications of knowledge.

Knowledge is slowly becoming an integral business function to them (Metaxiotis, Ergazakis & Psarras, 2005). Previous research (Davenport & Prusak, 1998; Liebowitz, 2000, Macher & Mowery, 2006) has shown that a knowledge-based company possesses knowledge that allows it to man-oeuvre with intelligence and creativity giving it a special advantage. For Davenport and Prusak (1998) knowledge is the only source of a sustainable competitive advantage.

However, since knowledge is not directly observable or measurable, then, it becomes a construct whose existence and properties can only be inferred through firm capabilities that are manifested in observable action (Stehr, 1992). This differentiates knowledge from resources, which can be identified without observable action.

Different actions can be ascribed to different capabilities. Thus, a specific constellation of actions represents a specific set of capabilities inside the firm and implies the existence of specific knowledge that is required to exercise these capabilities (Kaplan, Schenkel, Von Krogh, & Weber, 2001).

Similarly, Kale and Singh (1999) believe that knowledge processes represent a vital core competence that can be leveraged to build other strategic capabilities or second order dynamic capabilities (Zollo & Winter, 2002) as, for example, the capability to manage phenomena such as acquisitions, corporate restructuring, etc.

Sher & Lee (2004) argue that Knowledge includes three main functions: Knowledge creation, accumulation and sharing. Knowledge creation includes innovation, knowledge accumulation includes collecting new knowledge, codifying it and combining new and old knowledge, and knowledge sharing allows for diffusion of skills, experience and knowledge throughout the organization.

Lee & Kang IW (2005) add two more functions: knowledge utilization and knowledge internalization. Knowledge utilization can occur at all levels of management activities in firms: one of the popular forms of knowledge utilization is to adopt the best practice from other leading organizations, uncover relevant knowledge, and apply it. Knowledge internalization may occur when individual workers discover relevant knowledge, obtain it and then apply it. Therefore, internalization may give rise to new knowledge. In this way, it provides a basis for active knowledge creation.

2.4 Productivity Efficiency

With the continuous development of information technology, more and more textile enterprises begin to speed up the pace of technological change and information innovation, many top leaders would like to use the advanced information technology to promote the information development. With regards to this, some enterprises put a multitude of material, human and funds to realize the technological transformation, to enhance the enterprise's production management level, and to strengthen the management of the production process. Furthermore, the goal what they do is to lower production cost, enhance equipment utilization, obtain much more core competitive force (Mei, 2008), and increase much more profit value. At present, some textile enterprises of the developed countries, such as Switzerland, Belgium and Japan, etc... They have achieved the information and networking management during production management and decision analysis business, such as (Mei, 2008), (Shao & Qin, 2006) has described in detail respectively, put forward some advanced theories and technologies, e.g. Paolo Torroni (Lesser et.al, 2006), Tucker Balch (Yang, Zhu, & Zhou, 2005), etc., and developed corresponding management systems (Xu,et.al, 2006). The techniques of them have up to the first-class advanced level round the world.

Nonetheless, some studies have focused on IT value and have totally ignored a highly relevant and significant question: what are the determinants of IT value? That is, what are the factors that affect the business value of IT? As far as we know, there are only three studies that are related to this issue. One study of this nature, by Dewan et al. (1998), conducts an empirical analysis of the firm characteristics and the demand for investments in IT. The scope characteristics used in this work are related diversification (RD), unrelated diversification (UD), vertical integration (VI), and

growth option represented by the assets to value ratio (AV). On the side of the scale (size) of the firm, the only variable included in the study is annual sales. The generalized production function model, with the dependent variable being IT capital, is used to analyze how the scope and scale characteristics influence IT demand rather than IT value. However, it seems to us that the model is miss-specified and the production function is misapplied because the function is a production function in which the dependent variable must be value- added or actual output, instead of IT capital (Lin & Shao, 2000, 2006a; Lin, 2009). As a matter of fact, this study does not concern with IT value. Instead, its objective is to empirically analyze how scope and scale characteristics at the firm level affect the demand for IT capital.

The firm-level study by Shao & Lin (2000) was actually the first study devoted to examining the determinants of IT value as measured by the productive efficiency computed based on the stochastic frontier production (SFP) approach in which the production and the trans-log function frontiers were deployed. The determinants were identified to include the beta, debt-equity ratio, return on asset, return on equity, shareholder return, sales growth, and R&D expenses. All these characteristics were found to have significantly positive impacts upon IT value as measured by productive efficiency.

The third study by Chen & Lin (2009) is a country-level analysis of how six identified national characteristics influence the value of IT as measured by a country's productive efficiency. These six national attributes are the time variable (T), per capita consumer expenditure (PCC), government bond yields (R), the ratio of foreign exchange reserves to imports (TRIM), the unemployment rate (UER), and the inflation rate (FLA). The analysis is based on the one-equation and two-equation SFP models of two-factor and three-factor CES (constant elasticity of substitution)

production frontiers. However, the studies of Shao and Lin (2000) & Chen and Lin (2009) obviously differ from the work by Dewan et al. (1998) in methodology, research models, data, and focus. The present country-level study attempts to extend Chen & Lin (2009) by identifying some country characteristics that differ from Chen & Lin (2009) but are as close as possible to the counterparts of the firm characteristics of Dewan et al. (1998)2, and then analyze how they affect the value of IT based on the SFP approach. Numerous authors (Chen & Lin, 2009; Lin, 2009; Prasad & Babbar, 2000; Rosenzweig, 1994; Tam, 1998) have stressed the urgent need for country-level studies in an era of increasing globalization. The compelling reasons for making a strong case for country-level studies were stated and summarized in Lin (2009, in details), Chen & Lin (2009), and Prasad & Babbar (2000).

2.5 Innovation

Business innovation involves a wide spectrum of original concepts, including development of new ways of doing business, new business models, business application of technology and communications, new management techniques, environmental efficiency, new forms of stakeholder participation, telecommunication, transport and finance. Previous literature has recognized and analyzed, based mainly on theoretical arguments, the great potential of IT to drive significant innovations in business processes, products and services of firms, and through them improvements of business performance (Bresnahan et al., 2002; Bresnahan & Trajtenberg, 1995; Brynjolfsson & Hitt, 2000; Davenport, 1993; Gunasekaran & Nath, 1997; Hammer, 1990).

Hammer (1990) argues that firms should not simply embed outdated processes in hardware and software', but on the contrary should exploit the innovation capabilities offered by IT for totally redesigning their processes so that they become much more efficient, and finally summarizes his recommendations in a widely cited dictum 'don't automate, obliterate'. Davenport (1993) argues that IT is 'the cornerstone to process innovation', which is 'a revolutionary new approach that fuses information technology and human resources management that can dramatically improve business performance'. In this direction, he proposes nine modes of using IT for supporting a substantial process innovation, which can be quite beneficial: automation, informational, sequential, tracking, analytical, geographical, integrative, intellectual and dis-intermediating. Bresnahan & Trajtenberg (1995) identified a fundamental difference between the IT capital (assets) and the non- IT (regular) capital (assets): the former is a 'general purpose technology, which is highly flexible and adaptable, so it can be used in many different ways and for various purposes, and enable many innovations in processes, products and services, while on the contrary. The latter is much less flexible and adaptable to different uses, so it can serve much fewer functions and has a much lower potential as innovations enabler.

Gunasekaran & Nath (1997) argue that ITs can be very useful for simplifying most business process and reducing considerably the number of their activities, and for achieving cross-functional process level optimization rather than departmental level optimization. In addition, they propose ways of using ITs for reengineering the basic business processes: order flow, strategic process, product design and production, marketing/sales, services, accounting and personnel management.

Brynjolfsson & Hitt (2000) argue that most of the existing work practices and business processes have been developed in the past and reflect the historically high

cost of communication and information processing; since modern, IT can reduce dramatically these costs. Thus, IT can be a key enabler and facilitator of new enhanced business processes and work practices, which lead to big productivity increases, initially by reducing costs and, subsequently, by enabling firms to increase output quality through the design of new products or the improvement of important intangible aspects of existing products, such as convenience, timeliness, quality, etc. In the same direction, Bresnahan et al. (2002) emphasized that IT enables a radical restructuring of work that allocates routine. Well-defined tasks associated with symbols processing to computers, separate, and redesign tasks that require human skills; furthermore, ITs enable an individual worker to have all the required information for completing a bigger part of a process, so historical fragmentation of many processes can be dramatically reduced resulting in large efficiency gains.

Moreover, there has been considerable literature analyzing the innovative potential of the Internet/e-business in particular. Also based mainly on theoretical arguments, which concludes that e-business enables and drives significant transformations in business models, value propositions, products and services of firms, and their internal processes and structures, which can offer substantial benefits (Amit & Zott, 2001; Tavlaki & Loukis, 2005; Timmers, 1998; Wu & Hisa, 2004, 2008; Zwass, 2003).

For example, Timmers (1998) argues that internet gives rise to new business models, and describes the most important of them: e-shop, e-procurement, e-auction, e-mall, third party marketplace, virtual community, and value chain service provider, value chain integrator, collaboration platform, information brokerage and trust services. Amit & Zott (2001) argue from a broad theoretical foundation concerning virtual markets, value chain analysis, Schumpeterian innovation, resource-based view of the firm, strategic networks and transaction cost economics, proposed four dimensions of

innovation and value creation in e-business: transaction efficiency, novelty, complementarities (between various products and services, on-line and off-line assets, activities) and customers lock-in.

Zwass (2003) argues that the WWW/Internet compound enables significant innovations in the way organizations arrange their business processes, address their marketplaces and partner with other organizations. Also, he proposes a large number of innovation opportunities grouped in eleven categories associated with marketplace, universal supply-chain linkage, network of relationships, collaboration, use of forum, interactive media, goods and services delivery, anytime-anywhere connectivity, development platforms, universal telecommunications networks and computing utility. Wu & Hisa (2004, 2008) categorize the innovations caused by e-commerce based on the extent of change in product's core components (defined as 'the distinct portions of the product that embody the core design concept and perform a well-defined function).

Also, on the extent of change in the business model (defined as 'the way in which the components are integrated and linked into a coherent whole') into four groups: Incremental innovation (no significant changes in core components and business models), modular innovation (considerable changes in core components but not in business model), architectural innovation (considerable changes in business model but not in core components), and radical innovation (considerable changes in both core components and business model).

Tavlaki & Loukis (2005) propose a methodology for designing new 'digital business models', which consists of six stages: design of value proposition, design of production architecture (value chain), definition of value chain actors, analysis of

competition, design of economic model and elaboration of relations among actors. Another research stream focuses on analyzing how the web supports 'distributed' collaborative innovation creation both within and among firms (e.g. Sawhney & Prandelli, 2000). Therefore, an extensive theoretical foundation has been developed concerning the potential of IT in general and e-business in particular to enable and drive innovation in products, services and processes, and through them improve significantly business performance, which, however, has not been sufficiently investigated empirically using large samples of firms. In some cases the innovation rests not in the technology or product or service, but in the business model itself. Business model is a broad-stroke picture of how an innovative concept will create economic value for the ultimate user, for the firm and its shareholders and partners. It considers the infrastructure required to move the product/service to the market in a manner that it both easier and more convenient for customers and profitable for the organization.

2.6 Customer-Supplier Relationships

Increasing evidence suggests that business relationships are of paramount importance for firms because such relationships can create value for both parties involved (e.g. Achrol, 1997; Anderson et al., 1994). However, value creation depends on special relationship characteristics, including trust and commitment (Morgan & Hunt, 1994). Apart from focusing on business relationships, practitioners and scholars have explored and exploited modern means of information technology (IT). Competitive advantage, for example, can be generated through the employment of state-of-the-art IT (Clemens & Row, 1991; Mata et al., 1995; King & Teo, 1996; Palvia, 1997). According to Buxmann & Gebauer (1999), IT is one of the key success factors in any

organization. As such, business relationships are affected by IT developments, e.g. internal order handling, e-commerce, and electronic data interchange (EDI), to name a few. Despite research on a general marketing level (e.g. Good & Stone, 2000), the impact of IT on relationships, and their social aspects in particular, have not been discussed sufficiently. Exempted from this statement is the work on EDI and relationships (e.g. Angeles et al., 1998). Engaging and exploiting the opportunities offered by IT is one of the hot topics for almost any modern organization. The importance of IT within a business environment increased significantly during recent years. We use a definition of IT, which combines the definitions of Martin, Brown, DeHayes, Hoffer, & Perkins (1999) and www.whatis.com:

Information technology is a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived). In other words, this definition of IT includes computer hardware, software, and communication systems, whereas some authors also include personnel and resources dedicated to supporting these capabilities (King et al., 1989; Stump & Sriram, 1997). Advanced inter-organizational systems have a major impact on the way business is done in organizations (Buxmann & Gebauer, 1999). Ives and Mason (1990) say that IT enables organizations to customize their services instead of standardize them. IT can be internally oriented or outwardly directed (Stump & Sriram, 1997). Information systems that do not directly involve external organizations are called internal IT. Internal IT falls into the domains of office and factory automation systems that organize work more efficiently. While almost any organization has implemented these internal systems, many organizations have begun using IT to manage information

between organizations. With the emergence of the Internet and other wide area networks, the technological basis for connecting a firm's internal IT with outside computer networks created is. Shared IT is often used between suppliers and customers, but sometimes also involves competing organizations, research institutions, or consultancies.

2.6.1 Internal IT

The category of internal IT encompasses all information systems that only used within the organizational boundaries. These systems can support the entire organization, or specific tasks or functions within the organization. Applications are basically used inside the organization are office automation, transaction processing systems, enterprise resource planning systems, data warehousing systems, group ware applications, intranets, and executive information systems. Table (2.1) illustrates the major benefits of the different types of internal IT applications. These are the information function, communication function, and decision support.

Table (2.1) Applications of internal IT and their benefits

Office automation	Reduction of processing time
	Improvement of quality
	Reduction of time-consuming routine work
Transaction process	Reduction of overhead
	Faster response to customer demand
Enterprise resource planning	Force business process re-engineering
	Reduction of cost
	Improvement of customer services
Data warehousing	Improved customer care
	Better planning of future developments
Groupware	Improved flow of information
	Reduction of redundant
	Improvement of work- quality
Intranets	Provide additional organization- intern services
	Improved flow of information
	Better customer services
Executive information	Improved strategic planning
	Executive decision-making support
	Improvement of customer orient

2.6.2 Shared IT

None of today's corporations exists as isolated entities. Companies are part of a marketplace where different types of organizations come together and exchange information, services, and goods. Shared IT relates to computer and communication technology, which supports doing business between a corporation and organizations outside its boundaries (Jonston & Vitale, 1988). These organizations can be geographically dispersed and utilize modern network technology. The shared use of IT helps to support an organization's interactions with other organizations, i.e. buyers and sellers (Applegate et al., 1996). Inter-organizational systems, EDI and extra nets are the most popular shared IT tools. Table (2.2) shows these applications of shared IT and the benefits to an organization engaging in these technologies.

Table (2.2) Applications of shared IT and their benefits

Inter-organizational system [a]	Reduction of transaction cost
	Increase customer responsive
	Increase efficiency
	Differentiated products and services
	Increase bargaining
Electronic data interchange [b]	Reduction of costs for order processing
	Reduction of inventory and inventory costs.
	Elimination of labor- intensive tasks
	Enhanced communication
Extranets	Strength closeness between participating organization
	Reduction of operational costs
	Enhanced communication
	Reduction of cooperation costs

Notes: [a] For detailed discussion of the benefits of inter-organizational systems see McFarlan (1984); [b] In- depth information about the benefits of electronic data interchange can be found in Scale and McGrath (1993) and Kumer and Cook (1996). Their theories about the benefit of electronic data interchange are supported by field studies of Mukhpadhyay *et al.* (1995) in the automotive and Venkatraman and Zaheer (1990) in the insurance industry. Teo *et al*. (1995) conducted a similar study for Tradenet in Singapore.

2.7 Database Marketing

Following the concept of Stan Rapp & Tom Collins, the relationship marketing is a maxi – marketing which has as a main purpose the sales maximization and creating a long term relationship by selecting, contacting, activating and holding on to the consumers and to the best clients of the service providing enterprise. The need for creating a personal relationship with the clients has imposed the one-to-one marketing concept, which based on the following principles: up to date database, a dialog with each client, differentiating the clients according to needs and values, customized services (Luigi, 2009).

Based on a customer relationship management (CRM), whose heart is the marketing database, the relationship marketing aims towards transforms the clients into a loyal one as well as attracting new ones. A strategy of the CRM must be based on modern information and communication technologies. The data and the information about the clients must be stored in databases, which can be collected using data mining techniques with the purpose of revealing important information. With the help of this information, the service providing enterprise can elaborate marketing and sales strategies and policies which are aimed towards individual clients (Luigi & Mircea, 2010).

Also, Luigi et al (2010) indicates taking into account the large number of information, which the relationship marketing uses them in all the stages of the decision making process, the marketing database becomes vital in a marketing information system. The database marketing is important for:

(a) Using the collected information from each contact with the client (visit, phone call, web, mailing, etc.),

(b) Establishing more and more complex types of target groups (clients, prospectors),

(c) The definition of the magic moments (the most sensitive moments for the client) of the relationship with the client (the first order, the complaint, providing the service), and

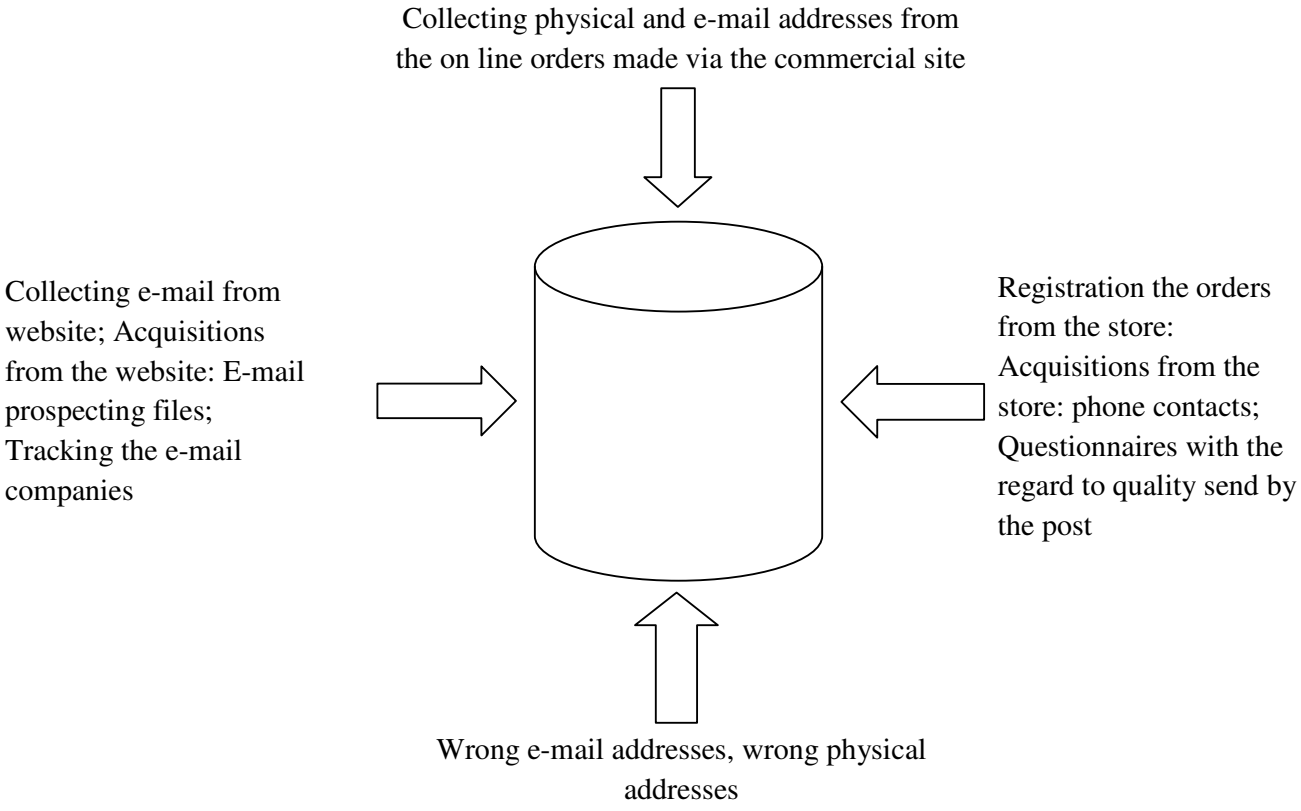
(d) The submission of the best product / service is in the best moment and for the best client.

In order to ensure the usage of an efficient CRM, a marketing database must contain more types of information:

Nominal Variables (name, surname), coordinates (address, phone number, e-mail), socio-demographical data (age, income, marital status), specifically data (in case of B2B), socio-graphical data (region, county, place, types of habitat), behavioral data (hobbies, fields of interest), relationship data (contacts, history of the sent messages), acquisition behavior (payment options, the nature of the acquisition, the acquired products), data obtained from the data mining process (client profile, scoring, segmentation), and subjective information (the level of interest with regard to the supply), etc. (Claeyssen,, Deydier, & Riquet., 2009).

All the information necessary for marketing database is collected by traditional methods as well as by on line methods. From this point of view we embrace the opinion of Yan Claeyssen, by which there can be pointed out several new ways of determining the size of a marketing database (Claeyssen, et all., 2009) – figure (2.3).

Figure 2.3: the diagram of supplying a multi-channel marketing database

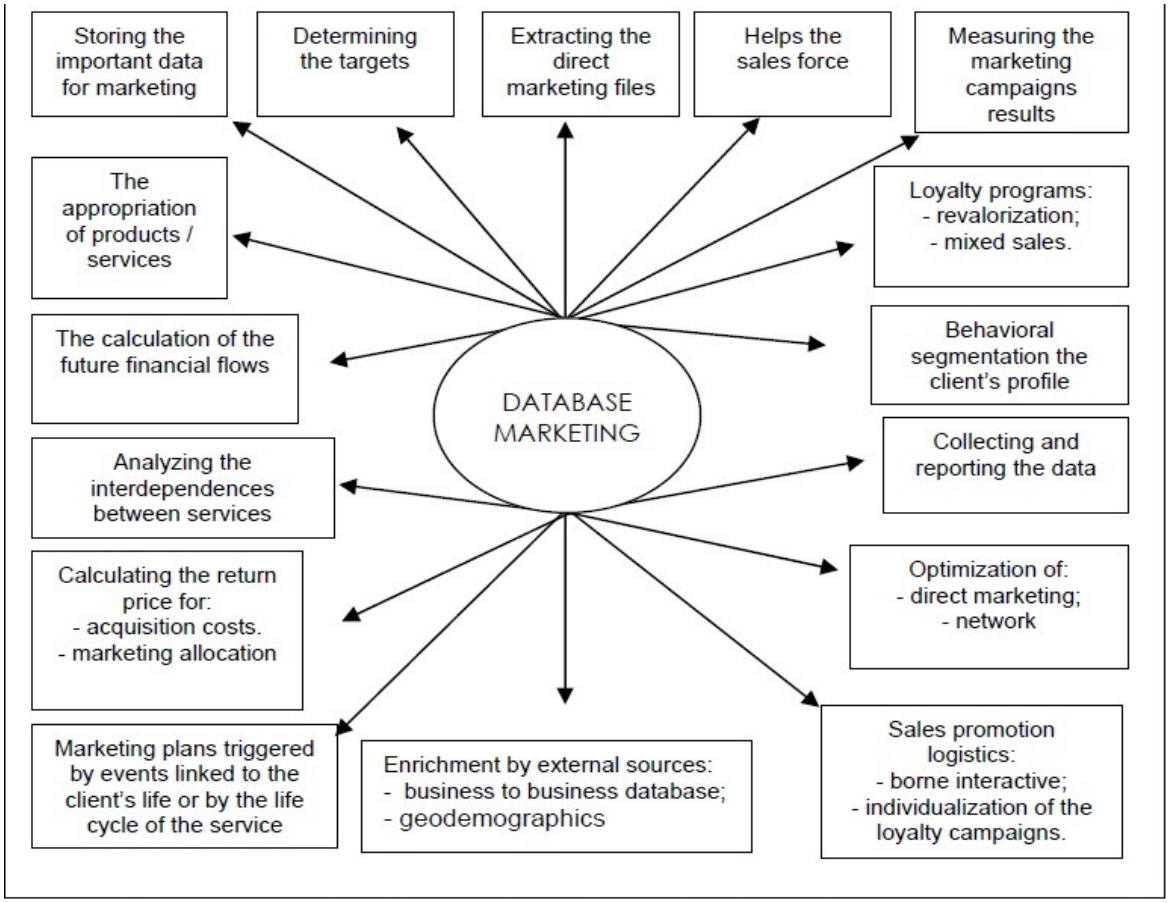


A marketing database must be permanently maintained in an operative status by creating systematical operations, like the deletion of the content that is doubled in the different files, the deletion of the content that is doubled in the same files and the suppression of all the useless data the database cannot use them.

The main objective of the database marketing is to generate the biggest profit by using the marketing and the sales with regard to the client (Lebon & Laethem, 2003,). Considering the expansion of the relationship marketing, the marketing database becomes the decisive mean for taking the marketing decisions. These decisions can be on one hand strategic ones and on the other hand, they can be tactical ones. The first mission of the database marketing is to become the storage place for all the

information collected, hence necessary and relevant for marketing. The database marketing is far from being a static receiver; the data are not just stored and recorded but sorted, analyzed and combined.

Figure2.4: The role of database marketing



Source: Adaptation after A. Michaux – *Le marketing de bases des donees,* Eyrolles, 1993

From this perspective, we share the point of view of Yan Claeyssen, (Claeyssen, et al. 2009), according to whom a marketing database must evaluate in accordance to the request and the needs of the providing organizations. A database must be a flexible one (to accept new parameters) but it must be easily accessed and used. The second mission of the database marketing is to ensure the free usage of the data for the marketing needs. The obligation of the marketing departments is to use the data in

order to sell more and better, for the transformation of the client into a loyal consumer at the best moment, with the best service, in order to invent new segments according to the constant evolutions.

With regard to the benefit of the database marketing, this is evaluated by the advantages presented in table (2.3).

Table (2.3) The advantage of database marketing for marketing mix

The marketing mix	Database advantage
The product	Analyzing the services package/ products range Complementary or cannibalism The sales evolution by clients segments or by geographic areas Analysis of the satisfaction or quality criteria The detection of the preferences of the products or services Detecting the new needs for products / services
The price	The calculus of the client's value all long its life cycle The calculus of the average attraction cost The evolution of the prices and of the sales per product/ service The calculus of the acquisition/ retention costs of a prospector and client
The placement/ Distribution	The analysis of the distribution channel Analysis of the client segment for each distribution channel The optimization of the commercial and marketing action
The promotion/ Communication	The management of addresses and of the files in relationship marketing Measuring the results Managing the relationship marketing campaigns and of direct marketing The creation of client lists based on well define criteria

2.8 Summary:

In this chapter, the researcher had aimed to provide an overview of the literature regarding IT and competitive advantages. The literature review indicates that IT is focused to the four parts. Four parts from IT and competitive advantages were included to study the influence of each every factors from IT . The four parts -selected- to build competitive advantages, instead of using IT implementations as a whole as used in previous studies: Productive efficiency, Innovation, Provides Customer-Supplier Relationships, and Database marketing.

The IT were included based on a thorough literature review, and based on their impact to build competitive advantages and from the literature review, a research framework was created.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this chapter, the researcher deals with hypotheses related to the study, methods used in data analysis, and field of study. Therefore, the researcher tried to prove his hypothesis, and find the relationship between the applications of management information systems and the effectiveness of decision-making.

3.2 Research Framework & Hypotheses

3.2.1 Research Framework

A conceptual framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought. Research topic deals with the strategic role of information Technology towards achieving competitive advantages. We can determine this through the ability to establish of competitive advantage by using information technology and to achieve the targets.

FIGURE 3.1 Research Framework (A)

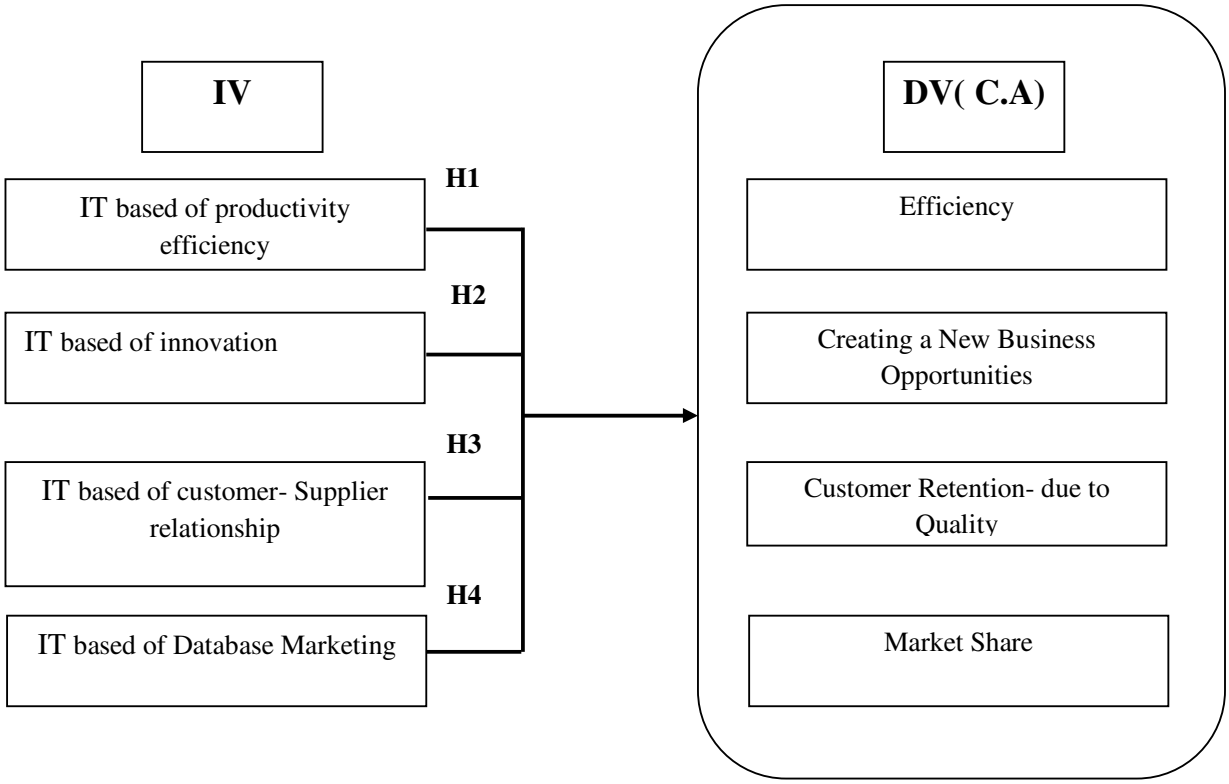
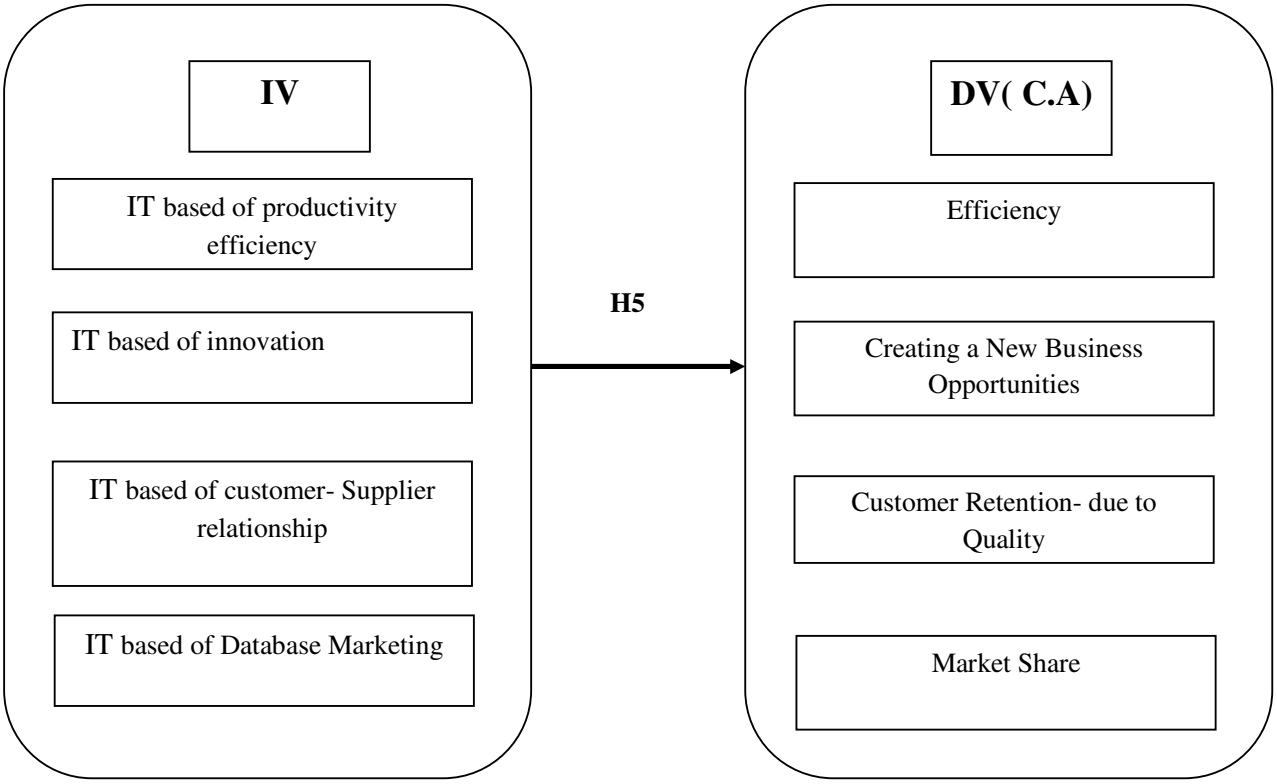


FIGURE 3.2 Research Framework (B)



3.2.2 Hypotheses

There are many uses for information technology in order to build competitive advantage. Therefore, this study develops five main hypotheses as following:

H1: There is a relation between IT based productivity efficiency and competitive advantages.

H2: There is a relation between IT based innovation and competitive advantages.

H3: There is a relation between IT based Customer- supplier relation and competitive advantages.

H4: There is a relation between IT based database marketing and competitive advantages.

H5: There is a relation between IT and competitive advantages (Main Hypothesis).

3.3 The Research Design

This descriptive study is undertaken in order to ascertain and describe the IT and the competitive advantage.

The goal of descriptive study is to offer a profile or to describe relevant aspects of the phenomenon of interest to research from individual, organizational, industry-oriented or perspective. There are a little previous studies of this research in this area.

3.4 Type of Study

This study is a quantitative type of research since; it aims to determine the relationship between the independent variable and the dependent variable.

3.5 Sources of Data

The sources of data for this research are in the form of both primary and secondary data. Primary data is collected from the individuals specified in the specified organizations. The researcher defines the respondents.

3.6 Unit of Analysis

The unit of analysis is the major entity that is being analyzed in the study (Sekaran, 2003). The unit of analysis is the individual employee in each organization included in this study.

3.7 Population Frame

The population terms of this study covered all the employees, with the focus of persons have been used the information technology, Management departments, and IT department across the companies.

As for the sample to be chosen for distributing out the questionnaire to select sample subjects that represent the most suitable ones in providing data about the dimensions of the study. This method is been chosen in order to choose the right sample to represent the whole employees.

Samples of 130 Yemeni individuals are selected for the current study to obtain data from using the disproportionate stratified random sampling. These individuals are the most suitable people to provide data about the dimensions of the study. Under simple random sampling, all elements in the employees are considered and each element has an equal chance of being chosen as the subject. The sample subjects include individuals working for private and governmental sectors, and businessmen. The questionnaires returned were 130 questionnaires that represent 100% response rate. Twenty percent of the sample was female.

3.8 Variables Measurement

Information technology is measured with a25-item scale consisting of statements about four factors. Four factors of IT were included in the study. These IT factors were obtained from other studies, which showed significant effectiveness/anticipated significant effectiveness of these factors to build competitive advantage.

The measures of IT factors are as follows: productivity efficiency (5 items), innovation (5 items), customer-supplier relation (5 items), database marketing (5 items), and there is comprehensive relation between IT and all these factors together to build competitive advantage (5 items). Each IT factors were measured by several items using a five point Likert scale, (1 =strongly disagree, 5=strongly agree).

3.9 Data Collection and Administration

In this study, data for the research is collected using the close-ended questions. According to Sekaran (2003), the questionnaire is an efficient data collection method because it provides opportunity for researcher to administer personally, mail to the respondent or even by distributing using electronic devices. Therefore, the information can be easily analyzed and compared. Besides, the findings from this survey could be generalized to the other population of interest.

3.10 Data Analysis Techniques

The statistical analysis of the data is conducted using the computer software program Statistical Package for the Social Sciences (SPSS) version 11.5. The relationship between the independent and dependent variables was determined by using the Pearson Correlation coefficient.

3.11 Reliability

Reliability test is used to test the appropriateness of questionnaire to measure the variables. The Cronbach's Alpha testing was used as it is the most well accepted reliability test tool applied by social researchers. Sekaran (2005) mentioned that if reliability coefficient is close 1.0, the appropriateness of questionnaire to measure the variables is better. However, generally, the reliabilities which are less than .60 are considered to poor, and those in the .70 range, are acceptable, and over .80 classify as good (Sekaran,2003).

In order to determine whether there are significant relationships among the independent variables and dependent variable, Pearson Correlation Coefficient analysis were carried out. The scale model suggested by Davies (1997) used to describe the relationship between the independent variables and the dependent variable, are as shown below:

1. 0.7 and above – very strong relationship,

2. 0.50 to 0.69 – strong relationship,

3. 0.30 to 0.49 – moderate relationship,

4. 0.10 to 0.29 – low relationships and

5. 0.01 to 0.09 – very low relationship.

Multiple Regression Analysis it is conducted to exam, which among the five independent variables is the most important variables in explaining organizational performance. According to Sekaran (2005), the correlation coefficient, R, will indicate the strength of relationship between two variables and it will also show how much of the variance in the dependent variable will explain when several independent variables are theorized to simultaneously influence it. Besides that the square of multiple, R^2 is the amount of variance, which will explain the dependent variable by the predictors and this is known as Multiple Regression. In the event of R^2 value, the F statistics and its significant level are known; the result can then be interpreted.

3.12 Validity Test

Test validity concerns the test and assessment procedures used in psychological and educational testing, and the extent to which these measure what they purport to measure. “Validity refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests.”(American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). Although classical models divided the concept into various "validities," such as content validity, criterion validity, Face validity and construct validity, (Guion, 1980), the modern view is that validity is a single unitary construct (Messick, 1995).

3.13 Conclusion

This chapter had discussed the research method proposed for the study. It includes the discussion of research design, type of study, source of data, unit of Analysis, population frame, and sample and sampling techniques, measurement, instrumentation, data collections and administration, and data analysis techniques. The next chapter will discuss the result and finding.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter outlines the results of data analysis obtained from data collected from respondents. The main purpose of this study is examining the relationship between Information Technology (IT) and Competitive Advantage (C.A). This study aims to achieve the research objectives as well as answers the research questions highlighted in chapter one. In addition, this study intends to verify the hypotheses listed in chapter three. This chapter is divided into seven parts, which includes; overview of data collected, profile of respondents, reliability analysis (goodness of measure), descriptive analysis, major findings, summary of the findings, and conclusion.

4.2 Overview of Data Collected

4.2.1 Response Rate

A total of 130 sets of questionnaires were distributed to respondents and fortunately 100% were returned to researcher.

Table 4.1 Response Rate

Response Rate	Total	%
Questionnaires distributed	130	100
Collected questionnaires	130	100

4.3 The Respondents' Background

This section presents the finding about the respondents' profile in terms of their gender, age, occupation, working experience, qualification, and type of organization, type of company, sector and the total of employee in the organization. The data are shown in frequencies and percentages in table 4.2.

Table 4.2 Respondents' Background

Demographic	Categories	Frequency	Percentage (%)
Gender	Male	104	80.0
	Female	26	20.0
Age	20-29	52	40.0
	30-39	63	48.5
	40-49	11	8.5
	50 & above	4	3.1
Occupation			
	C.E.O	1	0.8
	General Manager	8	6.2
	Manager	17	13.1
	Executive	20	15.4
	Other	84	64.6
Working Experience			
	1-5 years	67	51.5
	6-10 years	40	30.8
	11- 15 years	16	12.3
	16 & above years	7	5.4
Qualification			
	High school certificate	14	10.8
	University Degree	54	41.5
	Master	47	36.2
	Other	15	11.5
Type of Organization			
	Public	61	46.9
	Private	69	53.1
Type of Company			
	Private Limited	38	29.2
	Public Limited Company	6	4.6
	Partnership	11	8.5
	Sole Proprietorship	14	10.8
	The Respondent does not	61	46.9

Sector			
	Manufacturing	32	24.6
	Health Care	10	7.7
	Banking	22	16.9
	Education	35	26.9
	Other	31	23.8
Total number of employee in			
	Fewer than 50	27	20.8
	51- 100	21	16.2
	101- 200	21	16.2
	201- 400	24	18.5
	401- 600	6	4.6
	More than 600	31	23.8

The study indicates that 80% of the respondents are male while the remaining of 20% with 20 respondents is female. In term of age, 40% of the respondents whose age is between 20-29 years old, 48.5 % between 30-39 years old, and 8.5 % of the respondents were between 40-49 years old. A few 3 % of them were between 50 years old & above.

For occupation, majority of the respondents C.E.O. 0.8 %, followed general management of occupation is 6.2 %, manager is 13.1 %, executive 15.4 % and other 64.6%.

This study also indicates that majority of the respondents 46.9 % were public organizations, and 53.1 % are private organizations.

For work experience, majority of the respondents 51.5 % had worked between 1-5 years, followed by 6-10 years of experience 30.8 %, 11-15 years 12.3 %, and 16 & above 5.4 %.

This study also indicates that majority of the respondents 41.5 % were university degree 10 % finish high school, 36.2 % finish the master, and some 11.5 % of them have others certificates.

The respondents have been classified into four groups of type of companies: Private Limited Company is 29.2%, Public Limited Company is 4.6%, partnership is 8.5%, sole proprietorship is 10.5% and around 46.9% is not working in private organization.

Table 4.2 indicates that there were almost 24.6% of the respondents who from manufacturing. Around 7.7% of the respondents is who works from health care. About 16.9% of the respondents are who had working from banking. About education is 26.9% and other respondents of 23.8% chose last choice is (other).

In total number of employee in the respondent's organization, 20.8 % has fewer than 50 employees, between 51-100 employees is 16.2 %, between 101- 200 employees is 16.2 %, 18.5 % of the respondents are choosing between 201- 400 employees. A few 4.6 % of them are between 401-600 employees. A round 23.8% of them are more than 600 employees.

4.4. Reliability Analysis

Data for this research were gathered through a set of questionnaires, which forms the primary source of data collection. Thus, it is essential to verify the appropriateness of this instrument used for measurement. According to George & Mallery (2003), reliability is the degree to which measure are free from error and therefore yield consistent results. According to Sekaran (2005), the closer the reliability coefficient gets to 1.0, the better it is, and those values .80 are considered as good. That value in the .70 is considered as acceptable and those reliability values less than .60 is considered to be poor.

Table 4.3 Reliability Analysis

Variables	No. of Items	Items Dropped	Cronbach's Alpha
IT based			
Productivity Efficiency	5	-	0.663
Innovation	5	-	0.733
Customer –Supplier Relationship	5	-	0.633
Database Marketing	5	-	0.705
IT (All IV)	4		0.802
Competitive Advantage	4	-	0.758

Table 4.3 shows the Cronbach's Alpha value for independent variables, Information Technology namely Productivity Efficiency, Innovation, Customer- Supplier Relationship and Database Marketing, and dependent variable, Competitive Advantage. The values range from.0.663 to 0.802 and are all most above 0.70, which is considered as good.

4.5 Validity Test:

There are several validity test can be conducted such as Face and content validity tests. In relation to this study, both tests were used to evaluate the validity on the research instruments. Specifically, experts in the field on information technology reviewed the research instruments.

4.6 Descriptive Analysis

Descriptive analysis such as means and standard deviation were obtained for the interval-scaled independent and dependents variables. The means and standard deviations for all variable used in this study are as recorded in Table 4.4.

Table 4.4: Descriptive Statistics of All Variables in the Study

	N	Minimum	Maximum	Mean	Std. Deviation
productivity efficiency	130	2.40	5.00	4.079	0.543
innovation	130	2.40	5.00	4.079	0.590
customer-supplier relationship	130	2.60	5.00	4.039	0.515
database market	130	2.20	5.00	4.060	0.522
IT (IV)	130	2.85	4.85	4.064	0.431
CA	130	2.50	5.00	4.281	0.546
Valid N (list wise)	130				

All variables were evaluated based on a 5-point scale. Table 4.4, Based on the above table, the mean value of IT based Productivity Efficiency was (4.079); this reveals that the Productivity Efficiency was strongly as the minimum value was (2.40) and the maximum was (5.00). In addition, there are small differences between the values of Productivity Efficiency as indicated by the small value of the standard deviation (.543).

The mean value of IT based Innovation was (4.079) which means that the Innovation was strongly because the minimum value was (2.40) and the maximum was (5.00). Besides, there are small differences between values of Innovation because the standard deviation was low (.590).

The mean value of IT based Customer-Supplier relationship was (4.039).This means that the Customer-Supplier relationship was strongly because the minimum value was (2.60) and the maximum was (5.00), and the differences were small between the values of Customer-Supplier relationship because the standard deviation was very high (.515).

The mean value of IT based Database Marketing was (4.060); this means that Database Marketing was strongly because the minimum value was (2.20) and the maximum was (5.00). There were small differences between the values of Database Marketing because the standard deviation was small (.522).

Finally, the mean value of IT (All IV) was (4.064) which indicates that IT (All IV) was strongly because the minimum value was (2.85) and the maximum was (4.85), and there were small differences between the values of wind because the standard deviation was small (.431).

4.7 Major Findings

The results of Pearson Correlation Analysis and Multiple Regression Analysis are presented in the following section.

4.7.1 Pearson Correlation Coefficient

According to Sekaran (2003), in research project that includes several variables, beyond knowing the means and standard deviation of the dependent and independent variables, the researcher would often like to know how one variable is related to another. Inter correlations analysis indicates the nature, direction and significance of the bivariate relationship of the variables used in the study. Theoretically, there could be a perfect positive correlation between two variables, which is represented by 1.0 (plus 1), or a perfect negative correlation which would -1.0 (minus 1). While correlation could range between -1.0 and +1.0, the researcher need to know if any correlation found between two variables is significant or not (i.e.; if it has occurred solely by chance or if there is a high probability of its actual existence).

Davis (1997) proposed the rules of thumb that need to be used in interpreting the R-value obtained from inter correlation analysis as in Table 4.5 below.

Table 4.5 Interpreting the R-value for Inter correlations

R-value	Relationship
Above 0.70	Very strong relationship
0.50- 0.69	Strong relationship
0.30- 0.49	Moderate relationship

0.10- 0.29	Low relationship
0.01- 0.09	Very low relationship

The correlation matrix between dependent variable and independent variables an exhibited is in Table 4.6 below. The finding from this analysis is then compared against the hypotheses developed in study.

Table 4.6 Pearson Inter-correlation Matrix Result

	productivity efficiency	Innovation	customer-supplier relationship	database market	IT all (IV)	CA
productivity efficiency	1	.420(**)	.463(**)	.452(**)	.735(**)	.356(**)
		.000	.000	.000	.000	.000
		130	130	130	130	130
Innovation		1	.466(**)	.522(**)	.773(**)	.389(**)
			.000	.000	.000	.000
			130	130	130	130
customer-supplier relationship			1	.731(**)	.827(**)	.549(**)
				.000	.000	.000
				130	130	130
database market				1	.844(**)	.639(**)
					.000	.000
					130	130
IT all (IV)					1	.604(**)
						.000
						130
CA						1

** Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 1: There is a relationship between IT based Productivity and Competitive advantage.

The relationship between IT based Productivity Efficiency is tested against Competitive advantage by using Inter-correlation analysis. The results indicate that there is a significant, positive relationship between the two variables ($r=.365$, $n= 130$, $p<.01$). The relationship between the variables is significant with moderate correlation.

Hypothesis 2: There is relationship between IT based innovation and competitive advantage.

The relationship between IT based Innovation is tested against Competitive advantage by using Inter-correlation analysis. The results indicate that there is a significant, positive relationship between the two variables ($r=.389$, $n=130$, $p<.01$). The relationship between the variables is significant with moderate correlation.

Hypothesis 3: There is a relationship between IT based customer-supplier relationship and competitive advantage.

Inter-correlation analysis carried out to test the relationship between IT based customer-supplier relationship and competitive advantage shows a significant positive relationship ($r=.549$, $n=130$, $p<.01$) between them. The relationship between the variables is significant with strong correlation.

Hypothesis 4: There is a relationship between IT based database marketing and competitive advantage.

The relationship between IT based database marketing and competitive advantage has been using inter-correlation analysis. The results of the inter-correlation analysis

indicate that there is a strong significant relationship (r =.639, n=130, p>0.01) between the two variables.

Hypothesis 5: There is a relationship between There is a relationship between IT and competitive advantage.

The relationship between IT based Productivity Efficiency is tested against Competitive advantage by using Inter-correlation analysis. The results indicate that there is a significant, positive relationship between the two variables (r=.604, n=130, p<.01). The relationship between the variables is significant with strong correlation.

4.7.2 Multiple Regression Analysis (MRA)

From the table below, it shows sufficient explanation or the variance. The Multiple Regression Analysis (MRA) treated the dimension of dependent variables and independent variables separately. This is a way to recognize whether there is significant relationship between independent variables and dependent variables or not. The model sufficiently explained the variance or coefficient of determination or the R Squared in the effect of control variables relations. Four independent variables that are recognized in this research are productivity efficiency, innovation, customer-supplier relationship and database marketing.

Hypothesis 1: There is a relationship between IT based Productivity and Competitive advantage.

Table 4.7 & Table 4.8 indicate the two variables have positive and strong relationship; R^2 = 0.127, Adj.R^2 = 0.12, and F (1,128) = 18.614, P< 0.01. This R^2 means that 12.7 % of the variance in the Competitive Advantage (C.A) increase is explained by IT

based of productivity efficiency. Approximately 12.7% of the variance of the competitive advantage was accounted for its linear relationship with IT of productivity efficiency. Thus, H1 is accepted.

Table (4.7) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.356(a)	.127	.120	.51245	18.614

a Predictors: (Constant), PRODUCTIVITY EFFICIENCY

Table (4.8) Measuring the degree of influence of Competitive Advantage (C.A) and IT based of productivity efficiency

Model		Unstandardized Coefficients		Standardized Coefficients	t	*p*
1		**B**	**Std. Error**	**Beta**		
Out Source: C.A	F (1,128)					
Predictor: IT based of productivity efficiency	18.614	.358	.083	.356	4.314	.000

a Dependent Variable: CA
Note: R^2 = 0.127, Adj. R^2 = 0.120, ** p<01

Hypothesis 2: There is relationship between IT based innovation and competitive advantage.

Table 4.9 & Table 4.10 indicates the two variables have positive and strong relationship; R^2 = 0.151, Adj.R^2 = 0.145, and F (1,128) = 22.852, P< 0.01. This R^2 means that 15.1 % of the variance in the Competitive Advantage (C.A) increase is explained by IT of productivity efficiency. Approximately 15.1% of the variance of the competitive advantage was accounted for its linear relationship with IT of productivity efficiency. Thus, H2 is accepted.

Table (4.9) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
2	.389(a)	.151	.145	.50520	22.852

a Predictors: (Constant), INNOVATION

Table (4.10) Measuring the degree of influence of Competitive Advantage (C.A) and IT based of Innovation

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	***p***
2		**B**	**Std. Error**	**Beta**		
Out Source: C.A	F(1,128)					
Predictor: IT based of Innovation	22.852	.360	.075	.389	4.780	.000

a Dependent Variable: CA
Note: R^2 = 0.151, Adj. R^2 = 0.145, ** p<01

Hypothesis 3: There is a relationship between IT based customer-supplier relationship and competitive advantage.

Table 4.11 & Table 4.12 indicate the two variables have positive and strong relationship; R^2 = 0.302, Adj.R^2 = 0.296, and F (1,128) = 55.308, P< 0.01. This R^2 means that 30.2 % of the variance in the Competitive Advantage (C.A) increase is explained by IT of productivity efficiency. Approximately 30.2 % of the variance of the competitive advantage was accounted for its linear relationship with IT of productivity efficiency. Thus, H3 is accepted.

Table (4.11) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
3	.549(a)	.302	.296	.45830	55.308

a Predictors: (Constant), Customer-Supplier Relationship

Table (4.12) Measuring the degree of influence of Competitive Advantage (C.A) and IT based of Customer-Supplier Relationship

Model		Unstandardized Coefficients		Standardized Coefficients	t	*p*
3		**B**	**Std. Error**	**Beta**		
Out Source C.A	F(1,128)					
Predictor: IT based of Customer-Supplier Relationship	55.308	.360	.075	.389	4.780	.000

a Dependent Variable: CA
Note: R^2 = 0.302, Adj. R^2 = 0.296, ** p<01

Hypothesis 4: There is a relationship between IT based database marketing and competitive advantage.

Table 4.13 & Table 4.14 indicates the two variables have positive and strong relationship; R^2 = 0.408, Adj.R^2 = 0.404, and F = 88.273, P< 0.01. This R^2 means that 40.8 % of the variance in the Competitive Advantage (C.A) increase is explained by IT of productivity efficiency. Approximately 40.8 % of the variance of the competitive advantage was accounted for its linear relationship with IT of productivity efficiency. Thus, H4 is accepted.

Table (4.13) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
4	.639(a)	.408	.404	.42193	88.273

a Predictors: (Constant), Database Marketing

Table (4.14) Measuring the degree of influence of Competitive Advantage (C.A) and IT based of Database Marketing

Model		Unstandardized Coefficients		Standardized Coefficients	t	*p*
4		**B**	**Std. Error**	**Beta**		
Out Source: C.A	F(1,128)					
Predictor: IT based of Database Marketing	88.273	.668	.071	.639	9.395	.000

a Dependent Variable: CA
Note: R^2 = 0. 408, Adj. R^2 = 0.404, ** p<01

Hypothesis 5: There is a relationship between There is a relationship between IT and competitive advantage.

Table 4.15 & Table 4.16 indicates the two variables have positive and strong relationship; R^2 = 0.365, Adj.R^2 = 0.360, and F (1,128) = 73.459, P< 0.000. This R^2 means that 36.5 % of the variance in the Competitive Advantage (C.A) increase is explained by IT of productivity efficiency. Approximately 36.5 % of the variance of the competitive advantage was accounted for its linear relationship with IT of productivity efficiency. Thus, H5 is accepted.

Table (4.15) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
5	.604(a)	.365	.360	.43717	73.459

a Predictors: (Constant), All (IV)

Table (4.16) Measuring the degree of influence of Competitive Advantage (C.A) and IT all IV

Model		Unstandardized Coefficients		Standardized Coefficients	t	*p*
5		**B**	**Std. Error**	**Beta**		
Out Source: C.A	F(1,128)					
Predictor: IT all IV	73.459	.766	.089	.604	8.571	.000

a Dependent Variable: CA
Note: R^2 = 0. 365, Adj. R^2 = 0.360, ** p<01

4.8 Summary of Findings

Table 4.9 below shows the summary of hypotheses.

Table 4.17 Summary of hypotheses

	The Hypotheses	Decision
H1	There is relationship between **IT based productivity efficiency and competitive advantage.**	**Accepted**
H2	There is relationship between **IT based innovation and competitive advantage.**	**Accepted**
H3	There is relationship between **IT based customer-supplier relationship and competitive advantage.**	**Accepted**
H4	There is relationship between **IT based database marketing and competitive advantage.**	**Accepted**
H5	There is relationship between **IT and competitive advantage.**	**Accepted**

4.9 Conclusion

This chapter had presented the results of the statistical analyses of the hypotheses, and the finding collected from the respondents. The correlation analyses were used to test for the relationships among the variables of interest provided in the study. From the above findings, correlation analysis concludes that all four independents variables are significantly related to competitive advantage. However, the results from multiple regression analysis (MRA) indicated that only productivity efficiency, innovation, customer- supplier relationship and database marketing are significantly related to competitive advantage. The next chapter will discuss the recommendation and conclusion for the study.

CHAPTER FIVE

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the finding of the study will be further discussed and recommendations for future research are suggested.

5.2 Discussion

The purpose of this study is to explain the influence of Information Technology to build competitive advantage, by using four independents variables namely productivity efficiency, innovation, customer- supplier relationship and database marketing relations with the dependents variable competitive advantage.

In the following discussion, results of each objective are reviewed and compared with previous literature.

Objective1: To examining, the relationship between IT based productivity efficiency to build competitive advantage

The study shows that there is a moderate positive relationship between IT based productivity efficiency and a competitive advantage, which also indicated productivity efficiency, is significant to build a competitive advantage, IT based productivity efficiency is considered as an important factor to improve the efficiency.

Productivity efficiency plays an important role in this respect. The higher productivity is, the lower costs are in producing goods and services, the lower prices can be (Md. Entazul Huque & Md. Anwarul Islam, 2007). Several studies both at the industry-level and at the firm level have contributed differing understandings of this phenomenon. Of late, however, firm-level studies, primarily in the manufacturing sector, have shown that there are significant positive contributions from IT investments toward productivity efficiency to establish competitive advantage (Baba & Patrick, 1997).

Objective2: To identify the relationship between IT based innovation and competitive advantage

It showed that effective IT based on innovation would lead the organizations to get the competitive advantage. Also, shows that there is a moderate positive relationship between IT based innovation and a competitive advantage, that lead to increase the quality of the product, which improve the brand of organization.

Companies who adopt innovative IT systems that are likely to serve as a competitive advantage or that are likely to create a radical change in business practices are more likely to be viewed favorably by the marketplace and consequently experience positive cash flows (Oh & Pinsonneault, 2007).

Objective3: To describe the relationship between IT based customer-supplier relationship and competitive advantage

In addition, this study found is a strongly positive relationship between IT based customer-supplier relationship and competitive advantage. Concerning IT based customer-supplier relationship; this study is in line with many previous researchers.

According to Buxmann and Gebauer (1999), information technology is one of the key success factors in any organization. Organizations are facing fast-paced changes of their business environment. Drucker (1992) says, "Change is the only constant in an organization's life." This change relates to evolving customer needs, evolving technologies for meeting customer needs, and evolving managerial practices (Porter, 1997). Organizations will be more successful if they focus on obtaining and maintaining inter-organizational relationships with a specific group of customers (Ford, 1997; Porter, 1997; Wells, Fuerst & Choobineh, 1999). It is within these relationships that value is created for both the customer and the supplier (Walter, Ritter and Gemünden, 1999).

Objective4: To show the relationship between IT based database marketing and competitive advantage

In addition, this study found is a very strongly positive relationship between IT based database marketing and competitive advantage, almost all industries that sell products and services need to advertise and promote their products and services. Now days, a huge amount of information on customers is kept in database. Thus, data mining can be very effective for direct marketing (Ling & Li, 1999). Data mining applications automate the process of searching the huge of data to find patterns that are good

predictors of purchasing behaviors. After mining the data, marketers must feed the results into campaign management software that, as the name implies, manages the campaign directed at the defined market segments. Data mining, an integration of machine learning, computer visualization, and statistics, has been widely used in direct marketing to target customers (Ling & Li, 1999).

Objective5: To look into the relationship between IT (All IV) and competitive advantage

This study found is a very strongly positive relationship between IT based database marketing and competitive advantage. In terms of IT and a competitive advantage, this finding is consistent with previous researchers such as (Bidgoli, 2011) Information technology can help bottom-line and top-line strategies. The focus of a bottom-line strategy is to improve efficiency by reducing overall costs. A top-line strategy focuses on generating new revenues by offering new products and services to customers or increasing revenues by selling existing products and services to new customers. For example, e-commerce businesses are adapting business models to reduce distribution costs dramatically.

Douglas & William (2005) specifically addressed the IT base line key success factors, in stating, “IT may provide limited advantages to the innovator before being readily copied by competitors”. In the arena of IT applications, as with other goods or set of services that are universally available by a large number of competing firms, the opportunity of that good or service alone to be a source of competitive advantage for a single firm is very low.

5.3 Conclusion

The five objectives in this study have been achieved whereby the results had shown that information technology including productivity efficiency; innovation, customer-supplier relationship and database marketing are leading to build competitive advantage. Information Technology explained the variance to build competitive advantage by 36.5% (R Square) which indicates that the model is satisfactorily moderate. Among all the four variables of IT based database marketing, customer-supplier relationship are found to be the strong independent variables that influencing to build a competitive advantage in the organization, Therefore, organization should be focus on enhancing its database marketing, customer–supplier relationship activities as it brings a great impact in enhancing the competitive advantage.

5.4 Limitations of the Study

This study is subject to several limitations. First, the findings are limited to the specific sample. The sample is drawn partly from 130 Yemeni individuals who most of them live in the southern region. Thus, generalizing the results may not give the same results reached by this study despite the fact that this study tries to select sample from different southern and northern individuals who live in the southern region.

Future study might include employees from other regions in Yemen, especially those regions with a high number of employees, including cities Sana'a, Aden, Taiz and Hudidah. A comparative study between Yemen and other countries could provide a trend and more explanation of employees who used Information Technology to gain a competitive advantage. It is a worthwhile exercise to find out whether location is a significant indicator for using information technology.

Future research could also include all types of employees. It could be interesting to examine whether there is a significant difference between those who are aware of using information technology as an advantage and those who are not. Furthermore, the results of this study are limited to the time in which the questionnaires are distributed, 2011. Importantly, the level of IT adoption in companies, especially the public sector, is associated with the economic, political, and social conditions of the country. Therefore, the change in these conditions might cause a change in the degree of IT developments. Under this circumstance, generalizing the results of this study to future research might result in different findings.

5.5 Recommendation for Future Research

Despite the above limitations, this study makes a significant contribution about understanding and implementation IT in the sectors to gain a competitive advantage. Future research may focus on a specific sector sample in companies to statistically validate the results of this study that had provided only a small portion of contribution regarding achieving organizations' competitive advantage. Hence, it would be beneficial for future research to consider the following suggestion:

- To expand the study into specific industries to enhance the consistency of results.
- To include other of Information technology components such as resources and IT-Business Alignment Process so that this will increase the accuracy of understanding the drivers that could affect the achieving a competitive advantage.
- Should consider information technology adoption from a different perspective, to investigate how using information technology applications in

workflow and project management, communication and coordination and knowledge management would affect service innovation practices and performance in different service design stages (e.g., idea generation, service specification and modification and new service launch. Also, a cross-industry comparison study of information technology adoption for service innovation practices to examine whether there are different influences for different industries or service sectors would also greatly contribute to the field.

- To propose the complementarity of resources and IT capabilities as a source of business value.

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APPENDIX A

UNIVERSTIY UTARA MALAYSIA
COLLEGE OF BUSINESS

Date: _ _ /_ _ / _ _ _ _

Dear Sir/Madam

Survey on strategic role of information technology towards achieving competitive advantage: study in Yemen (southern region)

I am currently pursuing a master degree in Msc. Management at College Of Business, Universiti Utara Malaysia. As part of my study, I am conducting the above-mentioned survey to investigate the strategic role of information technology in helping firms to compete successfully.

In this regard, I would like to invite you to be a respondent to this survey. Your contribution will provide useful inputs, as it would help to achieve the objective of this study, i.e. to examine the effectiveness of Information Technology towards achieving better Competitive Advantage. Please be assured that all information provided will be kept strictly confidential, as findings will be presented on an aggregated basis to be used solely for academic purpose.

In anticipation of your positive response, I would appreciate very much your kind assistance in completing and returning the attached questionnaire within a week or by _ _ / _ _ /_ _ _ _ .

Any question or suggestions please call or email HAMAD SALMEN SAEED, 017-6571987, hamed_salmeen@yahoo.com.

Thank you very much for your time and cooperation.

Yours faithfully,

Hamad Salmen Saeed
Graduate College of Business
Universiti Utara Malaysia
06010 Sintok, Kedah
Malaysia

Dr. Haim Hilman Bin Abdullah
Supervisor
Universiti Utara Malaysia
06010 Sintok, Kedah
Malaysia

Part I: Respondent's Background (RB)

Kindly, tick (□) whichever particular is applicable

1 .Gender: A. Male ☐ B. Female ☐

2. Age: A. (20 - 29) ☐ B. (30 - 39) ☐

C. (40 - 49) ☐ D. (50 & above) ☐

3. Occupation:

A. C.E.O ☐ B. General Manager ☐ C. Manger ☐

D. Executive ☐ E. Other _____ (Please Specify).

4. Working experience:

A. (1-5) years ☐ B. (6-10) years ☐

C. (11-15) years ☐ D. (16 & above) years ☐

5. Qualification:

A. High School Certificate ☐ B. University degree ☐

C. Masters ☐ D. Others ☐ _____ (Please Specify)

6. Type of Organization:

A. Public ☐

B. Private ☐

(If you are working in private based organization, please answer **RB7**.)

7. Type of Company:

A. Private Limited Company ☐

B. Public Limited Company (PLC) ☐

C. Partnership ☐

D. Sole Proprietorship ☐

8. Sector:

A. Manufacturing ☐ B. Health Care ☐

C. Banking ☐ D. Education ☐

E. Other _____ (Please Specify)

9. The total number of employee in the organization:

A. Fewer than 50 ☐ B. 51-100 ☐

C. 101- 200 ☐ D. 201- 400 ☐

E. 401- 600 ☐ F. More than 600 ☐

Part II: Respondent's Views on Information Technology to build Competitive Advantage

The legend for this section is follows:

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

For each of the following statement, please circle the relevant number on its right-hand side which represents your choice based on the above legend:

A- Information Technology (IT) Based Productivity Efficiency

1. Improve distribution/logistic and inventory visibility and effectiveness, thereby reducing costs	**1**	**2**	**3**	**4**	**5**
2. Reduce production costs	**1**	**2**	**3**	**4**	**5**
3. Create shorter time to market and improve production effectively.	**1**	**2**	**3**	**4**	**5**
4. Rationalize the use of materials (inputs)	**1**	**2**	**3**	**4**	**5**
5. Develop the technical capacity	**1**	**2**	**3**	**4**	**5**

B- Information Technology (IT) Based Innovation

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. Enable innovations varies dramatically by industry	**1**	**2**	**3**	**4**	**5**
2. Drive innovation and productivity	**1**	**2**	**3**	**4**	**5**
3. Stimulate the continuity of organizations	**1**	**2**	**3**	**4**	**5**
4. Strengthen relationship between suppliers and customers on innovation activity	**1**	**2**	**3**	**4**	**5**
5. Increase profits and reduce costs.	**1**	**2**	**3**	**4**	**5**

C- Information Technology (IT) Based Provides Customer-supplier relationship

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. Improve the relationship between customer-supplier towards producing better quality product or services	**1**	**2**	**3**	**4**	**5**
2. Provide the supplier with clear and sufficient information so that supplier know precisely what to produce	**1**	**2**	**3**	**4**	**5**
3. Provide the quality that will satisfy the customer and submitting necessary data upon customer's request	**1**	**2**	**3**	**4**	**5**
4. Help to exchange information which sometimes-using multifunctional teams as to improve the product or service quality.	**1**	**2**	**3**	**4**	**5**
5. Enable to evaluate the quality of the product or service	**1**	**2**	**3**	**4**	**5**

D- Information Technology (IT) Based Database Marketing

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. Enable to strengthen customer- supplier relationships	**1**	**2**	**3**	**4**	**5**
2. Provide useful information about customers of company.	**1**	**2**	**3**	**4**	**5**
3. Market product, which could help to obtain bigger market share.	**1**	**2**	**3**	**4**	**5**
4. Identify new product, market, and business opportunities.	**1**	**2**	**3**	**4**	**5**
5. Reveal contact points to be used in direct marketing programs	**1**	**2**	**3**	**4**	**5**

E- Competitive Advantage:

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. Information Technology improves efficiency.	**1**	**2**	**3**	**4**	**5**
2. Information Technology creates new business opportunities	**1**	**2**	**3**	**4**	**5**
3. Information Technology helps company to retain customers.	**1**	**2**	**3**	**4**	**5**
4. Information Technology helps to increase the market share.	**1**	**2**	**3**	**4**	**5**

Thank you so much for taking part in this survey

Moreover, Best regards

Hamad Salmen Saeed BanAlzwaa
Masters of Science Management
Graduate School of Business

Universiti Utara Malaysia (UUM)

06010 Sintok, Kedah
Malaysia

APPENDIX B

RESPONDENT BACKGROUND

GENDER		Frequency	Percent
Valid	male	104	80.0
	female	26	20.0
	Total	130	100.0

AGE		Frequency	Percent
Valid	20-29	52	40.0
	30-39	63	48.5
	40-49	11	8.5
	50 & above	4	3.1
	Total	130	100.0

OCCUPATION		Frequency	Percent
Valid	C.E.O	1	.8
	General Manager	8	6.2
	Manager	17	13.1
	Executive	20	15.4
	Other	84	64.6
	Total	130	100.0

WORKING EXPERIENCE		Frequency	Percent
Valid	1-5 years	67	51.5
	6-10 years	40	30.8
	11- 15 years	16	12.3
	16 & above years	7	5.4
	Total	130	100.0

Qualification		Frequency	Percent
Valid	High school certificate	14	10.8
	University Degree	54	41.5
	Master	47	36.2
	Other	15	11.5
	Total	130	100.0

Type of Organization		Frequency	Percent
Valid	Public	61	46.9
	Private	69	53.1
	Total	130	100.0

COMPANY		Frequency	Percent
Valid	Private Limited Company	38	29.2
	Public Limited Company	6	4.6
	Partnership	11	8.5
	Sole Proprietorship	14	10.8
	Total	69	53.1
Missing	System	61	46.9
Total		130	100.0

SECTOR		Frequency	Percent
Valid	Manufacturing	32	24.6
	Health Care	10	7.7
	Banking	22	16.9
	Education	35	26.9
	Other	31	23.8
	Total	130	100.0

EMPLOYEE		Frequency	Percent
Valid	Fewer than 50	27	20.8
	51- 100	21	16.2
	101- 200	21	16.2
	201- 400	24	18.5
	401- 600	6	4.6
	More than 600	31	23.8
	Total	130	100.0

Demographic	**Categories**	**Frequency**	**Percentage(%)**
Gender	male	104	80.0
	female	26	20.0
Age	20-29	52	40.0
	30-39	63	48.5
	40-49	11	8.5
	50 & above	4	3.1
Occupation			
	C.E.O	1	0.8
	General Manager	8	6.2
	Manager	17	13.1
	Executive	20	15.4
	Other	84	64.6
Working Experience			
	1-5 years	67	51.5
	6-10 years	40	30.8
	11- 15 years	16	12.3
	16 & above years	7	5.4
Qualification			

	High school certificate	14	10.8
	University Degree	54	41.5
	Master	47	36.2
	Other	15	11.5
Type of Organization			
	Public	61	46.9
	Private	69	53.1
Type of Company			
	Private Limited Company	38	29.2
	Public Limited Company	6	4.6
	Partnership	11	8.5
	Sole Proprietorship	14	10.8
	The Respondent does not work in Private company	61	46.9
Sector			
	Manufacturing	32	24.6
	Health Care	10	7.7
	Banking	22	16.9
	Education	35	26.9
	Other	31	23.8
Total number of employee in the organization			
	Fewer than 50	27	20.8
	51- 100	21	16.2
	101- 200	21	16.2
	201- 400	24	18.5
	401- 600	6	4.6
	More than 600	31	23.8

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

1) Reliability Of Productivity Efficiency

		Mean	Std Dev	Cases
1.	A1	4.0308	.8254	130.0
2.	A2	4.0154	.8978	130.0
3.	A3	4.0462	.8340	130.0
4.	A4	4.1846	.7448	130.0
5.	A5	4.1154	.8503	130.0

N of Cases = 130.0

Statistics for	Mean	Variance	Std. Dev.	N of Variables
Scale	20.3923	7.3720	2.7151	5

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.0785	4.0154	4.1846	.1692	1.0421	.0050

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
A1	16.3615	4.9613	.4704	.3244	.5864
A2	16.3769	4.6553	.4932	.2753	.5730
A3	16.3462	4.7862	.5180	.2824	.5631
A4	16.2077	6.0573	.2073	.1328	.6937
A5	16.2769	5.1165	.3984	.1840	.6200

Reliability Coefficients 5 items

Alpha = .6632 Standardized item alpha = .6570

2) R E L I A B I L I T Y OF INNOVATION

		Mean	Std Dev	Cases
1.	B1	3.8462	.8757	130.0
2.	B2	4.1077	.8376	130.0
3.	B3	4.0231	.8757	130.0
4.	B4	4.1462	.7687	130.0
5.	B5	4.2692	.8786	130.0

N of Cases = 130.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	20.3923	8.7054	2.9505	5

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.0785	3.8462	4.2692	0.4231	1.1100	.0247

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
B1	16.5462	5.7227	.5289	.2965	.6737
B2	16.2846	6.0191	.4829	.2685	.6917
B3	16.3692	6.0021	.4513	.2260	.7044
B4	16.2462	6.0320	.5515	.3268	.6686
B5	16.1231	5.9382	.4660	.2302	.6988

Reliability Coefficients 5 items

Alpha = .7334 Standardized item alpha = .7357

3) R E L I A B I L I T Y A N A L Y S I S OF CUSTOMER – SUPPLIER RELATIONSHIP

		Mean	Std Dev	Cases
1.	C1	4.0000	.6589	130.0
2.	C2	4.0615	.8514	130.0
3.	C3	4.0000	.6820	130.0
4.	C4	4.0000	.8536	130.0
5.	C5	4.1308	.8751	130.0

N of Cases = 130.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	20.1923	6.6371	2.5763	5

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.0385	4.0000	4.1308	.1308	1.0327	.0034

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
C1	16.1923	4.8697	.4585	.2726	.5983
C2	16.1308	4.2231	.4827	.2769	.5776
C3	16.1923	5.3968	.2446	.0637	.6778
C4	16.1923	3.9240	.5868	.4098	.5213
C5	16.0615	4.6163	.3338	.1199	.6538

Reliability Coefficients 5 items

Alpha = .6627 Standardized item alpha = .6611

4) R E L I A B I L I T Y A N A L Y S I S OF DATABASE MARKETING

		Mean	Std Dev	Cases
1.	D1	3.9769	.8488	130.0
2.	D2	4.0692	.7280	130.0
3.	D3	4.0308	.7568	130.0
4.	D4	4.1846	.7952	130.0
5.	D5	4.0385	.7196	130.0

N of Cases = 130.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	20.3000	6.8163	2.6108	5

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.0600	3.9769	4.1846	.2077	1.0522	.0060

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
D1	16.3231	4.4840	.4484	.2332	.6634
D2	16.2308	4.9231	.4219	.2233	.6716
D3	16.2692	4.6324	.4946	.3152	.6424
D4	16.1154	4.4439	.5190	.3238	.6309
D5	16.2615	4.9388	.4251	.1983	.6704

Reliability Coefficients 5 items

Alpha = .7047 Standardized item alpha = .7051

5) R E L I A B I L I T Y A N A L Y S I S OF ALL IT (IV)

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

1. PRODUCT
2. INNOVATE
3. CUTOMER
4. MARKET

		Mean	Std Dev	Cases
1.	PRODUCT	4.0785	.5430	130.0
2.	INNOVATE	4.0785	.5901	130.0
3.	CUTOMER	4.0385	.5153	130.0
4.	MARKET	4.0600	.5222	130.0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	16.2554	2.9650	1.7219	4

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected I tem-Total Correlation	Alpha if Item Deleted
PRODUCT	12.1769	1.8850	.5265	.7947
INNOVATE	12.1769	1.7424	.5612	.7829
CUTOMER	12.2169	1.7631	.6843	.7209
MARKET	12.1954	1.7206	.7094	.7079

Reliability Coefficients

N of Cases = 130.0 N of Items = 4

Alpha = .8021

6) R E L I A B I L I T Y A N A L Y S I S OF COMPETITIVE ADVANTAGE

		Mean	Std Dev	Cases
1.	E1	4.2385	.6911	130.0
2.	E2	4.3385	.7213	130.0
3.	E3	4.2385	.7239	130.0
4.	E4	4.3077	.7350	130.0

N of Cases = 130.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	17.1231	4.7754	2.1853	4

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	4.2808	4.2385	4.3385	.1000	1.0236	.0025

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
E1	12.8846	3.1261	.4795	.2420	.7397
E2	12.7846	2.9455	.5290	.2937	.7148
E3	12.8846	2.7075	.6480	.4209	.6479
E4	12.8154	2.8339	.5663	.3336	.6944

Reliability Coefficients 4 items

Alpha = .7576 Standardized item alpha = .7569

DESCRIPTIVE STATISTICS

	N	Minimum	Maximum	Mean	Std. Deviation
productivity efficiency	130	2.40	5.00	4.0785	.54303
innovation	130	2.40	5.00	4.0785	.59010
customer-supplier relationship	130	2.60	5.00	4.0385	.51525
database market	130	2.20	5.00	4.0600	.52216
IT all (IV)	130	2.85	4.85	4.0638	.43048
CA	130	2.50	5.00	4.2808	.54632
Valid N (list wise)	130				

CORRELATIONS

		productivity efficiency	Innovation	customer-supplier relationship	database market	IT all (IV)	CA
productivity efficiency	Pearson Correlation	1	.420(**)	.463(**)	.452(**)	.735(**)	.356(**)
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000
	N		130	130	130	130	130
Innovation	Pearson Correlation		1	.466(**)	.522(**)	.773(**)	.389(**)
	Sig. (2-tailed)			.000	.000	.000	.000
	N			130	130	130	130
customer- supplier relationship	Pearson Correlation			1	.731(**)	.827(**)	.549(**)
	Sig. (2-tailed)				.000	.000	.000
	N				130	130	130
database market	Pearson Correlation				1	.844(**)	.639(**)
	Sig. (2-tailed)					.000	.000
	N					130	130
IT all (IV)	Pearson Correlation					1	.604(**)
	Sig. (2-tailed)						.000
	N						130
CA	Pearson Correlation						1
	Sig. (2-tailed)						
	N						

** Correlation is significant at the 0.01 level (2-tailed).

REGRESSION

1- IT of productivity efficiency

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	IT of productivity efficiency (a)	.	Enter

a All requested variables entered.
b Dependent Variable: CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.356(a)	.127	.120	.51245

a Predictors: (Constant), PRODUCT

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.888	1	4.888	18.614	.000(a)
	Residual	33.614	128	.263		
	Total	38.502	129			

a Predictors: (Constant), PRODUCT
b Dependent Variable: CA

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.819	.342		8.246	.000
IT of productivity efficiency		.358	.083	.356	4.314	.000

a Dependent Variable: CA

2- **IT of Innovation**

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	INNOVATE(a)	.	Enter

a All requested variables entered.
b Dependent Variable: CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.389(a)	.151	.145	.50520

a Predictors: (Constant), INNOVATE

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.832	1	5.832	22.852	.000(a)
	Residual	32.669	128	.255		
	Total	38.502	129			

a Predictors: (Constant), INNOVATE
b Dependent Variable: CA

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.811	.311		9.051	.000
	INNOVATE	.360	.075	.389	4.780	.000

a Dependent Variable: CA

3- **IT based of Customer-Supplier Relationship**

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	IT based of Customer-Supplier Relationship (a)	.	Enter

a All requested variables entered.
b Dependent Variable: CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.549(a)	.302	.296	.45830

a Predictors: (Constant), CUTOMER

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.617	1	11.617	55.308	.000(a)
	Residual	26.885	128	.210		
	Total	38.502	129			

a Predictors: (Constant), CUTOMER
b Dependent Variable: CA

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.929	.319		6.050	.000
	CUTOMER	.582	.078	.549	7.437	.000

a Dependent Variable: CA

4- IT based of Database Marketing

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	MARKET(a)	.	Enter

a All requested variables entered.
b Dependent Variable: CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.639(a)	.408	.404	.42193

a Predictors: (Constant), MARKET

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.715	1	15.715	88.273	.000(a)
	Residual	22.787	128	.178		
	Total	38.502	129			

a Predictors: (Constant), MARKET
b Dependent Variable: CA

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.567	.291		5.381	.000
	MARKET	.668	.071	.639	9.395	.000

a Dependent Variable: CA

5-IT based of All (IV)

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	IV(a)	.	Enter

a All requested variables entered.
b Dependent Variable: CA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.604(a)	.365	.360	.43717

a Predictors: (Constant), IV

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.039	1	14.039	73.459	.000(a)
	Residual	24.463	128	.191		
	Total	38.502	129			

a Predictors: (Constant), IV
b Dependent Variable: CA

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.166	.365		3.192	.002
	IV	.766	.089	.604	8.571	.000

a Dependent Variable: CA