

THE USES OF INFORMATION TECHNOLOGY
FOR COMPETITIVE ADVANTAGE
BY PROFESSIONAL AUDIT FIRMS

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ABSTRACT

As the pace of competition intensifies in the late 1980's the use of information systems as competitive weapons is accelerating. The use of Information Technology as a competitive weapon has become a popular cliché; but there is still a marked lack of understanding of the issues that determine the influence of information on corporate strategy.

This paper begins with a discussion of the importance of the link between information technology and corporate strategy. It covers this interface in historical perspective and then discusses in detail the major frameworks developed by various writers which enable management to identify and evaluate information technology opportunities into their corporate situation. It continues with a discussion of the use of information technology as currently being achieved in the accounting profession as described in the current literature.

Through the use of examples it is then shown that information technology can be used by professional audit firms to gain a strategic advantage over their competitors, both within and beyond the profession. The research report reaches the conclusion that professional audit firms that choose to ignore the potential of information technology do so realising they may never be competitive again.

DECLARATION

I declare that this research report is my own, original work.
It is being submitted for the degree of Master of Education
to the University of the Witwatersrand. It has not been
submitted before for any degree or examination to any other
university.

Howard Cheliff
Johannesburg
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PREFACE

"The philosophy of the divine right of kings died hundreds of years ago, but not, it seems, the divine right of inherited markets. Some people still believe there's a divine dispensation that their markets are theirs - and no one else's - now and forevermore. It is an old dream that dies hard, yet no businessman in a free society can control a market when the customers decide to go elsewhere. All the king's horses and all the king's men are helpless in the face of a better product.

Our commercial history is filled with examples of companies that failed to change with a changing world, and became tombstones in the corporate graveyard."

(Walter B. Wriston, Chairman of Citicorp, 1981, in Naisbitt, J. 1982.)

Traditionally professional audit firms have refrained from open competition. However, in today's competitive market place this is no longer feasible and open competition is rife.

Although many articles have appeared in the Management Information Systems literature on the use of Information Technology as a competitive weapon, no information is available specifically addressing the uses of Information Technology for competitive advantage by the professional audit firm. This paper is aimed at filling this gap in the literature.

Using the theoretical frameworks presented in the Management Information Systems literature as a starting point, a generalised framework is developed which is applied as a basis for classifying existing and future uses of Information Technology for competitive advantage by professional audit firms.

The scope of the technical report is not limited to the area of audit, but extends to all possible areas a professional audit firm may become involved in. The purpose is not to provide a comprehensive list of all possible uses of Information Technology as a competitive weapon but, through the use of examples in each area of strategic importance, to show that Information Technology can be used by the professional audit firm to gain a strategic advantage over their competitors.

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1. INTRODUCTION

During the last decade, strategy has become a business buzzword. Top executives ponder strategic objectives and missions. Managers down the line develop marketing and product strategies. Repeatedly companies that are "strategically managed" have been winning market share from more traditionally managed companies.

Kaufmann (1966) urged management to

"think beyond their own organisational boundaries to the possibilities of extra-corporate systems."

Since Kaufmann's article appeared, developments in computer technology have made feasible many new applications of strategic importance.

"The benefits of the computer will not be seen if we simply use them - as we are doing - to save us from the inefficiency of our current way of doing things. The advantage of the computer is that it allows us to develop totally different systems of organisation."

(Edward de Bono, 1980, in Gerstein and Reisman, 1982.)

Companies that have a strategic planning process formulate competitive strategy in two steps. According to Canning (1984,a), the first step involves using some form of framework (e.g., Porter's industry competitive analysis) to describe their competitive environment.

During the next step management consider the resources available to derive and implement corporate strategy. Traditionally companies have not explicitly considered the potential uses of Information Technology as part of this process.

In 1980 Kantrow wrote :

"the past decade reveals managers' growing awareness of the need to incorporate technological issues within strategic decision making. They have increasingly discovered that technology and strategy are inseparable."

Chandler (1962) observed that the organisation structure of a corporation followed the strategy the corporation was following. However, beyond the use of Information Technology to support the existing business strategy lies the opportunity to utilise Information Technology to create new business opportunities.

This double linkage of Information Technology both supporting business strategy and simultaneously creating new strategic opportunities provides corporations with a powerful competitive weapon which they can utilise in their quest for maximising profitability.

He identified four driving forces which affect organisational strategies ie. personnel, processes, structure and technology. Either the organisation's external environment or technology can put the other elements of an organisation's processes into motion.

He noted that specific individuals often played unique and crucial roles in developing the congruence between an organisation's evolving strategy and its organisation structure. Many of the structural changes and strategy shifts noted by Chandler were necessitated by changes in technology.

Technology has become such a powerful force that it is now driving the other three elements in Chandler's model. However, it is the impact of technology on an organisations strategy that has the most critical potential. During the last five years the large accounting practices have become more business oriented. From their solid audit base they are diversifying, becoming competitive members of the fastest growing sector of the economy - the services sector.

Traditionally, professional auditing practices have remained from open competition with one another. However, in today's competitive environment, due to factors ranging from fee pressure to mere survival, auditing firms are beginning to compete more aggressively. This has lead to an increase in the use of computer technology both as a time and cost saving device and as a means of offering additional services beyond that of statutory audit.

In 1985, Stevens wrote :

"Just a decade ago the notion of accounting wars would have seemed preposterous not only to casual observers of the profession but also to those intimately involved in it. That practitioners of this conservative discipline would be assaulting each other with hit lists, press leaks, megamergers, talent raids, and hard-sell marketing campaigns - well, that would have seemed appropriate for mouthwash makers but not CPA's. Today the wars have spread beyond the first militarized zone, the audit market, to an evolving scope of services in a changing America, a changing world."

In 1986 Abrahamson noted :

"The revolution of Information Technology is the wave of the future. Whether we like it or not, the accounting profession will ride the crest of that wave - or drown. Accountants are in the information business. Our professional future will depend largely on how well we adapt to the profound, permanent impact of Information Technology on all the institutions in our society and on the relationships among those institutions. The same process that's reshaping the world around us will transform our own profession."

Traditionally, professional auditing practices have refrained from open competition with one another. However, in today's competitive environment, due to factors ranging from fee pressure to mere survival, auditing firms are beginning to compete more aggressively.

Before discussing the major theories regarding the use of Information Technology as a competitive weapon it is necessary to identify some of the events that have brought about this change in strategy formulation.

2. HISTORICAL PERSPECTIVE

As early as 1958 Leavitt and Whisler predicted that the advent of the computer and management science would significantly change the structure and processes of most corporations. They suggested that the roles of most top executives would be significantly influenced by this new technology. During the following quarter of a century little evidence was published which substantiated their claims.

According to Scott-Morton and Rockart (1983) computer based systems have passed through three separate "eras" of use. The first, commencing in the late 1950's was termed the "accounting era" and was characterised by expensive machines and huge software overheads resulting in computers being utilised mainly to automate accounting functions e.g.. payroll, accounts payable, general ledger etc.

In the late 1960's computers entered the "operational era" where the emphasis changed to manufacturing control systems and on-line order entry systems. The first two "eras" were primarily concerned with the computerisation of the paperwork processes of the firm. One would expect few changes in an organisation as a result of changes in the way paperwork is processed.

In the mid 1970's a new era began. It was termed the "information - communication era" and focused on providing information to top and middle management and in facilitating data analysis and communication of analytic results. This stage has been characterised by increasingly powerful and diversified technology and an increase in the "computer literacy" of todays management.

With these changes in technology we find an evolution in the management of this change. Whereas in the 1960's we had the "EDP" department, which later gave way to the "DP" department, today we find such terms as "Information Services".

The third era has been triggered by four major trends i.e.. significant developments in computer hardware, communication technology, software technology and data availability. As a result of these developments todays managers are more "informed" than ever before in planning and monitoring the progress of both their own and other organisations. Managements ability to utilise this technology without a costly investment of either time or resources has been enhanced. Technology now affects management and its actions as opposed to merely automating the paperwork processes of the earlier stages.

At the very least this new technology offers opportunities to manage the organisation in increasingly efficient and effective ways. More significantly the technology can be focused on those aspects of particular importance to the organisations strategy. This requires moving beyond the support of existing strategies to the creation of new strategies through innovative use of Information Technology. It is this impact of Information Technology on an organisations strategy that has the most critical potential.

3. RESEARCH APPROACH

Tricker (1979) states :

"Research in the pure sciences - physics, chemistry, astronomy, for example - utilises hard data. There are static, replicable sets of relationships waiting to be discovered. The phenomena may be dynamic, but beneath the flux lie ever constant relationships. ... But business phenomena are not like that. The ever changing flux conceals a system whose only structure and boundaries are the ones men impose on them. ... In other words there are no fundamental laws waiting to be discovered. ... At best accounting research can reduce some of the uncertainty, high-light the significant variables and push back marginally at the frontiers of our ignorance."

(page 8)

In order to demonstrate that Information Technology can be used for competitive advantage by professional audit firms the following research methodology has been employed. The frameworks in the MIS literature describing the (general) use of Information Technology as a competitive weapon serve as the starting point. The frameworks of Porter and the other major writers on the use of Information Technology as a competitive weapon are synthesized into a more generalised framework which is then used as the structure of the argument. Existing uses of computers as documented in the accounting literature are then "fitted" into this generalised framework in order to highlight potential areas where Information Technology can be used to gain competitive advantage by professional firms.

According to Tricker (1979) :

"The classical approach (hypothesis generation followed by experimentation leading to the formulation of a new theory) of the pure sciences can cause difficulties for the social scientist. ... But there is an alternative approach to accounting research that adopts a different procedure. It assumes a feedback process : The researcher observes his world and, in the light of known theory, formulates a model describing relevant aspects of the world in view. He then collects more data, tests and reformulates his model, exploring its robustness in different conditions, checking its general application. Then, when the model is consistent with observations of the real world, it is added to the body of knowledge."

(page 10)

It is this second method which is used in this paper. It is not intended to provide a comprehensive list of all potential uses of Information Technology for competitive advantage by professional audit firms. Rather to show, by highlighting some potential areas of use, that Information Technology can be used for this purpose.

Questionnaire analysis and / or interviews were considered as alternative research methods, but were rejected on the following grounds. First, many potential respondents, not being au fait with the subject area, would not have been able to answer the questions as intended.

Secondly, due to the strategic nature of the subject matter, if Information Technology is currently being utilised for competitive advantage or plans exist to begin implementation, respondents would be reluctant to divulge this information. Thirdly, as the author is currently employed by a professional audit firm in an Information Technology related field, it was not considered ethical to collect the information from competitors under the guise of academic research.

The theories of the major (MIS) writers are now described in order to provide a framework within which the impact of Information Technology on professional audit firms can be discussed.

4. THEORETICAL FRAMEWORKS

According to Bakos and Treacy (1986) technology based competitive opportunities are overlooked because of :

"(1) senior management's ignorance of Information Technology and its potential uses, (2) poor communications between the information systems group and the rest of the business, (3) resistance to change, among both the information systems and business personnel, (4) a lack of focus on opportunities for competitive advantage, and (5) a lack of instruments to measure the benefits."

Senior executives need a method to determine where strategic opportunities for the use of Information Technology exist. A number of authors have identified potential opportunities for the application of Information Technology to create competitive advantage through the use of various frameworks. The theories of Porter and other major writers are discussed in detail below.

4.1. PORTER

Porter (1979) states :

"The essence of strategy formulation is coping with competition. Competition in an industry is rooted in its underlying economics, and competitive forces exist that go well beyond the established combatants in a particular industry. Customers, suppliers, potential entrants, and substitute products are all competitors that may be more or less prominent or active depending on the industry."

In 1979 he identified five major competitive forces (CFs) :

CF1 - The threat of new entrants :

The seriousness of the threat of entry depends on the barriers present and the reaction a new entrant can expect from existing participants. If the barriers are "strong" and sharp retaliation can be expected from the existing competition then the threat of new entrants is low.

The potential threat of new entrants continually changes as an industry develops and strategic decisions made by a large sector of an industry can have a major impact on the conditions determining this threat (e.g.. formation of a cartel will inhibit new entrants). Management must continually monitor the status of their industry to determine the potential from such threats.

CF2 - The intensity of rivalry between existing competitors :

Rivalry amongst competitors manifests itself in the form of tactics such as price competition, new product introduction and advertising campaigns. While all companies have to contend with many of these factors they may have latitude to improve their position through strategic shifts e.g., increasing customers switching costs or through product differentiation.

CF3 - Pressure from substitute products :

By placing a ceiling on prices in the market substitute products limit the potential of an industry. Substitutes play an increasing strategic role if a development in their industry increases competition and causes price reductions or performance improvements.

CF5 - The bargaining power of buyers :

Buyers gain power through large volume purchases, in industries filled with substitute products, in traditionally low margin industries or where quality and not price is the major purchasing determinant.

CF5 - The bargaining power of suppliers :

Suppliers can exert influence on participants in a market by increasing prices or reducing quality and quantity of products supplied. Powerful suppliers can thereby increase their own profitability in industries unable to recover cost increases in their own prices.

A company's choice of suppliers or customers is a major strategic decision as its strategic position can be enhanced by finding suppliers or customers who possess the least power to influence their own strategic posture.

Porter suggests that, for any organisation, significant strategic actions consist either of diminishing supplier or customer power, holding off new entrants into the industry, lowering the possibility of substitution for their products, or gaining a competitive edge within their existing industry.

The goal of the strategist is thus to find the best position for his organisation in its market sector.

"Establishing a position can take many forms - solidifying relationships with favorable customers, differentiating the product either substantively or psychologically through marketing, integrating forward or backward, or establishing technological leadership."

(Porter 1979)

Porter maintained that firms wishing to gain a competitive advantage should build defences against these forces and formulate specific strategic actions to directly influence these forces. He suggests that a firm may choose one of three possible competitive actions :

- (1) overall cost leadership (become the lowest cost producer) :

Information Technology offers strategic value if, for example, it can allow significant reductions in inventory, provide better utilisation of materials or permit better utilisation of manufacturing facilities.

- (2) differentiation (of a product or service) :

Information Technology allows product differentiation along numerous dimensions i.e.. quality, design etc.

- (3) focus (e.g.. finding a specialized niche in an industry) :

Information Technology could be utilised to identify special customer needs in specific geographic regions.

Porter's (1979) analysis of competitive forces does not specifically address Information Technology, but does provide a framework for assessing the role Information Technology can play in a firm's competitive strategy. If the nature of the organisation's operation don't include any of the above, then Information Technology is unlikely to offer it any strategic opportunities.

In 1985 Porter specifically addresses Information Technology as a means of securing competitive advantage

"Information Technology is more than just computers. Today, Information Technology must be conceived of broadly to encompass the information that businesses create and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information. The information revolution is affecting competition in three vital ways :

- It changes industry structure, and in so doing, alters the rules of competition.
 - It creates competitive advantage by giving companies new ways to outperform rivals.
 - It spawns whole new businesses, often from the within a company's existing operations."
- (Porter and Miller, 1985)

Porter introduces the concept of a "value chain" as a means of highlighting the role of Information Technology in competition. The value a company creates is measured by the amount buyers are willing to pay for its products. A business is profitable if the value it creates exceeds the cost of performing the value creating activities. To gain competitive advantage, a company must either perform these activities at a lower cost or in a way that leads to differentiation and a premium price.

A company's value chain is made up of interdependent activities, connected by linkages. Linkages exist when the manner in which one activity is performed affects the cost or effectiveness of other activities.

Optimisation of linkages requires trade-offs which must be in accordance with the company's strategy. Linkages may be internal as well as external to the company (e.g.. just-in-time delivery systems linking a company to its suppliers).

Information Technology is permeating this value chain at every point, transforming the way value activities are performed and the nature of the linkages amongst them. Information Technology is also enhancing the company's ability to exploit linkages between activities both within and outside the company.

Porter identifies three areas where Information Technology is changing the nature of competition :

(1) Changing industry structure :

The structure of an industry is embodied in the five competitive forces (CFs) discussed above. Information Technology can alter each of the five competitive forces and hence alter industry attractiveness. While managers can use Information Technology to improve their industry structure , the technology has the potential to destroy this structure.

(2) Creating competitive advantage :

There are three alternative ways to create this advantage i.e.. lowering costs in any part of the value chain, enhancing differentiation through product customisation and changing competitive scope by increasing the company's ability to coordinate its activities regionally, nationally and globally.

(3) Spawning new businesses :

The information revolution is creating new industries in three ways i.e. it makes new business areas technologically feasible, it creates derived demand for new products through the spread of Information Technology and it creates new businesses within old ones as companies move into supplying information as a form of diversification.

Porter (1985) concludes :

"The importance of the information revolution is not in dispute. The question is not whether Information Technology will have a significant impact on a company's competitive position; rather the question is when and how this impact will strike. Companies that anticipate the power of Information Technology will be in control of events. Companies that do not respond will be forced to accept changes that others initiate and will find themselves at a competitive disadvantage."

4.2. PARSONS

Parsons (1983) presents a three level framework (refer Appendix 1) to help senior management assess the current and potential impact of Information Technology on their organisation.

"In order for Information Technology to become a viable competitive weapon, senior management must understand how Information Technology may impact the competitive environment and strategy of the business."
(Parsons 1983).

At a global level, Information Technology changes the nature of the industry in which the organisation competes e.g.. Information Technology may change the nature of the industries products or services by altering the product life cycle or increasing the speed of product distribution. To link Information Technology to the organisation's strategy, management must anticipate the potential impact of Information Technology at this level before it occurs, in order that strategies can be developed to place the organisation in the best possible position. Executives must be able to visualise the situation five to ten years into the future.

At the firm level, Porter's competitive forces (discussed above) become relevant. As industries become more dependent on Information Technology, the Information Technology supplier will become an important force for the organisation to consider when planning future strategy.

Since Information Technology represents an unlimited opportunity to structure the relationship between a corporation and its competitors, Information Technology becomes a vital component of a strategy dealing with rivals. The problem lies in identifying which relationships should be co-operative and which should be competitive.

On a strategic level Information Technology can impact the ability of an organisation to execute a specific strategy. In the long term nearly all functions can be enhanced to some degree by utilising Information Technology. The strategic issue is the allocation of scarce resources to obtain the maximum benefits.

Organisations will enjoy greater strategic benefits from Information Technology applications which are consistent with and supportive of their competitive strategies. Understanding an organisation's strategy is the first step in selecting from the many Information Technology alternatives. In many organisations little attempt is made to understand how Information Technology will impact on the strategic position or how it could support a future strategy.

Parsons then discusses the potential uses of Information Technology as competitive weapons using Porters critical factors (CFs) as a framework. He continues that Information Technology can impact the firm's ability to execute a particular strategy. Parsons states :

"Clearly, a firm should use Information Technology to support, reinforce or enlarge its business strategy. In general, firms pursuing an overall cost leadership strategy should use Information Technology to reduce costs either by improving the productivity of labour or by improving the utilisation of other resources, such as machinery and inventory. Firms following a differentiation strategy should use Information Technology either to add unique features to the product or service or to contribute to quality, service, or image."

Although an organisation may benefit from an Information Technology application that is not congruent with its competitive strategy the benefits will be far greater from an application that is. Therefore understanding the organisation and its strategy is the starting point to considering the potential impact of Information Technology on the organisation.

4.3. SCOTT-MORTON and ROCKART

Using Porter's (1980) competitive forces (CFs) as a starting point Scott-Morton and Rockart (1983) suggest that a useful way to look at the interaction between strategy and technology is from a "value-added-chain" perspective. Using this approach, a manager analyses all steps in the business process from research and development through purchasing and manufacturing to sales in order to ascertain the critical points to which Information Technology can best be applied. Information Technology is then applied to the most critical areas i.e.. areas where the return from investment will be the greatest. The process is then repeated until the stage is reached where Information Technology can no longer be introduced on a cost justifiable basis. As it is applied in practice it results in new methods being discovered to achieve objectives. Information Technology moves beyond departmental boundaries and becomes more closely involved with the business, its customers and suppliers. Ultimately Information Technology will create new strategic opportunities for the organisation.

Scott-Morton and Rockart recommend that each senior manager should focus on the following two questions :

"1. Can I use the technology to make a significant change in the way we are now doing business so my company can gain a competitive advantage?

and

2. Should we, as a company, concentrate on using Information Technology to improve our approach to the marketplace? Or, should we center our efforts around internal improvements in the way we currently carry out activities in the firm?"

Significant opportunities exist today in some industries to utilise Information Technology to revolutionise the industry. If not recognised and utilised by one's own company, this opportunity is open to exploitation by others. Alternatively, if no such opportunity exists, attention should be turned inwards to improving current operations through the use of Information Technology.

They conclude :

"It is clear that all companies will not choose this organisational approach. Those organisations which choose to conduct business as usual in the midst of a major information technology revolution will, we believe, be overlooking a very major opportunity".

4.4. LUCAS and TURNER

Lucas and Turner (1982) observed three types of relationships between information processing technology and corporate strategy (refer Appendix 2).

At the lowest level they found "independent" information systems which help the organisation implement strategy by creating greater operational efficiencies. These systems are not directly linked to the strategy formulation process or integrated with a strategic plan. Their primary objective is to improve operational efficiency. Most existing information systems fall into this category.

A more direct contribution to strategy comes from policy support systems which are designed to aid the strategic planning process. In this instance the computer system helps in the formulation of the plan but is not part of the plan. An example of this is a financial modelling system which is developed to aid strategy formulation.

The greatest potential advantages exist where the technology itself becomes part of the strategy, as it will expand the range of strategic alternatives available to the organisation.

They state :

"Technology should be viewed as a central part of business thinking at all levels and not as a kind of a line phenomenon to be held at arm's length by all but R & D engineers."

They recognise that technology helps define the range of strategic possibilities and also provides the means by which the strategy, once chosen, is implemented.

4.5. McFARLAN and McKENNEY

McFarlan and McKenney (1983) recognized the role Information Technology was playing in organizations and they developed a strategic grid (refer Appendix 3) whereby they could classify firms on the basis of the creditability of existing applications and the potential creditability of future applications under development. They recognise that while for certain organisations Information Technology represents an area of great strategic importance, for others it plays a cost-effective but supportive role.

It is inappropriate for organisations of the latter type to devote the same amount of senior management thinking to the use of Information Technology as a strategic weapon as for organisations of the former type. The issue is further complicated by the fact that while Information Technology may not be of strategic value today, this may change in the future.

They developed a grid which managers could use to determine the impact of Information Technology on their current and future positions.

The grid consists of the following four sectors :

Support Computer systems ease the day to day functions of the organisation. Strategic goal setting and linkage to long term corporate strategy is not vital. An improvement in the function would have a negligible effect on the success of the organisation e.g.. computer systems are used to replace manual systems (record keeping functions).

Factory Computer systems are essential to the continued existence of the business. Strategic goal setting for information systems and linkage to long term corporate strategy is more critical. The organisation depends heavily on smooth functioning of current applications but new applications are not critical to the organisations continued ability to compete e.g.. major airlines could not cope with the tremendous volumes of transactions without computer technology.

Turnaround Computer systems have potential strategic uses. These organisations require substantial information systems planning effort. Long term performance can be severely impacted by shortfalls in information system functioning. Here the strategic value of current applications is low, while that of future applications is high e.g.. supermarket chains which have installed point of sale and scanning equipment are better able to monitor stock movements (thereby cutting stock holding to a minimum) and credit facilities (cutting potential bad debts to a minimum).

Strategic Computer systems dictate the nature of competition in the industry i.e.. major banks compete by offering more automatic teller machines than competitors and better on-line information to corporate clients

By using this grid management will be able to identify the impact of Information Technology on their organisation. There is of course the danger that the organisation may be incorrectly categorised.

McFarlan (1984) mapped this grid onto Porter's competitive forces model. He proposed the following five questions for assessing the strategic impact of Information Technology on a firm (Porter's competitive forces are noted in parenthesis) :

- Can Information Technology be used to build barriers against new entrants (CF1)?

A successful entry barrier not only offers a new service to the customer but has features that forestall intervention from competitors. The more difficult, both technologically and on a cost justification basis, the service is to emulate, the stronger the barrier against competition e.g.. a complex software package that adds value to the customer environment.

The benefit of including value added features is a potential increase in market share and the resultant increase in turnover and therefore profitability. The potential disadvantage is in the high cost (and associated risk) inherent in the development of the software. Should the project fail, the large capital investment will lead to large potential losses in the event of a withdrawal from the industry.

An added potential benefit is the advantage of being portrayed as an industry leader i.e., an enhanced company image which in itself can help strengthen market position.

- Can Information Technology change the basis of competition (CF2)?

In industries dominated by cost based competition Information Technology has permitted the development of product features that are so different from those presently existing in the industry that they cause a radical change in the basis of competition.

Three forms of changes have been identified :

1. cost based - where through the use of Information Technology a company can produce at a much lower cost than its competitors e.g.. increased machine efficiency through more efficient scheduling.
2. product differentiation - where a company offers a mix of product features e.g.. product supply plus technological backup.
3. niche specialisation - where a company specialises in one specific niche of the market i.e.. it distinguishes itself by unusual cost or product features.

- Can Information Technology be used to generate new products (CF3)?

Through utilisation of Information Technology products can be delivered faster, cost less and be of superior quality e.g.. an electronic support service supplied with a product which increases the value of the product from the customers perspective. In some markets companies are able to combine all three of these potential advantages.

- Can Information Technology be used to build in switching costs (CF4)?

The ideal electronic support system contains a series of routines that while being easy to use become part of the customer's daily operating routines. The customers reliance on the system increase to the extent where the investment in both time and money is too great to change to another (possibly better) system.

- Can Information Technology change the balance of power in supplier relationships (CF5)?

Through the development of interorganisational systems (e.g.. just-in-time delivery systems) vast cost reductions can be achieved. Should suppliers be unwilling to become part of such a system due to the risk of being dictated to by customers, their market share could drop due to their subsequent exclusion as potential suppliers. The balance of power has shifted to the customer through the use of Information Technology which now dictates market procedure.

An affirmative answer to any of the above questions identifies that a strategic opportunity exists for management exploitation.

McFarlan (1984) states :

"Such opportunities vary widely from one company to another just as the intensity and rules of competition vary widely from one industry to another. Computer advances have affected even the smallest companies. Further, in different situations, a company may appropriately attempt to be either a leader or an alert follower. The stakes can be so high, however, that this must be an explicit, well planned decision."

4.6. RACKOFF, WISEMAN and ULLRICH

They begin their (1985) argument by stating that traditionally the targets of information systems applications are the organisation's planning and control processes as discussed by Anthony (1965). These include strategic planning, management control and operational control. While this conventional perspective has served to identify opportunities to improve internal business functions, it does not lead to the identification of competitive uses of Information Technology. Using Porter's model as a basis they develop "the theory of strategic thrusts". They define strategic thrusts as major competitive moves (offensive or defensive) made by an organisation and contend that the multitude of such moves reduce to five basic thrusts :

- (1) Differentiation - achieving advantage by distinguishing your products from the competitors or by reducing the differentiation advantage of rivals.
- (2) Cost - achieving advantage by reducing your costs, supplier's costs or customer's costs or by raising the costs of the competition.

- (3) Innovation - achieving advantage by introducing a product or process change that results in a fundamental change in the manner in which business is conducted in the industry.
- (4) Growth - achieving advantage by volume or geographical expansion, backward or forward integration, product line or entry diversification.
- (5) Alliance - achieving advantage by forging marketing agreements, forming joint ventures, or making acquisitions related to the "thrusts" of differentiation, cost, innovation or growth.

Information Technology can be used to support or shape a corporation's competitive strategy by supporting or shaping these strategic thrusts. Strategic thrusts constitute the mechanisms for connecting business strategy and Information Technology. The thrusts - according to Wiseman (1986) - strike at three classes of strategic targets :

- (1) Supplier targets - Organisations providing the materials a company needs to make its product.
- (2) Customer targets - End users as well as organisations purchasing the company's product.
- (3) Competitor targets - Organisations selling competing products.

4.7. IVES and LEARMONTH

Ives and Learmonth (1984) criticise the other writers (Porter, McFarlan and McKenny, etc.) :

"These studies (of the other writers) present descriptive models for classifying successful strategic applications and for evaluating the potential of proposed applications. These models are not generally useful, however, for identifying these applications. A more detailed model is necessary : one that can help to find new opportunities for the successful application of information system technologies."

They propose a model that focuses on the relationship between the provider of goods or services and the customer as they believe it is this relationship where the primary competitive strategy evolves. With this relationship in mind management can elect its strategy i.e.. product differentiation, low cost production, the seeking of a specialised niche in the market or product differentiation on the basis of customer service.

Using a life cycle approach (based on IBM's Business Systems Planning methodology) they develop their "Customer's Resource Life Cycle" consisting of thirteen distinct stages (refer Appendix 4). They then, through the use of practical examples, show how this stage approach can be applied in practice.

They conclude that the model serves :

"as a vehicle for identifying potentially important opportunities for applying information system technology competitively. As a firm examines its role from the Customer's Resource Life Cycle perspective, it discovers opportunities to enhance its overall strategy".

4.8. NOTOWIDIGDO

Notowidigdo (1984) states :

"the organisation's strategy and mission to develop information systems as competitive weapons, should reflect the following considerations :

- The company's dominant (generic) strategy.
- The current business role of information systems and its relative importance in the functional hierarchies of the corporate culture.
- The operating stage of information systems in relation to the company's capacity to use computer technology.
- the company's style of management leadership and how it uses information systems for getting at "information intelligence".

It is difficult to put these factors into a balanced perspective so that management can take constructive action. Notowidigdo divides strategic information systems into internal systems "that have direct benefit to the company" and external systems "that have direct benefit to the company's customers."

4.9. SYNTHESIS OF THE MAJOR THEORIES

As can be seen from the discussion of the major theories in information plays three roles in a firm's strategy :

- (1) Information is used to report on the transactions of the business.
- (2) Information is used to guide business decision making.
- (3) Information is used as an integral part of the products or services a business offers its clients.

It is in this third category that immense opportunities exist to exploit Information Technology to gain a strategic advantage over one's competitors. The formula for success appears to be straightforward :

- Identify an unfulfilled customer want or need.
- Create a means whereby Information Technology can fill the need in a manner that enhances your services, improves the quality and reliability of your product, and distinguishes your products from those of your competitors.

- Bring this Information Technology to the marketplace as an integral part of your corporate strategy.

Senior executives, strategic planners and data processing managers are realising that there are opportunities for achieving competitive advantage through the use of Information Technology. However, without a formal framework as a guide to the areas of potential exploitation it is difficult for the strategic planner not to overlook an area of importance. The aim of this framework is not to provide a complete integration of all the factors discussed in the above theories, but rather to provide a guideline for the identification of areas where professional accountants can utilise Information Technology to gain competitive advantage.

Using Porter's (1980) competitive forces (CFs) as a starting point, it can be seen that these only relate to a firm's strategy on an individual firm level. According to Parsons (1983) firms compete on three levels :

- global - competitive forces affect the industry as a whole.
- firm - competitive forces affect individual firms within an industry.

- strategic - competitive forces affect the ability of an individual firm to implement a specific strategy.

Porter's framework is only relevant at the firm level. Lucas and Turner (1982) address the strategic potential of Information Technology at both the strategy and the firm levels. At the strategy level Information Technology is utilised to create greater organisational efficiencies but is not directly linked to the strategic plan. At the firm level technology itself becomes part of the strategy as highlighted by Porter's Competitive Forces.

McFarlan and McKenney (1983) introduced the concept of a strategic grid used to determine the impact of Information Technology on a firm's strategy. The support and factory levels are congruent with Parsons' strategy level - computers are used to ease day to day operations and eventually become essential to ensure the continued existence of the business. The turnaround and strategic sectors of the grid equate to Parsons' firm level - computer systems have potential strategic uses and begin to dictate the very nature of competition in the industry.

McFarlan (1984) then mapped this grid onto Porters' competitive forces model and developed a question which management can ask to determine whether or not a specific competitive force is applicable to their firm's strategy.

A diagrammatic representation of this synthesised framework appears in appendix 5. This framework is used as a basis for identifying potential areas where professional accounting firms can exploit Information Technology for competitive advantage.

A summarised list of potential opportunities (key concepts) utilising Information Technology, which can be referred back to during chapters 5 and 6 is now presented :

1. cost reduction in a firm (least cost producer)
2. cost reduction in suppliers
3. cost increase to competitor (barrier to entry)
4. product differentiation
5. industry change (structure and focus)
6. growth
7. alliance
8. change basis of competition
9. switching costs
10. new products
11. new businesses
12. alliance and cooperation
13. niche specialisation
14. balance of power in supplier relationships

The status of the use of Information Technology by professional audit firms appearing in the current literature is now discussed.

5. THE ACTUAL USES OF INFORMATION TECHNOLOGY BY PROFESSIONAL
AUDIT FIRMS

Although there are many recent articles in the Management Information Systems (MIS) field dealing with the use of Information Technology as a strategic weapon no articles could be found in the accounting literature discussing the potential strategic uses of Information Technology by the professional auditor.

There are many articles addressing the use of (micro) computers by audit firms but these stop short of addressing the (potential) strategic impact of Information Technology on the profession. The main thrust of the existing literature describes audit firms using computers to automate many manual functions.

Chonowitz (1985), in a survey of the use of microcomputers for audit assistance, notes that "very little research exists". An earlier research report (Hyslop, 1983), found the use of computers by the "Big Eight" firms in South Africa to be in the "embryonic" stage. This lack of the use of computer technology by audit firms is supported by the overseas journals at the time making no mention of the subject.

Early in 1984 the position changed with the emergence of several articles detailing the (cost saving) uses of micro computers by audit professionals. Since then a profusion of articles on the subject has appeared.

Articles and advertisements appearing in both local and overseas journals refer to software packages currently in use as opposed to packages envisaged or under development.

Chonowitz found that thirty - three percent of (South African) audit firms were using micro computers in 1985 mainly to perform the following functions (in descending magnitude of usage) :

(functions performed by ten or more firms :)

- Recording and posting of adjusting journal entries.
- Preparation of lead schedules, working trial balances etc.
- Drafting financial statements.
- Analytical review - ratios and statistics.
- Recording and posting of reclassifying journal entries.
- Audit time control / time budgets.
- Memorandum and report writing.
- Preparation of working papers.
- Variance analysis.
- Cash flow analysis.
- Materiality computations.
- Consolidations.
- Setting up subsequent years working papers.

Although a wide range of applications are covered the uses can all be classified as computerised replacement of manual procedures i.e.. cost and time saving mechanisms.

The results of the above surveys are confirmed by Vayanos (1984) who found that approximately thirty percent of (South African) audit firms are actively involved in their clients system development. This would be expected in view of the recent involvement by auditors with computer technology as the associated skills require a long period of education and development prior to their becoming marketable commodities.

The international accounting literature abounds with examples similar to those identified by Chonowitz. White (1983) states that when used as an audit tool, the micro computer can improve productivity and increase audit efficiency. Roussey (1983) discusses the use of micros to perform statistical and other numerical analyses. Thomas (1984) describes his firm's development of a computerised audit package which has resulted in an increase in audit efficiency. Golden and Golden (1984) found that fifty percent of CPA firms use spreadsheet programs to automate various audit procedures.

The recent development of customised audit working paper packages can be ascertained from an article by Johnson (1985) called "Automated Working Papers : A New Audit Tool". The overseas literature describes uses that are congruent with those listed by Chonowitz. Although the profusion of articles is certainly greater than in South Africa, the uses described are similar in strategic importance.

The typical audit package currently in use (an example of which is Feinstein's AIM - Automated Information Management) allows the auditor to capture a client's trial balance, for both the current and prior year, and then automatically update the current years figures by means of journal entries. A multitude of reports can then be generated eg. lead schedules, ratio analyses, journal entry reports, consolidations, tax calculations, income statement and balance sheet etc.. The package interfaces with popular spread sheet and word processing packages which allows the auditor to change the presentation of the data as required without recapturing it. The source data can be transferred directly from a clients (micro) computer based accounting package into the audit package.

The acceptance of computers in audit practices is borne out by several other factors : the formation of The EDP Auditors Foundation in the United States of America and the publication of guidelines by various statutory accounting bodies world - wide dealing with the audit of computer systems.

Only recently have articles appeared theorising on other potential audit applications. Roussey (1985) discusses future scenarios involving audit practices. Abdolmohammadi (1987) discusses potential uses of decision support and expert systems in auditing.

These articles, although moving away from the traditional "computerisation of manual audit procedures" fail to identify the potential range of areas for strategic advantage and the related benefits of Information Technology to an audit practice. A possible reason for the lack of this type of article could be a reluctance to publish ideas which could be of strategic value to competitors.

The literature relating to other (similar) professions on the topic of Information Technology appears to be at the same stage of development. A paper by Goldstone (1985) on computers in the legal profession focuses on aspects such as word processing, accounting (calculation of fees and monitoring of debtors) and information retrieval.

In looking at the future of computers in the legal profession he stresses the need for both internal and external data bases and the potential of expert systems.

Although no mention is made of gaining a competitive advantage through the use of Information Technology by legal firms, he concludes :

"While computers are not a magical cure for everything, if properly used, they can improve efficiency, productivity and profitability in the legal profession and contribute to providing legal firms' clients with a comprehensive, efficient service. It can even be said that within the foreseeable future, all legal firms will be forced to become computerised in order to remain competitive."

(page 58)

Two studies sponsored by the Chartered Institute of Management Accountants (London) have similar findings to those discussed by Goldstone. The first by Collier (1984) on the impact of Information Technology on management accountants found that computers have had a considerable impact on the demand for "computer literate" accountants and he states that Information Technology may open new opportunities for those who adapt and acquire the required skills.

Kaye (1986), in a study of the impact of Information Technology on accountants (both professional and those in commerce), found the accounting profession to have been much slower in adopting Information Technology than their counterparts in commerce, primarily due to lack of computer related education as part of formal accountancy courses.

He states (in reference to the professional accounting practice) :

"... accountants are adapting to Information Technology at varying degrees ... there are 'leaders and laggards' ... the leaders will exploit Information Technology and move forward, whilst the laggards must chase to stay in business."

(page 32)

Although all the above authors stress the importance of adopting Information Technology to survive in tomorrow's competitive world, they do not attempt to show the potential range of (strategic) opportunities available to the professional accountant through exploitation of Information Technology, other than as a cost and time saving device. Even in discussing the future potential uses of Information Technology in the profession, these are limited to the same narrow band of applications. It is the aim of this paper to highlight other potential areas for exploitation through the use of Information Technology.

6. THE POTENTIAL USES OF INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE BY PROFESSIONAL AUDIT FIRMS

Muggridge (1985) states :

"There will be ... a big shakeout, particularly among smaller practices. There will be ... a major migration of their (small firms) clients to larger practices which provide a most-effective technology-based service. Accountants who adopt the new technology will be in considerable demand for the foreseeable future."

In order for audit firms to be able to fully address strategic planning, they must be aware of the potential strategic uses of Information Technology. The approach adopted in this chapter is to use the synthesised model developed in chapter 4 (refer Appendix 5) as a framework for identification of potential strategic uses of Information Technology, working from the lower strategic level (strategy) to the highest strategic level (industry).

6.1. STRATEGY LEVEL

This is the first level where the introduction of Information Technology into a professional audit firm can begin to play a strategic role.

Information Technology reflects the firm's strategy as it is used to create greater organisational efficiencies (ie. to ease day to day functions of the organisation) :

The professional audit firm, like any other business, performs certain internal functions required for the smooth operation of the day to day activities.

Examples where computer technology could be utilised in this manner include allocation of staff among planned future audits, computerisation of the firms debtors, time budgets, calculation of costs per audit compared to expected (budgeted) costs and detailed variance analyses, etc. The use of computer technology in this manner replaces the need to perform these functions manually and enables the professional firm to function more efficiently as information is prepared both more accurately and more timeously.

The major function of a professional audit practice is the performance of the statutory audit (although current trends indicate a move towards the major percentage of fees coming from other areas ie. consulting services).

According to the literature on the use of computers by auditors (discussed in chapter 5), since 1984 audit firms have been utilising computer technology to automate many of the audit functions. Most audit practices have used microcomputers, many of which are portable and therefore have the advantage that they can be taken to the clients premises for use by staff performing the audit, for this purpose. Specialised packages have been developed both in house and by third party software vendors which automate many standard audit functions e.g. those identified by Chonowitz (1985) as listed in chapter 5. Chonowitz states that this automation of audit procedures "must surely be the first step towards the end of the working paper file as we know it today".

There is a wide range of reasons why computer technology has become widely used in this manner :

- the decrease in the cost of both hardware and software.
- the increase in computer literacy in the accounting profession and the ease of use of many of the currently available software packages.
- the increased awareness in the profession of the benefits to be gained by automating the audit.

Chonowitz identified the following major benefits being achieved through the use of Information Technology for audit assistance (ranked in descending order of importance) :

- time savings
- increase in accuracy in casts, working papers etc.
- improved staff motivation as less time is spent performing clerical tasks
- improved audit efficiency
- allowing more time to 'think'
- enhancement of the firm's image
- improved documentation
- enhanced profitability
- improved level of computer literacy of staff
- greater consistency in working papers
- improved time and budget control
- improved audit planning
- reduced staffing levels and thereby staff costs
- etc.

Reported savings through the use of computer technology on audits have been as high as reductions of between 25 and 40 percent in audit times over a three year period and savings of over 80 percent on analytical review procedures (Pratt and Dillon-Hill, 1983).

The major benefits perceived from audit automation are therefore greater accuracy, increased staff motivation, and an enhancement of the firm's image. According to Bernstein (1985) :

"The future will see a growth in audit based software which will make the use of portable computers on audits a necessity rather than just a useful tool".

An example of a further advancement in this area is MARS (Micro Audit Retrieval System) developed in South Africa by Deloitte, Haskins and Sells. The system allows audit staff to down-load mainframe computer information in-house via a tape drive unit connected to a micro computer. A high level audit specific language can then be used to interrogate the data. The advantages of such a system include greater audit independence as the client has no access to the data once supplied to the auditors, greater involvement of the staff actually performing the audit work, and the ability to use a variety of micro computer packages to interrogate the data without having to recapture the data.

Immense benefits can be obtained by removing the computer audit specialist from the audit through the use of a package such as MARS as firstly the audit team become more familiar with the clients data, and secondly, their level of computer experience and confidence increases.

6.2. FIRM LEVEL

It is at this level that immense scope exists for professional audit firms to utilise Information Technology to gain competitive advantage. Whereas major time and cost savings have been achieved by audit automation, due to rising costs and increased fee pressure, this is no longer the area where maximum profit potential exists. Although advertising by members of the profession is prohibited, it is common knowledge that many practices have diversified into other areas of the services industry e.g. management consulting, recruitment, systems development and installation, facilities management, tax planning etc.

Using McFarlan's questions from the synthesised model it can be shown that audit firms can (and do) compete on this higher level :

Question 1 :- Can Information Technology be used to build barriers against new entrants?

New entrants include both new auditing firms and financial service groups who, although they cannot provide statutory audit services, compete with accounting firms in all other areas.

As far as new accounting firms are concerned the startup costs are so great that other than small practices, which are not competition for large existing practices, it is difficult to envisage the creation of a large new firm other than through mergers with or takeovers of existing firms which will not greatly affect existing market share. The potential threat from beyond the profession is far greater as other groups ie. consultants, banks, software houses encroach on audit clients offering them a broad range of products and services.

However Information Technology does provide the audit firm with the ability to increase their market share. The audit firm with an established computer consulting division has an opportunity to offer its existing audit clients access to its services and can recommend their use (either formally or informally).

In fact accounting firms have been so successful in this area that

"computer dealers are concerned that ... these consultants enjoy an unfair competitive advantage (through) their links with the audit side of business".

(Coetzer, 1987.)

In the future audit firms will be able to communicate directly with client's systems and perform audit functions on an on-going basis. Through the use of in-house expert systems auditors will be able to identify problem areas as they arise and immediately notify the client. The external auditor will take over many of the functions currently performed by the internal auditors.

Once an audit firm is interacting with a client on a continual basis the client's cost of switching firms is greatly increased and the longer the relationship continues the more entrenched the audit firm becomes.

An audit firm specialising in the high-tech audit area would be in a strong position to offer the more traditional audit services to their clients and expand their practice in this manner eg. using an advantage in Information Technology to diversify into other (more traditional) areas, thereby increasing their revenues and market share.

Question 2 :- Can Information Technology change the basis of competition?

Through the use of technological advancements in the Information Technology field, audit firms will be able to function more cost efficiently. Office automation, shared databases, networks etc. will all allow audit firms to automate many functions and ultimately lower their costs.

Through utilisation of various aspects of Information Technology audit firms will be able to distinguish themselves from competitors on the basis of the mix of products they offer. Through specialisation in specific areas of Information Technology related expertise audit firms will be able to supply services to specialised consumers of their products.

The current basis of auditing round the computer (testing controls around computer systems) is changing to one of auditing through the computer (testing the computer itself). The day is fast approaching where audit firms which are not technologically advanced will not be able to supply the same level of service to clients as firms that can utilise Information Technology as part of their audit.

Question 3 :- Can Information Technology be used to generate new products?

In the area of the statutory audit any software developed in-house by an audit firm can be sold. Firms have tended to refrain from doing this as firstly it provides the competition with access to their own cost saving devices and secondly many firms lack the expertise to provide adequate backup.

However, with the advent of expert systems, a new potential market appears to have arisen. In recent years there has been a trend among many audit firms to specialise in a specific market sector i.e. stock brokers, furniture retailers, the banking sector, etc. The level of specialised knowledge and expertise that has been built up in certain firms in relation to the audit of specific sectors can form the basis of the rules required to develop expert systems to aid in the audit of such businesses.

Usually the audit problems specific to a business sector are similar on a world wide basis. This provides the firm creating the expert system with a potential world wide market of other audit firms who are not direct competitors.

It is beyond the statutory audit that the real potential for the development of new products really exists :

- The advent of computerised (public) networks allows the audit firm the opportunity to place pertinent information e.g. relating to changes in tax legislation, computer developments, accounting procedures etc. at the reach of the business community. Not only can a fee be charged for access to this information, but more important is the exposure to be gained from becoming an information provider.
- The analysis of trends in various industries and technologies in which the audit practice has in-depth knowledge (e.g. computer security) provides it with a further sales product.

- Industry specific databases can be developed which can supply information to both internal audit staff and external subscribers. Providing information in areas of expertise built up over the years through interaction with clients in many different market sectors provides the audit firm with another saleable product. An example would be information relating to market sector payment history (required by creditors), turnover and other stock related statistics (required by potential new entrants, merchant bankers) etc.
- Publishing is a further area not to be overlooked. Once specific knowledge has been gained in an Information Technology related area this can be made available to a wide range of subscribers (either electronically, for those who require fast dissemination of information, or through the medium of news-letters, regular articles etc.).
- The auditor is probably the best suited person to provide the client (who is unable to do so himself) with a financial modelling service. The benefits to the auditor include additional income, a better understanding of the clients business leading to a potentially more efficient audit, and the development of a collection of reusable financial models.

Question 4 :- Can Information Technology be used to build in switching costs?

The audit firms that are currently involved in the design and implementation of accounting systems for existing (audit) clients have a distinct advantage over those firms that do not supply these services :

- As the computerised accounting system has been installed by the firm performing the statutory audit, the audit can be performed with prior knowledge as to the level of controls both within the computerised system (e.g. depth and completeness of audit trails, strength of access controls etc.), as well as an in-depth knowledge of the personnel using the system, their level of computer knowledge, and the extent of segregation between their computer related tasks and other (possibly incompatible from an internal control perspective) functions in the client organisation. This will lead to a cost saving as a review of the computer system is no longer required.

The detailed knowledge of the system present in the audit firm should also lead to a more effective audit as tests need only be directed at specific problem areas which in turn saves further audit costs.

Once an audit firm has installed a computer system at an audit client it becomes more difficult for the client to change auditors as firstly another audit firm will not be able to provide the same level of support to the computer system until they have developed the same in-depth knowledge of the system (a time consuming and potentially costly procedure) and secondly, the new audit firm will probably require a computer audit review as part of their first audit, again pushing up the clients costs.

A further plus factor in installing computer systems is the potential to increase the audit base by installing systems at non clients as this provides the audit firm with an opportunity to "sell" their range of other services.

Question 5:- Can Information Technology change the balance of power in supplier relationships?

Audit firms themselves are potentially large information purchasers. The kind of information envisaged is information that would be of use to a large proportion of the profession e.g. an on-line data base containing audit specific information and current literature. The professional audit firm that is both a large user of such information and is technologically advanced may be able to dictate the market procedure once such on-line services become available.

Audit firms also purchase skills. Firms that are technologically advanced and which have a reputation for encouraging innovation (in Information Technology and other fields) will attract the most ambitious and motivated staff. The calibre of the staff, in turn, enhances the firm's reputation with their customers, the business community.

6.3. INDUSTRY LEVEL

- Information Technology changes an industries products and services, markets and production economics.

As can be seen from the discussion above the "audit industry" as a whole is about to undergo a major change due to the impact of Information Technology. The basis of competition is shifting towards those firms that can harness Information Technology and use it for competitive purposes.

Auditors are moving towards becoming information specialists working in real time rather than "after the event monitors". In the foreseeable future businesses will require almost instantaneous audit reports and on-line consulting services. The auditor who does not plan to utilise Information Technology will be unable to provide these services.

An important benefit to be gained from the utilisation of Information Technology in an auditing practice is the increased level of computer skills that will develop within the firm that can be used in a diverse range of areas e.g. tax planning, stock exchange listings, mergers and acquisitions, etc.

All audit firms must address all these issues as part of their strategic planning process. To address some of the issues in isolation from others may lead to strategic opportunities being missed.

7. CONCLUSION

Although the literature abounds with examples of companies which have successfully employed Information Technology for strategic purposes, and with frameworks for identifying and categorising strategic opportunities utilising Information Technology, there is a notable absence of any suggestion that these techniques can be utilised by professional firms. However, the examples discussed above have shown that the potential does exist for the professional audit firm to use Information Technology to gain a strategic advantage over their competition.

Suggestions to draw attention to the potential of Information Technology range from the development of better measures of efficiency and effectiveness of organisational functions to major changes in the structure of the organisation itself. The writers all stress the importance of informed management for the successful use of Information Technology for strategic purposes. The frameworks presented above are the starting point for management (whether in a professional or commercial environment) to begin the search for strategic uses of Information Technology.

The critical question to be answered is whether Information Technology is, or can become, a strategic weapon in the corporate armoury. As technology continues to evolve rapidly and becomes a major factor in more diverse industries, organisations must begin to think strategically. Failure by management to recognise the strategic importance of Information Technology may be fatal - once a competitor has established himself in the market it may be impossible to regain lost market share and profitability.

Although no formal research has been performed on the strategic implications of Information Technology for the audit professional it is clear from the above that opportunities do exist to exploit Information Technology for competitive advantage. Areas of interest for further research include a study of the attitude of members of the accounting profession towards using Information Technology in this manner, a longitudinal study of audit firms who utilise Information Technology specifically to gain competitive advantage, compared with those that do not, in order to gauge the impact on profitability of such a strategy, and a study of the manner in which such firms actually correlate Information Technology into their strategic planning.

Cox (a management consultant in direct competition with accounting practices based in the United Kingdom) sees the marketplace changing rapidly with :

"further specialisation and a greater emphasis on new developments (in Information Technology related fields) to come. Accounting firms are overtaking the general consultants and the image of the industry is improving".

(The Accountant, 15 April 1987)

The impact of Information Technology is not in dispute. It is up to management to utilise this strategic opportunity or face the consequences.

"A look at what's happening at Harvard Business School is very enlightening. Up to now the Harvard Business School has not regarded information systems as being something that should be part of the core curriculum of training future general managers. It was an elective course alongside other tools of business like market research or industrial relations. As from 1985, it became a vital part of the core curriculum alongside marketing, production, finance and business policy. And indeed one of the problems in integrating it into that core curriculum has been to decide which come first, business policy or information systems. What happens at the Harvard Business School today both reflects and predicts the focus of top management tomorrow."

(Biebuyck, June 26, 1987.)

There is no doubt that management in the 1990's is going to be dramatically affected by Information Technology. Successful organisations will be the ones which harness this technology and use it competitively in their fight for survival and growth.

Porter (1985) stresses the urgency with which management must address these issues :

"Competitive advantage is at the heart of a firm's performance in competitive markets. After several decades of vigorous expansion and prosperity, however, many firms lost sight of competitive advantage in their scramble for growth and diversification. Today the importance of competitive advantage could hardly be greater. Firms throughout the world face slower growth as well as domestic and global competitors that are no longer acting as if the expanding pie were big enough for all."

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APPENDIX 1

PARSONS : The Three-Level Impact of Information Technology

INDUSTRY LEVEL

Information Technology changes an Industry's :

- products and services
 - markets
 - production economics
-

FIRM LEVEL

Information Technology affects key competitive forces :

- buyers
 - suppliers
 - substitution
 - new entrants
 - rivalry
-

STRATEGY LEVEL

Information Technology affects the firm's strategy :

- low - cost leadership
 - production differentiation
 - concentration on market or product niche
-

(Source : Parsons, G.L. 1983. "Information Technology : A New Competitive Weapon". Sloan Management Review, Vol. 24 No. 1: pg. 4.)

APPENDIX 2

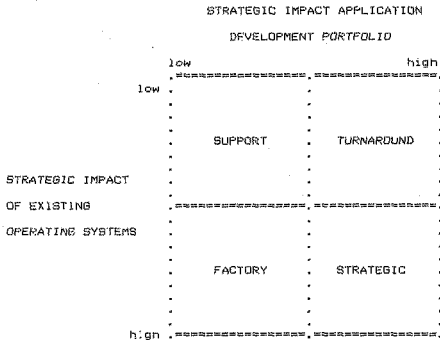
LUCAS and TURNER : Information Technology and Corporate Strategy

Level of integration with strategy formulation	Primary objective	Secondary objective
Independent	Operational efficiency	Managerial Information
Policy support	Aid repetitive decision making	Better understanding of problem dynamics
Fully integrated	Open new products, markets and directions	Change decision making processes : alternatives considered : evaluation criteria

(Source : Lucas, H.C. and Turner, J.A. 1982. "A Corporate Strategy for the Control Of Information Processing". Sloan Management Review, Vol. 23 No. 3: pg. 26.)

APPENDIX 3

McFARLAN and McKENNEY's Information Systems Strategic Grid



(Source : McFarlan, F.W. and McKenney, J.L. 1983.
"Corporate Information Systems Management - The
Issues Facing Senior Executives". Richard D.
Irvin, Illinois, pg. 75.)

APPENDIX 4

IVES and LEARMONTH : Thirteen Stage Resource Life Cycle

1 . Establish requirements	To determine how much of a resource is required
2 . Specify	To determine a resource's attributes
3 . Select source	To determine where customers will buy resources
4 . Order	To order a quantity of a resource from a supplier
5 . Authorise and pay for	To transfer funds or extend credit
6 . Acquire	To take possession of a resource
7 . Test and accept	To ensure the resource meets specifications
8 . Integrate	To add to existing inventory

9	Monitor	To control access and use of a resource
10	Upgrade	To upgrade a resource if conditions change
11	Maintain	To repair a resource, if necessary
12	Transfer or dispose	To move, return, or dispose of inventory as necessary
13	Account for	To monitor where and how much is spent on a resource

(Source : Ives, B. and Learmonth, G.P. 1984. "The Information System as a Competitive Weapon". Communications of the ACM, Vol. 27 No. 12: pg. 1198.)

APPENDIX 5

SYNTHESISED MODEL

INDUSTRY LEVEL

Information Technology changes an industries products and services, markets and production economics (Parsons)

FIRM LEVEL

Information Technology affects key competitive forces (Parsons) :

Long term performance can be severely impacted by shortfalls in information system functioning (Turnaround - McFarlan and McKenney)

Computer systems dictate the nature of competition in the industry (Strategic - McFarlan and McKenney)

-CF1 - Threat of new entrants (Porter) - Can Information Technology be used to build barriers against new entrants? (McFarlan)

-CF2 - Intensity of rivalry between existing competitors (Porter) - Can Information Technology change the basis of competition? (McFarlan)

-CF3 - Pressure from substitute products (Porter) - Can Information Technology be used to generate new products? (McFarlan)

-CF4 - Bargaining power of buyers (Porter) - Can Information Technology be used to build in switching costs? (McFarlan)

-CF5 - Bargaining power of suppliers (Porter) - Can Information Technology change the balance of power in supplier relationships? (McFarlan)

STRATEGY LEVEL

Information Technology affects the firm's strategy (Parsons) :

Information Technology is used to create greater organisational efficiencies (Lucas and Turner)

Information Technology is used to ease day to day functions of the organisation (Support - McFarlan and McKenney)

Computer technology is required to ensure smooth operational functioning of the organisation (Factory - McFarlan and McKenney)

APPENDIX 6

PRACTICAL EXAMPLES

The following examples illustrate the practical uses of Information Technology as a competitive weapon :

- In order to solve service problems, a major distributor installed an on-line network to its key customers enabling them to directly input orders into its computer. The perceived benefits were to cut order costs and provide customers with greater flexibility in the timing and processing of orders. The system led to a substantial rise in sales as well as market share. Once terminals had been placed at customers, these customers were unwilling to accept additional terminals from other suppliers.
- A large airline, by placing its reservation system at major travel agents, was able to gain access to reservation levels of smaller airlines and thereby monitor mutually competitive routes and adjust flight regularity and prices accordingly. Furthermore, Information Technology listed its flights first and as travel agents tend to accept the first available booking this resulted in a large increase in fares booked.

(From : McFarlan, F.W. 1984. "Information Technology Changes the Way You Compete." Harvard Business Review, Vol. 63 No. 3: pg. 98.)

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(From : McFarlan, F.W. 1984. "Information Technology Changes the Way You Compete." Harvard Business Review, Vol. 63 No. 3: pp. 98.)

APPENDIX 7

COPY OF ARTICLE SUBMITTED FOR PUBLICATION TO DE RATIONE

THE POTENTIAL USES OF INFORMATION TECHNOLOGY FOR STRATEGIC
ADVANTAGE BY PROFESSIONAL AUDIT FIRMS

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THE POTENTIAL USES OF INFORMATION TECHNOLOGY FOR STRATEGIC
ADVANTAGE BY PROFESSIONAL AUDIT FIRMS

ABSTRACT

As the pace of competition intensifies in the late 1980's the use of information systems as competitive weapons is accelerating. Although Information Technology (IT) is being utilised as a competitive weapon in many businesses, its strategic potential has largely been ignored by audit firms.

This paper begins with a description of the link between IT and corporate strategy. Using the major frameworks developed by various writers which enable management to identify and implement IT opportunities into their competitive strategies a synthesised model is developed to enable management to identify areas where IT can be utilised to gain strategic advantage.

By means of examples it is then shown that IT can be used by professional audit firms to gain strategic advantage over their competitors, both within and beyond the profession. This leads to the conclusion that professional audit firms that choose to ignore the potential of IT risk never being competitive again.

KEY WORDS / PHRASES

Information Technology, competitive advantage, strategic advantage, professional audit firms, use of computers.

INTRODUCTION

During the last decade, strategy has become a business buzzword. Top executives ponder strategic objectives and missions. Managers down the line develop marketing and product strategies. Repeatedly companies that are strategically managed have been winning market share from more traditionally managed companies. Kaufmann (1986) urged management to "think beyond their own organisational boundaries to the possibilities of extra-corporate systems." Since Kaufmann's article appeared, developments in computer technology have made feasible many new applications of strategic importance.

Companies that have a strategic planning process formulate competitive strategy in two steps. According to Canning (1984,a), the first step involves using some form of framework (e.g., Porter's industry competitive analysis) to describe their competitive environment. During the next step management consider the resources available to derive and implement corporate strategy. Traditionally companies have not explicitly considered the potential uses of IT as part of this process. However, beyond the use of IT to support the existing business strategy lies the opportunity to utilise IT to create new business opportunities. This double linkage of IT both supporting business strategy and simultaneously creating new strategic opportunities provides corporations with a powerful competitive weapon which they can utilise in their quest for maximum profitability.

INTRODUCTION

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During the last five years the larger accounting practices have become more business oriented. From their solid audit base they are diversifying, becoming competitive members of the fastest growing sector of the economy - the services sector. Traditionally, professional auditing practices have refrained from open competition with one another. However, in today's competitive environment, due to factors ranging from fee pressure to mere survival, auditing firms are beginning to compete more aggressively. This has lead to an increase in the use of computer technology both as a time and cost saving device and as a means of offering additional services beyond that of the statutory audit. Stevens (1985) wrote : "Just a decade ago the notion of accounting wars would have seemed preposterous not only to casual observers of the profession but also to those intimately involved in it. That practitioners of this conservative discipline would be assaulting each other with hit lists, press leaks, megamergers, talent raids, and hard-sell marketing campaigns - well, that would have seemed appropriate for mouthwash makers but not CPA's. Today the wars have spread beyond the first militarized zone, the audit market, to an evolving scope of services in a changing America, a changing world."

Abrahamson (1986) stated : "The revolution of Information Technology is the wave of the future. Whether we like it or not, the accounting profession will ride the crest of that wave - or drown. Accountants are in the information business. Our professional future will depend largely on how well we adapt to the profound, permanent impact of Information Technology on all the institutions in our society and on the relationships among those institutions. The same process thats reshaping the world around us will transform our own profession."

STRATEGIC FRAMEWORK

According to Bakos and Treacy (1986) technology based competitive opportunities are overlooked because of "(1) senior management's ignorance of Information Technology and its potential uses, (2) poor communications between the information systems group and the rest of the business, (3) resistance to change, among both the information systems and business personnel, (4) a lack of focus on opportunities for competitive advantage, and (5) a lack of instruments to measure the benefits."

Senior executives need a method to determine where strategic opportunities for the use of IT exist. A number of authors have identified potential opportunities for the application of IT to create competitive advantage through the use of various frameworks.

Porter (1979) states that "the essence of strategy formulation is coping with competition. Competition in an industry is rooted in its underlying economics, and competitive forces exist that go well beyond the established combatants in a particular industry. Customers, suppliers, potential entrants, and substitute products are all competitors that may be more or less prominent or active depending on the industry."

Porter (1979) identified five major competitive forces (CFs) :

- CF1 - The threat of new entrants
- CF2 - The intensity of rivalry between existing competitors
- CF3 - Pressure from substitute products
- CF4 - The bargaining power of buyers
- CF5 - The bargaining power of suppliers

He maintained that firms wishing to gain a competitive advantage should build defences against these forces and formulate specific strategic actions to directly influence these forces. He suggested that a firm may choose one of three possible competitive actions :

- (1) overall cost leadership (become the lowest cost producer)
- (2) differentiation (of a product or service)
- (3) focus (e.g.. finding a specialized niche in an industry)

Porter's (1979) analysis of competitive forces does not specifically address IT, but does provide a framework for assessing the role IT can play in a firm's competitive strategy. If the nature of the organisation's operations do not include any of the above, then IT is unlikely to offer it any strategic opportunities.

Porter (1985) specifically addressed IT as a means of securing competitive advantage : "Information Technology is more than just computers. Today, Information Technology must be conceived of broadly to encompass the information that businesses create and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information.

The information revolution is affecting competition in three vital ways :

- It changes industry structure, and in so doing, alters the rules of competition.
- It creates competitive advantage by giving companies new ways to outperform rivals.
- It spawns whole new businesses, often from the within a company's existing operations."

Porter (1985) concluded : "The importance of the information revolution is not in dispute. The question is not whether Information Technology will have a significant impact on a company's competitive position; rather the question is when and how this impact will strike. Companies that anticipate the power of Information Technology will be in control of events. Companies that do not respond will be forced to accept changes that others initiate and will find themselves at a competitive disadvantage."

McFarlan and McKenney (1983) recognized the role IT was playing in organizations and they developed a strategic grid whereby they could classify firms on the basis of the creditability of existing applications and the potential creditability of future applications under development. They recognised that while for certain organisations IT represents an area of great strategic importance, for others it plays a cost-effective but supportive role.

McFarlan (1984) mapped this grid onto Porter's competitive forces model. He proposed the following five questions for assessing the strategic impact of IT on a firm (Porter's competitive forces are noted in parenthesis) :

- Can IT be used to build barriers against new entrants (CF1)?
- Can IT change the basis of competition (CF2)?
- Can IT be used to generate new products (CF3)?
- Can IT be used to build in switching costs (CF4)?
- Can IT change the balance of power in supplier relationships (CF5)?

McFarlan (1984) states : "Such opportunities vary widely from one company to another just as the intensity and rules of competition vary widely from one industry to another. Computer advances have affected even the smallest companies. Further, in different situations, a company may appropriately attempt to be either a leader or an alert follower. The stakes can be so high, however, that this must be an explicit, well planned decision."

SYNTHESISED FRAMEWORK

Using Porter's (1980) five competitive forces (CFs) as a starting point, it can be seen that these only relate to a firm's strategy on an individual firm level. According to Parsons (1983) firms compete on three levels :

- global - competitive forces affect the industry as a whole.
- firm - competitive forces affect individual firms within an industry.
- strategic - competitive forces affect the ability of an individual firm to implement a specific strategy.

Porter's framework is only relevant at the firm level. Lucas and Turner (1982) address the strategic potential of IT at both the strategy and the firm levels. At the strategy level IT is utilised to create greater organisational efficiencies but is not directly linked to the strategic plan. At the firm level technology itself becomes part of the strategy as highlighted by Porter's Competitive Forces.

McFarlan and McKenney (1983) introduced the concept of a strategic grid used to determine the impact of IT on a firm's strategy. The support and factory levels are congruent with Parsons' strategy level - computers are used to ease day to day operations and eventually become essential to ensure the continued existence of the business. The turnaround and strategic sectors of the grid equate to Parsons' firm level - computer systems have potential strategic uses and begin to dictate the very nature of competition in the industry.

McFarlan (1984) then mapped this grid onto Porters' competitive forces model and developed a question which management can ask to determine whether or not a specific competitive force is applicable to their firm's strategy.

The following diagrammatic representation of this synthesised framework is used as a basis for identifying potential areas where audit firms can exploit IT for competitive advantage :

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INDUSTRY LEVEL

Information Technology changes an industries products and services, markets and production economics (Parsons)

FIRM LEVEL

Information Technology affects key competitive forces (Parsons) :

Long term performance can be severely impacted by shortfalls in information system functioning (Turnaround - McFarlan and McKenney)

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Computer technology is required to ensure smooth operational functioning of the organisation (Factory - McFarlan and McKenney)

USES OF IT AS A COMPETITIVE WEAPON BY PROFESSIONAL AUDIT FIRMS

Although there are many recent articles in the Management Information Systems (MIS) literature dealing with the use of IT as a strategic weapon no articles have appeared in the accounting literature discussing the potential strategic uses of IT by members of the profession. There are many articles addressing the use of (micro) computers by audit firms but these stop short of addressing the (potential) strategic impact of IT on the profession. The main thrust of the existing literature describes audit firms using computers to automate many manual functions.

Muggridge (1985) warns that "There will be ... a big shakeout, particularly among smaller practices. There will be a major migration of their (small firm) clients to larger practices which provide a cost-effective technology-based service. Accountants who adopt the new technology will be in considerable demand for the foreseeable future."

STRATEGY LEVEL

This is the first level where the introduction of IT into a professional audit firm can begin to play a strategic role. IT can be used to create greater organisational efficiencies (ie. to ease day to day functions of the organisation).

Examples where computer technology could be utilised in this manner by the professional audit firm include allocation of staff among planned future audits, computerisation of the firms debtors, time budgets, calculation of costs per audit compared to expected (budgeted) costs and detailed variance analyses, etc. The use of computer technology in this manner replaces the need to perform these functions manually and enables the professional firm to function more efficiently as information is prepared both more accurately and more *simultaneously*.

The major function of a professional audit practice is the performance of the statutory audit (although current trends indicate a move towards the major percentage of fees coming from other areas ie. consulting services).

According to the literature on the use of computers by auditors, audit firms have been utilising computer technology to automate many of the audit functions. Most audit practices have used microcomputers, many of which are portable and therefore have the advantage that they can be taken to the clients premises for use by staff performing the audit. Specialised packages have been developed both in house and by third party software vendors which automate many standard audit functions e.g. those identified by Chonowitz (1985). Chonowitz states that this automation of audit procedures "must surely be the first step towards the end of the working paper file as we know it today".

There are a wide range of reasons why computer technology has become widely used in this manner :

- the decrease in the cost of both hardware and software.
- the increase in computer literacy in the accounting profession and the ease of use of many of the currently available software packages.
- the increased awareness in the profession of the benefits to be gained by automating the audit.

Chonowitz identified the following major benefits being achieved through the use of IT for audit assistance (ranked in descending order of importance) :

- time savings
- increase in accuracy in casts, working papers etc.
- improved staff motivation as less time is spent performing clerical tasks
- improved audit efficiency
- allowing more time to 'think'
- enhancement of the firm's image
- improved documentation
- enhanced profitability

- improved level of computer literacy of staff
- greater consistency in working papers
- improved time and budget control
- improved audit planning
- reduced staffing levels and thereby staff costs
- etc.

Reported savings through the use of computer technology on audits have been as high as reductions of between 25 and 40 percent in audit times over a three year period and savings of over 80 percent on analytical review procedures (Pratt and Dilton-Hill, 1983).

The major benefits perceived from audit automation are therefore greater accuracy, increased staff motivation, and an enhancement of the firm's image. According to Bernstein (1985), "the future will see a growth in audit based software which will make the use of portable computers on audits a necessity rather than just a useful tool".

An example of a further advancement in this area is a system which allows audit staff to down-load mainframe computer information in-house via a tape drive unit connected to a micro computer. A high level audit specific language can then be used to interrogate the data.

The advantages of such a system include greater audit independence as the client has no access to the data once supplied to the auditors, greater involvement of the staff actually performing the audit work, and the ability to use a variety of micro computer packages to interrogate the data without having to recapture it.

Immense benefits can be obtained by removing the computer audit specialist from the audit through the use of such a package as firstly the audit team become more familiar with the clients data, and secondly, their level of computer experience and confidence increases.

FIRM LEVEL

It is at this level that immense scope exists for professional audit firms to utilise IT to gain competitive advantage. Whereas major time and cost savings have been achieved by audit automation, due to rising costs and increased fee pressure, this is no longer the area where maximum profit potential exists. Although advertising by members of the profession is prohibited, it is common knowledge that many practices have diversified into other areas of the services industry e.g. management consulting, recruitment, systems development and installation, facilities management, tax planning etc.

Using McFarlan's questions from the synthesised model it can be shown that audit firms can (and do) compete on this higher level :

Question 1 :- Can IT be used to build barriers against new entrants?

New entrants include both new accounting firms and financial service groups who, although they cannot provide statutory audit services, compete with accounting firms in all other areas.

As far as new accounting firms are concerned the startup costs are so great that other than all practices, which are not competition for large existing practices, it is difficult to envisage the creation of a large new firm other than through mergers with or takeovers of existing firms which will not greatly affect existing market share. The potential threat from beyond the profession is far greater as other groups ie. consultants, banks, software houses encroach on audit clients offering them a broad range of products and services.

However IT does provide the audit firm with the ability to increase their market share. The audit firm with an established computer consulting division has an opportunity to offer its existing audit clients access to its services and can recommend their use (either formally or informally).

In fact accounting firms have been so successful in this area that "computer dealers are concerned that ... these consultants enjoy an unfair competitive advantage (through) their links with the audit side of business". (Coetzer, 1987.)

In the future audit firms will be able to communicate directly with client's systems and perform audit functions on an on-going basis. Through the use of in-house expert systems auditors will be able to identify problem areas as they arise and immediately notify the client. The external auditor will replace many of the functions currently performed by the internal auditors.

Once an audit firm is interacting with a client on a continual basis the client's cost of switching firms is greatly increased and the longer the relationship continues the more entrenched the audit firm becomes.

An audit firm specialising in the high-tech audit area would be in a strong position to offer the more traditional audit services to their clients and expand their practice in this manner eg. Using an advantage in IT to diversify into other (more traditional) areas, thereby increasing their revenues and market share.

Question 2 :- Can IT change the basis of competition?

Through the use of technological advancements in the IT field, audit firms will be able to function more cost efficiently. Office automation, shared databases, networks etc. will all allow audit firms to automate many functions and ultimately lower their costs.

Through utilisation of various aspects of IT audit firms will be able to distinguish themselves from competitors on the basis of the mix of products they offer. Through specialisation in specific areas of IT related expertise audit firms will be able to supply services to specialised consumers of their products.

The current basis of auditing round the computer (testing controls around computer systems) is changing to one of auditing through the computer (testing the computer itself). The day is fast approaching where audit firms which are not technologically advanced will not be able to supply the same level of service to clients as firms that can utilise IT as part of their audit.

Question 3 :- Can IT be used to generate new products?

In the area of the statutory audit any software developed in-house by an audit firm can be sold. Firms have tended to refrain from doing this as firstly it provides the competition with access to their own cost saving devices and secondly many firms lack the expertise to provide adequate backup.

However, with the advent of expert systems, a new potential market appears to have arisen. In recent years there has been a trend among many audit firms to specialise in a specific market sector i.e. stock brokers, furniture retailers, the banking sector, etc. The level of specialised knowledge and expertise that has been built up in certain firms in relation to the audit of specific sectors can form the basis of the rules required to develop expert systems to aid in the audit of such businesses.

Usually the audit problems specific to a business sector are similar on a world wide basis. This provides the firm creating the expert system with a potential world wide market of other audit firms who are not direct competitors.

It is beyond the statutory audit that the real potential for the development of new products really exists :

- The advent of computerised (public) networks allows the audit firm the opportunity to place pertinent information e.g. relating to changes in tax legislation, computer developments, accounting procedures etc. at the reach of the business community. Not only can a fee be charged for access to this information, but more important is the exposure to be gained from becoming an information provider.
- The analysis of trends in various industries a technologies in which the audit practice has in-depth knowledge (e.g. computer security) provides it with a further saleable product.
- Industry specific databases can be developed which can supply information to both internal audit staff and external subscribers. Providing information in areas of expertise built up over the years through interaction with clients in many different market sectors provides the audit firm with another saleable product.

An example would be information relating to market sector payment history (required by creditors), turnover and other stock related statistics (required by potential new entrants, merchant bankers) etc.

- Publishing is a further area not to be overlooked. Once specific knowledge has been gained in an IT related area this can be made available to a wide range of subscribers (either electronically, for those who require fast dissemination of information, or through the medium of news-letters, regular articles etc.).
- The auditor is probably the best suited person to provide the client (who is unable to do so himself) with a financial modelling service. The benefits to the auditor include additional income, a better understanding of the clients business leading to a potentially more efficient audit, and the development of a collection of reusable financial models.

Question 4 :- Can IT be used to build in switching costs?

The audit firms that are currently involved in the design and implementation of accounting systems for existing (audit) clients have a distinct advantage over those firms that do not supply these services :

As the computerised accounting system has been installed by the firm performing the statutory audit, the audit can be performed with prior knowledge as to the level of controls both within the computerised system (e.g. depth and completeness of audit trails, strength of access controls etc.), as well as an in-depth knowledge of the personnel using the system, their level of computer knowledge, and the extent of segregation between their computer related tasks and other (possibly incompatible from an internal control perspective) functions in the client organisation. This will lead to a cost saving as a review of the computer system is no longer required.

The detailed knowledge of the system present in the audit firm should also lead to a more effective audit as tests need only be directed at specific problem areas which in turn saves further audit costs.

Once an audit firm has installed a computer system at an audit client it becomes more difficult for the client to change auditors as firstly another audit firm will not be able to provide the same level of support to the computer system until they have developed the same in-depth knowledge of the system (a time consuming and potentially costly procedure) and secondly, the new audit firm will probably require a computer audit review as part of their first audit, again pushing up the clients costs.

A further plus factor in installing computer systems is the potential to increase the audit base by installing systems at non clients as this provides the audit firm with an opportunity to "sell" their range of other services.

Question 5:- Can IT change the balance of power in supplier relationships?

Audit firms themselves are potentially large information purchasers. The kind of information envisaged is information that would be of use to a large proportion of the profession e.g. an on-line data base containing audit specific information and current literature. The professional audit firm that is both a large user of such information and is technologically advanced may be able to dictate the market procedure once such on-line services become available.

Audit firms also purchase skills. Firms that are technologically advanced and which have a reputation for encouraging innovation (in IT and other fields) will attract the most ambitious and motivated staff. The calibre of the staff, in turn, enhances the firm's reputation with their customers, the business community.

INDUSTRY LEVEL

IT changes an industries products and services, markets and production economics.

As can be seen from the discussion above the "audit industry" as a whole is about to undergo a major change due to the impact of IT. The basis of competition is shifting towards those firms that can harness IT and use it for competitive purposes.

Auditors are moving towards becoming information specialists working in real time rather than "after the event monitors". In the foreseeable future businesses will require almost instantaneous audit reports and on-line consulting services. The auditor who does not plan to utilise IT will be unable to provide these services.

An important benefit to be gained from the utilisation of IT in an auditing practice is the increased level of computer skills that will develop within the firm that can be used in a diverse range of areas e.g. tax planning, stock exchange listings, mergers and acquisitions, etc.

All audit firms must address all these issues as part of their strategic planning process. To address some of the issues in isolation from others may lead to strategic opportunities being missed.

CONCLUSION

Although the literature abounds with examples of companies which have successfully employed IT for strategic purposes, and with frameworks for identifying and categorising strategic opportunities utilising IT, there is a notable absence of any suggestion that these techniques can be utilised by professional firms. However, the examples given above have shown that the potential does exist for the professional audit firm to use IT to gain a strategic advantage over their competitors.

Suggestions to draw attention to the potential of IT range from the development of better measures of efficiency and effectiveness of organisational functions to major changes in the structure of the organisation itself. The writers all stress the importance of informed management for the successful use of IT for strategic purposes. The frameworks presented above are the starting point for management (whether in a professional or commercial environment) to begin the search for strategic uses of IT.

The critical question to be answered is whether IT is, or can become, a strategic weapon in the corporate armoury. As technology continues to evolve rapidly and becomes a major factor in more diverse industries, organisations must begin to think strategically.

Failure by management to recognise the strategic importance of IT may be fatal - once a competitor has established himself in the market it may be impossible to regain lost market share and profitability.

Although no formal research has been performed on the strategic implications of IT for the audit professional it is clear from the above that opportunities do exist to exploit IT for competitive advantage. Areas of interest for further research include a study of the attitude of members of the accounting profession towards using IT in this manner, a longitudinal study of audit firms who utilise IT specifically to gain competitive advantage, compared with those that do not, in order to gauge the impact on profitability of such a strategy, and a study of the manner in which such firms actually correlate IT into their strategic planning.

Cox (a management consultant in direct competition with accounting practices based in the United Kingdom) sees the marketplace changing rapidly with "further specialisation and a greater emphasis on new developments (in IT related fields) to come. Accounting firms are overtaking the general consultants and the image of the industry is improving" (The Accountant, 15 April 1987).

The impact of IT is not in dispute. It is up to management to utilise this strategic opportunity or face the consequences. "A look at whats happening at Harvard Business School is very enlightening. Up to now the Harvard Business School has not regarded information systems as being something that should be part of the core curriculum of training future general managers. It was an elective course alongside other tools of business like market research or industrial relations. As from 1986, it became a vital part of the core curriculum alongside marketing, production, finance and business policy. And indeed one of the problems in integrating it into that core curriculum has been to decide which come first, business policy or information systems. What happens at the Harvard Business School today both reflects and predicts the focus of top management tomorrow." (Biebuyck, June 26, 1987).

There is no doubt that management in the 1980's is going to be dramatically affected by IT. Successful organisations will be the ones which harness this technology and use it competitively in their fight for survival and growth. Porter (1985) stresses the urgency with which management must address these issues: "Competitive advantage is at the heart of a firm's performance in competitive markets. After several decades of vigorous expansion and prosperity, however, many firms lost sight of competitive advantage in their scramble for growth and diversification. Today the importance of competitive advantage could hardly be greater. Firms throughout the world face slower growth as well as domestic and global competitors that are no longer acting as if the expanding pie were big enough for all."

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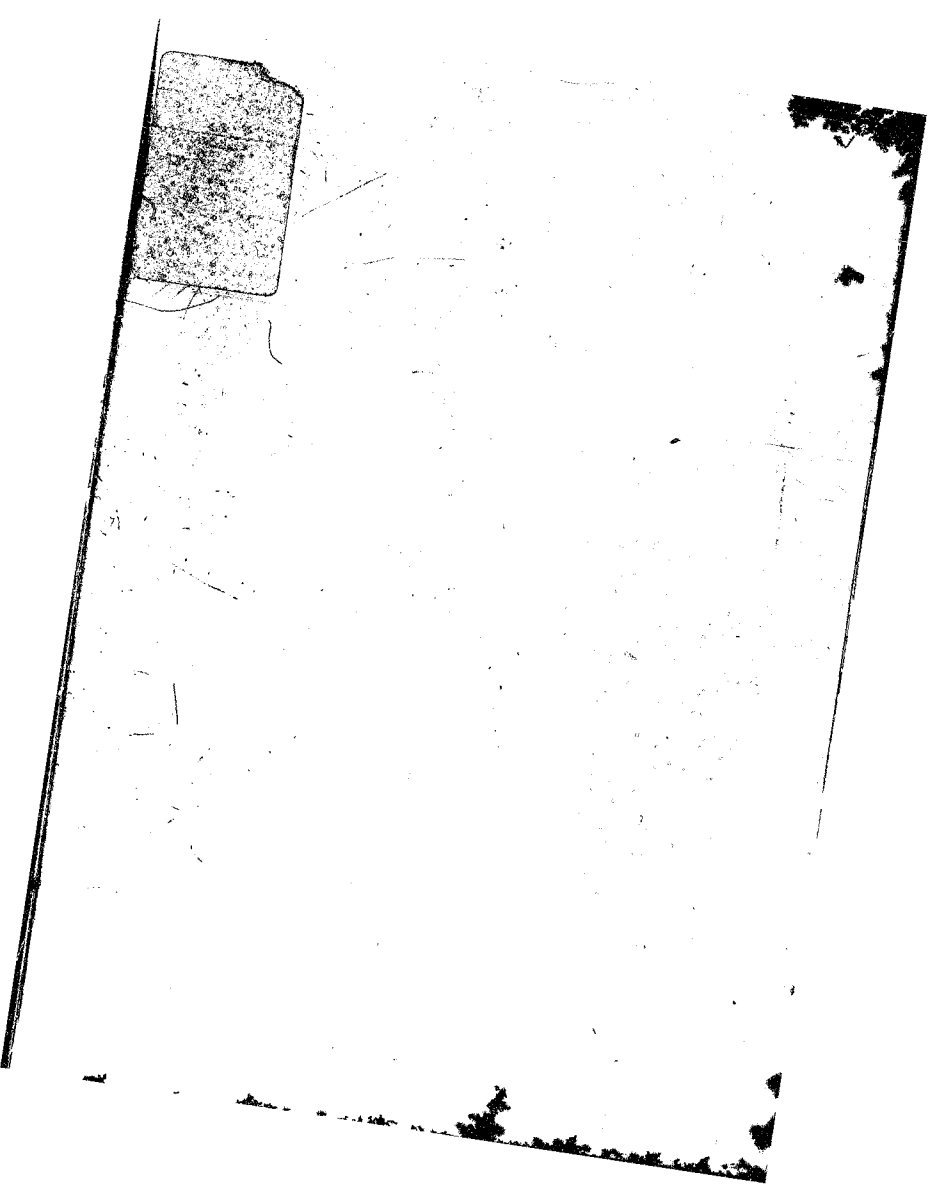
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