DEVELOPMENT OF A CONCEPTUAL OVERVIEW OF THE STRATEGIC MANAGEMENT OF INFORMATION TECHNOLOGY AND AN ENQUIRY INTO INFORMATION TECHNOLOGY STRATEGY FORMULATION IN PRACTICE

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ABSTRACT

Strategy is not a new term, the word has been in use as far back in the history of man to whenever conflict between man has been evident. Today, the battleground is the business environment and the conflict has arisen through the desire to prosper (for some the need to survive) in a highly competitive and increasingly dynamic situation.

Business leaders, academic theorists and researchers in general are now directing a large proportion of their skills and resources

toward the topic of strategic management. Their efforts over just a short period (20 or so years), have produced a wide range and variety of approaches, concepts and practical conclusions rapidly increasing in both quantity and scope.

This research study tackles the entire subject of strategic management, but in particular it goes beyond traditional boundaries to investigate the equally dynamic and high profile topic of strategic information technology (IT) management and presents both fields within the "strategic management" umbrella.

There can be no conclusive result or definitive statement when dealing with an outlook as broad as this. The real benefit and intention for the study is one of education and enlightenment on the history and evolution of strategic management and its effect and influence upon IT management, to its current state of the art. This is presented as a conceptual overview as the result of a review of the literature concerning both corporate and information technology management issues.

As a balancing element the study investigates from the New Zealand perspective, the impact and level of penetration that strategic management has achieved within large and successful organisations, which again focuses upon the management of information as a strategic resource.

Results from 55 respondents to the study's survey questionnaire show that only eight companies (15%) do not have either an IT or a corporate strategic plan, and that conversely 26 (just under half) do have strategic plans within both corporate and IT realms. This reveals that 47, or an overwhelming majority of 85% of those that responded to the questionnaire, are currently involved in the preparation of strategic plans whether IT or corporate.

The high level of interest and involvement in strategic management as indicated by the survey is reflected in the multitude of literary works on the subject and the increased attention to the topic evident in the content of new courses offered by tertiary education institutions.

This report will be useful to academics, theorists and practitioners alike and can be utilised as (1) a general annotated bibliography of readily available past literature, (2) a tool for rapidly reviewing how strategic management has evolved, (3) a source of quick reference for trends and significant findings within N.Z. businesses, or (4) where an individual has not yet encroached the subject, a starting point for their appreciation of the topic.

It is my desire that this work contribute in some small way to the consideration by all who read it that information and communication are the essence of our everyday lives, and that therefore the adoption of an holistic approach to each and every means for making information more communicable, more valuable, more accurate, more relevant and appropriate, and more easily and effectively communicated whether through the use of technology or not, is both a logical and a most desirable proposition.

To my partner Roseann and my parents Jeanette and Doug

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INTRODUCTION

Since the introduction and earliest application of the computer in the business environment, a sustained and relentless barrage of **change** and new challenges has been unleashed on management of organisations large and small. From the literature there is evidence that contemporary writers agree that the rapid evolution and spread of information technology (IT) has profoundly affected both how organisations operate and how they choose to compete. (Cash et al 1988, p.1 [8]).

Information technology has progressed from the central computer, to data processing (DP), to management information systems (MIS), to information resource management (IRM), to strategic information systems (SIS). In fact, it is widely agreed that information technology is becoming **a strategic resource**. (QED Information Sciences 1989, preface [42]; Earl 1986, p.157 [79]).

Advances in software applications and the convergence of data processing, communications and automation technologies, in conjunction with rapid technological advances (matched with equally rapid reducing costs), provide business organisations with new strategic options in today's environment of constant change,

global competition, economic uncertainty and industry deregulation.

> "In global competition, the spread of information technology and their social and economic consequences, management was confronted by change on a scale and at a speed which had never before been contemplated." (Caulkin 1991, [9]).

Consider the influence of information technology within the following "unavoidable issues", highlighted by some of the most prominent management thinkers of today. (Caulkin 1991, preface [9]).

- The simultaneous globalisation and fragmentation of markets.
- The changing world economic order.
- The impact of information and information technology.
- Innovation and entrepreneurship.
- The unshaping of the organisation.
- The nature of competition.

The key realisation, is of course, that information technology deals with the most fundamental of all organisational resources, assets and activities - **organisational information**, and so, it is not unusual that information technology **is being exploited** by firms to make spectacular strategic thrusts, and **is becoming a driving force** which is eroding and fusing many boundaries within

and between many sectors. (Benjamin et al 1984, p.3 [60]; Earl 1986, p.157 [79]; Parsons 1983, p.4 [146]).

There are at least four different ways that information technology can and is being applied strategically, (1) to gain competitive advantage, (2) to improve productivity and performance, (3) to enable new ways of managing and organising, and (4) to develop new businesses.

Consequently, "Should information systems (IS) and information technology still be considered as just a support activity serving management's planning and control needs, and automating business operations?" There is overwhelming evidence from the literature, to argue that in addition to these duties, information technology should be harnessed to support the firm's strategy and structure (Benjamin et al 1984, [60]; Parsons 1983, [147]), be managed and exploited as a potential strategic weapon (McFarlan 1984, [129]; Porter & Millar 1986, [150]), and even be considered as **inseparable from strategy** in general. (Long 1982, p.9 [27]).

This study focuses upon these additional duties and the ways that information technology can be applied strategically in preference to the more traditional duties of supporting management and automating operations.

There are continual demands to plan the use of information technology and information systems strategically (Earl 1986, [79]; Lucas & Turner 1982, [126]), and information systems strategy formulation and information technology planning has evolved considerably since the introduction of computers in the 1950's. Generally, there has been a progression from the rudiments of (1) ensuring top management direction, (2) defining hardware and systems platforms, (3) analysing and forecasting resource requirements, (4) allocating resources effectively, and (5) controlling information processing, through the early 1980's needs to (6) exploit the strategic opportunities afforded by information technology, and (7) align information technology with business strategies, to the present day desire to (8) combine information systems knowledge with corporate strategy, organisational behaviour, technology management and industry economics - a considerably more holistic attitude.

1 Statement of the problem

The task of facing and mastering the new sets of challenges concerning information technology is complex. Many members of corporate senior management have received both their education and early work experience prior to the wide-scale acceptance of information technology (if that has yet arrived), and predominantly in the "separate" **field of management**. Many IT

managers face similar problems, since their first-hand technical experience is unlikely to be consistent with modern technological developments (Cash et al 1988, [8]), and their education confined to the equally "separate" **field of computer science.**

The continual demands for strategic information systems have, of course, not waited or even slowed in their pace, and so practitioners have experimented in information systems strategy formulation, consultants have developed new methodologies and academics have been evaluating both the techniques and the outcomes. (Earl 1986, p.158 [79]).

The sheer amount of work, academically - within two traditionally separate fields, and practically - through external advisement and within general management and IS management disciplines, and over such a short period of time, has produced a lack of definitive results and a myriad of different approaches.

In addition to the contributions from advocates, there is also a healthy scepticism about some of the strategic outcomes of IT applications, concern that some of the strategic frameworks are superficial, that strategic formulation techniques are not yet mature, prescriptions too generalised and expectations over-optimistic. This is perhaps reflected in the fact that many strategic information technology success stories have been the result of unplanned rather than planned experiences.

An important aspect of the problem, is that of language and understanding. Terminology in a field such as management is pitifully undefined with many management terms having widely different meanings to different people. When coupled with terminology from a technology oriented field, simple reference to even a word such as "system", can be misinterpreted. For example, Kast and Rosenzweig's "systems" philosophy concerns thinking about complex human endeavours (Kast & Rosenzweig 1969, 25]), whilst to computer programmers, "systems" are regarded as software applications.

Effective communication is a key critical factor for and throughout the study. Because the audience will most likely embody diverse and unique individuals with varied backgrounds, skills and experiences, the problem of language and understanding is addressed in the following section prior to the explanation of research purpose.

2 Definitions

The most important terms, for the purpose of this study are those of strategy, information technology, and strategic management. Throughout the literature survey, a progression of these terms is evidenced, and often it is found that the use of a particular word

can vary tremendously between both individual authors and periods of publication.

Instead of analysing and clarifying each occurrence of an ambiguous statement in the literature review, or of altering the researched material in order to "modernise" the phrases used, an attempt is made here to present the definitions and developments as they have appeared and altered over time, particularly for the key terms **strategy** and **information technology**. Furthermore, an explanation of new or specific terminology, that can be realistically assumed to have retained a uniform meaning, but may have appeared or disappeared from common use over time, is presented within the following related sections. The third key phrase, **strategic management** is introduced and defined in the last section relating to contemporary works.

Over the centuries, the word **strategy** has undergone several transition periods. The original Greek word from which strategy comes means "the art of the (military) General". (Scott Morton 1988, p.58 [167]). Carl von Clausewitz's classical 19th century definition "the employment of battles to gain the end of war" summed up Napoleonic strategy, and then came the American civil war with the accurate firepower of the long-range infantry rifle revealing the strategic importance of economic and manpower resources. (Encyclopaedia Britannica 1990, [15]).

The earliest development of strategy within the context of the business environment emerged with the desirability of long-range planning as;

> "The determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals." (Chandler 1962, p.13 [10]).

By the early 1970's, the interest had shifted to a focus on business or corporate planning which involved executives giving top-down guidance to the organisation to promote bottom-up plans from the division and functional levels. These were then put together to produce an overall corporate plan.

The latter 1970's and early 1980's produced two new significant changes in attitude toward strategy. Portfolio planning emerged first, with management's new emphasis on separate strategic business units (SBU's), and this contributed to a better awareness of competition and the growth potential of markets served. The competitive position of the firm in the context of the infrastructure of its industry emerged thereafter, with Michael Porter introducing his ideas on generic strategies. (Porter 1980, [39]).

More recently in the evolution of strategy, has been the focus on the means by which an organisation can add value to its products or services through analysis of its value chain. (Porter 1985, [40]).

Many contemporary writers continue to provide revised definitions for strategy, and attempt to incorporate these ever changing concerns.

> "A set of objectives and integrated set of actions aimed at securing a sustainable competitive advantage." (Gluck 1986, [97]).

However, for the purposes of this study, an appreciation that strategy as a concept, has evolved as a steady progression of ideas and will continue to be refined, revised and added to over the years to come, and a general appreciation of the term as presented in the preceding paragraphs is perhaps more appropriate than a fixed definition.

The term **information technology** has evolved in recent years so much so, that defining IT, is perhaps easier if presented more as **what IT consists of**, rather than what the actual words mean.

The most important consideration for information technology is that IT is no longer simply the computer, but that it now includes the technologies of computers, telecommunications and office

automation. There appears to be no clean way of categorising IT, however it too has progressed from Thomas Whisler's 1960's definition that regards information technology as having three components (1) The computer - being the engine that drives the technology, (2) Telecommunications (data networks) and, (3) Management science techniques - or the mixed bag of such things as Bayesian decision analysis, linear programming and various models which fit the elements of management computational and decision problems (Whisler 1967, p.18 [182]), to Michael Scott Morton's more recent definition which provides a good overall perspective as follows. (Scott Morton 1988, p.56 [167]).

Information technology consists of at least the following:

1. Computers - which are a central component of information technology, and together with the wide spectrum of computers exists the wealth of data and information that is available to an organisation in an electronic form.
2. Telecommunications - which can be internal or external to the organisation. Telecommunications should be considered within the context of the powerful difference between a computer that is isolated, and what the computer becomes in the hands of the user when it is linked into a network and has flexible access to information, other computers, and other organisations.
3. White Collar Productivity Tools - these are commonly known as office automation and clerical support systems.

4. Blue Collar Productivity Tools - most obvious in cases of robotics and factory automation, but extend to computer-aided design and computer-aided engineering and the likes of bank loan officers evaluating loan possibilities through the use of an interactive work station.
5. Smart Problems - where information technology becomes included into the technology of the product itself, such as a car computer's fuel management system.

Throughout the literature survey, references to **strategy** and **information technology** will usually comply with the publication time period for the work or works under review.

2.1 The 1950's to the early 1970's

Administration and in particular long-range planning emerged as new terms or with new meanings during the 1950's and 1960's and with the introduction of the computer, attention was drawn toward data, information and data processing systems. The following are some selected definitions that suitably describe these terms from publications of that time.

Administration includes executive action and orders as well as decisions taken in coordinating, appraising, and planning the work of the enterprise and in allocating its resources (Chandler 1962,

p.8 [10]), and **structure** represents the design of an organisation through which the enterprise is administered. (Chandler 1962, p.14 [10]).

Planning is essentially a process of preparing for the commitment of resources in the most economical fashion and, by preparing, of allowing this commitment to be made faster and less disruptively. (Warren 1966, p.21 [53]).

> "Planning and doing are separate parts of the same job; they are not separate jobs. There is no work that can be performed effectively unless it contains elements of both..." (from Drucker's *The Practice of Management*, 1954 as cited by Warren 1966, p.21 [53]).

Long-range planning is a process directed toward making today's decisions with tomorrow in mind and a means of preparing for future decisions so that they may be made rapidly, economically, and with as little disruption to the business as possible. (Warren 1966, [53]). In our modern times of environmental uncertainty, the use of this term has virtually become redundant.

Information can be put into two broad categories: (1) The process stream - information which must flow laterally between the operations of a business and, (2) The management stream - where one of the major purposes of an information system is to assist management to make the best possible decision in any situation

because, the essence of management is decision-making. (Institute of cost and Works Consultants 1967, p.50 [21]).

A **management information system** is a system in which defined data are collected, processed and communicated to assist those responsible for the use of resources. (Institute of Cost and Works Accountants 1967, p.10 [21]).

2.2 The middle 1970's to the early 1980's

The concentration of corporate management toward industry and environment analysis and the selection of corporate strategy (or strategies), progressed considerably during the late 1970's and early 1980's. Spurred on by attention toward competitive forces and the identification of alternatives for any given scenario, many "every day" words and terms took on new importance rather than new meaning. Apart from IT jargon, the major changes in information technology terminology reflected the changing attitudes toward information itself.

The following are some selected definitions that are either newly introduced during this time period or that have altered to reflect their renewed importance.

Competitive strategy is an area of primary concern to managers, depending critically on a subtle understanding of industries and competitors. (Porter 1980, preface [39]).

Data is a representation of "raw" facts, concepts, or instructions in a formalised manner, suitable for communication, interpretation, or processing by human or by automatic means, but not usually in context. (Horton 1979, p.313 [20]).

Information is the meaning that a human assigns to data by means of the known conventions used in their representation. (Horton 1979, p.313 [20]).

Information resources are all of the data and information facilities, sources, services, products, and systems needed by the agency manager to support and fulfil his information needs. (Horton 1979, p.313 [20]).

Information systems' **long-range plans** focus on a point somewhere beyond any particular computer application or project (Parkin 1980, p.1 [37]), **medium-range** plans for DP development include selecting and prioritising a collection of projects to be started during the planning period. (Parkin 1980, p.12 [37]).

2.3 The middle 1980's through present day

In recent times, many of the old terms and expressions have given way to entirely new ones as innovative solutions and pioneering concepts have appeared in response to the growing demand for increased proficiency in both theory and practice. The majority of these terms are introduced and explained within the final section of the literature review and as their meanings are contemporary, they are not elaborated upon here.

For some words however, there are simply no alternatives to properly convey their associated meaning, even within the diversity of the English language. Information is one of these words, strategy another and the following are some specifically selected definitions to help convey modern opinion, particularly in light of new couplings of, for example strategy, with older more established terms such as planning and management.

A **strategic plan** concerns the number and variety of product and service markets that the organisation will compete in, together with the development of the necessary resources (people, capacity, finance, research, etc) required to support the competitive strategies. Strategic plans relate to the whole organisation, cover several years and are generally not highly detailed. (Johnson & Scholes 1988, [22]).

Michael Porter says that a bona fide **corporate strategy** should be more than a compilation of business units' plans - it should be a device to integrate business units and enable the parent company to capitalise on synergies so that the whole of the corporation is more than just the sum of its units. (Business Week 1984, p.68 [64]).

Information, it was discovered, can be acquired, manipulated, and allocated just as any other economic resource can. (Mason 1984, p.276 [133]). This realisation gives information a strategic significance in organisations.

A major problem in **strategic management** lies in both analysing a chaotic environment and developing a level of understanding that utilises intuitive skills to create strategic opportunities. (McGinnis 1984, p.45 [132]).

The new concept of strategic management can be presented generally as;

> "A system of corporate values, planning capabilities, or organisational responsibilities that couple strategic thinking with operational decision-making at all levels and across all functional lines of authority in a corporation." (Gluck et al 1986, [97]).

However, strategic management (with particular reference to information technology) can probably best be described using Michael Earl's following propositions which he has elicited from a wide range of literary contributors. (Earl 1986, p.173 [79]).

1. If a firm does perceive IT as a **strategic issue**, then strategy becomes much more than a set of strategy formulation techniques, and four **strategic management tasks** - (1) Giving strategic direction, (2) Creating a strategic culture, (3) Developing a strategic organisation, and (4) Developing strategic managers - become essential.
2. If IT is perceived by a firm to be a **strategic resource**, then information technology can no longer be managed as a support or service activity. It becomes an **integral part** of strategy.
3. If IT is to be a mechanism for **creating competitive advantage**, then information systems will be more reminiscent of industrial innovations, than of traditional computer applications. The promotion of innovation and entrepreneurial traits becomes necessary.
4. If a firm operates in a sector whose infrastructure is founded on IT, finds its business strategies dependent on IT or sees IT providing new tools and strategic weapons, information management will be concerned with managing **strategic change**.
5. If a firm's business is **technology-based** or it is making a business of information, then its management practices will

require business focus, adaptability, organisational cohesion, entrepreneurial culture, sense of integrity and "hands-on" management.

6. If IT is agreed to be **strategic**, affecting the firm's future and requiring consideration of environmental matters as well as internal functioning, both IT executives and general managers will need to **interact with and manage** their environments.

3 Research purpose

This study concerns **strategic management**, and in particular focuses upon information technology.

Thousands of books and articles, published within a short fifty year period, present the history of information technology and an important slice of the history of management. The study attempts, through a systematic and methodical approach, to trace the evolution of strategic management - as evidenced in the literature - from the time of the first introduction of the computer to the business environment.

The topic is extremely complex. Concepts that contribute to strategy formulation are continually evolving, information technology and indeed the world-wide business environment itself

is changing and so it is the impact that each has upon the other that proliferates the complexities. As such, the task of presenting a conceptual overview of the strategic management of information technology is indeed demanding. However, it is the **primary purpose** of this work.

With only few exceptions, the literature, the case studies, the reflections and reports from experienced executives, and the contributions from academic research concern the United States of America and the United Kingdom. New Zealand on the other hand, is an island in the Southern Hemisphere of the World. It has slightly more land area than the U.K., but only one twentieth the population and New Zealand harbours an altogether different business and economic environment. Small businesses for example, constitute over 80 percent of the business population overall. (Bollard 1988, p.7 [5]).

The **secondary purpose** of the study is to enquire into information systems strategy formulation as practiced by a balanced representation of large, successful New Zealand businesses.

4 Methodology, boundaries and limitations

The study has four research objectives:

1. To present a chronological account of the evolution of corporate strategic management and the strategic management of information technology through a systematic investigation of the literature.
2. To extract from the literature research, a comprehensive list of strategic management concerns, processes and methodologies, and a means for categorising or grouping these items so that a questionnaire may be developed.
3. To design a questionnaire, and survey a selection of large, successful New Zealand businesses on the topics of corporate strategic management and the strategic management of information technology.
4. To design and develop the computer-based software programs necessary to produce a working database system for the recording, querying and reporting of survey responses.

With the exception of the second objective, which is an on going activity within the undertaking of the first (the survey of the literature), each objective must be successfully completed prior to commencement of the next, as each is in effect, dependent upon the acquired knowledge and gathered information of their precursor.

The study has boundaries and limitations. First, there is no "proposition to prove" or "side to defend", nor is there even a working hypothesis beyond expectations (for the survey questionnaire), that are based upon practical experiences of the author. The literature research is purposefully restricted to the books, serials, periodicals, dissertations and study guides accessible from the Massey University library, and the University's departments of Management Systems and Information Systems. It is assumed that the collective demands for the procurement and maintenance of prominent, topical works by the University's staff, students and external concerns, will provide an extensive coverage of the subject, more than adequate for the purposes of the study.

The survey questionnaire is limited to New Zealand businesses through the stated purpose of the study, however it is recognised that many of the organisations may be partly or wholly guided and/or controlled by off-shore enterprises. No consideration is made to differentiate this circumstance, nor in either the survey questionnaire nor the survey of the literature, is any attempt made to address the special need environments of small businesses, not-for-profit operations or public service organisations.

4.1 Literature research

The **primary purpose** of the study - presenting a conceptual overview of the strategic management of information technology (page 19) - is achieved through the successful completion of objective one. Due to the breadth and complexity of the task and the associated problems already identified, little attempt is made toward filtering or selectively evaluating the bulk of available material. The conceptual overview therefore, is imparted informally and a full appreciation of the topic is gained from progressive reading.

The focus upon information technology provides an ideal starting point, limiting the historical depth of the literature research to the time of the first commercial introduction of computers to the business environment. It also enables different techniques to be employed - a greater emphasis is placed on researching the strategic management of information technology than is placed on researching corporate strategic management in general - as much material is common to both disciplines (especially among modern contributions).

The **literature research method** employed comprises (1) compiling an extensive list of books, dissertations and articles in any way concerning strategic management, (2) conducting a primary analysis of each work to determine its relevance, (3) reading the relevant

works whilst making review notes with accurate references and recording any concepts, concerns or methodologies used, and (4) producing the final manuscript.

Chronological representation of the literature is diligently adhered to throughout the review. Within the earlier time periods, the introduction of a significant concept or methodology that has also received a more recent review or modification will have comments concerning the more contemporary work included if deemed appropriate.

In the modern day time period, the bulk of reviewed publications are journal articles and/or selected reprints compiled within an edited work. A deviation from strict chronological review is often necessary as the attempt is made to group together and continue from the first introduction of a concept or methodology with any subsequent and related works from the same or other authors regardless of their time of publication. Many articles introducing simple methodologies or strategic planning techniques have also been reviewed, however their content is often not presented in the literature survey chapter, but instead simply recorded for later use in the questionnaire.

Successful completion of the literature survey fulfils objectives one and two and achieves the primary purpose of the study (page 19). It then enables the practical enquiry phase to proceed.

4.2 Survey questionnaire

The **secondary purpose** of the study - an enquiry into information systems strategy formulation as practiced by a representation of large, successful New Zealand businesses (page 19) - is achieved through the successful completion of objectives two, three and four.

The enquiry is conducted via a questionnaire designed from the information gathered in fulfilment of objective two - a comprehensive list of strategic management concerns, processes and methodologies. The focus is again upon information technology, however as the strategic management of information technology is becoming more integrated with corporate strategy, organisational behaviour, technology management and industry economics, it becomes difficult to identify the ideal target individuals. The assumption is therefore made that the survey would best be addressed to the Chief Executive Officer of each organisation for that person's delegation or redirection to whosoever they regard as the most appropriate respondent.

Again, due to the breadth of the topic and the associated problems already identified, the questionnaire seeks more to identify any trends, or categoric responses that can be considered as "general" business or industry norms, or generally accepted practices. Any industry considerations will of course depend upon sufficient

numbers of replies so that confidentiality can be maintained. There is little within the content of the questionnaire, that attempts to explain or expand upon specific terms or methodologies. The enquiry is therefore concerned with identifying common practices, techniques and attitudes **obvious** in name or usage to each respondent.

The enquiry phase of the study will produce upon the successful completion of objective four, a working database system, that whilst fulfilling this study's requirement as a data entry and query/reporting tool, will also be an extremely useful information base for any future and subsequent research work.

The **survey questionnaire research method** employed comprises (1) Designing the questionnaire, (2) Compiling a list of large, successful New Zealand businesses, (3) Conducting the direct mail survey distribution, (4) Developing the computer-based software system for data entry, (5) Recording all responses and developing the query and reporting capabilities of the software system, and (6) Producing the written analysis and report on results.

Successful completion of the survey questionnaire and enquiry phase fulfils all remaining objectives and achieves the study's remaining secondary purpose.

5 Organisation of the research study

The important principle to convey within the organisation of the research study is that reading should be conducted in an orderly and sequential manner, particularly within the literature survey chapter.

The study is presented in five chapters commencing with the usual introduction (**Chapter I**) of key concepts and concern over language and understanding problems within its "definitions" section, but it is **Chapter II: Survey of the literature**, that is crucial to imparting the conceptual overview of corporate and information technology strategic management. Progressive reading of this chapter will ensure fuller understanding and better preparation for the remainder of the work.

The literature survey chapter is separated into three time periods in relation to (1) major events and changes in concept, (2) types of literary works and contributors, and (3) the intended depth of review. Within each time period, an additional separation of corporate management versus information systems management is maintained and reviews are presented in chronological order of publication as best as possible, although in the discussion of a popular topic it is not uncommon for subsequent future evaluations, enhancements or comments to be considered within that topic's elaboration.

In addition, works reviewed within the most modern section - the middle 1980's through present day - are predominantly in the form of articles, editorials and texts instead of comprehensive book form. With over 130 of these, many are grouped by their common themes and most are communicated within a few sentences.

Chapters III and IV present the design, development and results of the survey questionnaire. The relatively separate elements of questionnaire development, data collection (incorporating the database software development), and survey results can be selectively considered, although a progressive consideration is again preferable.

In the final chapter (**Chapter V**), the success and applicability of the study is analysed through attention to its primary and secondary purposes, the specific methodology employed is evaluated and where determined alternatives to the adopted approach are proffered. To conclude the chapter some considerations and recommendations for future research are volunteered.

6 Concluding introductory comments

A burden is being placed on the senior managers of information technology today. Not only must they cope with day-to-day

operating problems and new technologies, they must also assimilate and implement quite different methods for managing the activity. The needs of two quite different entities - general corporation management and senior IT management - are now **integrated**, and should provide them with a common set of perspectives and a language system for communicating with each other. It would be a mistake to consider the problems of IT management as being totally unique and separate from those of general management.

Together, they must learn, pioneer and adapt to an ever rapidly changing environment (both within and without the organisation), and it will be through better use of the one universally important element - **information** - that opportunities will be capitalised upon, threats will be countered, and survival will be ensured.

> "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." (Porter 1986, preface [151]).

This study of the strategic management of information technology is not an in-depth thesis, the subject is too broad, too complex and of course, continually evolving. In the survey of the literature, little attempt has been made to analyse or evaluate the reported contributions beyond the recorded comments of other

contributors and the occasional opinion of the author. The conceptual overview is imparted to the reader through superficial exposure to the wide range of works as presented in chronological order which, within the scope of the study, provides a satisfactory evolutionary record.

The questionnaire survey and its recorded results are also maintained at an enquiry level with little attempt being made at quantitative or empirical analysis beyond necessary statistical consideration. It is hoped and intended, however that the database system developed for the recording of results, will prove a useful tool for further and subsequent research.

CHAPTER II.

SURVEY OF THE LITERATURE

This section provides a chronological evolution of published thought and teachings on topics related to strategic management, in order to communicate a conceptual overview. Coverage is purposefully of a general nature, hopefully representing the most pertinent and salient aspects of both corporate strategic management and the strategic management of information technology under these headings.

In order to provide an accurate account, the reviewed research is purposefully non-selective. Whenever, additional remarks, comments or extensions to any work are evident, it is most likely because the topic or topics are either widely established, or concerned with the strategic application, exploitation, alignment or integration of information technology with corporate management.

The introduction of the computer to the business environment provides the starting time period for the literature research.

One of the first devices to embody many of the operating principles of today's computers was the steam driven **analytical engine** developed by English mathematician Charles Babbage. This,

and his subsequent **differential analyser** has identified Babbage's work as the pioneering groundwork of computer technology. (Brandon 1970, pp.24-25 [7]).

From 1883 to 1895 Dr. Herman Hollerith at the U. S. Bureau of the Census developed the first electrical punched card system and data processing was introduced (Brandon 1970, p.25 [7]), but it was not until the 1940's that electronics were first used to handle large volumes of data. (Brandon 1963, p.2 [6]).

1 The 1950's to the early 1970's

Two most significant events occurred during the 1950's and 1960's each in their own right causing profound effects upon business organisation and management, with the possibility that one event may have actually contributed (indirectly, if not directly), to the other.

The first event was the introduction of the **computer** as a commercially desirable machine for the processing of business data, which rapidly grew in both capability and demand. In March 1951 the first commercial installation of a computer was made. By March 1958 over 1,250 computers had been installed in the U. S. (Brandon 1963, [6]).

The second event was the more subtle change in the business environment and market place from something reasonably predictable to a less predictable and more **risky** situation.

With regard to corporate management, the effects of these two events manifested in new possibilities and opportunities, but brought with them a need to develop **formal long-range plans** that required the long-term allocation of resources. This, (the beginnings of strategic choice and strategy development), in turn manifested in a need for new organisational structures. The **decentralised structure** emerged during this period, often as a result of, and dependent upon strategy.

Long-range planning therefore, needed to be more effective, more systematic, formalised on paper and plans were often presented alongside other viable formalised long-range plans for strategic selection. The process of long-range planning became increasingly important.

Meanwhile, the computer had become recognised as more than simply a data processing machine, it was starting to be applied as a **decision-making tool**, as an aid to management. Certainly, the technology was still new and rapidly advancing (which prompted a need for standards and well-defined methods), but its existing applications had already proved the value of information, the possibilities were sky-rocketing.

Unfortunately however, a **gap** and not unification, was growing between corporate management and the information technologies. The lack of senior management knowledge and interest, fuelled by the necessary large commitment of time and resources (matched by the apparently opposed centralise - decentralise needs), contributed to the 1950's and 1960's remaining an era of data and transaction processing, predominantly within the larger organisations.

1.1 Corporate management

Alfred Chandler's 1962 publication, *Strategy and Structure* developed from his work on the writing of comparative business history, where the enormous expansion of the American economy since the second World War had led to a rapid growth of a multitude of industrial companies.

Chandler hypothesizes that a study of the creation of new administrative forms and methods should point to urgent needs and compelling opportunities both within and without the firm and investigates the changing strategy and structure of the large industrial enterprise in the United States. (Chandler 1962, p.1 [10]). His work focuses on four companies - E. I. du Pont de Nemours & Co., General Motors Corporation, Standard Oil Company

(New Jersey), and Sears, Roebuck and Company - that were first to create a new **decentralised** structure comprising general office, central office, departmental headquarters and field unit administration entities. (Chandler 1962, p.8 [10]). Chandler states;

> "The general office makes the broad strategic or entrepreneurial decisions as to policy and procedures and can do so largely because it has the final say in the allocation of the firm's resources... ...The executives who actually allocate available resources are then the key men in any enterprise." (Chandler 1962, p.11 [10]).

A key and central aspect of the work is Chandler's attention to organisational **structure following strategy** and his noting that;

> "...changes in strategy which called for changes in structure appear to have been in response to opportunities and needs created by changing population, changing national income and by technological innovation." (Chandler 1962, p.15 [10]).

Chandler's reference to technological innovation is however, in relation to production technologies and does not at any point refer to computer and information technologies.

Strategic decisions - he concludes - deal with the long-term allocation of existing resources and the development of new ones essential to assure the continued health and future growth of the enterprise.

In 1965 Robert Anthony developed a model which presented a new way to view an organisation through its hierarchy of management processes and decision making. In *Planning and Control Systems: A Framework for Analysis*, Anthony presented what has come to be regarded as the classical conception of organisation and the formulation of strategy. (Ahituv & Neumann 1982, pp.111-115 [1]; Tricker 1982, p.50 [52]).

Within the shape of a pyramid, three management levels are classified (1) Strategic planning, (2) Management control, and (3) Operational control.

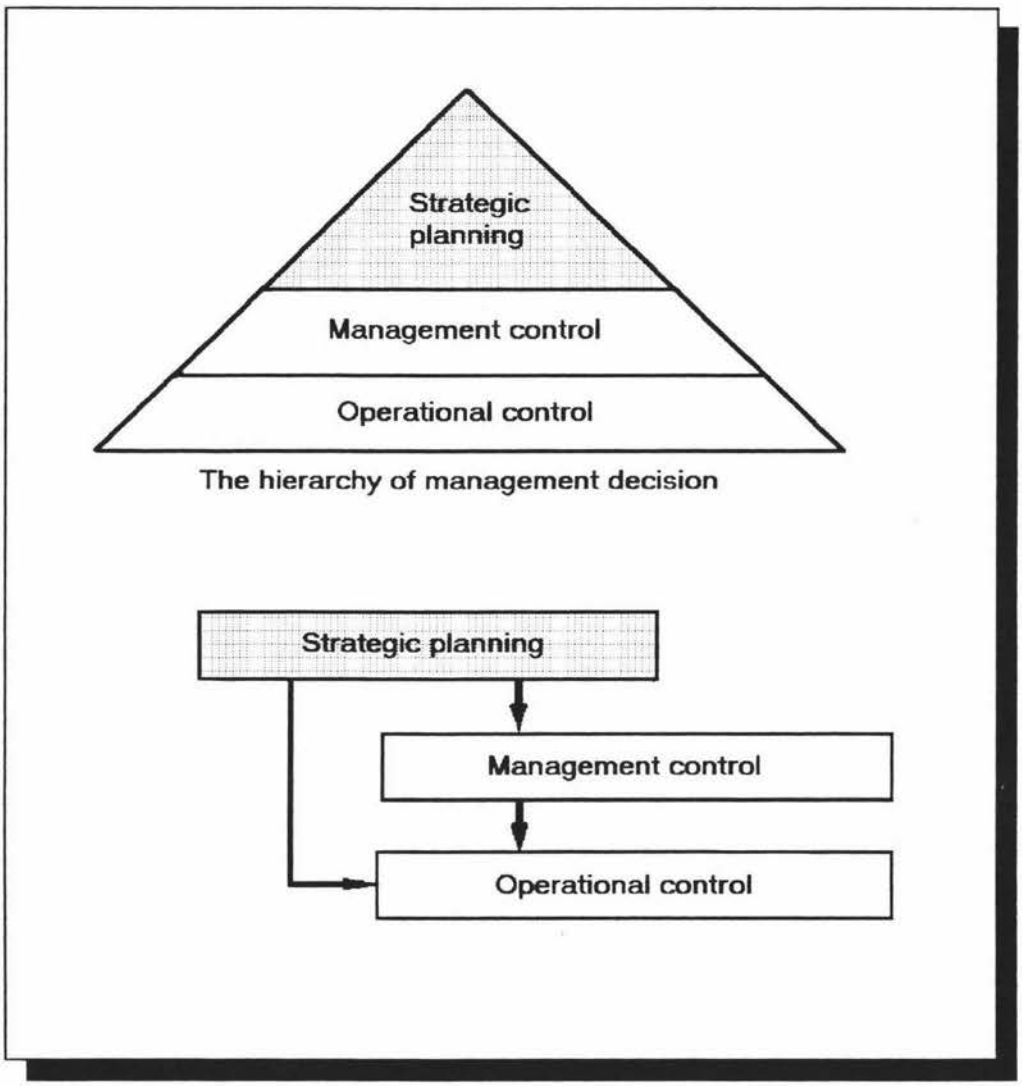

Figure [1]: Anthony's model: The hierarchy of management decision. (Tricker 1982, p.50 [52]).

The management functions at each level whilst similar, narrow in scope as we move downward in the organisational hierarchy and increase in quantity of tasks. The following diagram provides an insight of this through the consideration of Henry Fayol's five management functions at each level.

	STRATEGIC PLANNING	MANAGEMENT CONTROL	OPERATIONAL CONTROL
PLANNING	Long-range	Medium-range	Short-range
ORGANISING	General framework	Departmental level	Small unit level
STAFFING	Key persons	Medium-level staff	Operational staff
DIRECTING	General & long-range directives	Tactics and procedures	Daily and routine activities
CONTROLLING	Aggregate level	Periodic control and exceptions	Regular, continuous supervision

Figure [2]: Management functions at the various managerial levels. (Ahituv & Neumann 1982, p.114 [1]).

Kirby Warren noticed that for more than ten years, corporate long-range planning has been one of the most popular topics for management writers, with particular attention focussed upon the **need** for the development of a more systematic and effective approach to planning, as a means of dealing with ever accelerating rate, magnitude, and complexity of change which affects the corporation. (Warren 1966, preface [53]).

Warren, co-author of *The Process of Management* first published in 1962 (Newman et al 1982, [36]), notes in his 1966 publication, *Long-range Planning*, that the initial phase was writers' attention to the need (above), but that more recently they have turned their attention to the question "How do we go about developing an effective approach to formalised long-range planning?" (Warren 1966, preface [53]), and investigates management by results (profit) measurements against long-range planning techniques. (Warren 1966, p.64 [53]).

By taking a look at the American economy and the effects of government intervention in the private sector and recognising that the early stages of American industrial development were times when entrepreneurial types squandered resources and ignored opportunities because of their abundance, Warren established that corporate planning seldom extended beyond one year and when it did, it was largely on an informal, ad hoc basis. (Warren 1966, p.16 [53]).

"How long is long-range?" is a central question. For pulp and paper enterprises - 40 years - for computers and office equipment organisations (Eg. IBM & Xerox) - 5 years.

> "If planning is essentially preparation for decision-making on the commitment of resources, the length of the planning period must be determined by, (1) the time it takes to prepare for the decision plus, (2) the time it takes to implement it in the light of, (3) the time when implementation must be completed." (Warren 1966, p.21 [53]).

Warren construes on planning - that the biggest single failure has been the failure to recognise that to an even greater degree than in annual planning it is the **process, the mechanism for planning** and not the plan itself that is of the greatest importance. The choice of a time period for developing formal comprehensive plans becomes relatively unimportant within a range of roughly 2 to 10

years. He construes on **uncertainty** - if the future could be predicted, first the problem of rapid decision-making would be reduced, and second, the problems of implementation easily anticipated.

Therefore, with these in mind, a realistic set of expectations and benefits to be obtained might be (1) Clearer understanding of likely future impacts on present decisions (greater awareness of changes in future), (2) Anticipating areas requiring future decisions (awareness of key decisions which will have to be made in future), (3) Increasing the speed of relevant information flow (information mechanisms should enhance the speed and clarity of information flow among various groups contributing to the planning and decision-making process) and, (4) Providing for faster and less disruptive implementation of future decisions (processes and attitudes should contribute). (Warren 1966, p.30 [53]).

This leads to his decision that little or no real progress is made until top corporate executives are **personally willing** to commit a significant part of their energy and to adapt their managerial behaviour to the inherent requirements of the particular managerial challenge they face.

Richard Johnson, Fremont Kast and James Rosenzweig published the first edition of *The Theory and Management of Systems* in 1962. In their 1967 second edition, their interests and research have

expanded. Based upon their discovery that their **systems concept** is appropriate for most institutions, they provide evidence through a comprehensive case study illustrating an organisation as an open system and showing the problems of adaptation and innovation in a dynamic environment.

It is Johnson, Kast and Rosenzweig's contention that the 1960's large-scale organisation should apply the systems concept to meet the growing complexities and proliferation of operations.

> "It provides a framework within which the manager can integrate his operations more effectively." (Johnson, Kast & Rosenzweig 1967, p.1 [23]).

Planning, organising, control and communication are suggested as the four inter-related **managerial activities** - each of which is developed into a systems concept - and because an organisation is an integrated whole, where each system, sub-system, and supporting sub-system is associated with the total operation, the authors suggest that the management of a business firm can solve many of its problems and improve its effectiveness and efficiency by operating the business as a system. (Johnson, Kast & Rosenzweig 1967, p.128 [23]).

A model of the systems concept would include a master planning council (planning, resource allocation and decisions relative to the overall products or services provided) and project and

facilitating systems (planning, resource allocation and organisation of projects), and the system would be set-up for the achievement of a particular **objective**. **Control** features as a means of gaining greater flexibility in operation and **communication** is the connecting and integrating link within the systems network.

Having identified an integrated systems structure, Johnson, Kast and Rosenzweig draw parallels between automated information systems, as the office counterpart to production automation in the factory. An investigation of electronic data processing (EDP) is considered via the systems concept under the integrated data processing (IDP) label, but information technology is still regarded as little more than a transaction processing (TP) tool.

1.2 Information systems management

Dr Herbert Simon was the author or co-author of nearly 200 books and research papers on organisational theory and related areas of the behavioural sciences by the time he published the *New Science of Management Decision* in 1960. His research activities in the latter 1950's brought the realisation that;

> "The computer and the new decision-making techniques associated with it are bringing changes in white-collar, executive, and professional work as momentous

as those the introduction of machinery has brought to manual jobs." (Simon 1960, preface [44]).

After five years research on the processes of decision-making with particular attention to the use of electronic computers to stimulate human thinking, Simon distinguishes two types of decisions and identifies the traditional, versus the modern accepted decision-making techniques for each. For **programmed decisions** - those of a routine and repetitive nature - Simon suggests that habit, clerical routine and traditional organisational expectation through well-defined channels be superseded by (1) operations research involving mathematical analysis, models and computer simulation and (2) electronic data processing. For **nonprogrammed decisions** - those one-shot, ill-structured decisions - he suggests heuristic computer programs and better training for human decision makers. (Simon 1960, p.8 [44]).

Many types of business problems which can be handled successfully by automated processes are given, such as airlines being able to determine how many reserve aircraft to keep on hand (elementary stock control) (Simon 1960, p.19 [44]), and many possibilities of automating the non-repetitive types of decisions are presented. Simon even presents a new picture of the data-processing factory, for manufacturing the organisation's programmed decisions (Simon 1960, p.20 [44]), but reassures his readers that the new organisations will not be strange and unfamiliar. There will

still be **three layers** - the underlying physical production/distribution layer, the programmed (automated) decisions layer of day-to-day operations and the nonprogrammed (man-machine) layer for monitoring and re-defining. (Simon 1960, p.49 [44]).

The early works of Chester Barnard and Herbert Simon place strong emphasis on the importance of communication, stressing informal as well as formal channels of information (McDonough 1963, p.42 [29]), and many authors regard Simon as a pioneer in this field. (Tricker 1969, [51]).

The growth of information technology in the ten years prior to his 1963 book, *Management Standards for Data Processing*, is perceived by Dick Brandon as overwhelming, and forcing change in the scope and technical requirements of management. He sees automatic data processing equipment (ADP) and information technology as too complex, with few management men having the time, inclination, or training to obtain sufficient knowledge to direct its use adequately. (Brandon 1963, preface [6]).

Brandon's book is designed to achieve the following, (1) Provide data processing management with a definitive methodology for the installation of good standards and procedures, (2) Provide the skilled data processing technician with the proper methods for

organising his own work and, (3) Provide top management with a guide for the continued review of progress.

> "The use of computers to solve business or engineering problems is now commonly accepted as practical." (Brandon 1963, p.1 [6]).

Brandon emphasises that the rapidity of this acceptance has resulted in the data processing industry reaching economic maturity without the development of proper working methods, procedures, and disciplines, and suggests rules and procedures referred to as **management control standards**, must be adopted in order to restore the control function to management.

In July 1962 almost 9,500 computers had been installed in the United States with 7,000 more on order. (Brandon 1963, p.2 [6]). Brandon estimates the possibility that by 1970 there will be almost 20,000 operating installations in that year alone and using this arguing point, suggests that very few executives are fully aware of, (1) their own requirements for effective management, (2) the difficulties of incorporating existing clerical controls into a series of computer programs and, (3) the technical complexities of computer installation. (Brandon 1963, p.4 [6]).

It is interesting to note that in 1963 the installation of a computer assumes a management-controlled development program of about 30 months. (Brandon 1963, p.7 [6]).

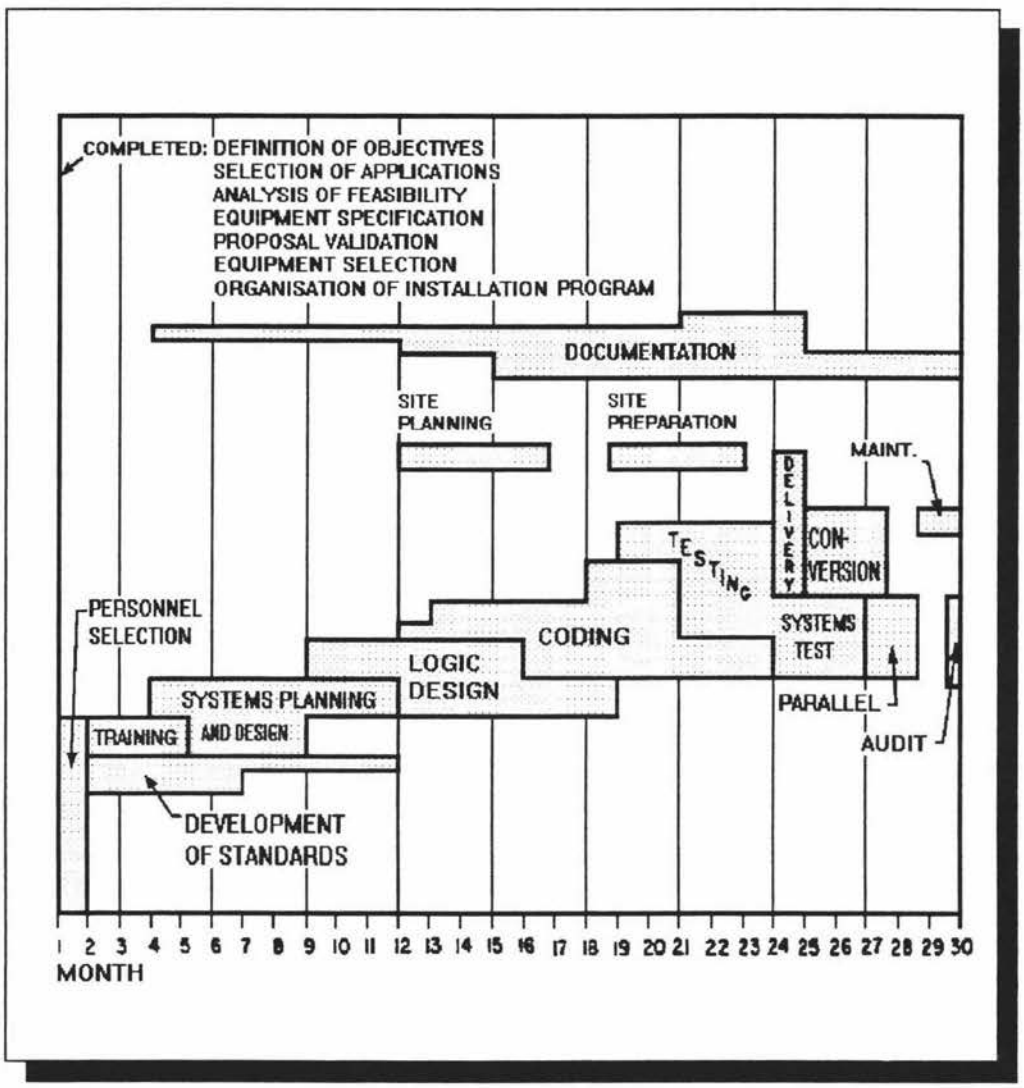

Figure [3]: Data processing tasks.

(Brandon 1963, p.8 [6]).

Brandon defines management control not as the function of the corporate auditor but as management's ability to retain complete control over the operation - it depends on the flow of information in a feedback cycle (Brandon 1963, p.16 [6]). He suggests that the first step in achieving management control is to establish **two**

sets of standards that dictate methods of operation and determine the amount of work to be produced in a given period of time - methods standards and performance standards. (Brandon 1963, p.17 [6]).

In 1970 Brandon's 1963 projection's are proving accurate with computer installations averaging 1,000 per month on an installed base of 50,000 users by 1968. (Brandon 1970, p.28 [7]). Accordingly, his management emphasis is even more ensconced in the planning and implementation procedures for these large and costly systems. Brandon's 1970 work suggests the manager focus on feasibility study, computer selection, resource preparation, systems design, programming, installation and management audit. (Brandon 1970, p.133 [7]).

The growing emphasis in management circles on channels of business information prompted Adrian McDonough in 1963 (*Information Economics and Management Systems*) to explore information values as well as information costs, in the context of the opportunities and hazards that are general to all business. Justifying the importance of value accounting in the early chapters of his book, he dedicates the remaining chapters to the investigation of a comprehensive information-retrieval system and the use of computers for assembling a **vocabulary of management**. (McDonough 1963, chapter 8 [29]).

McDonough makes the assumption that without accounting for the value of information, accounting for its cost is not balanced, and draws parallels with the existing view that the white-collar worker is regarded as a burden on this basis. (McDonough 1963, p.9 [29]). He suggests **cost** accounting - designing a system and selecting the appropriate equipment to carry the information - be offset with two **value** accounting tasks (1) Set the objectives and provide an updated inventory of problems to be solved and, (2) Identify the information needed to handle these problems.

McDonough recognises many **value-added** aspects for information and - with particular reference to Simon - identifies decision-making possibilities, but avoids the use of computers for this role in favour of his cataloguing role.

> "The content of all white-collar positions, high or low, is viewed as an information process resulting in the end product of decisions." (McDonough 1963, preface [29]).

An interesting retrospective comment made in 1969 by Robert Tricker states;

> "McDonough's general framework of information theory - which boils down to a value oriented measure - is nowhere quantified." (Tricker 1969, [51]).

Thomas Whisler's 1965 article *The Impact of Information Technology on Organisational Control* is found in Charles Myers' 1967 publication *The Impact of Computers on Management*.

Essentially, Whisler suggests that the current impact of information technology is to **centralise the control structure** in organisations or in the parts of them to which it is applied, although he hesitates in predicting that in the long-term this will remain so. He cites one specific reason for retaining central responsibility and control to prevent the shift and scramble on the power structure as functional departments benefit from applications.

Whisler concludes that machines are beginning to perform the function of control themselves, with power being ceded to them on the grounds of efficiency and convenience. As a consequence, he warns of individual loss of control and of formidable psychological problems arising from this loss.

> "While the 'body politic' of the organisation as a whole might, in theory at least, decide at some point to withdraw this power, the individual may find that he has no options." (Whisler 1965, p.49 [182]).

Because by 1967 commercial data processing had manifested itself primarily within the accounting function, members of the Institute of Cost and Works Accountants were among the most experienced in

the selection, installation and use of computers. This collection of discussion papers (*Management Information Systems and the Computer*), is an attempt to collect, analyse and define the current best practice for understanding management processes and management information needs inherent in management accountancy.

Suggesting that the study of management information systems should be dominated much more by the principles both of **decision-making** and of **control**, than by any consideration of the advent of computers, the text adopts a management of data orientation.

> "It is only when the needs of a particular business have been defined in detail that it is possible to decide whether the great strength for data processing... ...should be applied, and if so, to which areas of the management problem. (Institute of Cost and Works Accountants 1967, p.12 [21]).

The papers distinguish the **data bank school** - where the strength of the computer is as a live filing system - from the **systems school** - where the information flow is designed to accept and process data as a tool of management - and advocates compromise through recognising the following assumptions (1) Not all data has a value, (2) Most data becomes less valuable over time, (3) No particular person is essential to the operation of a properly designed information system, (4) Some management and information systems can be autonomous and, (5) Form, content and frequency of

information are subordinate not to the capacity of the computer, not to an individual manager, but to the management processes which are necessary to run the business. (Institute of Cost and Works Accountants 1967, pp.25-30 [21]).

The work concludes that the information function should be **centralised**, and coupled with a **decentralised** data collection responsibility, and presents a basic model of an information system suitable for the support of management decisions.

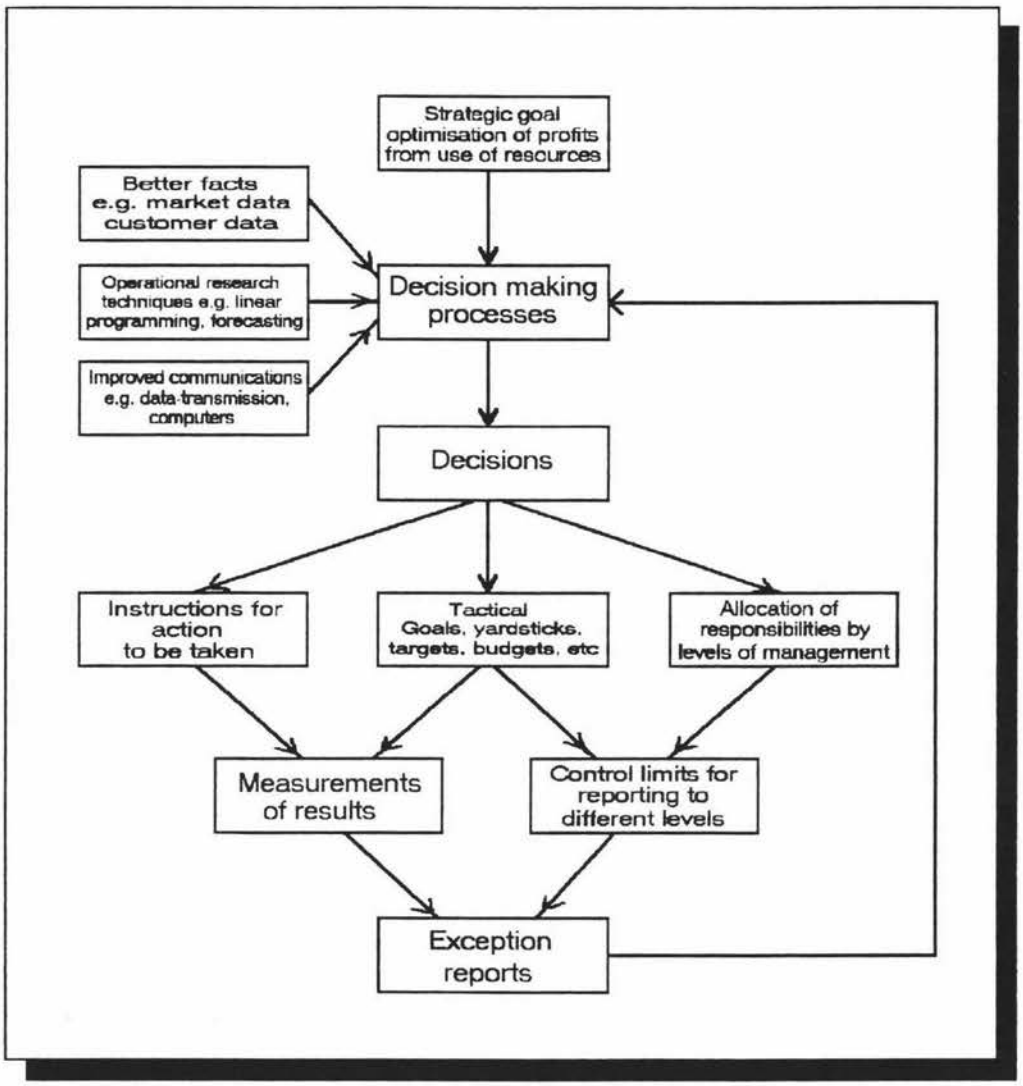

Figure [4]: Basic model of an information system.

(Institute of Cost and Works Accountants 1967,

p.55 [21]).

Thomas Prince introduced his **total information system** ideas in the 1966 first edition of *Information Systems for Management Planning and Control*, but has completely updated and re-written the related chapters in its revised edition, released in 1970.

Drawing attention to the new titles appearing in the more progressive business firms such as Manager of Information Systems, Director of Administrative Services and Director of Information Intelligence, Prince decides upon the perspective of the systems analyst throughout his book. This is based on the assumption that the systems analyst has the attribute of being able to simultaneously view, from an objective position, both the total organisation and the various segments or parts within the organisation (a focus upon information flows).

Prince doesn't really break any new ground however, other than to direct attention specifically toward the systems analyst. His overall objective is to teach the systems analyst to think scientifically about the **information dimensions** of decision-making activities throughout a business organisation and to acquire an approach toward establishing **criteria** for information flows. (Prince 1970, p.11 [41]).

In 1971 Anthony Gorry and Michael Scott Morton built a framework around their basic premise that a **decision-centred view** of an organisation provides the best basis for information technology development. In *A Framework for Management Information Systems*, they combine Anthony's categories (based on the purpose of the management activity) with Simon's classification (based on the way in which the manager deals with the existing problems) in order to

examine the purposes and problems of informations systems activity. (Gorry & Scott Morton 1989, p.53 [100]).

> "We believe that each organisation must share some common framework among its members if it is to plan and make resource allocation decisions that result in effective use of information systems." (Gorry & Scott Morton 1989, p.58 [100]).

Gorry and Scott Morton are among the first to merge corporate management considerations and models with the management of information technology.

Richard Nolan and Cyrus Gibson published a paper in 1974 entitled *Managing the Four Stages of EDP Growth*. (McNurlin & Sprague 1988, p.95 [31]).

In it they observed that many organisations go through four stages in the introduction and assimilation of new technology. By 1979 Nolan had identified six stages of growth extending the growth processes from two to four arguing that four were more useful for understanding the organisational learning (1) Applications portfolio, (2) Resources (technology and personnel), (3) Management (organisation, planning, and control), and (4) User awareness. (Nolan 1984, p.197 [142]).

Nolan's six stages are outlined as follows:

Stage One: Initiation - the beginning use of the new technology where early successes lead to increased interest and experimentation.

Stage Two: Contagion - the learning period for both uses and for new products and services as interest and technology grow rapidly.

Stage Three: Control - an awareness that the ad-hoc approach to providing systems solutions is too costly and generates waste leads toward tighter control, attempts at system integration and the desire for standards.

The effort for the first three stages is data processing, and the computers handle tasks rather than functions. (QED 1989, p.182 [42]).

Stage Four: Integration - costs continue to rise as computing use increases. Database systems are brought in, which helps the move toward data resource management.

Stage Five: Data Administration - the focus of computing management turns completely to data administration, in which control of computing resources is tight but slack is maintained in the development of systems that bring high, added value.

Stage Six: Maturity - maturity is achieved when the applications portfolio is "complete", and its structure mirrors the organisation and the information flows in the company.

John King and Kenneth Kraemer published an assessment of Nolan's stage model in their 1984 article *Evolution and Organisational Information Systems: An Assessment of Nolan's Stage Model*.

> "The model is shown to be an evolutionistic theory...
> ...focusing on assumed directions of growth and an implied end state toward which growth proceeds...".
> (King & Kraemer 1984, p.127 [118]).

They recognise that the Nolan model has had a powerful influence on the information systems field, but suggest that as a "grounded theory", the model fails. (King & Kraemer 1984, p.142 [118]).

2 The middle 1970's to the early 1980's

From the middle 1970's to the early 1980's a wide range of theoretical and practical developments emerged within both corporate management and information technology management disciplines. The period is significantly separated from more recent developments by two factors in particular. First, although technological advances were extremely rapid, the era of the micro-computer and desktop computing had not yet arrived and so

information systems still primarily concerned large and usually centralised operations. Second, the period continued to display a marked disregard in the **attitude** of corporate management theorists and practitioners toward information and information technology even though it was clearly obvious that information technology theorists and practitioners were crying out for more recognition, a greater interest and better support.

During the period, corporate management slowly turned to focus upon strategic management with practitioners such as William Rothschild introducing the prospect of investigating strategic alternatives. From the academic perspective, a similar focus developed arising from the wealth of new analysis techniques that were emerging. Many of these (John Rockart's critical success factor method, decision matrices, contingency views, strength and weakness analysis, the orientation towards goal setting, etc) appeared in response to the change in business environment which was rapidly becoming one of turbulence and increased risk.

Igor Ansoff's research discovered that firms were coping with change through "informal" **strategic thrusts**, but it was not until Michael Porter merged the diverging concepts into (1) A simple model of **competitive forces** to be considered within the firm's strategic analysis phase, and (2) Three **generic strategies** to be considered within the firm's strategic choice phase, that both

theorists and practitioners felt they had a viable formula to work with.

There is also evidence to suggest that during the period, some thought it necessary to **balance** the "runaway" formal planning approaches with exploitation of the experience and expertise presumed inherent in senior executives, coupled with a consideration of power-behavioural factors. James Quinn's research suggested that many businesses were already adapting to change informally, through a **logical incrementalism** approach as a result of these less obvious factors.

One other significant attitude change in corporate management became apparent in the early 1980's when attention focused upon competition and the need to plan for **competitive advantage**. This later intensified when large firms began considering competitive action at the global level as opposed to the limited national or regional level.

With many new developments and directions, more frequent change and a less predictable external environment, it is perhaps not surprising that corporate management's internal focus and in particular, its attitude toward information received minimal attention. Some advancement was made with an increase in senior management awareness of the value of knowledge (derived from timely, accurate information), but there were equal counter

attitudes arguing against too much information and the resultant feeling of **information overload**.

Information technology personnel on the other hand, had begun to realise the far reaching possibilities and future capabilities of computers and information systems. In addition to operational applications, Management Information Systems appeared and IS personnel began to perceive their new role as being caretakers of a valuable **corporate resource**. However, information services were still predominantly a low level entity within corporate structures and so IS executives had to take a more **proactive** and aggressive stance in their promotion of information and information technology.

On the academic front, IT theorists did little procrastinating and for their part, introduced a wealth of new methodologies and analysis techniques. These concerned every aspect from increasing awareness, improving systems development, forecasting, selecting, and attempting to identify new opportunities and likely threats. In addition, newly introduced technological products consistently performed many times better for many times less cost and these developments (coupled with promised future developments) fuelled the imaginations of planning and academic personnel throughout the world.

Though the importance and value of information to both the firm and the firm's management was frequently proven to be of **strategic or competitive benefit** (when suitably planned and produced by an information system), and many of the IT methods and techniques used had shown remarked similarities to those utilised in the corporate management task, there still remained during this time period little integration or alignment between the two disciplines.

2.1 Corporate management

James Quinn wrote a series of articles in the late 1970's that challenged much of the developing perceptions toward strategy formulation. *Strategic Change: "Logical Incrementalism"* published in 1978 suggests that well-managed major organisations make significant changes in strategy through approaches that bear little resemblance to those touted in the literature to date.

In analysing the formal systems planning approach, he suggests it tends to focus unduly on quantitative factors and underemphasises the vital **qualitative**, organisational and power-behavioural factors that so often determine strategic success, and to those proponents of power-behavioural approaches, he suggests few have offered much normative guidance for the strategist. (Quinn 1978, pp.45-46 [155]).

Due recognition is however, given to the benefits that can be attained from these approaches and many are listed and incorporated within his new concept. The emphasis of his work is thereafter, a discussion of the rationale behind **logical incrementalism.**

> "Logical incrementalism is not muddling, as most people use that word. It is conscious, purposeful, proactive, good management. Properly managed, it allows the executive to bind together the contributions of rational systematic analyses, political and power theories, and organisational behaviour concepts. It helps executives achieve cohesion and identity with new directions." (Quinn 1978, p.55 [155]).

In what is really an extension on their work with Johnson in their 1967 book *The Theory and Management of Systems*, Kast and Rosenzweig's 1979 publication *Organisation and Management: A Systems and Contingency Approach* further investigates systems philosophy (thinking about complex human endeavours), but is modernised in two significant subject areas - the **contingency concept** and the recognition of **management information-decision systems.**

The contingency view is a way of thinking about managing organisational endeavour or the diagnosis of specific actions appropriate to certain situations. Kast and Rosenzweig apply contingency views to the major managerial sub-systems of an open system from their earlier work (with the inclusion of four new ones), but again avoid specific application to information management, even though they recognise the extremely dynamic nature within this technology sub-system.

William Rothschild produced *Strategic Alternatives: Selection, Development and Implementation* in 1979 and although not recognised as such, appears to be one of the foremost advocates of many strategic management concepts widely followed today. Concerned about the lack of creativity and of true strategic alternatives in management, Rothschild identifies a large number of **strategic alternatives**, translates investment and management strategies into functional strategies and through implementation strategies imparts an understanding of many elements that make strategic plans viable.

> "The key is to recognise that you can't rest on your past accomplishments; you must be responsive and consider other ways to operate your business in the future. Those other ways are the essence of strategic alternatives." (Rothschild 1979, preface [43]).

Rothschild sees **investment strategy** as the setting of priorities for investments of both financial and human resources. **Management strategy** as the thrust of the business (strategic thrust) toward achieving its investment priorities, and **strategy implementation** as the development of consistent, integrated, crucial programs for planning and execution. Strategic planning therefore, becomes very important due to (1) Limited and increasingly expensive resources, (2) Dynamic and complex environmental changes and, (3) Increased competition. (Rothschild 1979, p.12 [43]).

Whilst examining strategic thinking, Rothschild presents the following representation of sources of change that affect the current market.

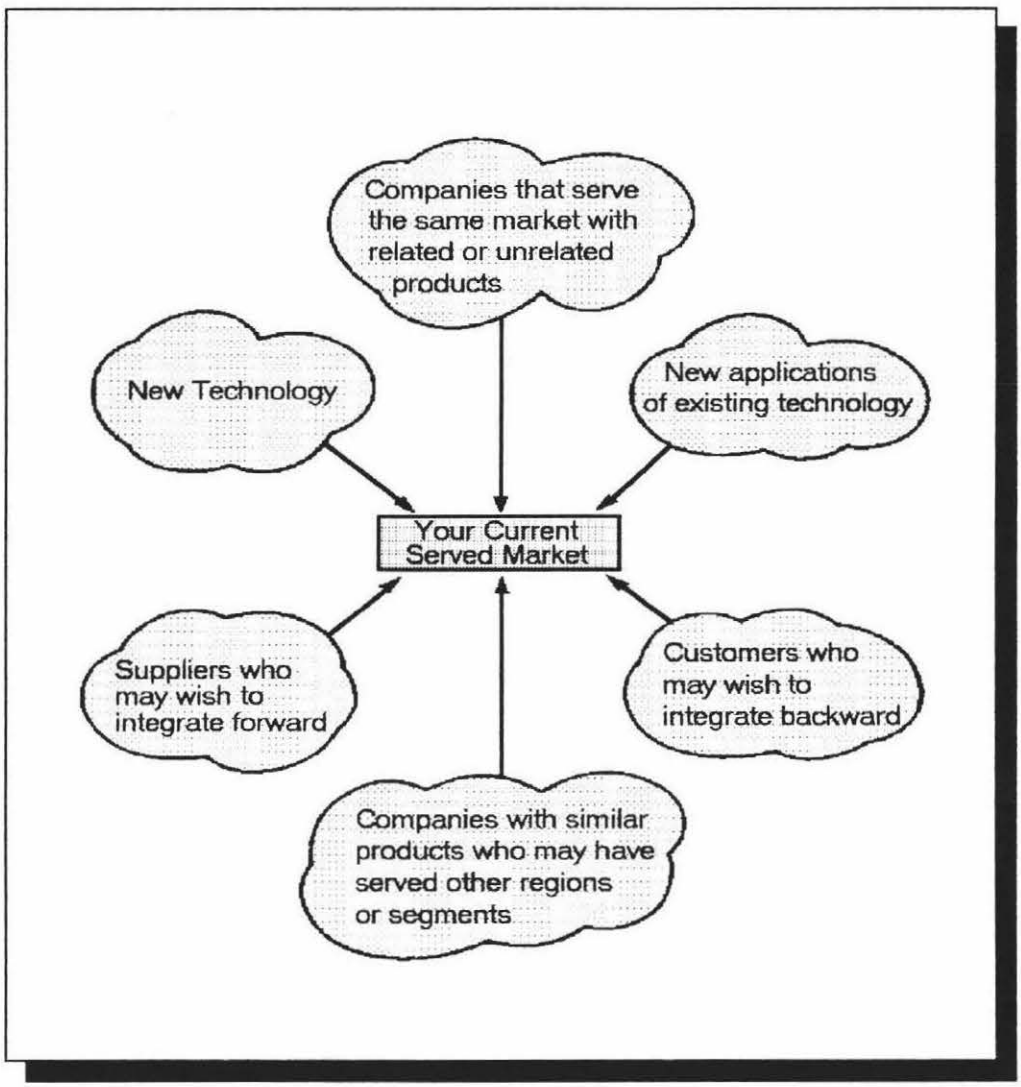

Figure [5]: Sources of change that affect your market.

(Rothschild 1979, p.33 [43]).

Within a section dedicated to making decisions and setting priorities, Rothschild examines the use of decision matrices as useful displays and **tools** to help determine where you are now and where you want to be in the future, and comments that they fall short in providing guide-lines on how to get there. Another significant contribution, although he only brushes on the topic

and does not really investigate the concept, is the identification of **critical success factors** such as adaptability, objectivity and the willingness to follow through with plans. (Rothschild 1979, p.99 [43]).

Many of Rothschild's concerns and observations become important considerations of this and more modern times.

Looking back to 1965, Igor Ansoff published *Corporate Strategy* which is described by Robert Tricker as a normative approach to the decision processes, that recognises and pursues needs and opportunities between the business and its environment. Ansoff's book has been influential in expanding the interest in strategic planning in business and one that contains realistic guide-lines for the planner and decision maker. (Tricker 1969, [51]).

Ansoff's 1979 work - *Strategic Management* - builds upon both *Corporate Strategy* and another of Ansoff's works, *From Strategic Planning to Strategic Management* and is also heavily influenced by *Behavioural Theory of a Firm* by Cyert and March, and Chandler's *Strategy and Structure*. (Ansoff 1979, p.6 [2]).

The theatre for Ansoff's study is an environment in a **condition of turbulence**, and he attempts to answer the following questions through theoretical analysis backed by predictive hypotheses (influenced by his practical management experience).

1. What are the patterns of organisational behaviour in a turbulent environment?
2. What determines the differences in the behaviour?
3. What factors contribute to success and to failure?
4. What determines the choice of a particular mode of behaviour?
5. What is the transition process by which organisations move from one mode to another?

A central concept of Ansoff's theory is that the commercial results realised by an environment serving organisation (ESO), are largely determined by an alignment of certain attributes. An external alignment between the organisation's **strategic thrust** (common thread or pattern) and the environment and internal alignments between the strategic thrust and its strategic culture, managerial capability and logistic capability. This concept is an extension and elaboration of Chandler's strategy-structure hypothesis. (Ansoff 1979, p.17 [2]).

In 1980 Michael Porter, Professor at the Harvard Business School, published *Competitive Strategy: Techniques for Analysing Industries and Competitors*. Touted as the "definitive work" on

the subject of competitive strategy (the "hottest new concept in American business"), the book aims to enable managers to anticipate and prepare for (rather than simply react to) sudden competitor moves, new entrants into their industry and shifts in industry structure, as well as to take forceful positive action to improve a company's position through **tested competitive strategies**.

Porter suggests that every firm competing in an industry has a **competitive strategy**. He expresses that there are significant benefits to be gained through an explicit or formal process of formulating this strategy (from the senior management level), in preference to an implicit or ad-hoc approach driven by functional departments.

The (emerging) strategy field has offered few analytical techniques for gaining an understanding of industries and competitors and so in this book, Porter attempts to rectify the shortfall through presenting a comprehensive **set of techniques** to help a firm (1) Analyse its industry as a whole and predict the industry's future evolution, (2) Understand its competitors and its own position and, (3) Translate this analysis into a competitive strategy for its particular business.

Porter's model for analysing the five competitive forces acting on an industry and their strategic implications, forms the foundation

for the first section of the book on industry and competitor analysis and is also the first of his two significant contributions to corporate strategy formulation in this work.

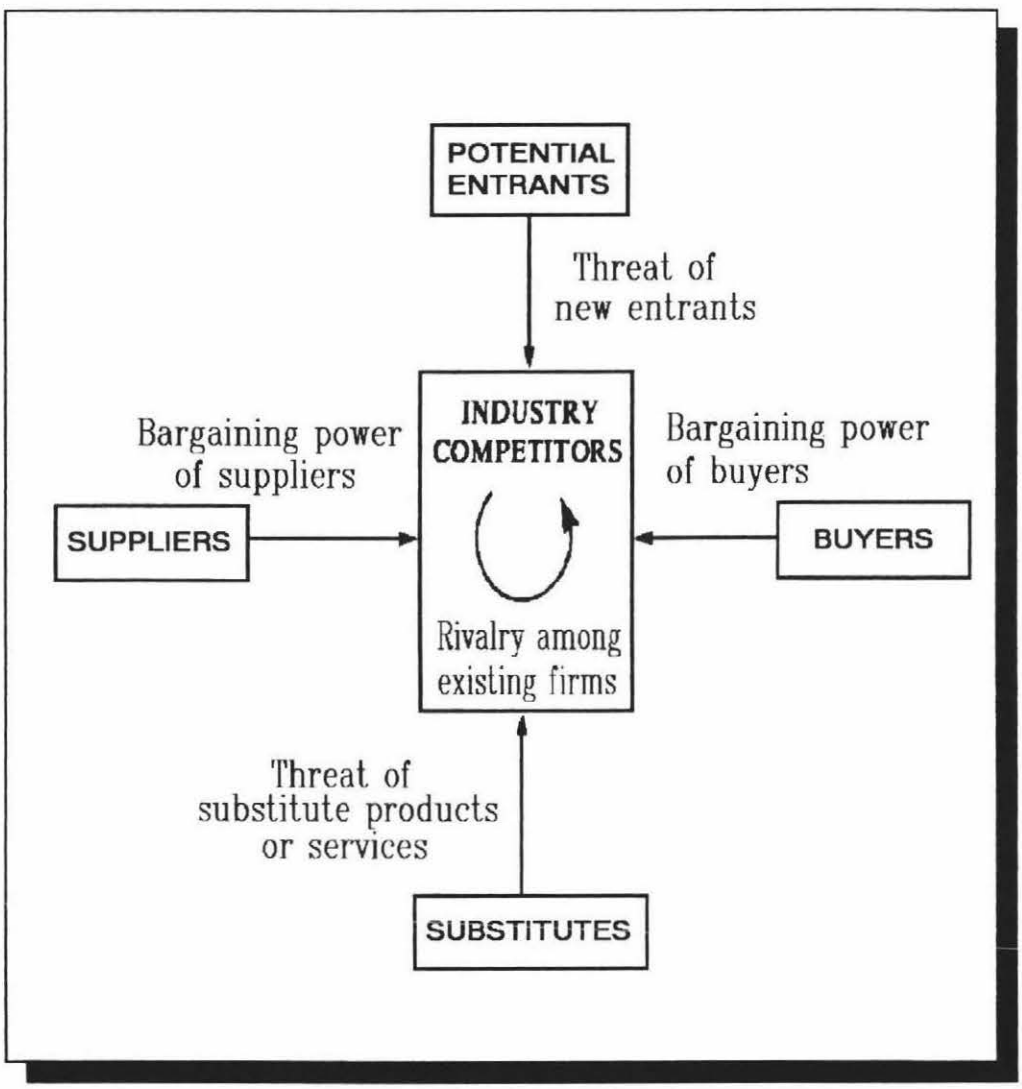

Figure [6]: Five competitive forces driving industry competition. (Porter 1980, p.4 [39]).

Bearing a marked resemblance to Rothschild's "Sources of change" (figure 5), this simple model identifies the fundamental factors

determining the nature of competition in a business. With consideration to each driving force, Porter presents - for a wide range of industry environments - alternative techniques for analysis and in addition, a list of **"generic" strategies** that may be applied or considered.

For example, consider each of the following list of "generic" industry environments;

Fragmented industries - where no firm has a significant market share or greater strength or influence.

Emerging industries - that are newly formed or reformed due to technological advancements.

Maturing industries - those passing from rapid growth to more moderate growth.

Declining industries - where an absolute decline has become sustained over a long period.

Global industries - those necessitating a coordinated world-wide operation.

Within the appropriate environment for a particular firm, the industry structure, the competitors or rivals, market signals, the power of suppliers and buyers, and so forth, are analysed on as much raw data as can be collected and through the use of many of the techniques that are utilised when analysing the firm itself, such as strengths, weaknesses, opportunities and threats (SWOT) analysis, financial analysis, CSF analysis (refer page 79) and so

forth. Porter in effect, simply extends the established and detailed internal techniques to the wider industry environment, and offers alternative strategies for differing scenarios.

In effect, what Porter is really offering in this section of his work, is a pick-list of "best fit" strategies within specified industry environments.

The second significant contribution to corporate strategy formulation in this work by Porter is his identification of three **generic competitive strategies** for coping with industry structure (1) Cost leadership, (2) Differentiation, and (3) Focus, which he continually returns to within his scenarios for industry environments and occasionally compliments with the less desirable "do nothing" or "divestment" strategies. Although Porter's views are widely accepted, many limitations have subsequently been reported.

> "Porter's generic strategies of cost leadership, product differentiation or niche concentration often turn out to be too simple a statement, the reality often being a complex and changing mix of strategic positioning, especially in both young and recovery businesses." (Earl 1988, [13]).

Timely and accurate information is critical for the successful analysis and subsequent strategy selection processes throughout

Porter's work and yet very little consideration of either the strategic or operational implementation of information technology is made. The following diagram outlines the functions and data flows of Porter's "competitive intelligence system" which illustrates the continuing emphasis toward paper-based filing and records management.

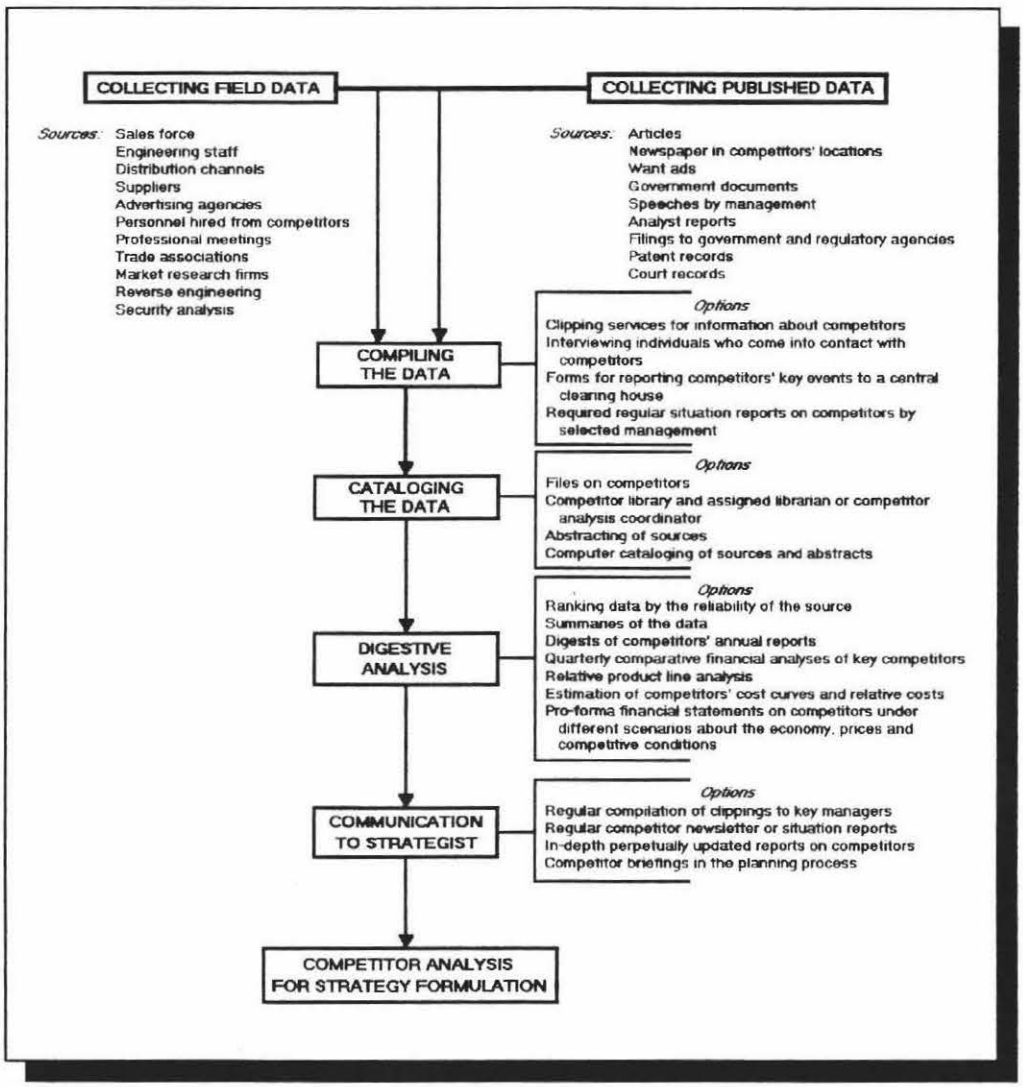

Figure [7]: Functions of a competitor intelligence system.

(Porter 1980, p.73 [39]).

Porter further developed and added to his "optional strategies" portfolio when in 1986 he co-published the article *End-game Strategies for Declining Industries* with Kathryn Harrigan. In summary, the article added sub-options of leadership, niche marketing, harvest the existing market or divest quickly, all

designed to fit snugly within the earlier "generic" divestment strategy. (Harrigan & Porter 1986, p.113 [105]).

In support of Porter's generic strategies, William Hall's 1986 article *Survival Strategies in a Hostile Environment* - the result of an on-going in-depth study of 64 U.S. companies - reveals that success comes to those that achieve either the lowest cost or most differentiated position.

With Thomas Hout and Eileen Rudden, Porter published another 1986 article *How Global Companies Win Out* and we begin to see a diversion from his 1980 strategies of (1) Full product line global competition, (2) Global focus for a market segment, (3) National focus or, (4) Protected niche through government regulations, to the attitude that "there is no safe formula for success in international business" (Hout, Porter & Rudden 1986, p.157 [109]), and that global companies would be better off "playing the **global chess** game" in conjunction with some simple management guide-lines such as (1) Manage the business as a single system and, (2) Match financial policies to competitive realities.

In their 1980 fourth edition of *Management Control Systems* (first published in 1965), Harvard professors Robert Anthony and John Dearden add several new chapters to their earlier work. A new focus on management control within the context of goals, and strategies for achieving these goals (which are decided upon in

the strategic planning process), is included and particular attention is now given to **information**, its value and relevance within the control process.

Anthony and Dearden examine strategic planning through systematic approaches developed by a few large U.S. companies and state that "Most companies do not make systematic strategic studies." (Anthony & Dearden 1980, p.87 [3]). The strategic planning process, they suggest, is activated when an opportunity or a threat is identified. The new situation is then studied (within the context of existing organisational goals) and the study may lead to a change in strategy.

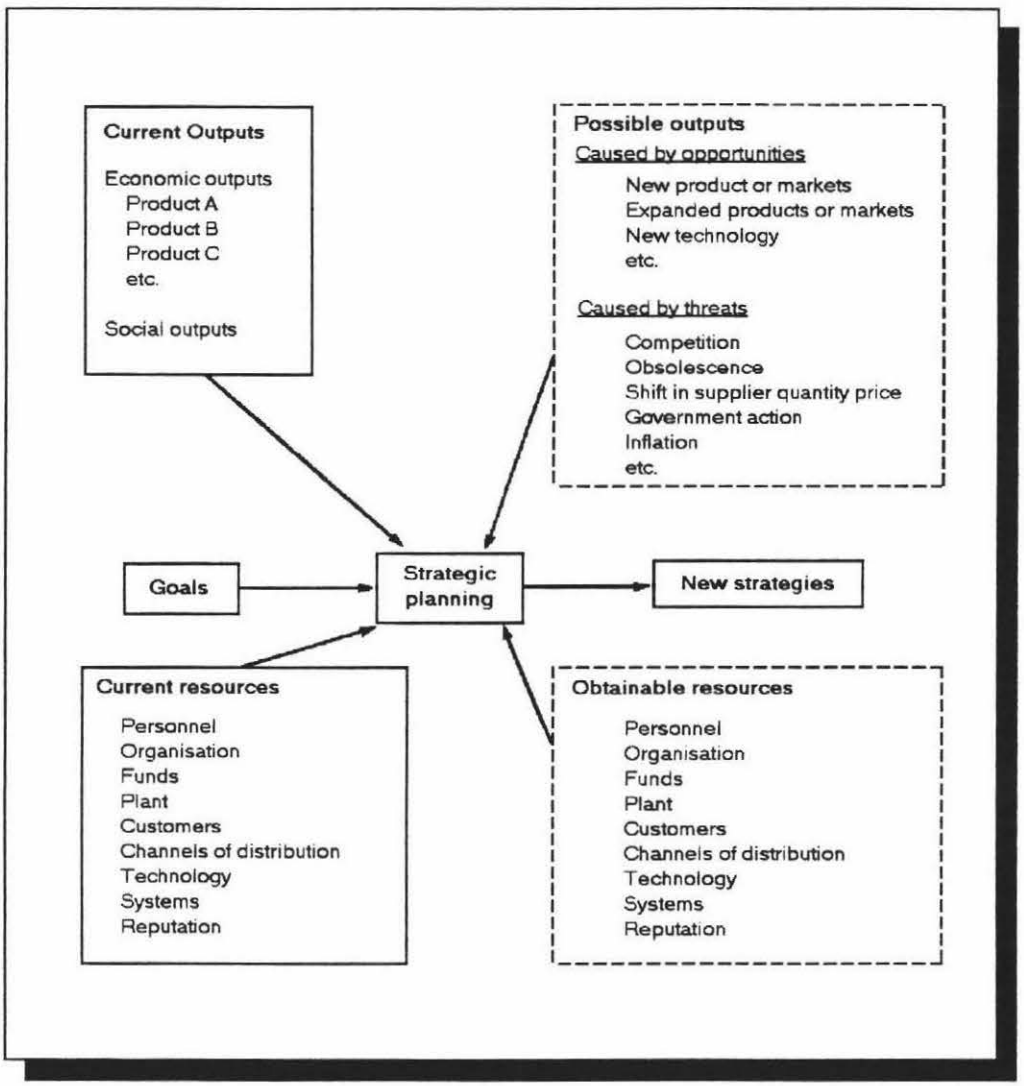

Figure [8]: The strategic planning process.

(Anthony & Dearden 1980, p.87 [3]).

Their interest is of course centred on management control, concerning the whole organisation and the task oriented operational control, with which many parallels can be drawn to their goal oriented strategic planning process.

Attention to the field of information theory is again concentrated upon within their management control process where the management control course sets parameters for information desired of information processing groups. Two interesting concepts are introduced however, the first concerning the value or **expected value** of information, the second concerning the requirement for information differentiation (negentropy), or the need for information with value to be **suitably identifiable** from information with little value.

In 1983 John Dearden further examined the information processing aspect in his submission *Will the Computer Change the Job of Top Management?* He makes a useful point with regard to the value of information and the misconception of "the more information the better".

> "Useful information has a very sharp exponential decay function. If you were to divide information into segments and then rank each segment according to its value to the manager, you would find a very sharp drop in value for each incremental segment. Therefore, if you increased the amount of information by 10 times, it might have an additional value of say 10 percent." (Dearden 1983, p.58 [72]).

Dearden suggests the value of information received after automation has not changed significantly from that received before

and surmises that additional computer applications must be of decreasing value. He firmly believes that the job of the top manager has not been affected significantly by the computer and that most management problems have not been solved by automation. (Dearden 1983, p.59 [72]).

Information, Organisation and Power, 1981 by D. E. Zand, examines the process of management in a society driven by the search for and the application of knowledge. In a **knowledge society**, managers and staff specialists diligently seek and process knowledge, their materials are ideas and opinions, assumptions and concepts, proposals and decisions. (Zand 1981, preface [55]).

The manager's effective power is the product of his formal power multiplied by his knowledge competence. If he is near zero in either factor he will have little effective power. Zand analyses the interplay between managerial behaviour and the organisation's growing dependence on knowledge, he looks at the effect of knowledge on organisations and their decision processes.

> "We stand on the threshold of the emergence of the knowledge society." (Zand 1981, p.4 [55]).

Suggesting that knowledge is rapidly becoming the firm's **primary instrument** of progress and competition. Zand suggests the manager plays a crucial role in efforts to acquire new knowledge and that one of the greatest dangers a manager faces in a knowledge society

is not knowing the assumptions and the ignorance in the knowledge he receives when he has to make a critical decision.

Parallels can definitely be drawn with strategic implementation principles in Zand's **phases of change** (1) Unfreezing - increasing the receptivity of others to a possible change, (2) Moving - altering the number, direction or size of aiding and opposing forces and, (3) Refreezing - stabilising and maintaining the new equilibrium (Zand 1981, p.110 [55]), although in reference to strategic change, Zand suggests this is always long term, usually 3 to 10 years with a focus on values, goals, policies, organisational structure, and investments of capital and other resources. (Zand 1981, p.169 [55]).

Of Zand's contribution, knowledge society pioneer Peter Drucker says, "This is an important and a timely book...".

As recent as 1982 when William Newman, Kirby Warren and Jerome Schnee published their 5th edition of the textbook *The Process of Management: Strategy, Action, Results* it is interesting to note the total lack of consideration of information technology or recognition of information as an asset or corporate resource from the corporate or senior management perspective. The concept of managing change is also given limited attention. It is perhaps not surprising therefore, that in the following section much

attention is directed at the solicitation of support from senior management personnel.

2.2 Information systems management

In *Information Resources Management: Concepts and Cases*, 1979 Forest Horton notes the enormous capital investments in information handling resources being made by both private and public sector enterprises and brings attention to the need for information to be regarded as a **corporate resource**.

> "These capital investments, as well as their associated operating expenses, are becoming much too large to treat as overhead expenses... ...the time has come for society in general, and the public and private enterprises in particular, to explore seriously and systematically the notion that information be reviewed as a resource." (Horton 1979, p.22 [20]).

Focusing on data and information as the key common denominator that links all other resources, Horton offers valid and logical argument on the need for this perspective and advocates a **systematic approach** to replace the inherent ad hoc approach to development common place in practice.

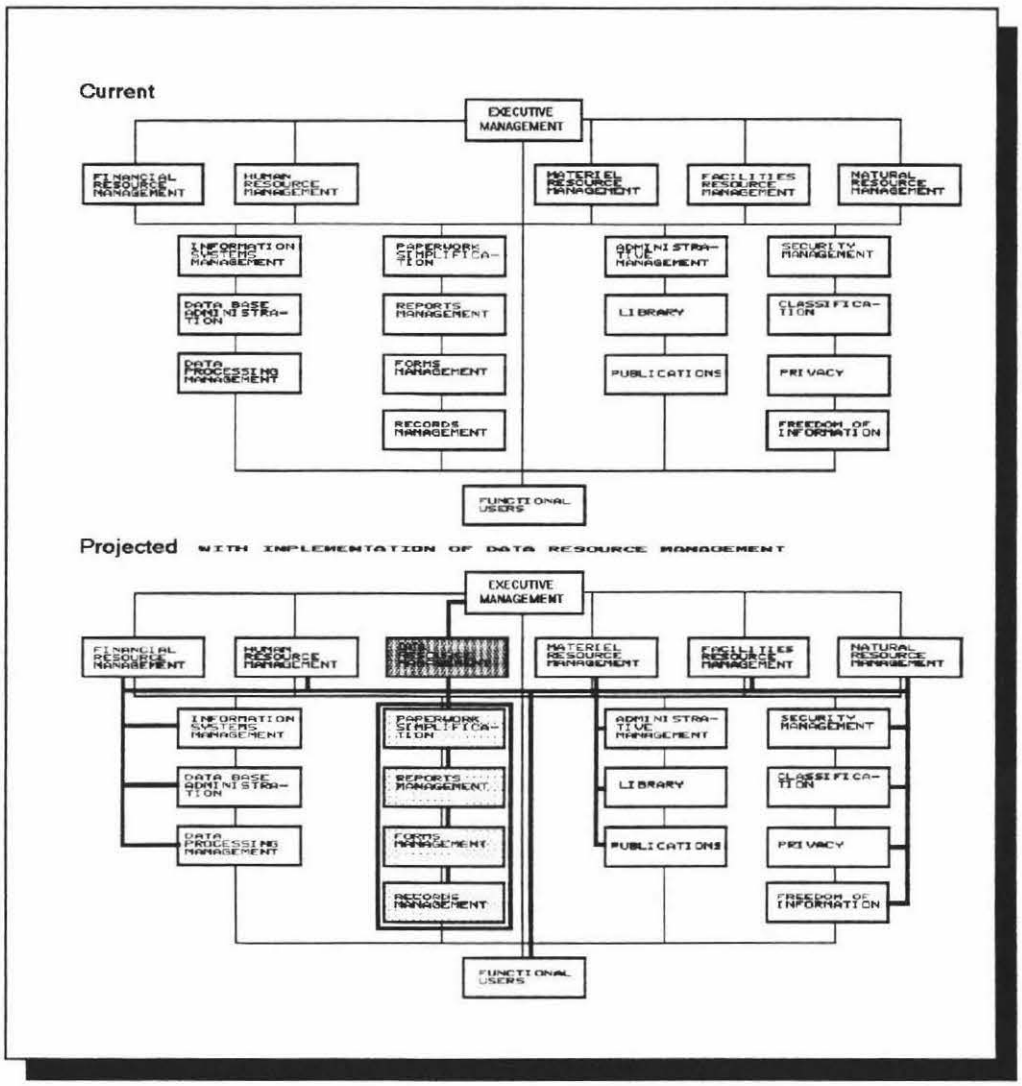

Figure [9]: Resources management environment.

(Horton 1979, p.103 [20]).

John Rockart first outlined his **critical success factor** approach to information needs in the 1979 March-April issue of the Harvard Business Review, entitled *How Chief Executives Determine their own Information Needs.* At the eleventh annual conference of The Society for Management Information Systems in September 1979 in his paper *The Critical Success Factor (CSF) Method for Determining*

Managerial Information Needs, he added three major new points and these were published by the society along with a number of other discussion papers in their book *MIS and the Bottom Line: Satisfying Senior Management Expectations*, 1979. (SMIS 1979, [46]; Rockart 1979, [160]).

Perhaps the best means of outlining the CSF approach is through the 1984 work of Andrew Boynton and Robert Zmud, *An Assessment of Critical Success Factors*. (Boynton & Zmud 1984, [63]).

Quoting Rockart - "Critical success factors are those few things that must go well to ensure success for a manager or an organisation" - Boynton and Zmud suggest therefore, that they represent those managerial or enterprise areas that must be given **special and continual attention** to bring about high performance.

> "The CSF methodology is a procedure that attempts to make explicit those few key areas that dictate managerial or organisational success." (Boynton & Zmud 1984, p.17 [63]).

A useful guide for the application of the CSF methodology is provided through a case study of a financial services firm, shown as follows:

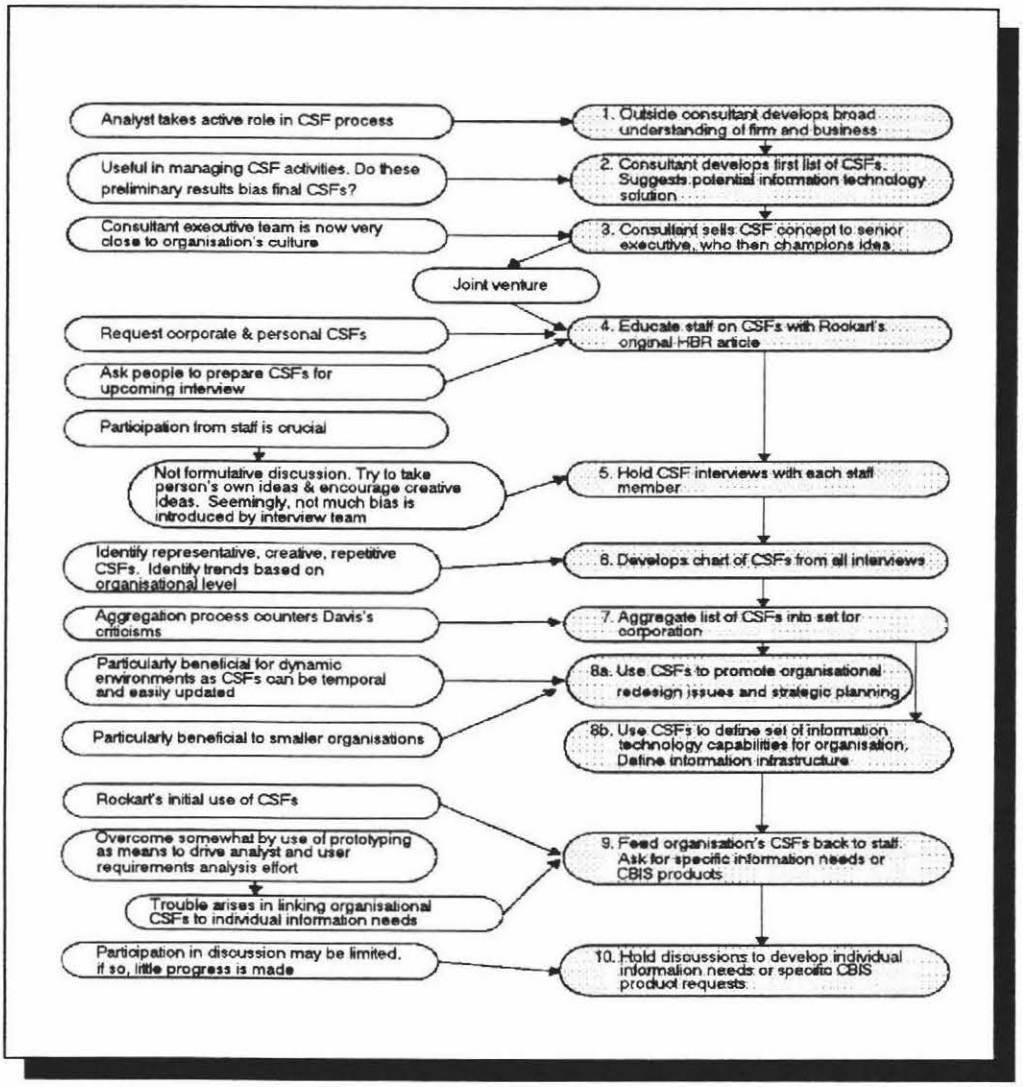

Figure [10]: Map of CSF procedure at a financial services firm. (Boynton & Zmud 1984, p.22 [63]).

Perhaps the most significant conclusions are that: (1) CSF's can be utilised in the development of not only management information systems (MIS) strategic plans, but can also be used to direct an organisation's overall strategic planning process, (2) CSF's can induce a structured design process promoting consistency and completeness in both MIS plans and managerial information needs

and, (3) If developed by a skilled analyst, CSF's provide a common language for managers and systems analysts, do not require a large commitment of resources and are a concept receptive to senior-level managers in that they identify important organisational issues. (Boynton & Zmud 1984, p.26 [63]).

In 1982 Rockart expanded the application of the CSF approach in his investigative article *The Changing Role of the Information Systems Executive: A Critical Success Factor Perspective.* (Rockart 1982, [161]). He concludes that the top information systems/services (IS) executive is no longer an implementor and doer, rather an aggressive, proactive, **communication-oriented** person who focuses heavily on helping his organisation adapt to a changing technical environment - the profile of a thinker, planner and coordinator. (Rockart 1982, pp.12-13 [161]).

Michael Earl and Anthony Hopwood, respectively from the Oxford Centre for Management Studies and the London Graduate School of Business Studies, published their 1980 article *From Management Information to Information Management* arguing that a new management perspective is required. The concern with information management as technical phenomenon must change to a concern with information management as a **substantive organisational phenomenon.** (Earl & Hopwood 1980, p.100 [78]).

Beginning with three researched observations (1) That managers frequently complain of information overload on the one hand and of an information gap on the other, (2) That top managers select and prefer informal information processing in most of their work, and (3) That management information systems (MIS's) are assumed to be good for us, Earl and Hopwood examine the existing nature of information processing and decision-making.

	ROUTINE	NON-ROUTINE
OFFICIAL	MIS Management Accounting Systems Production Control Systems	Access Facilities Task Forces Liaison Roles
UNOFFICIAL	Black-books Just in Case Files	The Grape Vine Lunch Table Chats

Figure [11]: The information processing mix.

(Earl & Hopwood 1980, p.103 [78]).

		UNCERTAINTY OF OBJECTIVES	
		LOW	HIGH
UNCERTAINTY	LOW	Decision by Computation	Decision by Compromise
OF CAUSE AND EFFECT	HIGH	Decision by Judgement	Decision by Inspiration

Figure [12]: Decision-making and uncertainty.

(Earl & Hopwood 1980, p.105 [78]).

From this, they suggest that information processing is viewed in too narrow and technical a manner, and suggest that this view is compounded by the increasing pressure on users and information

technology professionals, brought about by newly emerging technological developments and increasing IT expenditure.

> "... such a limited view of information processing may be impairing organisational performance and threatening organisational survival." (Earl & Hopwood 1980, p.110 [78]).

Earl and Hopwood reinforce their re-direction perspective through a framework of practical suggestions calling for new metaphors, new terms and language, a balance between IT and alternative forms of information processing and a call for increased research and understanding of how organisational decision-making and control is achieved.

Their most intuitive and accurate contribution however, is their farsighted future vision of information management.

> "With the technical so explicitly linked to the organisational, no one management function can be, or should be, responsible for the whole of information processing. The role of the information specialist therefore will need to become that of a catalyst for change. The user, in contrast, will need to have the confidence to explicate and describe his own information environment, processing and problems. In such a context, progress in information management therefore will depend on *us*, as managers and users as

much as, if not more than, on *them* as specialists." (Earl & Hopwood 1980, [78]).

Andrew Parkin, lecturer at Leicester Polytechnic, published, in 1980 *Systems Management* which attempts to provide a map or guide to long-range and medium-range information systems planning whilst stressing the importance of common sense, intuition and the need for consideration of **human values** on the part of the corporate manager.

Parallel's can be drawn between the ideas presented in Parkin's work and the critical success factor ideas of John Rockart although different terminology is utilised. In the development of an IS **long-range plan**, Parkin recommends that DP policies should be aligned to the policies of the organisation resolved through the top-down approach of **Management by Objectives** (MBO). The first step thereafter, is to define the organisation's **key result areas** (KRA's or alternatively, CSF's). (Parkin 1980, p.2 [37]).

Associated with each KRA, there should be one or more objective **measures of effectiveness** (MOE's). This is a very useful condition as it promotes deeper consideration of the KRA and its place and alignment to corporate goals and objectives. Parkin also provides an insight to the "flow-on" effect of these elements of the long-range plan throughout the organisation.

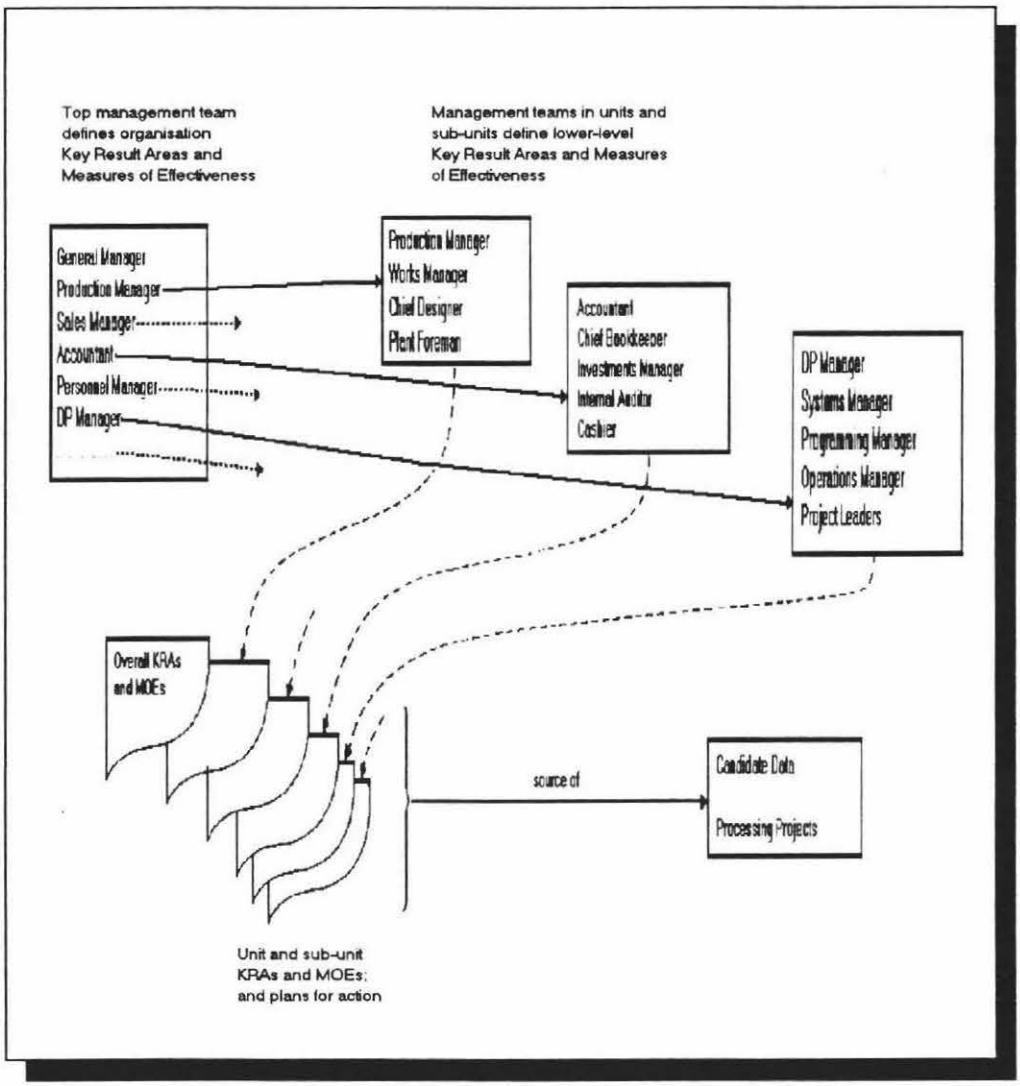

Figure [13]: How high-level plans can be propagated throughout the organisation. (Parkin 1980, p.6 [37]).

Parkin's medium-range information systems plans are the means for selecting and prioritising projects to be started during the first half of the long-range planning period and also seem to be the arena for determining possible strategic uses of IT. The aim of the medium-range plan is to (1) Generate ideas for new projects, (2) Choose from these the most beneficial collection which can

feasibly be started, and (3) Sequence the projects chosen in order of start-date.

Little consideration within Parkin's frameworks however, is given toward the possibility that IT might change the future **shape or direction** of the company.

Henry Lucas and John Turner ask two specific questions in their article *A Corporate Strategy for the Control of Information Processing* printed in 1982. "How can information technology contribute to the development of corporate strategy?" and "How should top management control information processing in their organisations?". Their work recognises that the use of information technology is widespread among business organisations and yet remains predominantly separate to strategy. They argue that the greatest benefits come when IT is **merged** with corporate strategy formulation.

Lucas and Turner identify three types of relationships between information processing technology and corporate strategy (1) Independent systems that concentrate on operational efficiency and provide managerial information, (2) Policy support systems that aid repetitive decision making, and (3) Systems fully integrated with strategy formulation that open new products, markets and directions and change the decision-making processes and evaluation criteria. Some very interesting cases are presented to reinforce

the potential of IT at the strategy formulation level, however few practical guide-lines are provided beyond the requirement for senior management involvement and projected thinking, and the formalisation of plans and priorities.

Design and Strategy for Corporate Information Services: MIS Long-range Planning by Larry E. Long, published in 1982 emerges as one of the earlier works to attempt to entice MIS management personnel to make an effort in strategic planning for corporate information services, referred to by Long as MIS long-range planning.

Long evaluates the state of the art of strategic MIS long-range planning as well below that of corporate long-range planning and of sister functions throughout the company. (Long 1982, preface [27]). He suggests it is time for the reactive days - when managers could operate by the seat of the pants and handle each situation as it arose - **to go** and a more proactive stance be adopted through formal MIS long-range planning.

The objective of his book is to provide a methodology that details the mechanics for developing a comprehensive MIS long-range plan.

Long puts forward the concept that an MIS long-range plan coordinates the activities of the entire company through information processing and information flow, and therefore should be a major consideration by senior management in the corporate

planning process and he recognises that in the existing environment, this is not happening.

> "The advantages of corporate and MIS cooperation in planning are overwhelming. First, if MIS personnel are made aware of the overall company objectives, they can subsequently develop priorities realistically. Second, MIS long-range planning helps executives to know and understand the goals and targets of MIS. ... Third, and perhaps most important, what is usually a highly developed corporate planning exercise can be transferred to the MIS planning function." (Long 1982, p.9 [27]).

In particular, he makes the point that the greater the number of management levels between the Chief Executive Officer and the Director of MIS, the ultimate effectiveness of the MIS long-range plan will **decrease**.

It is interesting to note that Long considers a typical corporate long-range plan to have, at a minimum, a ten-year horizon, with fifteen and twenty year horizons more common. (Long 1982, p.10 [27]).

Long's methodology for MIS long-range planning comprises three phases, (1) The decision to "long-range plan" and the set-up of

the function, (2) The plan development process, and (3) Implementation and maintenance of the plan.

X Planning for one impacts planning for the other

← ↑ Prerequisite to planning area noted

	1 Policy	2 Application system	3 Hardware	4 Systems software	5 Organization	6 Personnel (including education)	7 Management	8 Operation	9 Documentation and procedure	10 Productivity	11 Facilities	12 Contingency planning	13 Social and legal	14 Image	15 Word processing and office automation
1 Policy	■	←	X		X	X		←					X	X	←
2 Application systems		■	←	X		↑		X	X			X			
3 Hardware			■	←		↑		X			←	X		X	←
4 Systems software				■		↑		X				X			X
5 Organization					■	←					←	X			
6 Personnel (including education)						■	X		X	X	X			X	
7 Management							■			X	X	X			
8 Operations								■		X		X		X	X
9 Documentation and procedures									■	←	X				X
10 Productivity										■	X				X
11 Facilities											■	X		X	X
12 Contingency planning												■			
13 Social and legal													■	X	
14 Image														■	
15 Word processing and office automation															■

Figure [14]: MIS planning matrix.

(Long 1982, [27]).

In *Effective Information Management: Developing Information Systems Strategies* (1982), Robert Tricker introduces a method for

developing an information systems strategy that is closely aligned with the emerging corporate strategy process.

He proffers a useful comment on the relationship of data cost, to information value prescribing caution against regarding information as though it was a free good - floating around in the air to be utilised. (Tricker 1982, p.35 [52]).

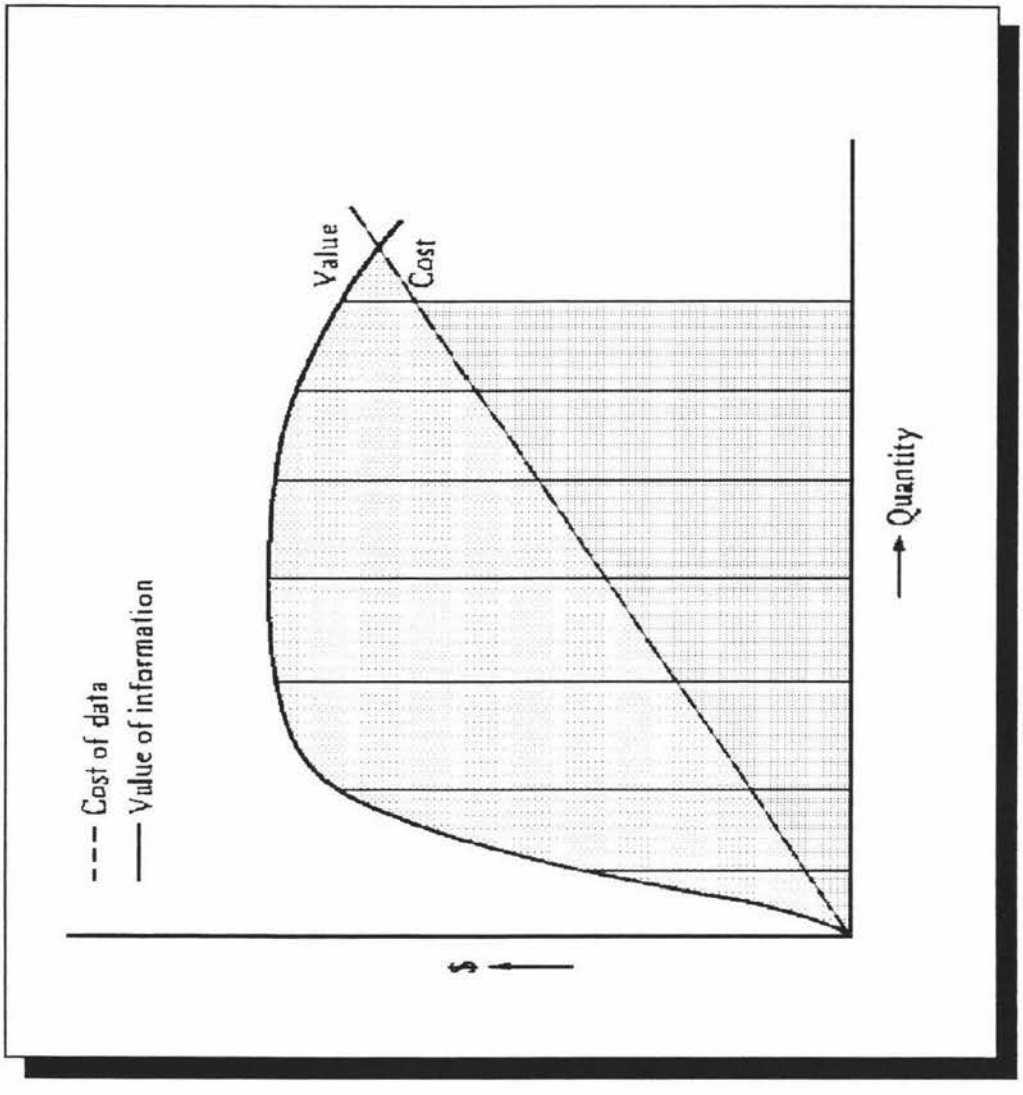

Figure [15]: Data has a cost, information a value.

(Tricker 1982, p.35 [52]).

Tricker then offers an alternative perspective to Anthony's Model, regarded as the classical conception of organisation and the formulation of strategy. He suggests that instead of the pyramid, a more convenient model might be of a **barrel of resources** which must be controlled on a day to day basis under the policy guidelines of corporate strategy, which is influenced by a turbulent

and ambiguous environment. (Tricker 1982, p.51 [52]). His main emphasis, is that information systems can and should be considered (in a strategic and operational sense), at technical, operational and organisational levels. (Tricker 1982, p.51 [52]).

PHASE	DRIVING FORCE	EMPHASIS
"Bottom-up" planning	The DP function and the computer manufacturers	Transaction orientated systems to reduce costs and improve efficiency of operations. Information is an incidental result.
"Top-down" planning	Senior management and consultants	A response to crises in the "Bottom-up" approach. Organisational effectiveness becomes important. Information needs are determined.
Systems evolution	Users of data and academic researchers	Systems evolve as organisations learn. The emphasis must be user orientated. Self design is suggested.
Strategic development	Top management and professional communications people	The strategic implications of information systems too great and wide-spread to be treated other than as part of the corporate strategy formulation process.

Figure [16]: The evolution of ideas in systems development.

(Tricker 1982, p.123 [52]).

Since the formulation of information systems strategy is part of the overall strategy formulation, Tricker suggests that the same elements of the strategy formulation process will also apply. (Tricker 1982, p.118 [52]).

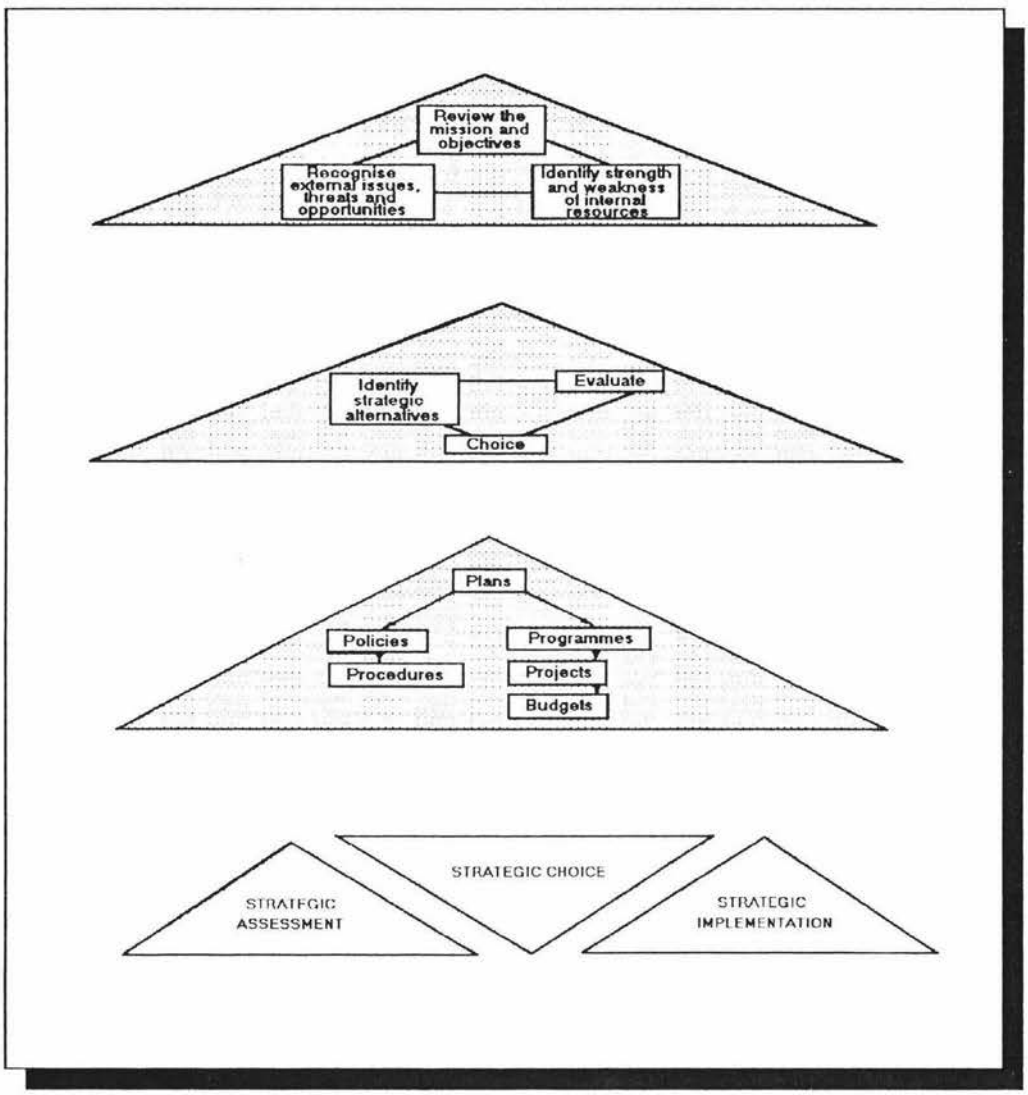

Figure [17]: The process of strategy formulation.

(Tricker 1982, p.118 [52]).

Niv Ahituv and Seev Neumann in their 1982 textbook, *Principles of Information Systems for Management*, dedicate one small chapter to information systems planning and within that, their attention to the strategic planning of information technology does not extend beyond the works already reviewed. In fact, they simply present

the concepts of long, medium and short range planning, concentrate upon the medium plan as the "master" plan for IS and the domain for the identification of strategic opportunities, and re-cap upon suitable versus inappropriate approaches within the development of these plans.

Approaches deemed inappropriate are (1) The ad hoc approach, (2) The data collection approach, and (3) The organisation chart approach - information following organisational lines. Appropriate approaches are (1) The top-down approach, (2) The bottom-up approach, (3) The evolutionary approach - extreme bottom-up, (4) The parallel approach - both bottom-up and top-down, and (5) The middle-out approach, which involves prototyping at whatever level is in need of consideration.

Another work published in 1982 was James Martin's *Strategic Data-Planning Methodologies* in which the top-down approach to information systems planning is solely advocated and IBM's **Business Systems Planning** (BSP) is proposed as;

> "...a structured approach to assist a business in establishing an information systems plan to satisfy its near- and long-term information needs." (Martin 1982, p.82 [32]).

The basic philosophy of BSP is that data is a corporate resource and that it should be managed from an overall organisational

viewpoint, so that it can best serve the organisation's objectives and support its decision-making activities. It attempts to discover a stable information architecture that supports all of the processes of the business, but must have top management backing and for larger organisations, can become a very time consuming and costly exercise. BSP is perhaps better suited to stable and more predictable business environments.

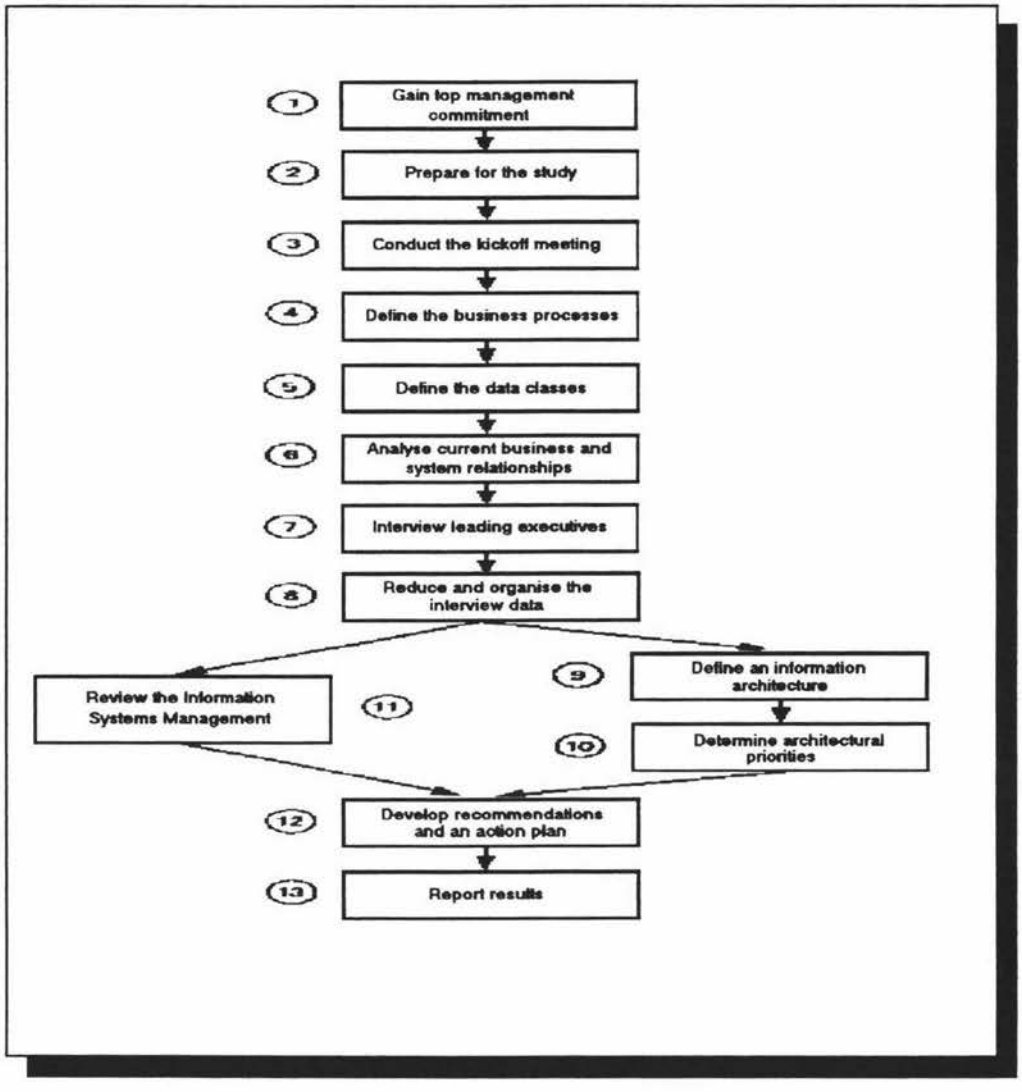

Figure [18]: Steps in a BSP study.

(Martin 1982, p.86 [32]).

Computer capacity planning is introduced as a potential major dilemma for Management Information System (MIS) managers in *Computer Capacity Planning: Strategy and Methodologies*, 1983 by Lynne Carper, Susan Harvey and James Wetherbe. Although the text is primarily concerned with this more operational IS management task and does not address strategic IT issues, its emphasis upon

modelling the workload and attempting to identify potential future requirements is useful for both IS and corporate management to consider.

Gregory Parsons, assistant professor at the Graduate School of Business Administration, Harvard University in 1983 published two papers *Information Technology: A New Competitive Weapon*, and *Strategic Information Technology*, within each of which he presented a multi-level framework for assessing the competitive impact of information technology on a firm.

Within his method, Parsons relied upon Michael Porter's five competitive forces model and Porter's three generic strategies, in order to present a case for integrating information systems strategy with corporate strategy, and justified its importance on the requirement that senior management must know whether IT will represent a major constraint or opportunity as the firm plans for its future. (Parsons 1983, p.3 [146]).

To identify when, where, and how IT becomes important to business strategy, an analysis must be performed at **three levels** (industry, firm and strategy levels).

> "This analysis identifies the impact of IT on the competitive domain of the firm, as it changes the competitive environment in which a firm operates and

the opportunities for the firm's competitive direction." (Parsons 1983, p.183 [147]).

INDUSTRY LEVEL:
IT changes an industry's:
1. Products and Services
   * Nature of products/services
   * Product life cycle
   * Speed of distribution
2. Markets
   * Overall demand
   * Degree of segmentation
   * Geographic distribution possibilities
3. Economics of Production
   * Relevant range for economies of scale
   * Flexibility-standardisation tradeoff
   * Value added stream

FIRM LEVEL:
IT affects key competitive forces:
1. Buyers
   * Switching costs
   * Buyer selection
2. Suppliers
   * Avoid switching costs
   * Backwards integration
3. New Entrants
   * Entry barriers
   * Entry deterrents
4. Substitution
   * Relative price-performance
   * Product features
5. Rivalry
   * New basis of competition
   * Shared IT

STRATEGY LEVEL:
IT affects a firm's strategy:
1. Overall Low-Cost Producer
   * Reduces overall costs directly
   * Enhances ability to reduce overall cost through other functions
2. Overall Differentiation
   * Adds unique features to product/service
   * Enhances ability to differentiate product/service through other functions
3. Focusing on Niche
   * Identify & create market niches directly
   * Enhances the ability to create market niches through other functions

Figure [19]: Three levels of strategic IT impact.

(Parsons 1983, p.184 [147]).

Parsons then extends the analysis to help firms identify and weigh competitive advantages of IT through the use of the strategic IT matrix tool.

> "One of the major hurdles management must overcome before strategically managing IT, is the ability to identify and weigh long-term competitive implications against today's dollars and cents." (Parsons 1983, p.192 [147]).

One factor however, that will affect the three-level framework's application, is whether or not a competitive strategy has been formulated beforehand. If so, the framework will have to be applied not at the firm level but at the level where particular product-market strategies are formulated or where Porter's five competitive forces are played out.

Parson's three-level impact framework can be regarded as a **strategy awareness** tool that is good for checking that the application of information technology is being aligned with strategic need.

3 The middle 1980's through present day

Although many of the evolving concepts about strategic management have developed and been extended from those introduced in the 1970's and early 1980's, there are several new factors to be considered within the modern time period. These and other contemporary concerns are discussed within the following reviews, but three in particular, deserve further elaboration at this stage.

First, the **technology element** within "information technology" has radically progressed to the extent that for a capital outlay well under that of the purchase of an automobile, today's individual can obtain, have set-up and begin operating, a computer that has many many times the capability of the best available a decade ago, and can utilise it as his or her own personal productivity or development tool. The astounding developments in hardware, software and communications technology do not yet look like slowing or declining in their progression rather, we can expect the situation to become even more uncertain and less predictable.

Information technology has consequently become the major **change-maker** of our current environment.

Second, there now exist **differing perspectives** in relation to strategic information systems. The traditional, where "strategic" referred to the key business planning of the corporation and the emerging, where "strategic" refers to the use of computers as a competitive weapon. This has become an accepted situation in the work place today and the emerging techniques and strategic planning methods have multiplied from the increased attention and in response to demand.

Thirdly, the strategic management concept is finally bringing together corporate managers, IT managers and academic theorists in their search for "ideal" strategic planning methodologies, but there is beginning to become evident, two separate underlying philosophies. One philosophy is predominantly **quantitative** with the strategic planning process effectively "mapped" as (1) Analysis, (2) Choice, and (3) Implementation, whilst the other adopts an **holistic** and people-oriented approach.

The following sections present the current state of the art of strategic management as evidenced in the literature, and its impact and relevance within both corporate and information technology concerns.

3.1 Corporate strategic management

Michael McGinnis takes a look at the ability of the firm and its managers to **integrate analysis and intuition** as a prerequisite to achieving strategic success. His 1984 article *The Key to Strategic Planning: Integrating Analysis and Intuition* examines six key issues that are instrumental in helping managers when deciding on a company's strategic direction.

The six issues are (1) Intelligence - the firm's ability to simultaneously scan and interpret its external environments, monitor itself, and communicate effectively within itself, (2) Organisational balance - the ability to be centralised and decentralised simultaneously, (3) Analysis - quantitative and qualitative analysis and the development of responses, (4) Innovation - being willing to learn new ways and willing to bend, (5) Proactivity - shaping the environment with new products, technologies, administrative techniques, and so forth, and (6) Risk taking - the ability to take bold and venturesome action in the face of uncertainty. (McGinnis 1984, pp.45-48 [132]).

The key to McGinnis' work is that the primarily analytical and systematic activities of the first three issues intelligence, organisational balance and analysis, are counter-balanced by the primarily holistic, intuitive-oriented activities of the last

three. This is ideal in his opinion for unstable, difficult to predict, complex and competitive environments.

Some further guide-lines and implications are presented and the article provides a good example of the progressing evolution of strategic planning to something more qualitative and "experience" reliant than formal structured planning methods. It is unfortunate that it is so difficult to back up idealistic methodologies such as McGinnis' with convincing factual evidence.

Business Week magazine declared that "the reign of the strategic planner may be at an end" (Business Week 1984, p.62 [64]) in their 1984 article *The New Breed of Strategic Planner*, and suggested that line managers were now successfully challenging and forcing professional planners from their positions of influence.

The magazine investigates the success of over 100 previously reported strategies and determines that less than half could be deemed to have become successful. Like McGinnis they conclude that existing techniques are overly quantitative resulting in companies devoting too much time to corporate portfolio planning and too little time to turning sick operations into healthy ones.

In an attempt to proffer an alternative, the article examines practical solutions in place among large corporations. Some split the planning job into two - one focused upon strategic operational

issues, the other upon long-term strategic issues such as competition, technology and acquisitions. Others suggest refinement to contingency or "what-if" planning whilst still others are emphasising the strategic planning role at the line management level utilising professional planners as more consultants and facilitators.

Business Week maintains that the biggest challenge still, is converting CEO's into true strategic planners themselves. (Business Week 1984, p.68 [64]).

In 1985 Michael Porter again published a book that became a landmark contribution and turning point in the evolution of strategic management, and finally a workable methodology appeared from the management discipline that is appropriate for amalgamating IT strategy formulation with corporate strategic management. *Competitive Advantage* takes up where his earlier work *Competitive Strategy* ends and goes beyond competitive analysis to show exactly how strategy can be selected and implemented.

Competitive advantage analysis is Porter's extension of the life cycle portfolio by comparing the development stage of the industry (growth, maturity, decline) with the strategic position of the firm. His work describes the way a firm can choose and implement a generic strategy in order to **achieve and sustain** competitive advantage. Porter also introduces his **value chain concept** which

is a particularly useful tool for analysing sources of competitive advantage. The value chain is simple to understand and looks for strategic opportunity in operational terms, it is therefore a framework which can analyse any firm's activities and functions.

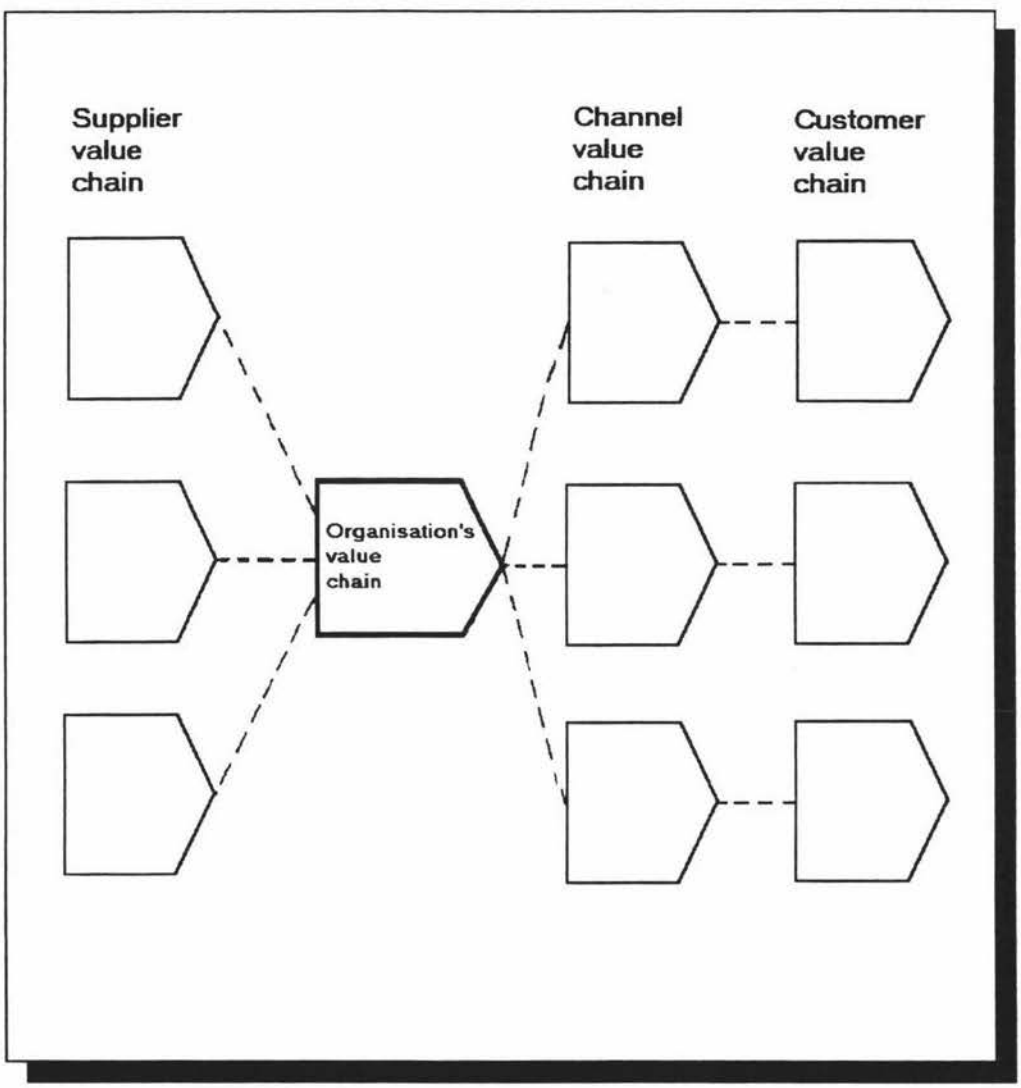

Figure [20]: The value system. (Johnson & Scholes 1988, p.87 [22]; Porter 1985, p.35 [40]).

Buyers or consumers of a firm's product are the ultimate judges of an organisation's strategic capability. In the **value system** it is the buyer's view of an organisation's product or service in relation to competitive offerings that determine its "value". Similarly, the firm places a value upon its suppliers' products or services in relation to alternative competitive offerings. Understanding the value chains of suppliers, buyers and competitors provides the wider context from which strategic advantages may be identified.

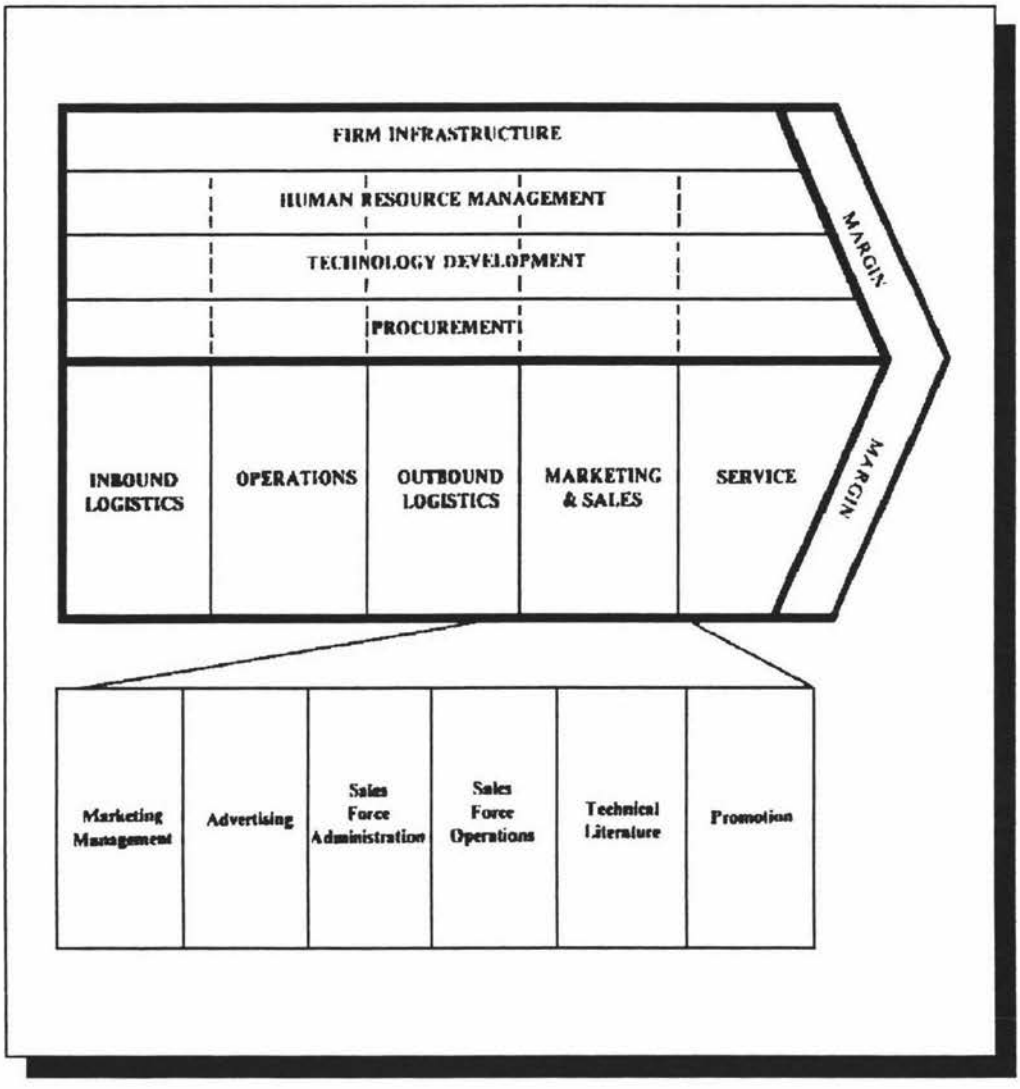

Figure [21]: The generic value chain (showing subdivision).
(Porter 1985, p.46 [40]).

Competitive advantages stem from the many discrete activities a firm performs in designing, producing, marketing, delivering and supporting its product. Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation. The firm's value chain represents these activities at the business unit level and when identified and

compared with the value chains of competitors, suppliers and buyers, can enable the tailoring of activities to lower cost or differentiation of a product, thereby enabling a particular industry segment to be exploited or alternatively, enable interrelation of activities with external organisations to exploit coalition advantages.

Within the value chain, value activities can be divided into two broad types, primary activities and support activities and the two are interdependent. The **linkages** between the way one value activity is performed and the cost or performance of another can lead to competitive advantage through optimisation or through coordination.

Porter's value chain concept has been incorporated in a large number of contemporary works. Its applicability within the field of information technology is reviewed in the following section of this chapter.

Arthur Sharplin's *Strategic Management* textbook for academic study was in 1985 one of the first comprehensive publications to amalgamate the many strategic planning concepts, techniques and methodologies under the banner of **corporate strategic management**. His text is concerned with the actual process of strategic management as it is and should be carried out and he promotes strategic management as a **literative process** - the process occurs

over and over in a never ending cycle, and in a nonsequential manner.

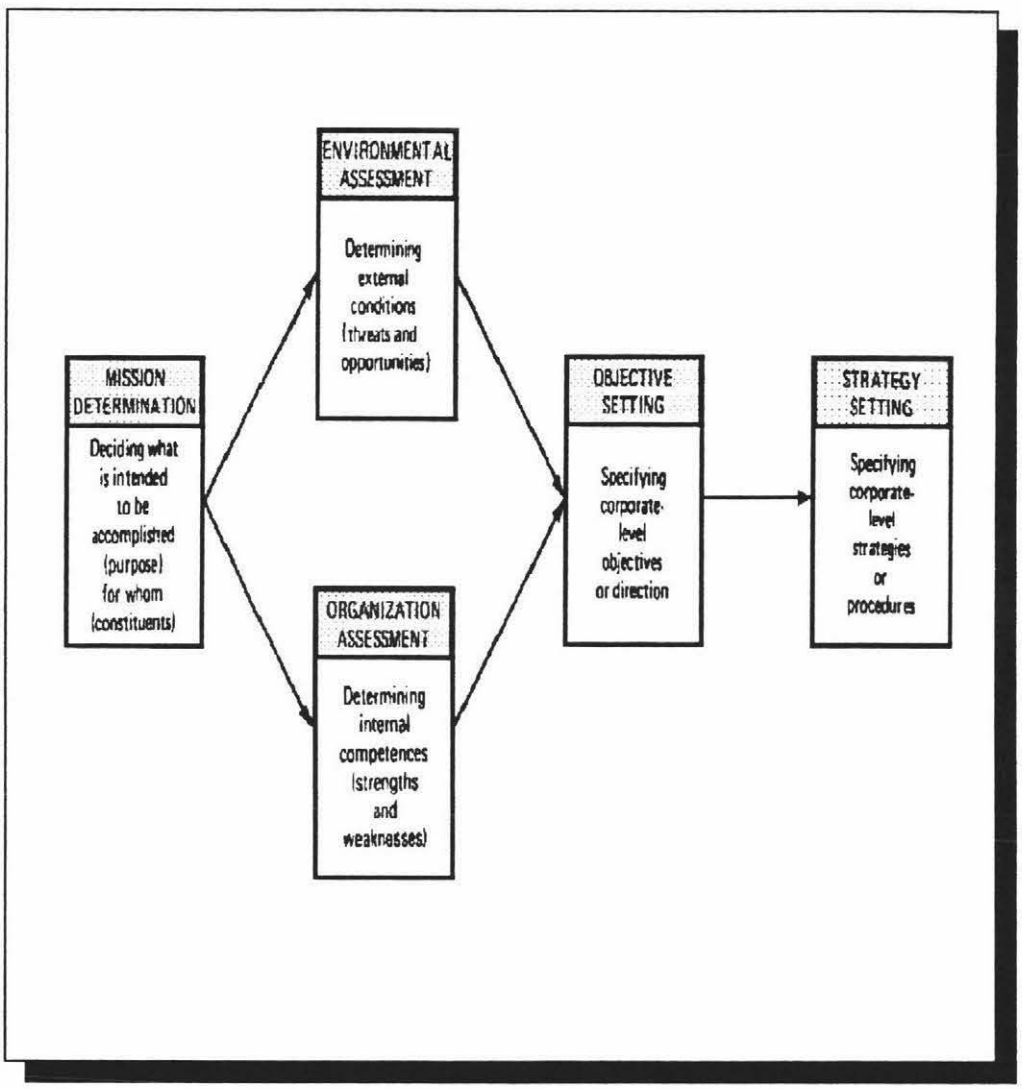

Figure [22]: The process of strategy formulation. (Sharplin 1985, p.49 [45]).

Sharplin's process of strategy formulation is based upon corporate mission determination and the specification of corporate level goals and objectives and he presents his ideas with sound

rationalisations of a practical orientation. For example, on financial ratio analysis Sharplin comments;

> "Published financial data can be manipulated in many ways under "accepted accounting practices". (Sharplin 1985, [45]).

Frederick Gluck and fellow colleagues of McKinsey & Co. Inc. Stephen Kaufman and Steven Walleck, set out in 1986 to determine how, and to what extent, **formal planning** actually influenced the major decisions shaping the business strategies of 120 U.S. companies. Their work provides a very useful evaluation of the extent to which **strategic management theory** has been practically implemented.

They examined the relation between formal planning and strategic performance looking for common patterns in the development of planning systems over time, and found that formal strategic planning evolved along similar lines in different companies and that even though rates of progress differed, they were able to broadly segment this progression into **four sequential phases** which they presented in their article *Strategic Management for Competitive Advantage*.

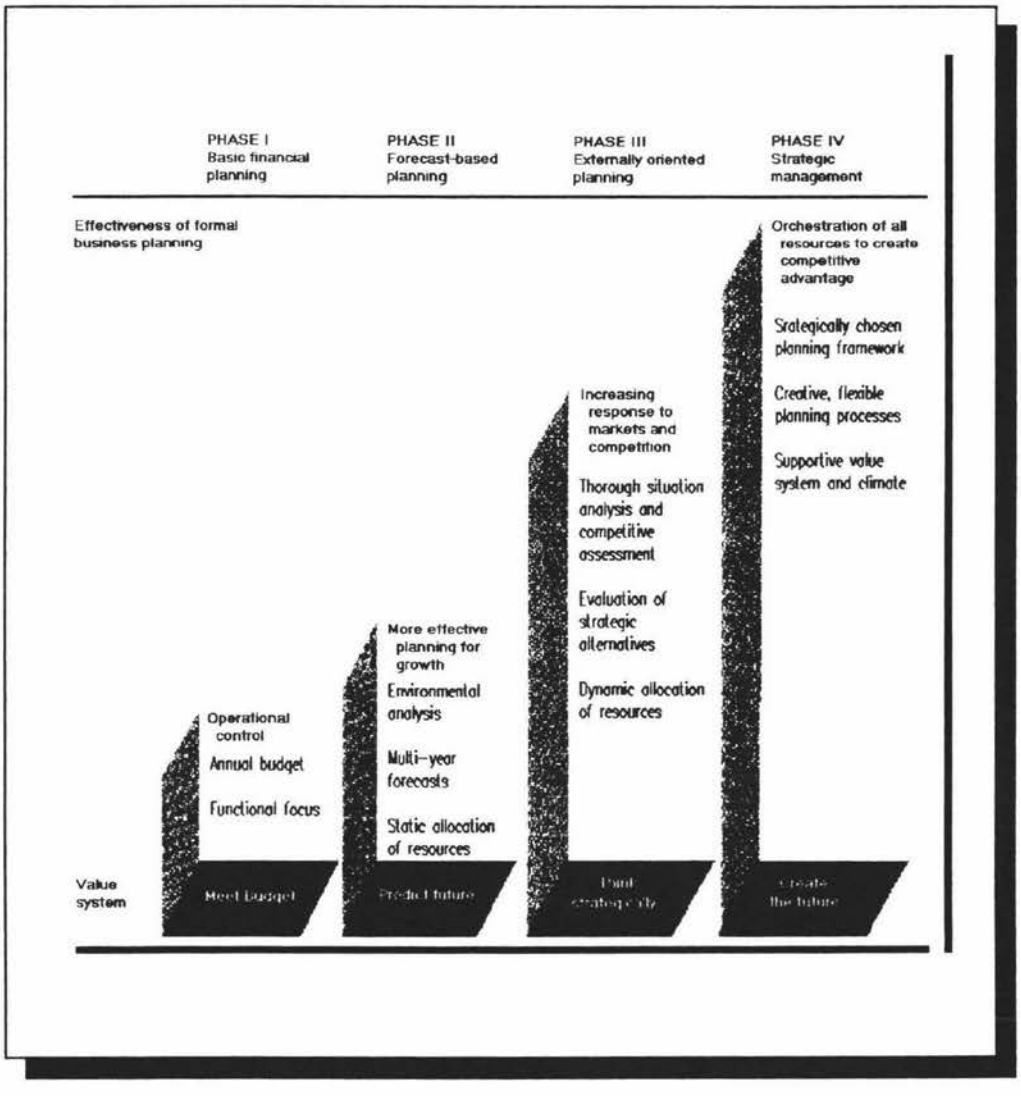

Figure [23]: Four phases in the evolution of strategic planning. (Gluck et al 1986, p.6 [97]).

Phase I companies although often displaying powerful business strategies rarely have formal or explicit strategies beyond financial budgeting and forecasting and therefore the quality of Phase I strategy is dependent upon the CEO and senior management.

Phase II, the **forecast-based planning** category moves towards explicit documentation of the still implicitly understood and "realm of senior management" strategies of Phase I. In simple terms, the time frame of Phase I is extended beyond the annual budget and past trends are analysed in an attempt to foresee the future impact of social, political, economic and environmental forces. More advanced forecasting tools are sought including trend analysis, regression models and computer simulation models. Unfortunately plans based on predictive models fail to signal often obvious major environmental shifts.

Phase II forces management to confront the long term implications of decisions, to give thought to potential business impacts and more. In particular, Phase II organisations use and allocate resources effectively due to the longer term horizon, however Phase II forecast-based planning all too easily becomes a **mechanical routine** as previous year's plans are copied, trend lines are extended and cosmetic adjustments are made.

Progression to Phase III - **externally oriented planning** - eventuates when planners become frustrated with forecasting and attempt to understand the basic marketplace phenomena driving change. This is most prevalent in rapid change environments, and resource allocation becomes both dynamic and creative. Characteristic of Phase III in diversified companies is the formal grouping of related businesses into strategic business units

(SBU's) that recognise two distinct strategic levels; corporate decisions and business units decisions. Limits to SBU are (1) many vertically integrated companies cannot be neatly split into discrete business units because they share important corporate resources, (2) strategy may dictate concerted thrusts by several SBU's, or (3) combined power (ie purchasing, IS) may be more valuable than individual SBU profit making potential.

Phase III differs from Phase II most significantly in that top management expects to be presented with a number of **alternative strategies**. Each alternative is usually characterised by a different risk/reward profile or gives priority to a different objective. Alternatives provide a heavy burden upon top management, explicit choices that could significantly affect long-term survival are being made by planners and managers deep down in the organisation without top level participation due to the volume of data and issues raised. This pushes top management to heavier involvement in the planning process, Phase IV.

> "Only a few companies that we studied are clearly managed strategically, and all of them are multinational, diversified manufacturing corporations." (Gluck et al 1986, [97]).

Phase IV joins strategic planning and management into a **single process**. The key is the thoroughness with which management links

strategic planning to operational decision-making and is accomplished by three mechanisms;

1. A planning framework that cuts across organisational boundaries and facilitates strategic decision-making about customer groups and resources.
2. A planning process that stimulates entrepreneurial thinking.
3. A corporate values system that reinforces managers' commitment to the company's strategy.

Instead of relying on the SBU concept to provide a planning framework, as many as **five planning levels** may be used (1) Product/market planning, (2) Business unit planning, (3) Shared resource planning, (4) Shared concern planning, and (5) Corporate level planning. The value system shared by top and middle managers in Phase IV provides a less visible linkage between planning and action.

> "Most long-range or strategic planning today is a Phase II system." (Gluck et al 1986, p.4 [97]).

Gordon Donaldson's 1986 discovery that many managers do not pay sufficient attention to how the achievement of different goals will affect the flow of funds, offered a balancing perspective to the "boots and all" rush into strategic management. *Financial Goals and Strategic Consequences* demonstrates how a company can check whether its strategic and financial goals are consistent with reality and may better prepare the company to make the right

trade-offs among conflicting goals and to anticipate what the consequences of its actions may be.

Manage Beyond Portfolio Analysis by Richard Hamermesh and Roderick White provides an additional perspective to Donaldson's article. Their comment that the traditional practice of taking cash from a healthy, stable unit to fund the growth of a less promising performer may overlook a key variable in that unit's relationship with corporate strategy and performance.

> "...administrative arrangements concerning the degree of autonomy a business unit has, how line responsibilities are structured, and how the unit's incentive compensation program is designed, have as much affect on its performance as market share and cash flow considerations." (Hamermesh & White 1986, p.69 [104]).

It seems a key concept is to consider the strategic consequences of chosen alternatives. Joel Goldhar and Mariann Jelinek promote this in their 1986 article *Plan for Economies of Scope* which although production oriented, effectively demonstrates this consideration through recognising *economies of scope* rather than economies of scale using the impact of information technology as their ideal example.

COMMON ASSUMPTIONS	
Old style technology	**CAD/CAM environment**
Economy of scale Experience curve Task specialisation Work as a social activity Separable variable costs Standardisation Expensive flexibility and variety	Economy of scope Truncated (or expanded) product life cycle Multimission companies Unmanned systems Joint costs Variety Profitable flexibility and variety
DESIRABLE OPERATING SYSTEM CHARACTERISTICS	
Centralisation Large plants Balanced lines Smooth flows Standard product design Low rate of change and high stability Inventory used as a buffer "Focused factory" as an organising concept Job enrichment and enlargement Batch systems	Decentralisation Disaggregated capacity Flexibility Surge and turnaround ability Many custom products Innovation and responsiveness Production tied to demand Functional range for repeated reorganisation Responsibility tied to rewards Flow systems

Figure [24]: A new logic for production. (Goldhar & Jelinek 1986, p.88 [98]).

Economies of scope exist where the same equipment can produce multiple products more cheaply in combination than separately.

> "A computer-controlled machine tool does not care whether it works in succession on a dozen units of the same design or in random sequence on a dozen different product designs - within of course, a family of given limits." (Goldhar 1986, p.88 [98]).

Goldhar and Jelinek's article has been included within the review for consideration of the economies of scope concept (coupled with the IT example), as it may be applied not only to production but also to operations and top level management tasks as well. It also reinforces the attention towards the need to constantly review wider organisation-wide consequences.

Philip Thurstons' 1986 *Should Smaller Companies Make Formal Plans?* investigates formal planning approaches and their application within the context of the smaller organisation. Thurston suggests **patience** on the part of senior management citing the current trend that the smaller companies seem to be following an idea, or "no-frills", down-to-earth plan of how to take advantage of the environment and how to allocate resources. Another example of a more qualitative and "experience dictated" attitude.

A long hard look at strategic planning among American manufacturing companies coupled with many personal years of experience prompted Robert Hayes to look at the issue of strategic planning from a different perspective. Hayes' 1986 article *Strategic Planning - Forward in Reverse?* suggests that a reason why success from strategic planning is so elusive may be the fault of the traditional approach of first selecting objectives or ends, then defining the strategies or ways of accomplishing them and finally allocating or developing the necessary resources or means.

Hayes suggests and is quite convincing that instead, strategic planning should be approached by reversing the process. First the resources or means should be identified and considered for development capability and limits, then the ways or alternative strategies available within the means can be considered and finally a realistic list of ends or attainable scenarios can be decided upon. Hayes' **means-ways-ends** approach is extremely logical and a far more realistic method for many firms seeking to not only find competitive advantage, but to simply find ways of surviving current economic difficulties.

Action is the key element of K. E. Weick's 1987 article *Substitutes for Corporate Strategy* and his argument against formal "ivory tower" strategic management. He argues that strategic planning, a focus on organisational culture or even management by walking around (MBWA) can all be beneficial as long as they encourage action.

> "Enthusiasm can produce wisdom because action creates experience and meaning." (Weick 1987, p.231 [181]).

The Emerging Paradigm of Strategic Behaviour, 1987 by Igor Ansoff provides an ideal overview of past and present academic approaches to the subject of strategic management. Ansoff, who has been an active contributor and developer of concepts and ideas in the field of management for more than 30 years also presents his ideal

view of the likely possible future scope for researchers of strategic behaviour, advocating (1) A multi-disciplinary view focusing on the interactions and influences of political, sociological, psychological and cognitive-logical rationalities, (2) Problem investigation that includes the interaction of strategic behaviour with the configuration and dynamics of the organisation, (3) Additional problem investigation of the coexistence of operating behaviours with strategic behaviours, and (4) The maintaining of an holistic attitude.

Ansoff's paradigm is an attempt to **refocus** the energies of the competing schools of theorists from conflict with others, to exploration and mutual enrichment. (Ansoff 1987, p.514 [57]). His evaluation of past and existing trends and developments provides a good confirmation medium for the suitability of the literature currently reviewed and also produces an interesting model on the complexity of the strategic management environment.

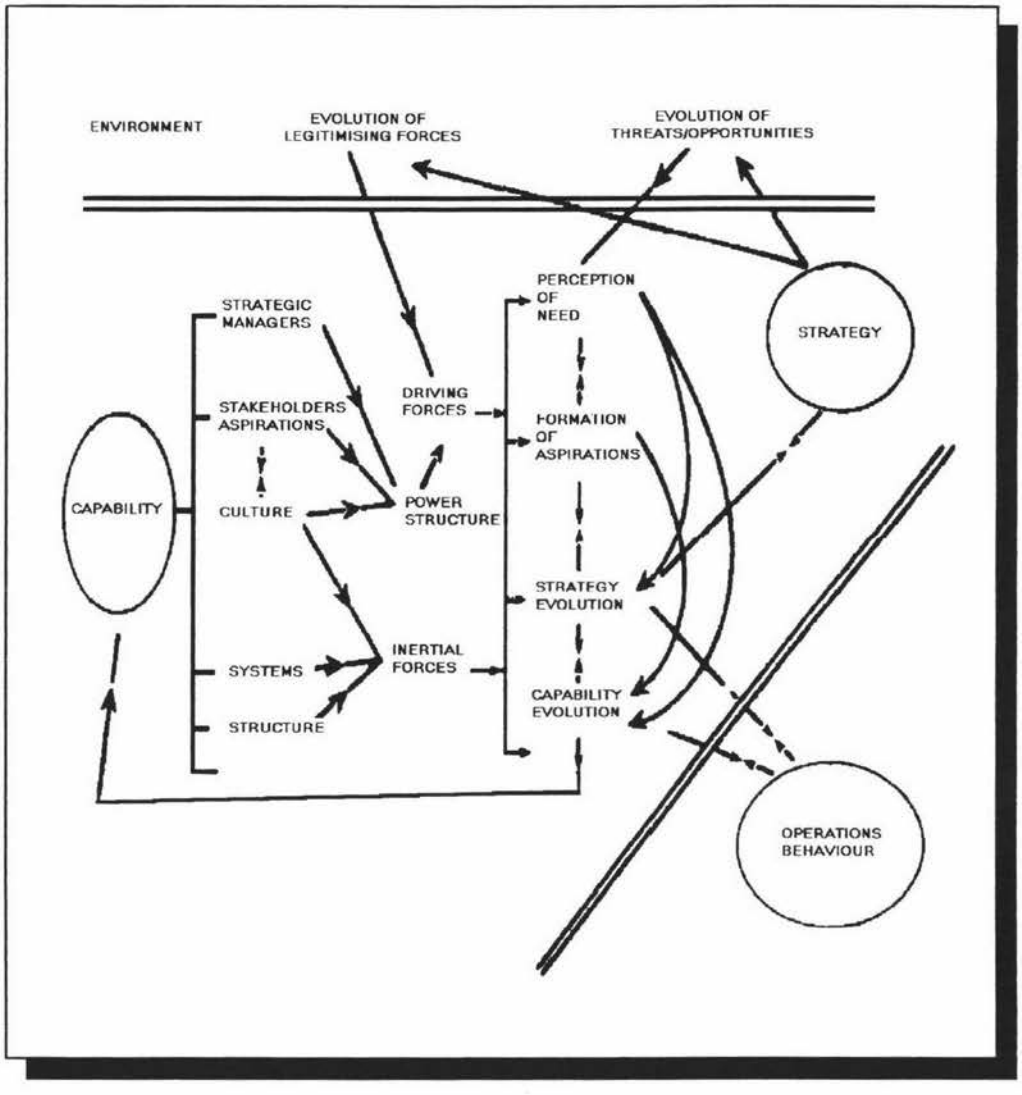

Figure [25]: Paradigmic complexity. (Ansoff 1987, p.511 [57]).

University professors Lawrence Jauch and William Glueck in their 1988 fifth edition of *Business Policy and Strategic Management* like textbook authors before them, gather together the many academic and practical advances reported to date and build upon their earlier contributions and work from contemporaries, in their promotion of the **strategic management process** as depicted below. Perhaps because they are revising many earlier editions, they seem

to have overlooked a few of the more subtle and recent changes in attitude found in many contemporary publications.

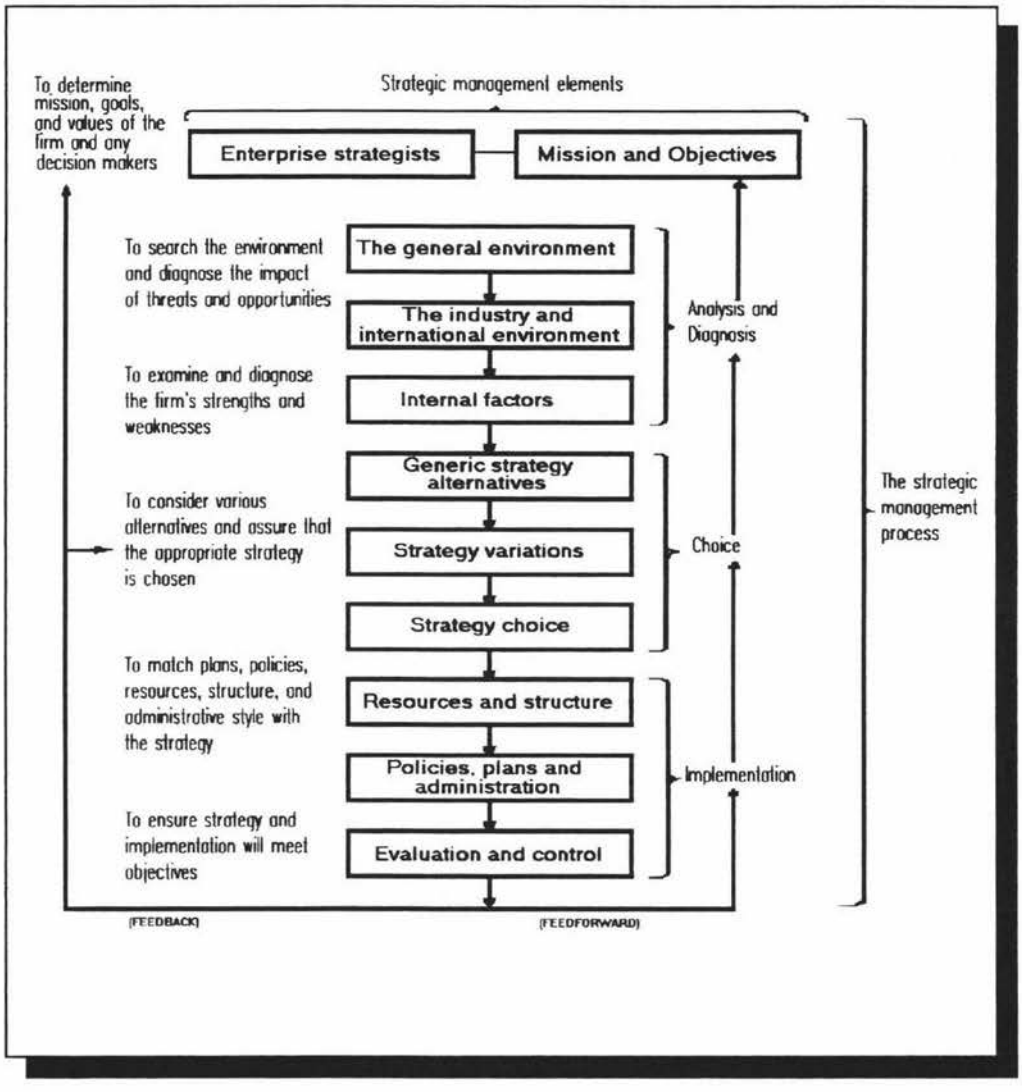

Figure [26]: A model of strategic management. (Jauch & Glueck 1988, p.7 [24]).

In Jauch and Glueck's strategic choice and strategic implementation phases, significant extensions to works such as Sharplin's are made and much consideration is given to the

strategic management processes of SBU's within larger organisations.

In order to provide a reference point on the promotion of strategic management concepts within today's academic environment, the second edition of Gerry Johnson and Kevan Scholes' textbook *Exploring Corporate Strategy* published in 1988 provides a suitable and appropriate example. In 1991, *Exploring Corporate Strategy* is the required text complimenting both graduate and postgraduate study of strategy, policy and general management at Massey University, New Zealand. The underlying premise is that there is no point formulating elegant analytical strategies without having an understanding of the actual existing processes.

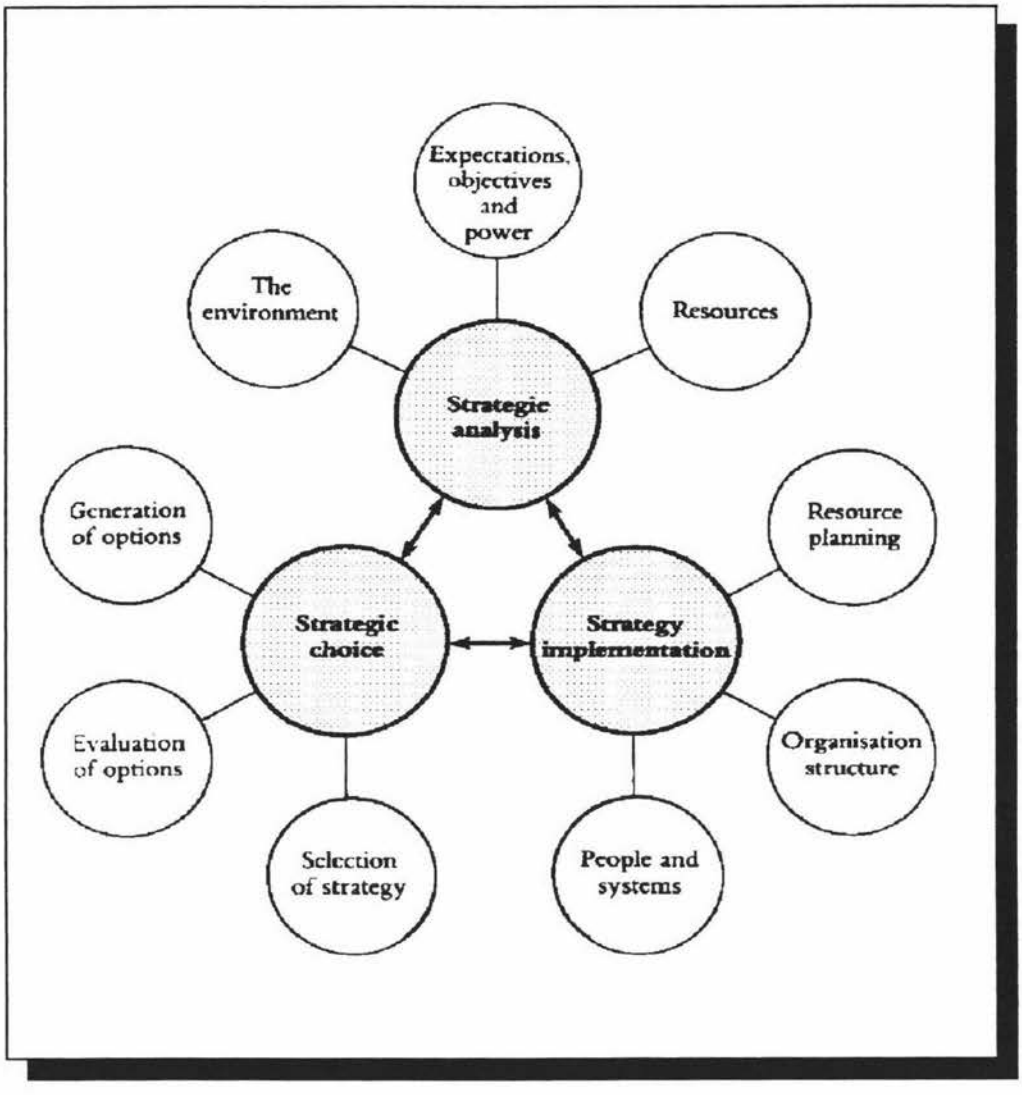

Figure [27]: A summary model of the elements of strategic management. (Johnson & Scholes 1988, p.16 [22]).

Johnson and Scholes recognise that strategic management problem solving is troublesome, that the problem is not clearly identified and that the information needed to solve the problem is not always available. Like many others, they suggest that in the absence of information, **realistic assumptions** should be researched, stated and recorded, and a solution which incorporates further

information gathering should be specified. Strategic changes when implemented, must also be large enough to match environmental change, otherwise **strategic drift** will be followed by crisis.

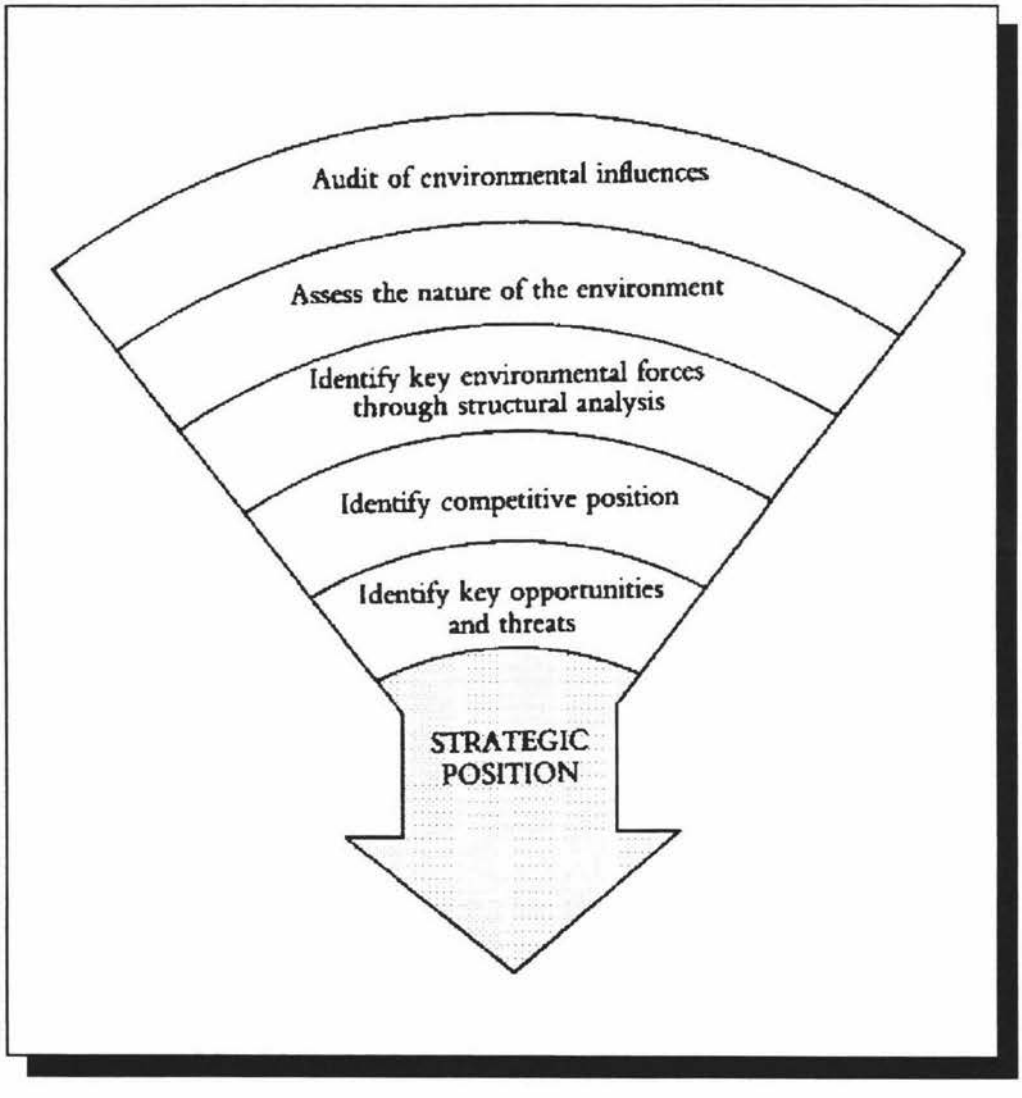

Figure [28]: Steps in environmental analysis. (Johnson & Scholes 1988, p.54 [22]).

Strategic analysis should be a process of becoming better informed about an organisation's situation, not a simple one-off exercise.

It should concentrate on (1) The environment - key variables affecting performance and position, (2) Resources - understanding how the configuration of resources (ie value chain) influences strategic capability, and (3) Culture - organisation objectives are the outcome of political and cultural processes rather than preordained targets.

The suggested three most frequently used tools for strategic analysis are the SWOT analysis, financial ratio analysis and competitive analysis. There is also an important deviation from the rigid setting of corporate missions as proposed by forerunners Sharplin, Jauch and Glueck.

Strategic choice is the core of corporate strategy, with emphasis on alternative **development strategies** rather than just growth strategies. Any strategy is suggested as having three separate aspects (1) Generic strategy - the basis on which to compete or sustain excellence, (2) Alternative directions to develop, and (3) Alternative methods for any chosen direction.

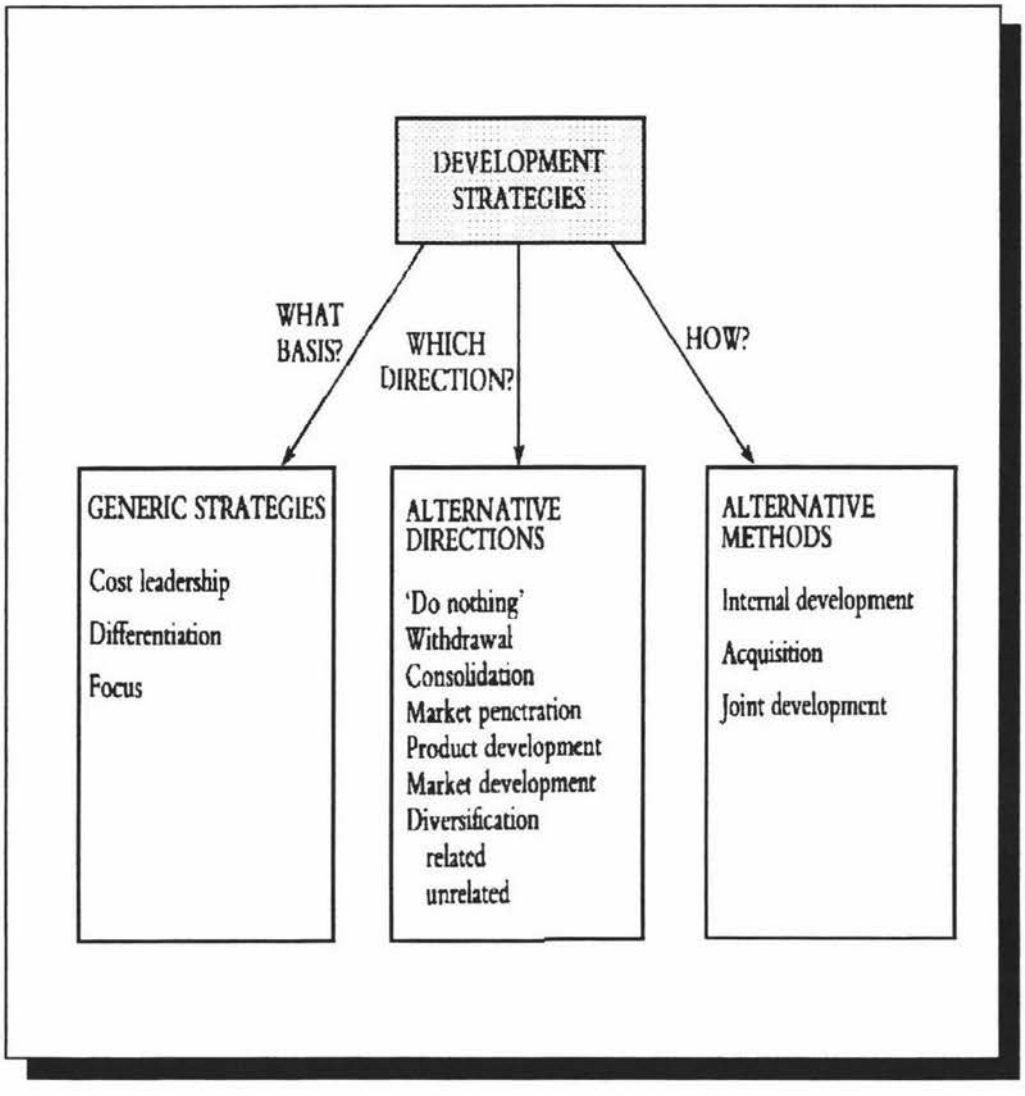

Figure [29]: Development strategies. (Johnson & Scholes 1988, p.148 [22]).

Alternative directions for strategy development also include options for (1) Backward integration - backward into inputs, (2) Forward integration - forward into outputs, and (3) Horizontal integration - competitive or complementary operations, and the text (like others), outlines a wide range of techniques and methodologies for strategy evaluation purposes.

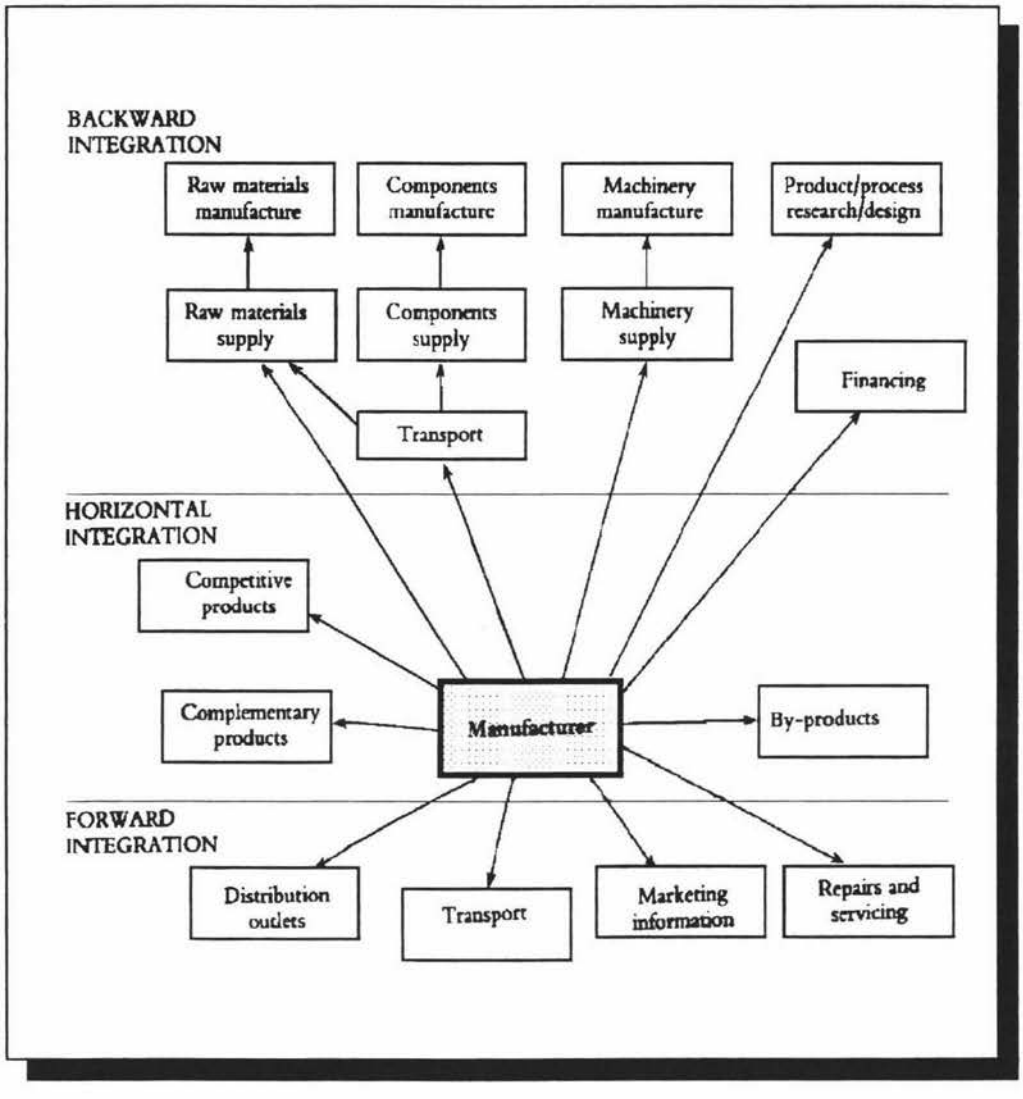

Figure [30]: Alternatives open to a manufacturer to develop by related diversification. (Johnson & Scholes 1988, p.161 [22]).

Johnson and Scholes' final section concerns **strategy implementation**, comprising the planning and allocation of resources, consideration and reorganisation of people and systems and effects upon organisational structure, many considerations for which have already been addressed by writers already reviewed.

They also dedicate a small but relevant chapter to control and information systems, but like so many others, avoid detailed discussion on the strategic use of IT for competitive advantage or within strategy development itself.

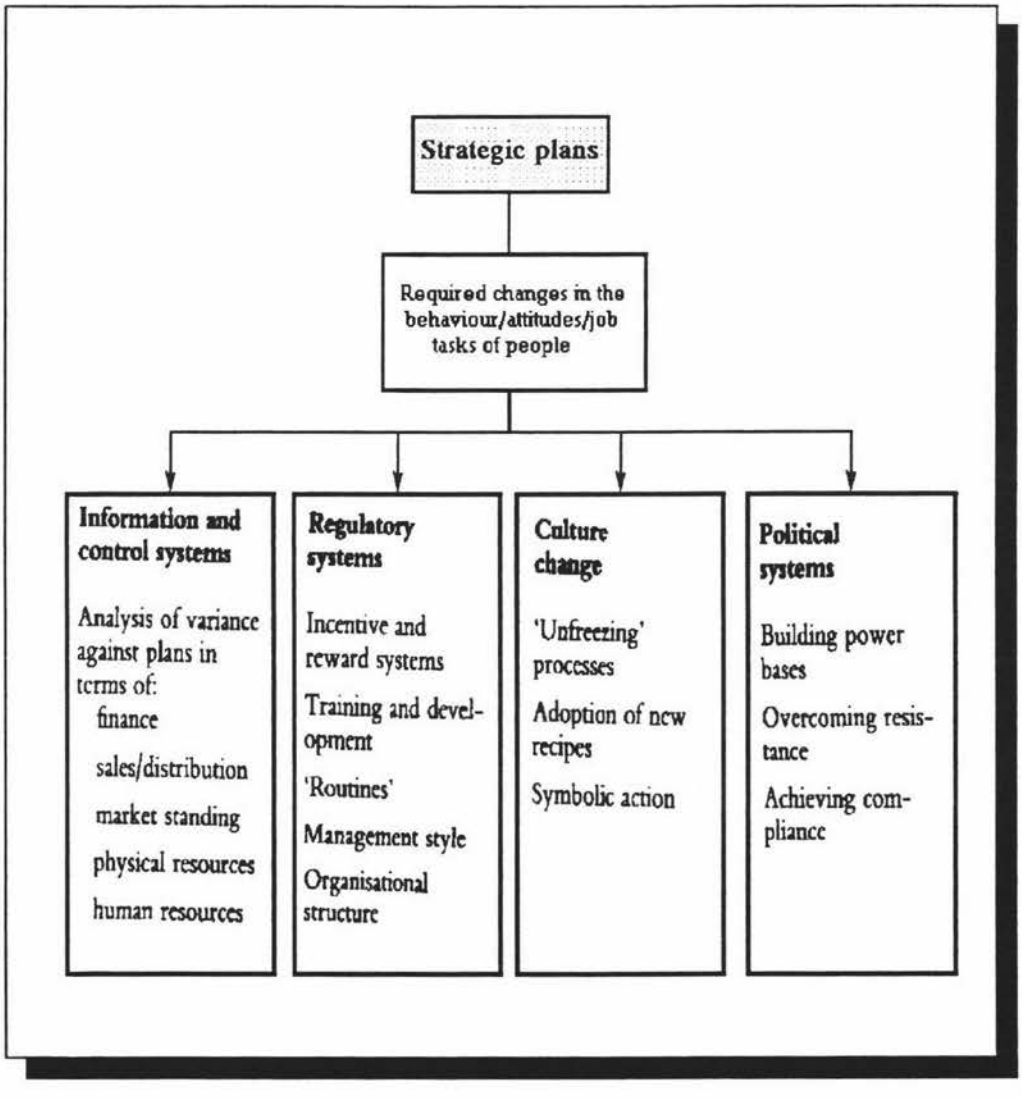

Figure [31]: Strategy implementation: The influence of organisational systems. (Johnson & Scholes 1988, p.292 [22]).

Similar strategic management concepts are presented by Arthur Thompson Jr., and A. J. Strickland in their 1989 text *Strategy Formulation and Implementation: Tasks of the General Manager* but still today, for all contemporary academic offerings, the process of strategic management retains a formal quantitative format and has a minimal consideration of the role information technology might play.

In order to balance the contributions from the academic environment with current concerns of the business world, Roy Forman's 1988 perspective on *Strategic Planning and the Chief Executive* provides a timely interruption. Forman cannot stress enough the importance of getting the **thinking of managers aligned** towards the **same** strategic goals and he emphasises that the strategic plan is not an end in itself, rather a means to an end that is to improve strategic management.

Although Forman dedicates a paragraph to many of the already identified "accepted" components of strategic management and planning, he highlight's the combination of **method with motivation**, the need for a common framework and integrated planning timetable throughout the organisation and the use of think-tank sessions.

With such a large proportion of management writers and corporate executives all pitting the more human and qualitative approaches

within strategic management against the quantitative and formal methods approaches, it is refreshing to find a balancing study that presents evidence of the contribution that both approaches together play in managerial decision-making and strategic planning.

Deepak Sinha's research of 1087 decisions made by 129 US Fortune 500 companies leads him to conclude that formal strategic planning makes an **important contribution** to decisions more likely to be considered important and risky. In *The Contribution of Formal Planning to Decisions*, 1990 Sinha reports;

> "In general, formal planning was useful: improved performance was noted in 10 of 15 comparisons, with five of these improvements statistically significant... Three comparisons showed no difference." (Sinha 1990, p.479 [170]).

An alternative study by Bill Wooldridge and Steven Floyd, *The Strategy Process, Middle Management Involvement, and Organisational Performance*, 1990 suggests that middle management involvement in the formulation of strategy is associated with improved organisational performance, and that consensus among middle-level managers - defined as strategic understanding and commitment - is related to involvement in the strategic process but, not to organisational performance. The study appears to

compliment the desires of many practitioners and theorists to better involve line-managers in the strategy formulation process.

In 1989 Simon Caulkin introduced and edited a series of management briefings from *The Economist Conferences 1989*. The briefings were presented by four "guru's" of management theory, Peter Drucker, Kenichi Ohmae, Michael Porter and Tom Peters and were all directly concerned with six "unavoidable issues", as highlighted by these prominent management thinkers. (Caulkin 1991, preface [9]). The issues are;

1. The simultaneous globalisation and fragmentation of markets.
2. The changing world economic order.
3. The impact of information and information technology.
4. Innovation and entrepreneurship.
5. The unshaping of the organisation.
6. The nature of competition.

Drucker elaborates on the **knowledge society** concept where information is regarded as a corporate and management asset as well as a resource, extending the 1981 work of Zand and in so doing implies that information systems should be an **integral part** of the knowledge acquisition process. He also suggests that the **learning society** is now taking over from the earlier knowledge society concept through innovation and the effective use of feedback in addition to education and experience. (Drucker 1989, p.13 [77]).

Ohmae's contribution revolves around his precept that;

> "Good strategy is to serve the customer in a manner that is uniquely different from that of competitors, using corporate strength as a sustaining fashion." (Ohmae 1989, p.23 [144]).

Although his perspective is oriented toward Japanese management ways and needs, Ohmae's "five C's" essence of strategy is interesting. The five C's represent (1) Customers - brand identification and export priority, (2) Corporation - structure and alliances, (3) Competitors - maintain a balanced concern without neglecting customers, (4) Country - globalisation and the power of information, and (5) Currency - finance and leveraging.

Porter extends his competitive advantage considerations to the global arena and finally, Tom Peters becomes the first high profile management theorist to recognise, champion and actively promote the importance and use of information technology within the field of management theory. Peters' emphasis on IT is driven by the issue of **speed**.

> "It cannot be over-emphasized that speed is the single most significant basis for competitive advantage in the years ahead. Speed in this sense does not mean doing things faster: it means totally transforming the organisation in order to do in minutes what used to take weeks." (Peters 1989, p.70 [148]).

With globalisation, the investigation of "foreign" business practices comes to the fore. Two works by Gary Hamel and C. K. Prahalad, *Strategic Intent* in 1989 and *The Core Competence of the Corporation* in 1990 outline their consideration of useful and applicable international practices.

Hamel and Prahalad believe that the blind application of generic strategy, SWOT, life cycle analysis, and so forth, can lead to competitive decline because the resulting strategy is often a **copy** of the best competitor. With their **strategic intent** approach, they argue that an organisation should set itself extraordinary goals to (1) Focus the organisation's attention on the essence of winning - thereby motivating people by communicating the value of the target, and leaving room for individual and team contributions, (2) Provide new operational definitions - thereby sustaining enthusiasm, and (3) Use intent consistently to guide resource allocations. (Hamel & Prahalad, p.64 [102]). Strategic intent is more than simply ambition, it captures the essence of winning, is stable over time, sets a target that deserves personal effort and commitment and gives employees the only goal that is worthy of commitment; to unseat the best or remain the best, world-wide.

In particular, Hamel and Prahalad studied Japanese companies, watching them build upon basic knowledge, skills and capabilities

to form a base from which core products (components) and ultimately business units and end products are built. Canon's **core competencies** for example, are precision mechanics, fine optics and microelectronics. Similarly, a major Japanese auto producer's strategic intent was to "Beat Benz".

> "1990's top executives will be judged on their ability to identify, cultivate and exploit the core competencies that make growth possible. This contrasts with 1980's executives who are judged on their ability to restructure, declutter, and delayer their organisations." (Prahalad & Hamel 1989, p.79 [154]).

When contrasted with approaches such as the business portfolio approach, the **portfolio of competencies** do not deteriorate like physical assets do, they in fact grow. Therefore, top management must add value by enunciating the strategic architecture that guides the competence acquisition process.

Further investigations and theories on the business strategies of Japan's most successful firms were carried out by Norman Smothers and are reported in his 1990 article *Patterns of Japanese Strategy: Strategic Combinations of Strategies.*

Smothers' emphasis is that additional strategic advantages can emerge for firms which think about how to link together **strategic**

patterns. In particular, (1) Knowledge-based - striving for higher ratios of value added in products and services, (2) Alliance-based - with workers and stakeholders not competitors, and (3) Productivity-based strategies are involved.

Deploy	
Pattern 1:	Carefully select, target, and nurture product/markets.
Pattern 2:	Gain customer trials, market share, and loyalty by setting low introductory prices, by offering standardised products, and by copying competitors (ie learning from them).
Improve	
Pattern 3:	Create value and gain further market share through improving or making better products (ie products or services supported more fully, developed more rapidly, and delivered more efficiently).
Pattern 4:	Service pay-back on early investments by capitalising on customer loyalty (ie leveraging strong demand or inelasticity thereof to raise prices) and by capitalising on expanding market share (ie leveraging scale and/or experience curve effects to lower costs).
Redeploy	
Pattern 5:	Internationalise and/or export operations to host countries.
Pattern 6:	Leverage the assets to redeploy the funds and repeat the process.

Figure [32]: Patterns of Japanese strategy.

(Smothers 1990, p.523 [171]).

3.2 Strategic management of information technology

By the middle 1980's information systems were beginning to converge on business strategy and were having a **direct impact** on organisational structure. However, as we have seen evidenced from the previous review, the impact and potential for IT was not usually driven by corporate management. Instead, new organisational forms and the development of information-intensive corporate strategies were evolving out of the IT department driven

by rapid innovation of new technology and application systems, and leading to the increasingly widespread creation of new concepts and ideas about information itself.

Richard Mason in *A Historical Overview*, 1984 and again in *Current Research Issues*, 1984 comments that "We are in the midst of an information age." (Mason 1984, p.261 [133]), and concentrates on the emerging realisation that **information** is a strategic resource for any organisation, arguing that strategy, structure and information systems are one.

> "The unification of information with the strategies and structures to which it relates has turned information into a crucial resource." (Mason 1984, p.276 [133]).

Uncertainty and change are seen by Allan Mohrman, Jr., and Edward Lawler as not just the resulting situation in the business environment, but also as internal, and actually being created by information technology. Their *A Review of Theory and Research*, 1984 cites three sources of uncertainty and change associated with IT (1) The technology itself rapidly evolving causing obsolescence, (2) The short-term ambiguity and uncertainty that accompanies the implementation of IT, and (3) The long-term responses by people and organisational structure to IT implementation.

In addition to these two specific elements, literature circa 1985 specifically addressing the potential strategic relevance of IS technology to organisations and the links between IT and corporate strategy, elaborate predominantly upon the following considerations: (McFarlan 1984, [129]; Ashenhurst 1984, [58]; Nolan 1984, [142]; and McGee & Thomas 1985, [131]).

1. Technological developments and decreasing costs which are expected to continue, permit businesses to gain new economies and offer radically different services.
2. The level of embedment of IT already existing within organisations is causing **restrictions** on their ability to quickly act on new strategic opportunities. Existing systems also often require specialist resources not in line with intended direction.
3. Strategic IS applications are forging better **links** between IT management and corporate management and making the best use of corporate information.
4. The use of corporate strategy frameworks, planning processes and organisational structure. In particular, there is much evidence that IT theorists are looking closely at management frameworks and methodologies (ie value added) in pursuit of better linkages.
5. Contingency theory concepts as alternatives.
6. People, in particular "users", the shift to user computing, and the management of innovation.

The drive for a better awareness of information technology by theorists and practitioners alike at this time begins to focus upon the use of computers by senior management personnel and reflects the growing acceptance of the personal computer within the field. David Davis in *Computers and Top Management*, 1984 suggests that over the next ten years there will be a dramatic increase in the use of personal computers by senior managers (Davis 1984, p.67 [71]), especially with expected advancements in software applications. However, William Miller's 1985 article *Why CEO's Won't Use Computers* offers a balancing perspective, that even after considering the various proven benefits of micro-computing technology and the growing capabilities of management information systems, CEO's are still "people" oriented and have a basic resistance to computers through pride in their own intellectual skills and judgement, even when many insist that their immediate subordinates make full use of the technology.

John Rockart and Adam Crescenzi also address the senior management involvement issue in their article *Engaging Top Management in Information Technology*, 1984 although their focus is more toward soliciting senior management involvement in organisational IT as opposed to personal use. They offer a three phase process for managerial involvement which, not surprisingly relies heavily upon Rockart's critical success factor methodology. As CSF's are becoming an important instrument in the corporate strategic

management arsenal, their approach is possibly one of the more suitable for this time period.

When several of the most renowned IT theorists band together to produce a framework to help executives determine where strategic opportunities for the use of information technology exist, their resulting article *Information Technology: A Strategic Opportunity*, 1984 is well worth the reading.

Robert Benjamin, John Rockart, Michael Scott Morton and John Wyman identify an ever expanding gap between the opportunities created by information technology and the effective utilisation of this technology, and see it to be caused by two factors; (Benjamin et al 1984, p.3 [60]).

1. An increase in functionality and cost performance of information technology (creating new opportunities), and;
2. A lack of experience and knowledge of information technology by senior managers.

Attention is therefore again directed at senior management who should focus on two significant questions:

1. Can I use information technology to make a significant change in the way we are now doing business so my company can gain a competitive advantage?
2. "Should we, as a company, concentrate on using information technology to improve our approach to the marketplace?" Or,

"Should we centre our efforts on internal improvements in the way we currently carry out the activities of the firm?"

	Competitive Marketplace	Internal Operations
Significant Structural Change	Gannett—USA TODAY Merrill Lynch General Electric	Digital Equipment
Traditional Products & Processes	American Hospital Supply Bank of America Toyota	Xerox United Airlines

Figure [33]: Strategic opportunities framework. (Benjamin et al 1984, p.7 [60]).

Both consideration of one's own company and consideration of competitive organisations should be plotted within the framework to improve awareness of strategic opportunities. In most

companies, there are strategic opportunities in **all quadrants** of the matrix and Benjamin et al suggest three straightforward actions for managers;

1. Ask the two basic questions above. For question one, the answer should always be - there are significant opportunities for competitive advantage through information technology.
2. Focus attention on information technology at the top of the corporation.
3. Generate awareness of the potential advantages of information technology, and incentives to take advantage of it, throughout the organisation.

Strategic uses of information technology, as suggested in 1985 by Charles Wiseman in *Strategy and Computers*, must be viewed from a radically different perspective and their identification be facilitated by new opportunity frameworks. The method preferred by Wiseman is that of the consideration of IT as applicable to or within the firm's *strategic thrusts* - a term well covered in the management literature reviews through the works of Ansoff and Porter - and it is this viewpoint in line with corporate direction, that Wiseman implies will encourage innovative ideas for strategic application solutions.

New methodologies begin to appear that are also much more closely aligned to those of corporate management. Paul Strassmann's book

Information Payoff: The Transformation of Work in the Electronic Age, 1985 looks at approaches to obtaining strategic benefit from IT from four different viewpoints (1) The individual's viewpoint, (2) The organisation's perspective, (3) The societal perspective, and (4) That of the executive.

Strassmann's specific contribution is his **value added** method of productivity measurement useful for assessing overall funding and strategic priorities for IT investments. (Strassmann 1985, pp.136-150 [48]). The method is quite involved but concentrates on removing external purchases and capital (somebody else's expenditure and labour) and then investigating the productivity of your own labour and management to ascertain the true value added of the company.

Cornelius Sullivan's 1985 article *Systems Planning in the Information Age* investigates the use, successes and limitations of various IT strategic planning methodologies within differing organisations. Upon determining that individual methodologies themselves had areas of strength and areas of failure, Sullivan re-introduces the very logical **contingent approach** to planning, and demonstrates the concept by plotting the areas where major approaches work best on a "positioning" matrix.

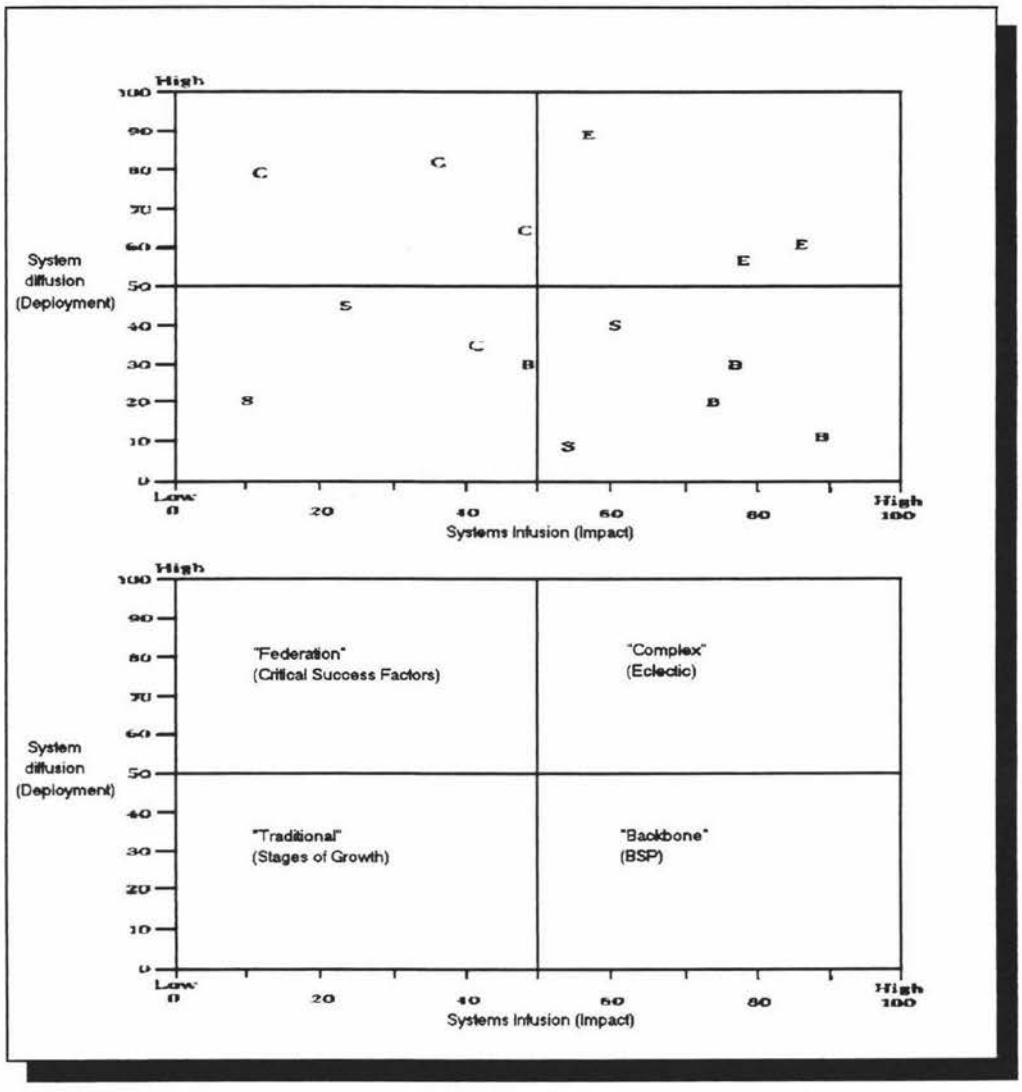

Figure [34]: Technology planning environments. (Sullivan 1985, p.7 [174]).

In simple terms, the contingent approach advocates the selection of the most appropriate methodology for the firm's identified existing systems' level of deployment and impact.

In *Information Systems Strategy Formulation*, 1986 Michael Earl develops a positioning framework which seeks to indicate a

preferred mode of IT strategic planning according to the IT strategic context in which the firm or business unit is placed. Earl's framework compliments Sullivan's contingent concepts with an alternative method for determining or position the existing IT planning needs.

Frameworks / Quality	Awareness	Opportunities	Positioning
Purpose	Vision	Ends	Means
Scope	Possibility	Probability	Capability
Use	Education	Analysis	Implementation

Figure [35]: Frameworks for analysis. (Earl 1986, p.165 [79]).

In addition, Earl proffers a multiple methodology approach as an appropriate and flexible strategic IT planning methodology.

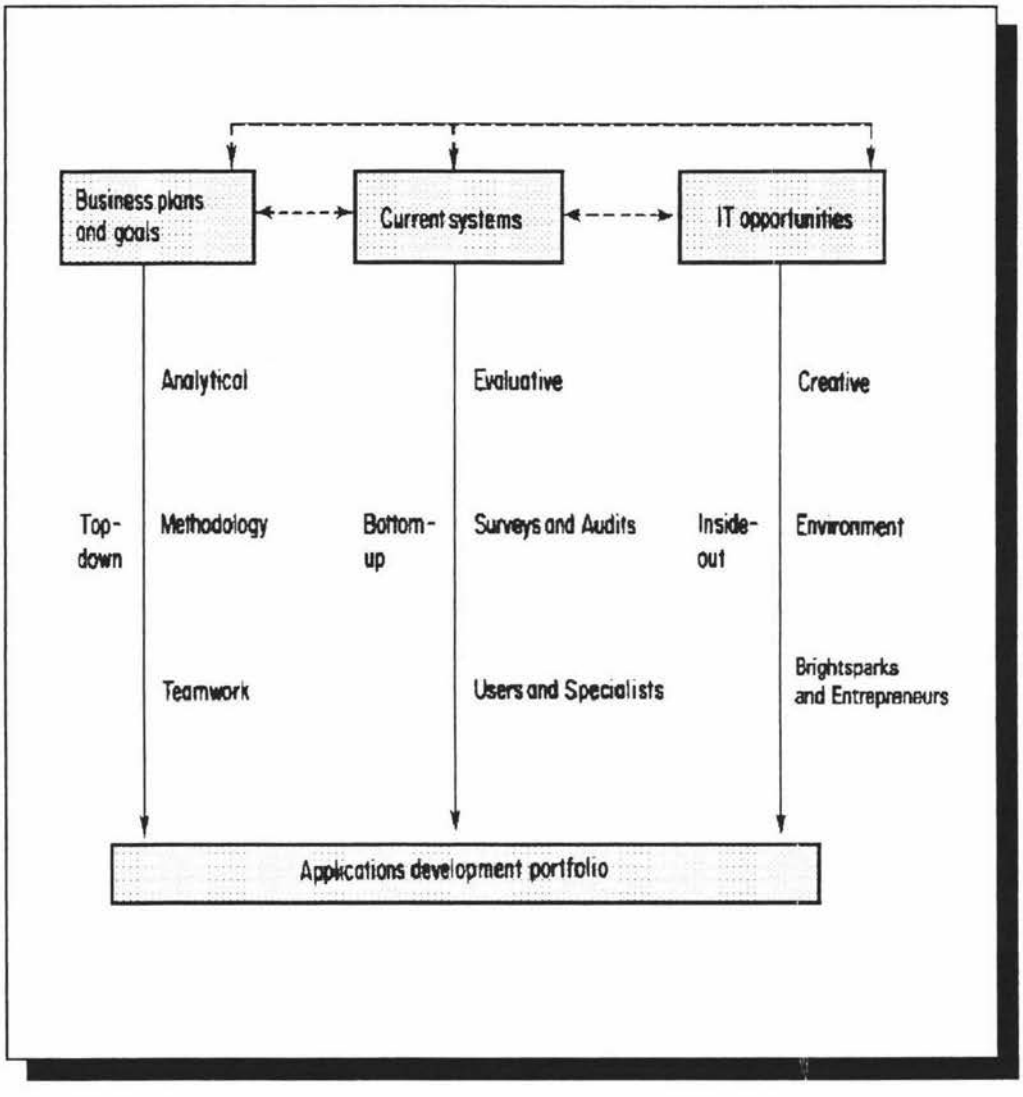

Figure [36]: IT strategic planning: A multiple methodology. (Earl 1986, p.169 [79]).

Another particularly useful tool is presented in Michael Porter and Victor Millar's *How Information Gives You Competitive Advantage*, 1986 analysis of the firm's value chain to see where

either the physical or the information processing component of information technology can transform the value chain to the firm's advantage. The work was built upon Porter's management work on value chains and competitive advantage as presented in the previous review section.

Firm infrastructure	Planning models					
Human resource management	Automated personnel scheduling					
Technology development	Computer-aided design	Electronic market research				
Procurement	On-line procurement of parts					
	Automated warehouse	Flexible manufacturing	Automated order processing	Telemarketing Remote terminals for salespersons	Remote servicing of equipment Computer scheduling and routing of repair trucks	
	Inbound logistics	Operations	Outbound logistics	Marketing and sales	Service	
	Primary activities					Margin

Figure [37]: Information technology permeates the value chain. (Porter & Millar 1986, p.180 [150]).

The two most significant features of information technology and its impact upon the value chain are the way information technology transforms the value activities performed, and the nature of the linkages between not only the firm's value chain activities, but also the activities of suppliers and buyers. (Porter & Millar 1986, [150]; Cash & Konsynski 1986, [69]; McFarlan 1986, [130]; and Wightman 1987, [183]).

> "Every value activity has both a physical and an information processing component. The physical component includes all the physical tasks required to perform the activity. The information processing component encompasses the steps required to capture, manipulate, and channel the data necessary to perform the activity." (Porter & Millar 1986, p.179 [150]).

Information systems and information technology can be exploited to improve the execution of value chain activities, to optimise their linkages and aid their coordination both within the firm and its customers and suppliers. The linkages between value activities can be portrayed and examined to establish where the application of information technology can provide missing links or enhance relationships.

Porter and Millar suggest five steps that senior executives can follow to take advantage of opportunities created by the information revolution;

1. Evaluate the existing and potential information intensity of the products and processes of the organisation's business units. Information technology will most likely play a strategic role in those industries characterised by high information intensity in the value chain and/or the product.
2. Predict the likely impact of information technology on their industry's structure (the five competitive forces).
3. Identify and rank the ways in which information technology might create competitive advantage. The value activities that are likely to be most affected in terms of cost and differentiation and the activities with important links to other activities inside and outside the company must be examined for ways in which information technology can create sustainable competitive advantage. Strategic alternatives should also be considered such as serving new segments, invading the province of niche competitors and looking twice at existing products.
4. Consider opportunities to create new businesses from existing ones using information technology as an avenue for corporate diversification. What information could the company sell or use to produce new items or services, and what information processing capacity can be used for new business.

5. Develop a plan for taking advantage of information technology.

Some authors have found it useful to regard IT as a **business within a business**, so that integrating the IT business into the rest of the firm can then have special organisational, strategy-formulating recognition and challenges. James Cash and Warren McFarlan combine their ideas and experience with James McKenney in their 1988 textbook *Corporate Information Systems: The Issues Facing Senior Executives* in order to promote this and other strategic management concepts.

Four notions of how the IT business can be better managed are;

1. Strategic relevance - which is not constant and varies between industries and firms, and over time, for an individual firm. Differing strategic relevance is critical in understanding the wide diversity of potential management and integration practices.
2. Corporate culture - "within a business", the values of senior management, the approaches to corporate planning, the corporate philosophy of control and the speed of technological change is one set of determinants, the other is composed of variables of the external marketplace. Both have a major influence on what is appropriate management practice - what works in one corporate environment may fail abysmally in another one.

3. Contingency - of much more an influence in the 1980's than it was in the 1970's. In the 1970's, IT management systems with simplistic, mechanistic approaches to management control, planning, and so on, were a great improvement over the chaos that often was before. The initial surge of value from their introduction gave way to frustration in may cases because of their inherent rigidity. More complexity and flexibility in the approaches used to adapt them to a continually changing environment is what is needed in the 1980's.

4. Technology transfer - The diffusion of information technology can and must be managed. If poorly managed, it will evolve into a collection of disjointed islands of technology and not a well-functioning support system. What makes the introduction and evolution of IT so challenging is that, in many of its applications, success only comes when people have changed their thinking processes, hence Cash et al refer to it as **intellectual technology**.

   "Without this change in thinking, technical success occurs but with administrative failure." (Cash et al 1988, p.4 [8]).

Cash, McFarlan and McKenney present a welcome integration of both corporate strategic management and IS strategic management doctrines, presenting an ideal concluding review for this chapter.

CHAPTER III.

RESEARCH DESIGN

This chapter concerning research design provides a step by step explanation of the development of the two part questionnaire. The requirement for the survey is that it shall enable a general enquiry into corporate strategic management and the strategic management of information technology as practiced by a balanced representation of large, successful New Zealand businesses, to be investigated and presented.

The questionnaire is complimented with a computer-based data recording and analysis software system so designed and developed as to assist in the satisfactory execution and accomplishment of the requirements above.

As the vast majority of investigative research and reported case studies in the literature review are concerned with companies of the United States of America and the United Kingdom, it was decided that a New Zealand perspective would be attempted. The survey results and collected data therefore, are most appropriate for N.Z. tertiary institutions and could be of benefit to any individuals or groups investigating the strategic management of information technology.

1 Questionnaire development

The questionnaire format needs to be clear, unambiguous and uniformly workable for (1) Respondents, (2) Data entry of responses, and (3) Analysis. In addition, a close relationship in layout and forms design is required to be maintained between the physical paper questionnaire and the computer screen displays.

The questionnaire is based and modelled upon the *Management Survey* presented in ICL Today, 1991 although several modifications, additions and corrections have been made. (ICL Today 1991, [112]). The reliance upon an existing format is hopefully justified in the desire to capitalise on the collective knowledge and experience of those individuals responsible for the development of the forerunner questionnaire and accordingly, new additions, modifications and changes are closely associated in style and format, with that of the original.

Aligning the questionnaire with the established ICL Today survey provides an opportunity for circumventing many of the questionnaire development issues. The choice of topics, level of generality, ordering and treatment of topics, and layout were already stipulated and therefore ensure a good relationship in the flow of questions, and present an interesting variety of question techniques.

This results in the respondent retaining interest and attention, and avoids the conditioning of responses in the direction of a certain kind of answer due to its familiarity. One negative aspect to the alignment is the possibility of inadvertently including an unnecessary or irrelevant question which, if such occurs, will hopefully be kept to a minimum.

It is intended that the final version of the questionnaire will both stimulate and arouse the respondents' interest in answering the questions and in conjunction, minimise the likelihood of errors in their replies.

Significant deviations from the ICL Today format are (1) The questionnaire is divided into two parts - one to be completed by the Chief Strategist or CEO of the organisation, the other to be completed by the Director of Information Systems or Chief IS Strategist, and (2) The many methodologies and techniques identified from the literature survey are included for "tick-list" acknowledgement by the respondents within each part.

The requirement for pilot testing is also assumed less necessary in light of the precept that the contributing questionnaire will itself have been subjected to fairly rigourous acceptance testing.

There is a need to consider the conclusions to be drawn from the survey and in particular those most desirable to the researcher, because we must ensure that the analysis of answers does not deviate from their intended focus, and that no responses are prejudged. The conclusions, together with consideration of the content and extent of detail for the reporting of results, are governed by the **aim**, which is to present only conclusive majority findings and/or significantly "out of character" responses.

For an overall **general hypothesis** based primarily upon the author's personal experience with large New Zealand businesses and past mail-out activities, it is expected that up to 24% of surveyed organisations will return a completed questionnaire and of those that do, the majority (80% or more), are more likely **not** to be proactively promoting strategic management **and** the strategic management of information technology within their respective firm's.

1.1 Selection of firms

The requirement for the list of companies to be surveyed was that it must depict a balanced representation of large, successful New Zealand businesses. The most likely and most accessable source of companies to make up the list is the annual publication of Management magazine's *Deloitte Ross Tohmatsu Top 200 Winners and*

Survivors listing. (Deloitte Ross Tohmatsu 1990, [74]). The most recent publication appeared in the December 1990 issue.

The Top 200 list of New Zealand's largest corporations (Appendix A) includes both "listed" and "unlisted" public companies, New Zealand subsidiaries of overseas companies, and co-operatives and government-owned organisations that operate as either limited liability companies or tax-paying corporations (state owned enterprises). Companies that qualify are those with a turnover in excess of $30 million or an after-tax profit greater than $2 million.

The format and structure of the Top 200 list is mirrored in the **database structure** for the dBase IV data recording system which understandably is named TOP200.DBF. With other fields ("slots" for recording specific information such as name, address, and so on) included, the TOP200.DBF database file is ready for data input.

Every company on the Top 200 list was keyed into the database and all available information such as company name, the city where the company's head office is located, its turnover, its profit and balance date information etcetera, was entered into the TOP200.DBF file.

The mailout database file was at this point still incomplete as postal address and telephone contact information were not available from the Top 200 list. As much "accurate" information as could be found was gathered from an exhaustive search of nearly all of New Zealand's 18 regional telephone directories which when entered, left just a few still void of any means for direct contact. For these, one particularly useful tool, that of the Telecom 018 Directory Assistance Service, provided an up-to-date contact telephone number for the organisation and subsequent telephone enquiries for these companies, obtained the desired address details.

From the list of 200 companies, only one was omitted from the mailout. That one was for an organisation which had, within the previous year, gone into receivership and for the purposes of the study was recorded as a reply without a completed questionnaire.

1.2 Question construction, measurement and statistics

The following two sub-sections present the reasoning in a sequential manner behind the make-up of all questions in both parts of the questionnaire. Explanations about question structure, sources contributing to question elements, database design implications and the targeted or desired methods of analysis are given.

In an attempt to encourage as many responses as possible it was deemed necessary to guarantee total confidentiality to all participants. This does however represent a major governing and limiting factor in the ability for reporting findings from the survey analysis, as **no information** can be presented that might enable the specific identification of any of the respondent companies.

The questionnaire was designed on a computer software package called Aldus Pagemaker 4.0 which provided a rapid development medium, the ability to quickly and easily make amendments or alterations and produced a high quality of presentation standard, very pleasing to the eye.

1.2.1 PART 1 - CEO questionnaire

Part one of the questionnaire (Appendix B) is a four page document intended to be completed by the **Chief Executive Officer** or **Chief Strategist** within the organisation. There are three sections within part one concerning and entitled (A) You and your organisation, (B) Corporate strategy and strategic management, and (C) The strategic role and relevance of information technology (IT).

The following concern the questions within subsection *(A) You and your organisation.*

Part 1, A) Questions one and two request the respondents to provide their own name, title and contact telephone number and then the name and address of the company. This information provides insight as to whom within the company is regarded as the Chief Strategist. Its relevance however must be considered within the context that the CEO - to whom the questionnaire is addressed - may simply delegate the task according to his or her own personal agenda and priority time commitments. Weight is added to any questionnaire therefore completed by the CEO themselves. The company details are important for validation and verification with the Top 200 list, for enabling direct contact back to the respondent should there be any need to do so, and for the alignment of the three database files during data capture. Company details are to be removed before the analysis phase.

Part 1, A) Question three - In which of the following general industry classifications would you place your organisation? - presents a list of 18 industry classes as identified by the Top 200 list. The respondent is requested to tick the most appropriate box or to specify an alternative classification. Industry classes and in particular the nature of the industry (as evidenced in the literature), can have a significant bearing on the need and practice of strategic management and/or the

prevalence and impact of information technology. If a sufficient number of respondents within a particular industry are received, some analysis by industry may be possible, however the primary application for this question will be for determining the balance of company representation.

Part 1, A) Question four - Enter the approximate number of total employees and the approximate number of "white collar" employees - will provide (1) A better perspective on the size of the organisation, (2) When compared to figures recorded from the Top 200 list will provide an insight into the changing employee situation, and (3) Will provide a ratio of personnel most likely to be in daily contact with information technology as opposed to those more likely not to. The use of this information will probably be restricted to percentage, ratio or general comparative value.

Part 1, A) Question five asks whether the existing served market is predominantly national, international or a combination of the two and then follows up with a query on the organisation's product structure or mix. This question will be considered within the general make-up of those companies that do actively practice strategic management.

Part 1, A) Questions six and seven also concern the structure and geographical spread of the organisation and whether corporate

management is predominantly a centralised or decentralised operation. These answers and the request on the number of management layers within the entire organisation will provide further insight as to the influence that strategic management issues have had upon individual companies and also will enable proportional analysis of trends across the entire range of replies.

The following concern the questions within subsection *(B) Corporate strategy and strategic management*.

Part 1, B) Question one - How has the predictability of your organisation's environment changed and how is it expected to change in the future? - is a question directed specifically at determining the dynamic nature and level of change within the firm's particular industry class and the perceived transition over time. Respondents are requested to select an answer of either near certainty, risk or uncertainty for the present period, five years ago and five years hence.

Part 1, B) Questions two and three concern direct answers to (1) Do you have a formal corporate strategic plan?, (2) When was it last updated?, and (3) How frequently, (4) for how long, and (5) for what time-period does the corporate strategic plan cover? If no corporate strategic planning is performed, respondents are requested to disregard the remainder of subsection (B) and to

continue with questions in subsection (C). These questions will provide the specific proportion of those respondents that do produce formal strategic plans and will provide the **first major subset** for further analysis.

Part 1, B) Question four - Strategy plans for your organisation's subunits (SBU's, divisions or functions) are developed by... - attempts to identify the major contributors to the formal planning process.

Part 1, B) Questions five and six concern the role that organisational subunits and external entities have to play in the generation or sourcing of information for a specified list of strategic planning activities (as identified in the literature review). By default, omissions in the tick list of activities may also highlight redundant activities or perhaps some, yet to become of practical importance. Steps or activities presented are as follows;

- Mission definition
- Goals and objectives setting
- Environmental analysis
- Resource analysis
- Alternative strategies development
- Strategy selection
- Preparation of functional plans
- Monitoring implementation
- Audit/revising of plan

Part 1, B) Question seven - What methods/techniques do you use in the development of your corporate strategic plan? - like the

previous question presents a comprehensive list of methods and techniques identified by the literature as components of the strategic planning process. The question will enable a proportional analysis of the importance placed upon each method by all respondents but, must be considered within the context of the individual respondent being able to associate the academic definitions presented with perhaps alternative terminology for the same method as or if it is applied in practice. Steps or activities presented in question seven are as follows;

- Analysis of environmental influences
- Budgeting (capital, revenue, zero based)
- Business nature/culture/power analysis
- Comparative analysis (historical/industry norms/experience curve)
- Competitive environment (5 forces model)
- Core or distinctive competence
- Cost/benefit analysis
- Decision matrices
- Decision trees
- Direction alternatives ('do nothing', withdraw, consolidate, diversify...)
- Feasibility
- Financial ratios
- Flexibility analysis
- Generic strategies (cost leadership, differentiation, focus)
- Key assumption recognition and testing
- Lifecycle model
- Method alternatives (acquisition, internal or joint development)
- Mission, goals and objectives setting
- Nature of environment (static/dynamic/complex)
- Network analysis (critical path)
- Political risk (stakeholders, game theory)
- Product portfolio (BCG)
- Profitability (IRR, DCF, NPV, ROCE, payback)
- Resource audit (physical, human, financial, intangible)
- Resource control measures
- Resource utilisation measures
- 'Rule of thumb' comparison
- Sensitivity analysis
- Skills analysis
- Simulation modelling
- Strategic group analysis

- Strategic plan audit
- Synergy (linkage between activities)
- SWOT
- Value chain analysis
- Others (please specify):

Part 1, B) Question eight - The corporate strategic plan and planning process tends to be... - **and nine** - The data collection and information gathering process tends to be... - both seek specific answers as to detail, characteristics and scope for the strategic planning and data collection processes within the firm. The question is presented in an alternative "circle" rather than "tick" format so as to provide variety for the respondent following the previous question's lengthy check list.

Part 1, B) Question ten - In your organisation's competitive environment, information technology (IT) is a competitively important area? - seeks a definitive personal opinion statement from the corporate management respondent indicating their attitude toward potential competitive advantage possibilities for information technology.

The following concern the questions within subsection *(C) The strategic role and relevance of information technology (IT).* Subsection (C) will be important in the determination of the level of alignment to corporate management that information technology has or has not achieved.

Part 1, C) Question one - How would you describe the existing role of IT within your organisation? - seeks a definitive statement on the existing utilisation of information technology. The following options are presented with the request that only the most appropriate be identified;

Information technology:

Is a primary product/service
Provides crucial internal services
Provides non-critical internal support services
Is not an essential product or service
Other (please specify):

Part 1, C) Question two - How has your organisation's attitudes towards the IT industry changed and how is it expected to change in the future? This is perhaps the most important question for this subsection because a trend will hopefully be able to be identified on the changing management perception of IT not only within each organisation but for all that returned completed questionnaires. Four alternatives are offered derived from the differing time period distinctions of the literature review and the standard (present day, five years ago and five years hence) considerations are requested. IT is regarded as either (1) A strategic resource, (2) A business resource, (3) A business expense, or (4) An administration expense.

Part 1, C) Question three - In your organisation there has been more emphasis placed on the strategy for IT in the last 5 years? - **and** - Where has this emphasis been placed? Again a personal

opinion is sought of the corporate management respondent as to his or her attitude toward the strategic development of IT, which is then followed by a ranking exercise for a list of emphasised areas. The use of questions such as this that require the respondent to rank or order the available options comes from direct duplication of similar questions in the original base questionnaire. They are however, more prone to respondent mis-interpretation and require a more involved analysis process.

Part 1, C) Question four - Interest and awareness of IT at Board level... - and its related investigation of the level of personal computing conducted by the Board merely seeks to determine an overall generalisation of the level of IT awareness at the Board level. Although there is possibly a great potential for Board's to influence senior management and vice-versa, no attempt will be made to determine whether those organisations with IT literate Board members have a discernibly higher level of IT awareness at the corporate management level when compared with those having little or no Board level IT interest.

Part 1, C) Question five - Business line managers in your organisation have become much more IT aware over the last 5 years? - investigates the general level of personal opinion on this matter which will be balanced with the literature review comments regarding the same. The second statement - Business managers will start to take on IT management responsibilities during the 1990's?

- seeks an opinion as to likely future transition in this direction and will be considered in relation to the corresponding ideas proposed by many IT theorists.

Part 1, C) Question six - Is the IT function represented at Board level? - and - If not, to whom does the IT function report? - is a simple way of determining the highest level, within the organisation's hierarchy, that direct influence by senior IT personnel can have impact. The second portion of this question requests the respondent to actually enter the title of the person being reported to within each of the standard time periods.

Part 1, C) Question seven - Has the IT function produced a strategic benefit or opportunity for competitive advantage over the last 5 years? - is asked at the conclusion of subsection (C) so that regardless of any previous responses, the Chief Strategist can consider whether or not IT has (at any time over the last five years), ever produced a strategic benefit or opportunity for competitive advantage.

If the answer to the above question is yes, further qualification is requested in the forms of - To what extent has the benefit been exploited? - and - ...and was the benefit the result of formal planning? Question seven is perhaps the **second most important** question for this subsection as it will provide a definite answer (although opinion based) to (1) The extent that IT has managed to

produce or be utilised for strategic and competitive advantage purposes, and, (2) Whether or not those benefits were the result of a formalised planning process. Of equal importance, is the fact that this question is solicited from the dominion of corporate or general management and not that of information technology management.

Part 1, C) Question eight allows open comment in response to - Are there any other key changes affecting the strategic role of IT over the last 5 years? All open comment questions will be recorded verbatim and will be considered together with any or all preceding questions at the time of their analysis.

1.2.2 PART 2 - IT Director questionnaire

Part two of the questionnaire (Appendix B) is a seven page document intended to be completed by the **Director of Information Systems** or **Chief IS Strategist** within the organisation. There are seven sections within part two concerning and entitled (A) You and your organisation, (B) The strategic role of IT, (C) IT and the structure of the organisation, (D) The IT services culture, (E) The provision of user support, (F) Responding to business/technical changes, and (G) Human resource development in IT.

The following concern the questions within subsection *(A) You and your organisation.*

Part 2, A) Questions one and two request the respondents to provide their own name, title and contact telephone number and then the name of the company. As for part one, this information provides insight as to whom within the company is regarded as the Chief IT or IS Strategist. Its relevance however must be considered within the context that again the CEO - to whom the questionnaire is addressed - may simply delegate the task according to his or her own personal attitude. The company details are important for validation and verification with the Top 200 list and for alignment with the other database files.

Part 2, A) Question three requests entry of the approximate number of IT employees, which will be considered in relation to the overall number of employees and the proportion of "white collar" employees as provided in part one. The second portion of question three requests the selection of one out of four responses to - Estimated percentage of all your organisation's employees who require IT input or output every week - over the standard (five years ago, now and in five years time) time periods. The four options presented within each time period are;

- 1%-25%
- 25%-50%
- 50%-75%
- 75%-100%

Part 2, A) Question four - IT management for the entire organisation is predominantly? - with responses of either centralised or decentralised, is an equivalent question to that of part 1, A) question six, to which it will be compared and analysed in a general sense only.

The following concern the questions within subsection (B) *The strategic role of IT*.

Part 2, B) Questions one and two like that asked of the corporate strategist, ask (1) Do you have a formal IT strategy?, (2) When was it last updated?, and (3) How frequently, (4) for how long, and (5) for what time-period does the corporate strategic plan cover? If no IT strategic planning is performed, respondents are requested to disregard the remainder of subsection (B) and to continue with questions in subsection (C). These questions will provide the specific proportion of those respondents that do produce formal strategic information technology plans and will provide the **second major subset** for further analysis.

Part 2, B) Question three - Strategy plans for the IT function are developed by... - attempts to identify the major contributors to the formal IT planning process.

Part 2, B) Question four - What methods/techniques do you use in the development of your IT strategy plan? - presents a

comprehensive list of methods and techniques identified by the literature as components of IT strategic planning processes. The question will enable a proportional analysis of the importance placed upon each method by all respondents. Steps or activities presented in question four are as follows;

- Analysis of environmental influences
- Budgeting (capital, revenue, zero based)
- Business nature/culture/power analysis
- BSP
- Comparative analysis (historical/industry norms/experience curve)
- Competitive environment (5 forces model)
- Core or distinctive competence/CSFs
- Cost/benefit analysis
- Decision matrices
- Decision trees
- Direction alternatives ('do nothing', withdraw, consolidate, diversify...)
- Feasibility
- Financial ratios
- Flexibility analysis
- Generic strategies (cost leadership, differentiation, focus)
- Investment strategy analysis
- Key assumption recognition and testing
- Lifecycle model
- Method alternatives (acquisition, internal or joint development)
- Mission, goals and objectives setting
- Nature of environment (static/dynamic/complex)
- Network analysis (critical path)
- Political risk (stakeholders, game theory)
- Product portfolio (BCG)
- Profitability (IRR, DCF, NPV, ROCE, payback)
- Resource audit (physical, human, financial, intangible)
- Resource control measures
- Resource utilisation measures
- 'Rule of thumb' comparison
- Sensitivity analysis
- Skills analysis
- Simulation modelling
- Stages of growth
- Strategic group analysis
- Strategic plan audit
- Synergy (linkage between activities)
- SWOT
- Value chain analysis
- Others (please specify):

Part 2, B) Question five - Which of the following components are incorporated into your IT strategy plan? - presents a list of common IT strategy plan components as identified in the literature review and when analysed, will provide a useful verification of their practical usage. Components presented are as follows;

- Alternative business projections
- Alternative technology projections
- Contingency plans
- Database plans
- Financial projections
- Hardware
- Organisational design
- Software
- Staff development
- System development projects
- Telecommunications plans
- Organisational design
- Others (please specify):

Part 2, B) Question six - The IT strategy plan tends to be... - seeks specific answers as to timeliness, detail, focus and level of attention paid to strategic IT plans by the organisation. The question again departs from the "tick" format to an alternative "circle" format for variety.

Part 2, B) Question seven - In your organisation's IT environment, new information technologies are identified, evaluated and assimilated when needed? - seeks a personal opinion statement on the dynamism of the firm in its pursuit of modern developments and changes to technology.

The following concern the questions within subsection *(C) IT and the structure of the organisation.*

Part 2, C) Question one - How has the IT department changed over the last 5 years? - concentrates specifically on the transition to or from centralisation and the trend in IT employment. The second question - How has the degree of autonomy in your user departments changed? - will provide answers that will hopefully demonstrate an increase in user department autonomy with the advent of "end-user-computing" as evidenced in the literature.

Part 2, C) Question two - Is IT in user departments controlled and co-ordinated from the central IT department? - looks first for the retention of or release of centralised control and then examines the possibility of a changing role for the IS department toward something more guiding and facilitative with - Which of the following methods of control and co-ordination have you found necessary and when? - over the standard time periods. Possible areas of change are;

- Formal strategic planning
- Policy/standards definition
- Authorisation of purchases
- Information Centre
- IT Steering Group
- Responsibility devolved to user
- Others (please specify):

Part 2, C) Question three - What major differences are there in the way IT projects are funded? - and - Method of funding used? -

are aside questions that are included for general interest purposes only.

Part 2, C) Question four allows open comment in response to - Have there been any other key changes affecting the organisation of the IT department over the last 5 years? All open comment questions will be recorded verbatim and will be considered together with any or all preceding questions at the time of their analysis.

The following concern the questions within subsection *(D) The IT services culture*.

Part 2, D) Question one - How are the major concerns of the IT industry changing? - adopts an alternative approach in asking for the respondent to tick only the 3 most appropriate items per time period so that an indication of change for the greatest areas of concern is attained. Areas of concern are presented as follows;

- System delivery dates
- Productivity
- IT standards
- Quality
- Support
- Training
- User department autonomy
- Alignment with business strategy
- Value for money
- Need to market services
- Obtaining/retaining staff
- Others (please specify):

Part 2, D) Question two - The IT department has developed a greater business orientation over the last 5 years - is expected

to be agreed to by the majority and - Which of the following criteria are used to prioritise and justify IT services? - is requested over the standard time periods for the following criteria identified from consideration of both corporate and IS strategic management literature reviews. The list of criteria are as follows;

- Competitive disadvantage
- Core competences/CSFs
- Cost/benefit
- First in first out
- Management recommendation
- Mandatory projects
- Mission, goals and objectives
- Political factors
- Profitability (IRR, NPV etc)
- Resource audit/measures
- Skills shortage
- Strategic opportunity
- Technical novelty
- Value chain linkages/synergy
- Others (please specify):

Part 2, D) Question three - Do you face greater competition for the supply of IT services, and from what sort of organisation? - examines competition among the organisation's suppliers and may possibly highlight trends and both internal and external value chain considerations. A ranking is requested for a list of possible competitive entities.

Part 2, D) Question four - The IT department now needs to market its capabilities more effectively - is another opinion-based question focused upon the level of internal promotion and education for IT developments and potential use. The question -

Do you market your IT services? - is followed up by a tick list of possible marketing techniques. Analysis of these responses will be maintained at the global comparative level.

Part 2, D) Question five - Are there any other key changes that have affected the culture of your IT organisation over the last 5 years? - invites open comment on the elements of subsection (D).

The following concern the questions within subsection *(E) The provision of user support*. The subsection is relevant to the growth in end-user-computing and investigates user satisfaction. Unfortunately, it should be remembered that the respondent, in answering many of these questions is, to a certain extent being asked to evaluate the performance of his or her own function - if their role is that of a senior IT executive.

Part 2, E) Question one - What methods do you use to agree with your users the quality and content of the services you provide? - presents a list of both traditional and evolving methods and techniques for attaining feedback from users. The question format covers the standard time periods in the hope of identifying any evolutionary transitions between the methods which are as follows;

- Workshops
- Workgroups
- Steering Committees
- Individual consultancy
- Feedback forms

- Questionnaires
- Service level agreements
- Quality circles
- Others (please specify):

Part 2, E) Question two - Users are more satisfied with the level of service they receive now than 5 years ago? - is a direct request for an opinion on the level of user satisfaction compared to that of five years ago. Care will have to be taken in the analysis of these responses due to the self-evaluation aspect and also the fact that IT usage "five years ago" may have been, and in fact is expected to have been considerably different. This question is immediately followed a query on the level of service provided to users. Is the level of service (1) Excellent, (2) Good, (3) Adequate, (4) Could be better, or (5) Poor.

The third and final part to this question - What methods are used to measure user satisfaction? - investigates which of the following alternative methods have been, are, or are likely to be most commonly used;

- Questionnaire/opinion survey
- Helpdesk/Hotline complaints
- Feedback forms
- User Groups
- Training workshops feedback
- Others (please specify):

Part 2, E) Question three - Do users adopt and use new systems more readily compared to 5 years ago? and Why? - coupled with - Do users demand new systems or more from existing systems compared with 5 years ago? - looks at the ability and capability of users

and their desire for and adaption to new information systems. The question seeks specific opinion-related answers and comment.

Part 2, E) Question four - Which methods of user support have you adopted? - is another useful validation of methods covered in the literature review which are as follows;

- Helpdesk
- Hotline
- Information Centre
- In-house training
- System documentation
- On-line system help
- Computer-based training
- Department support groups
- Others (please specify):

Part 2, E) Question five - Are there any other key factors that have affected the relationship between the IT department and the end users in your organisation over the last 5 years? - invites comment on any of the elements or concerns within subsection (E).

The following concern the questions within subsection *(F) Responding to business/technical changes.* It differs from the previous subsection in that the questions are enquiring about those within the IS function itself as opposed to being about the end-users.

Part 2, F) Question one - Have the development techniques used in the IT department changed over the last 5 years? - is not a very important consideration in fulfilling the enquiry requirements of

the study, however the extent of changes, and the following questions - (1) Why and where?, and (2) How? - provide a "feel" for the extent of change imposed on the IS function and provide an opportunity to discover any consistent themes or key development areas.

Part 2, F) Question two - How have your requirements for operational control changed over the last 5 years? - also deviates from the strategic slant but is another informative and balancing question.

Part 2, F) Question three - How has the IT department's business changed? - examines the changing emphasis on IT department tasks and functions and will hopefully reflect an increase in emphasis on the core operational business areas listed as follows;

- Maintenance
- New Developments
- Support
- Training
- Others (please specify):

Ilo In order to better qualify the changing emphasis, the respo are requested to indicate the percentage split of effort for each of the above areas over the standard time periods.

Part 2, F) Question four concerns an issue of relevance to indicating the long term effects that might have been considered in the procurement of information technology - How have

international standards affected your operation over the last 5 years? - seeks retrospective opinion and is followed by the more specific - Have you introduced or adopted Open Systems standards in the last 5 years? - then - If yes, How has this affected your operation? - followed by - In which areas have Open Systems affected your operation?

Part 2, F) Question five - In what other ways has the IT department responded to changes in business pressures? - invites open comment on the elements and concerns within subsection (F).

The following concern the questions within subsection *(G) Human resource development in IT*.

Part 2, G) Question one - How is the balance between technological and business skills of IT staff changing? - adopts a new approach in asking for a percentage split on the balance between technological and business skills of IT staff over the standard time periods.

Part 2, G) Question two - What types of qualifications have become more or less important in IT staff selection? - is asked to provide insight into present skill requirements which not only may produce an indication of the applicability of the current content of tertiary education courses to the practical environment, but will also show the perceived relative importance of each type of

qualification. The respondent is requested to indicate which of the following qualifications are more, or less important in the current staff selection process.

- Academic
- Business
- Professional
- Technical experience
- Business experience
- Others (please specify):

Part 2, G) Question three - How has rate of turnover of IT staff changed over the last five years? - provides three options to be circled (1) Increased, (2) Decreased, or (3) No change.

Part 2, G) Question four - How does the IT department maintain up-to-date IT knowledge? - is a ranking exercise and will assist in the assumptions made for question two. For the standard time periods, the relative significance of and between the following "knowledge imparting" processes is requested;

- Training courses
- Product/Technical seminars
- Specific IT seminars
- Periodicals/Computing press
- Supplier sales teams
- Direct mail shots
- Research projects
- Others (please specify):

Part 2, G) Question five - Other key changes affecting IT staff selection and development over the last 5 years and the coming 5 years? - invites open comment on the elements and concerns within subsection (G).

The very last item in part two of the questionnaire contains a specifically worded question in its request for a response - Please indicate with a tick in the box below if you would be interested in receiving a copy of the results when they have been finalised - as it was necessary that no definite commitment to the distribution of results be given. The question was asked however, so that an analysis of how many, if any, of the respondent organisations that are currently **not** involved in IT strategic management, actually show an interest in what the level of strategic management influence might be among the other organisations.

2 Data collection

The first consideration for the mailout was the decision on who was to be the intended recipient. As corporate strategic management is a primary concern of Chief Executive Officer's (CEO's) for any organisation and the majority of theorists advocate the necessity for senior level involvement in the strategic management of information technology, it seemed appropriate that all correspondence be addressed to the CEO.

The TOP200.DBF database was therefore globally set-up with "The Chief Executive Officer" to appear in the **name** field for each company.

With the questionnaire prepared and the name and address for each company recorded and printed onto self adhesive labels, the first letter (Appendix A) was compiled and on November 7, 1991 all companies were directly mailed the survey questionnaire package.

In an attempt to solicit a speedier response, a **facsimile number** to a private and dedicate facsimile machine, was publicised and every page of the questionnaire displayed both the return mail Post Office Box number and the facsimile telephone number for easy reference.

Over the ensuing four weeks, a total of 58 replies (29% of the mailout) were received and work commenced on the development of the dBase IV database system to be utilised for rapid data entry of the completed questionnaires and for the analysis of the results.

Those who replied declining the opportunity to participate in the survey, but also offering comment or reason for declining, had their comments recorded for the benefit of analysis.

There were six surveys returned to sender by N.Z. Post Ltd due to expiration of forwarding notice or with some other reason for the failure in delivery. Where possible, further effort went into establishing alternative addresses for these organisations.

On December 7, 1991 a second direct mail campaign was conducted (letter in Appendix A) to all those who had not already replied and by January 20, 1992 a further 24 replies were received.

All completed questionnaires, having both or in many cases, just one part completed, were verified with the Top 200 list and in only one instance was there discovered a fully completed questionnaire from a company not recorded. Ii was in fact received from a share registry organisation. The situation that led to this occurrence was eventually revealed in the discovery that one company's published address had in fact been that of their share registrar's and so a replacement mailing to that company's head office address was performed. Unfortunately, this also meant that the fully completed questionnaire by the non Top 200 company was no longer of any value to the research.

Of the final total of 82 replies - an amazing 41% of the mailout - 76 were delivered by mail to either the specified Post Office Box or Massey University (as displayed on the letterhead paper), whilst only six were received via facsimile transmissions. The researcher's hope that the use of a facsimile might promote a

higher level of replies, particularly from those not wishing to participate, was not realised.

Upon completion of the development of the database system's data entry programs, the questionnaires were keyed into the computer. Due to constraints in the dBase IV software, the Part 2 section had to be divided into subsections (A) through (E) and (F) through (G) although this really only had impact upon keying strategy. The time logged to fully record an entire questionnaire ranged between eight and twelve minutes depending upon the level of free comment included, however on average nine to ten questionnaires were recorded per hour.

Keying accuracy and data consistency and integrity were governed by the "checks" programmed into the database system.

2.1 dBase IV computer system development

Within the intended scope and purpose of the study, the development of a computerised database system for the recording and analysis of the survey questionnaire is not a requirement, merely a tool desired by the author which capitalises on his experience in systems design and speed at program development.

There is however, one aspect - concerning the motives for the production of the system - that is appropriate to the study and therefore deserves a mention within this section.

The essence of the research study is the subject of the strategic management of information technology and the database system provides an ideal example of information technology being put to use for an operational or functional purpose. However, if the system were also developed with a view to possible alternative or extended use, then it would possess a strategic opportunity potential for future exploitation. A strategic opportunity is evident in relation to the database system developed to assist this study, in that there is a revenue earning possibility for the system as a knowledge base valuable perhaps, to other scholars or survey participants.

The design of the database system to fulfil its operational requirements has therefore also taken into consideration the requirements for strategic application as well.

As discussed in the preceding section, the dBase IV database system provides data accuracy and integrity checks and controls, and ensures screen conformance to questionnaire layout to facilitate the lowest possible likelihood for errors in data entry.

The following section provides a very general overview of the database system. For additional information, refer to Appendix C.

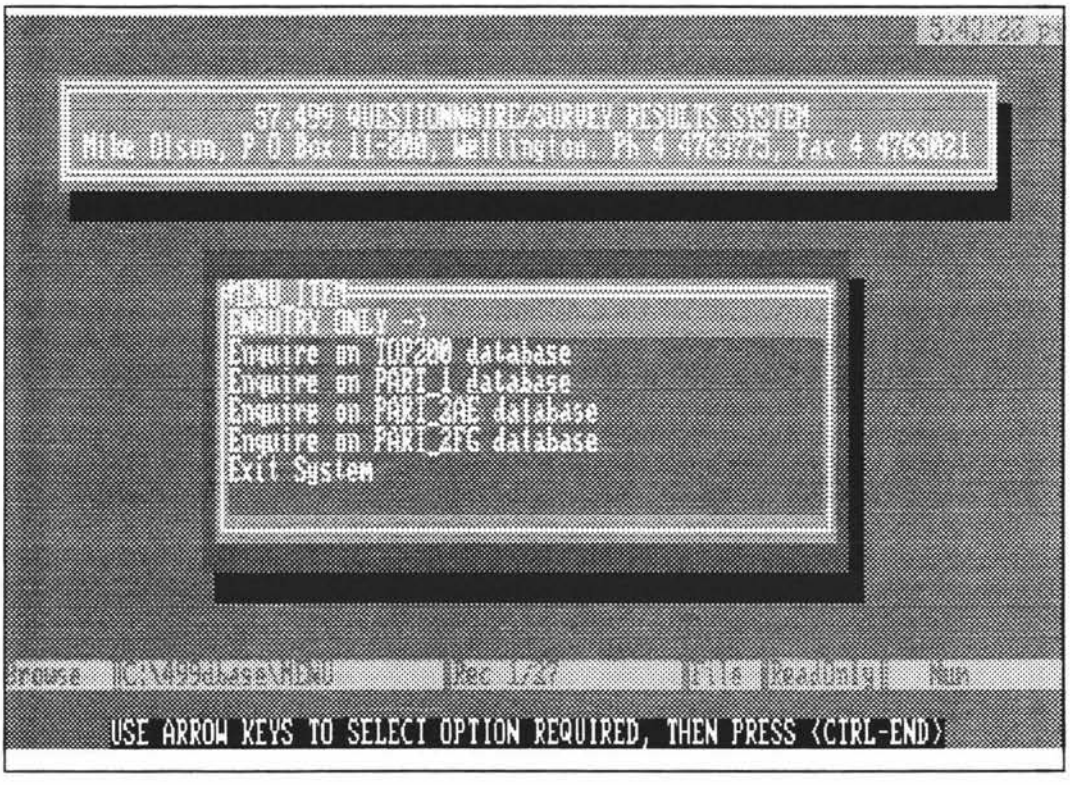

Figure [38]: Database system main menu.

The list of main menu options for the system are within a scrollable window and provide the following choices;

ENQUIRY ONLY ->
Enquire on TOP200 database
Enquire on PART_1 database
Enquire on PART_2AE database
Enquire on PART_2FG database
Exit System

DATA MAINTENANCE ->
Edit TOP200 database
Edit PART_1 database
Edit PART_2AE database
Edit PART_2FG database

DATA ANALYSIS SUBSET SELECTION ->
All companies that replied to mailout
All completed questionnaires (PART 1 or 2)
Have a corporate strategic plan
Have an IT strategic plan
Have both corporate and IT plans
Have neither corporate or IT plans but replied
Agree IT is competitively important
Will regard IT as strategic in 5 yrs
Agree on increasing IT emphasis
Agree business managers will take on IT
IT has produced a strategic benefit
75% to 100% of employees will need IT in 5 yrs
Agree IT dept. greater business orientation

Data entry and enquiry options display screen formats similar in layout to the questionnaire as the following figures demonstrate. The subset selections, greatly extend the range of analysis "filters" available as demonstrated in the following Chapter.

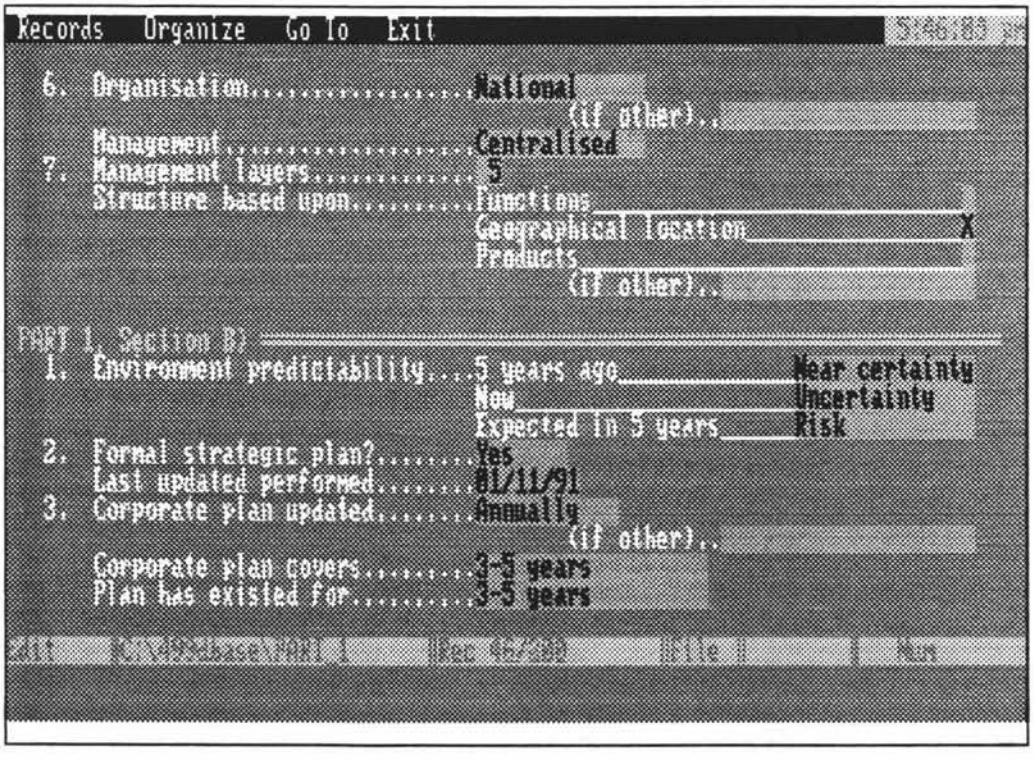

Figure [39]: Screen layout - Part 1, subsection (B).

```
Records   Organize   Go To   Exit

B)7.  Methods/techniques used.......Analysis of environmental influences__X
                                     Budgeting_____________________________X
                                     Business analysis_____________________
                                     Comparative analysis__________________
                                     Competitive environment_______________X
                                     Core or distinctive competence_______X
                                     Cost/benefit analysis_________________X
                                     Decision matrices_____________________
                                     Decision trees________________________
                                     Direction alternatives________________
                                     Feasibility___________________________X
                                     Financial ratios______________________X
                                     Flexibility analysis__________________
                                     Generic strategies____________________X
                                     Key assumption recognition & testing__
                                     Lifecycle model_______________________
                                     Method alternatives___________________
                                     Mission, goals & objectives setting___X
                                     Nature of environment_________________
                                     Network analysis______________________X
Exit    [C:\4GL4base\PART 1]    Rec 45/200    Write    Num
```

Figure [40]: Screen layout - Part 1, B) question 7.

```
Records   Organize   Go To   Exit
Mike Olson, P O Box 11-300, WELLINGTON.  Ph. 64 4 4763775.  Fax. 64 4 4763021

PART 2, Section A)
  1.  Name.........................
      Title........................Applications Dev Mgr / Operations Mgr
      Telephone....................          Fax...
  2.  Company......................
  3.  Approx. no. IT employees.......  30
      Percentage who require IT.....5 years ago_____________________1%-25%
                                    Now_____________________________50%-75%
                                    Expected in 3 years_____________75%-100%
  4.  IT management................Centralised

PART 2, Section B)
  1.  Formal IT strategic plan?.....No
      Last updated performed........ / /
  2.  IT strategic plan updated.....
                                          (if other)..
      IT strategic plan covers......
      Plan has existed for..........

Exit    [C:\4GL4base\PART 2A]    Rec 4/200    Write    Num
```

Figure [41]: Screen layout - Part 2, subsection (A).

CHAPTER IV.

RESULTS OF THE SURVEY

This section presents the analysed results of the questionnaire survey. Like that of the literature survey, coverage is purposefully of a general nature with the intention of presenting the more categorical or "general consensus" elements and concerns as evidenced in the respondents' comments as well as their direct answers to questions.

The focus is of course upon the strategic management of information technology but, as evidenced in the literature, the subject must also include consideration of strategic management in general. The questionnaire has been designed with this in mind as already discussed in the preceding Chapter.

A reminder is perhaps necessary, that the purpose of the survey as conveyed in both the study title and the statement of research purpose (page 19), is to simply enquire into information systems strategy formulation as practiced by a representation of large, successful New Zealand businesses.

The results of the survey therefore attempt to convey the level of interest, the extent of actual practice and the emerging issues and concerns as conveyed by the respondents.

1 Analysis of response and respondents' comments

Of the mailing list, comprising the top 200 companies in New Zealand, 82 replies were received from an initial mailout and one follow-up campaign.

The following analysis of the response and related percentage calculations are in relation to this **subset** of 82 companies, *all that replied to the mailout.*

Number of replies received from first mailing = 58
which represents 70.73% of the SUBSET (82)

Number of replies received from second mailing = 24
which represents 29.27% of the SUBSET (82)

Number that completed PART 1 = 53
which represents 64.63% of the SUBSET (82)

Number that completed PART 2 = 46
which represents 56.10% of the SUBSET (82)

Number that replied by facsimile = 6
which represents 7.32% of the SUBSET (82)

The 82 replies from 200, constitute a 41% reply level of which the majority responded within the first four weeks with just over half of these participating in at least one if not both questionnaires. This is not however the true response level for the survey. That information is only revealed when we examine the subset of *all companies that completed a questionnaire (Part 1 or Part 2)*:

```
Total number of records in TOP200 database for the SUBSET   =  55
Total number of records in PART_1 database for the SUBSET   =  53
Total number of records in PART_2AE database for the SUBSET =  46
Total number of records in PART_2FG database for the SUBSET =  46

Number that completed PART 1                  =  53
  which represents 100.00% of the SUBSET (  53)

Number that completed PART 2                  =  46
  which represents 100.00% of the SUBSET (  46)

Number that replied by facsimile              =   3
  which represents   6.52% of the SUBSET (  46)

Number that indicated a desire for results    =  34
  which represents  61.82% of the SUBSET (  55)
```

The **level of response** and participation from companies directly mailed with the questionnaire is therefore 55 or 27.5%.

The following selected comments represent the major concerns for those who declined to participate, but still had the courtesy to dispatch a reply:

> Over the past year or so, the number of survey requests to us has increased quite markedly. Some take days, some hours to complete. During this same time competitive pressures have increased causing us to critically assess all tasks as to the value each adds with respect to meeting the business plan.
> Rather than choose which surveys to answer or not to answer, our current policy is to not participate in any. I hope you understand our decision.

> This year we have been inundated with requests similar to your own and it has reached the stage where I feel as though I spend more time completing survey forms than carrying out my primary responsibilities. Therefore, I have decided to decline to participate in these surveys in future without exception.

> We do not wish to participate in this programme.

> Regretfully advise that it is contrary to <company> policy to participate in such matters.

We have recently established internal guide-lines to assist in determining whether to participate in research/survey projects initiated outside our company. This was necessary as the number of such requests is increasing, and we do not have the resources to meet the demand.
I am sorry we will not be participating in your study.

I regret it is our policy to not participate in such surveys, as we receive on average about 1 to 2 requests per week.

Two, who completed Part 1 but did not complete Part 2 on information technology, offered these respective explanations:

Note received from Chief Executive <name>.
PART 1 answered, not PART 2.
I.T. is like quality, it must be user friendly and used by all who needed it. It is nothing special, it is a function of being in business.

Part One received only.
Regarding part 2, we feel that the IS strategy is only just being developed and comparison with five years ago is not considered a useful exercise. In addition, there is a lack of continuity between the previous <company> and the new <company> as the Information Resource management group was disbanded in early <year>.

2 Data analysis

Although all questions were asked within the context of belonging to either part one or part two, many of the leading questions are in fact of an overall or organisation-wide nature. This section presents the analysis of responses to these combined or "global" considerations.

For both part one and part two, respondents were asked to enter freehand, their titles. The following is a grouped list and count of respondents' titles from part one, the CEO questionnaire. It provides a little insight as to who assumed the role of the **Chief Corporate Strategist**. The subset for this analysis is *all those that completed a questionnaire (Part 1 or Part 2)* and it is interesting to observe that CEO's, General Managers and Managing Directors total 24 of the 48 entered or exactly half (50%) of the respondents.

	5
AGM Finance	1
CEO	2
Chief Executive	4
Chief Executive Officer	5
Company Secretary	3
Corp. Exec. Strategy & Development	1
Corporate Development Manager	1
DIA Training	1
Director, Management Services	1
Employer Relations Advisor	1
Finance Director	2
Financial Controller	1
Financial Officer	1
General Manager	1
General Manager (CEO)	1
General Manager - Finance	1

General Manager - Finance & Admin.	1
General Manager, Resources	1
Group Managing Director	1
Information Services Manager	2
Manager Corporate Accounting	1
Manager Oil Planning Control	1
Managing Director	10
Planning Executive	1
Strategic Development Manager	1
Strategy Marketing Manager	1
Technical Manager	1
	53

The corresponding grouped list and count of respondents' titles from part two for the same subset shows 20 of 39 entered titles, or 51% relating to information technology but that there appears to be a wide range of alternative titles being used.

	7
AGM / DIT	1
AGM Finance	1
Applications Dev Mgr / Operations Mgr	1
Company Financial Director	1
Company Secretary	2
Company Secretary / Treasurer	1
Computer Services Manager	2
Computing Technology Manager	1
Data Processing Manager	2
Deputy Chief Executive	1
Director Management Services	1
Exec. Mgr - Finance & Business Services	1
Finance Director	1
Financial Controller	1
General Manager - Corporate Services	1
General Manager - Finance	1
General Manager - Finance and Admin.	1
Head Office Accountant	1
IT Manager	1
Info. Processing & CS Manager	1
Information Services Manager	4
Information Systems Manager	2
MIS Manager	1
Manager - Company Automation Centre	1
Manager - Computer & System Strategies	1
Manager - Information Systems	1
Manager - Management Information System	1
Manager Information Systems	1

Managing Director	1
Senior Systems Analyst	1
Systems Manager	1
Technical Manager	1
	46

The next consideration of a general nature is the mix of industry representation for the completed questionnaires received. As shown below, the result obtained is highly satisfactory with only building, investment and merchant industries not represented and at least one company from all other industry classes in the response.

Grouped list and count of industry distribution for SUBSET (55)

	2
Agricultural	3
Automotive	2
Banking	4
Chemicals	6
Communications	1
Computers & office equip.	2
Diversified	1
Electrical	3
Food	4
Insurance	6
Oil & fuels	4
Property	2
Retailers	1
SOE's	2
Transport	2
Other	8
Aluminium	
Beverages/Beer/Liquo	
Business Services	
Forestry Products	
Oil Refining	
Retail Gaming	
Stock & Station	
Telecommunications	
	53

The final consideration of an overall nature is directed toward the employee numbers provided by the respondents within both parts one and two. Part one requested the total number of employees and then the number of "white collar" employees, whilst part two requested the number of IT employees. The following re-produces this information in terms of percentage proportions in ascending order of the percentage of IT employees to white collar workers. This method of analysis would be better served if analysed within industry type for example, however the numbers for each industry are not sufficient for this to be performed. In the analysis below, those at top (0%) and bottom (485%) should be disregarded as they represent omissions and obvious errors on the part of the respondents.

Grouped analysis of available employee proportions for SUBSET (55)

% of white collar employees to total	% of IT employees to white collars
17.80%	0.00%
20.00%	0.00%
0.00%	0.00%
7.58%	0.00%
100.00%	0.00%
100.00%	0.00%
0.00%	0.00%
0.00%	0.00%
0.00%	0.00%
15.00%	0.00%
100.00%	0.00%
100.00%	0.00%
65.45%	0.56%
87.50%	0.71%
100.00%	0.89%
66.67%	1.50%
50.00%	2.00%
28.57%	2.00%
57.14%	2.00%
90.91%	3.00%
21.43%	3.00%
28.57%	3.00%

100.00%	3.08%
85.71%	3.33%
42.50%	3.53%
100.00%	3.55%
90.00%	3.89%
10.53%	4.00%
48.00%	4.17%
16.09%	4.29%
100.00%	5.00%
100.00%	5.33%
20.00%	6.43%
54.55%	6.67%
15.00%	6.67%
43.48%	7.00%
36.84%	7.14%
26.19%	7.73%
21.74%	8.00%
20.00%	8.00%
39.47%	8.00%
85.00%	9.80%
30.00%	10.00%
9.68%	13.33%
61.22%	13.33%
100.00%	16.33%
17.54%	20.00%
100.00%	23.08%
6.28%	26.92%
5.00%	33.33%
100.00%	38.46%
100.00%	100.00%
100.00%	485.07%

Two factors are considered in the analysis of questions specific to part one and part two. First, the results (within an appropriate subset for percentage calculations) are presented for assimilation and then, if any other specifically related subset analysis produces an overwhelming majority result or identifies a trend, that too is presented as an appropriate and additional consideration. To demonstrate, the subset of all who completed questionnaires shows an even industry spread however, the subset of those who have an IT strategy, might have highlighted only three say, industries and would have represented a significant

finding. This was not the case, but serves as a useful illustration.

2.1 PART 1 - CEO questionnaire

The most significant finding for part one is the level of corporate strategic planning currently in effect. The following is the response to formal planning within the subset of *all those that completed a questionnaire (Part 1 or Part 2).*

QUESTION B) 2, Responses to formal strategic planning for SUBSET (53)

Do you have a formal corporate strategic plan?:
43 or 81.13% stated YES
10 or 18.87% stated NO
0 or 0.00% suggested their intention to plan

The perspective for the enquiry is an orientation toward strategic management in general. Accordingly, the following analysis of answers to product mix and management structure, are presented using the above subset of *all those that have a corporate strategic plan*, of which there were 43 or 81% of the 53 that completed part one of the questionnaire. This subset, as outlined in **Chapter III: Research Design** is the first major subset for analysis.

QUESTION A) 5, existing market and product mix for SUBSET (43)

38 or 88.37% have a predominantly NATIONAL market
5 or 11.63% have a predominantly INTERNATIONAL market
9 or 20.93% have both a NATIONAL and INTERNATIONAL market

```
Response on product structure of   38 companies with a NATIONAL market:
Single product                      =    2 or   5.26%
Several related products  one major  =    7 or  18.42%
Several major  related products     =   26 or  68.42%
Several unrelated products  one major =  0 or   0.00%
Several major  unrelated products   =    3 or   7.89%

Response on product structure of    5 companies with an INTERNATIONAL mkt:
Single product                      =    1 or  20.00%
Several related products  one major  =    0 or   0.00%
Several major  related products     =    3 or  60.00%
Several unrelated products  one major =  0 or   0.00%
Several major  unrelated products   =    1 or  20.00%

Response on product structure of    9 companies with BOTH:
Single product                      =    1 or  11.11%
Several related products  one major  =    2 or  22.22%
Several major  related products     =    5 or  55.56%
Several unrelated products  one major =  0 or   0.00%
Several major  unrelated products   =    1 or  11.11%

Product structure over ALL COMPANIES in SUBSET (  43)
Single product                      =    3 or   6.98%
Several related products  one major  =    7 or  16.28%
Several major  related products     =   29 or  67.44%
Several unrelated products  one major =  0 or   0.00%
Several major  unrelated products   =    4 or   9.30%
```

The significant finding in relation to those that had a corporate strategic plan was that for 38 or 88%, their existing market was predominantly a national market.

```
QUESTION A) 6, organisations and their management structure for SUBSET (  43)

  19 or  44.19% are NATIONAL organisations
  15 or  34.88% are MULTINATIONAL organisations
   4 or   9.30% are GLOBAL organisations
   4 or   9.30% are among the following OTHER classifications

 space(19)+p1_a6_ooth
                    Regional
                    North Island
                    Regional
                    Regional
```

Reported management structure of 19 NATIONAL companies:
Centralised management = 14 or 73.68%
Decentralised management = 4 or 21.05%

Reported management structure of 15 MULTINATIONAL companies:
Centralised management = 6 or 40.00%
Decentralised management = 9 or 60.00%

Reported management structure of 4 GLOBAL companies:
Centralised management = 3 or 75.00%
Decentralised management = 1 or 25.00%

Reported management structure of 4 OTHER companies:
Centralised management = 3 or 75.00%
Decentralised management = 0 or 0.00%

Reported management structure over ALL COMPANIES in SUBSET (43)
Centralised management = 27 or 62.79%
Decentralised management = 14 or 32.56%

QUESTION A) 7, number of management layers for SUBSET (43)

Number of layers specified	Frequency	% of SUBSET
0	4	9.30%
1	1	2.33%
2	3	6.98%
3	15	34.88%
4	10	23.26%
5	7	16.28%
6	2	4.65%
7	1	2.33%
	43	100.00%

QUESTION A) 7, Combinations of basis for management structure for SUBSET (43)

	1	2.33%
Customer Segments	1	2.33%
Functions,	24	55.81%
Functions, Ability	1	2.33%
Functions, Geographical location,	5	11.63%
Functions, Geographical location, Products,	1	2.33%
Functions, Products,	2	4.65%
Geographical location,	1	2.33%
Geographical location, Products,	2	4.65%
Market Segmentation	1	2.33%
Products,	4	9.30%
	43	100.00%

The perceived change in predictability of the environment from the perspective of *all those that completed a questionnaire (Part 1 or Part 2)*, confirms the related concerns presented in the literature.

Situation five years ago:
24 or 55.81% specified NEAR CERTAINTY
5 or 11.63% specified RISK
13 or 30.23% specified UNCERTAINTY

Current situation:
8 or 18.60% specified NEAR CERTAINTY
13 or 30.23% specified RISK
22 or 51.16% specified UNCERTAINTY

Situation expected in five years time:
4 or 9.30% specified NEAR CERTAINTY
20 or 46.51% specified RISK
19 or 44.19% specified UNCERTAINTY

The changing perception of environmental uncertainty is perhaps best represented pictorially as shown in the following graph.

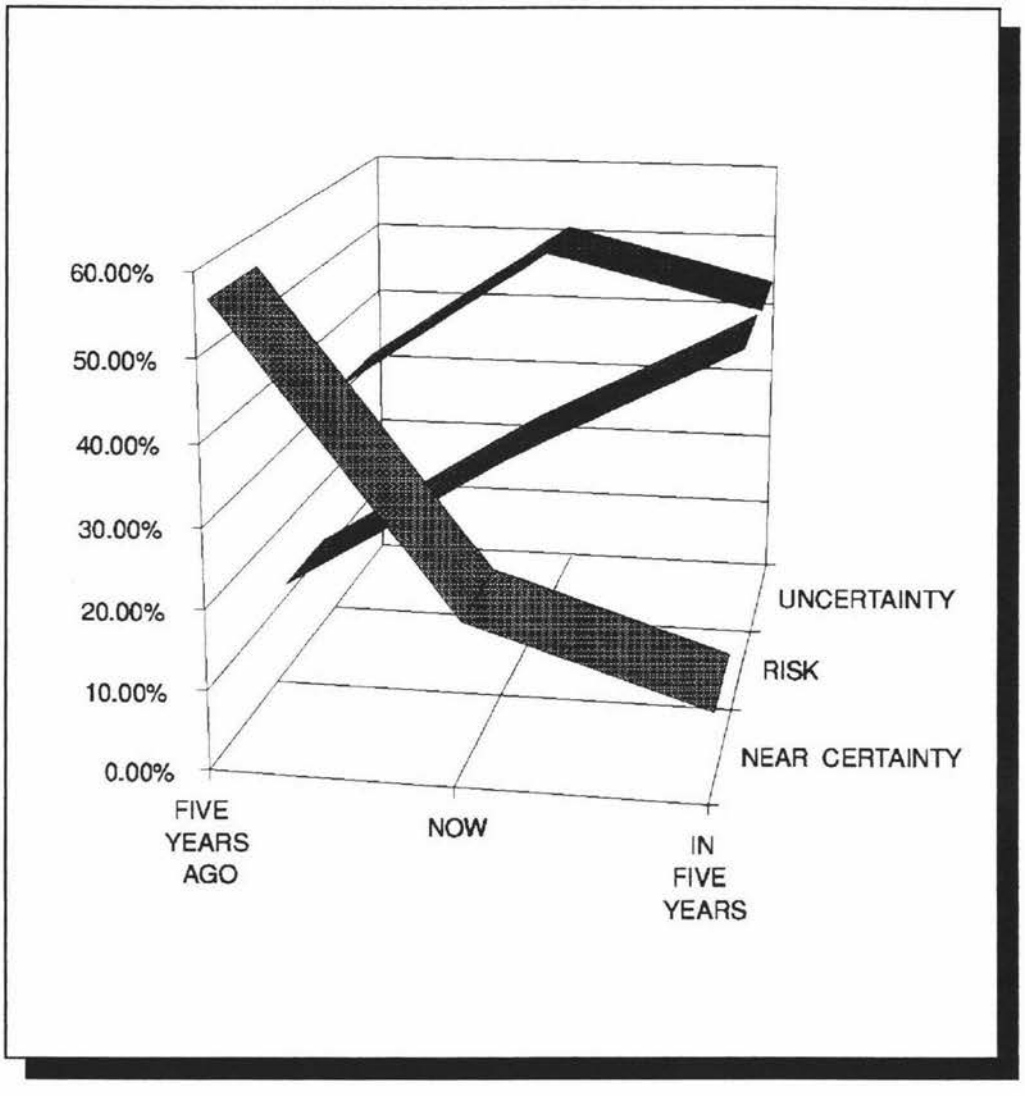

Figure [42]: Changing perspectives on environmental predictability.

The following series of analysis examines the planning characteristics for the 43 companies within the subset of *all those that have a formal corporate strategic plan.*

QUESTION B) 3, Planning characteristics for the SUBSET (43)

The corporate strategic plan is updated...
39 or 90.70% update their plan ANNUALLY
3 or 6.98% update their plan EVERY 2 YEARS
0 or 0.00% update their plan EVERY 3 YEARS
0 or 0.00% update their plan EVERY 4 YEARS
1 or 2.33% update their plan EVERY 5 YEARS
0 or 0.00% update over ANOTHER period

An overwhelming majority of nearly 91% update their plans annually.

The corporate strategic plan covers...
10 or 23.26% have plans covering 1-2 YEARS
32 or 74.42% have plans covering 3-5 YEARS
1 or 2.33% have plans covering 6-10 YEARS
0 or 0.00% have plans covering MORE THAN 10 YEARS

The corporate strategic plan has existed for...
8 or 18.60% have had plans for 1-2 YEARS
17 or 39.53% have had plans for 3-5 YEARS
7 or 16.28% have had plans for 6-10 YEARS
11 or 25.58% have had plans for MORE THAN 10 YEARS

QUESTION B) 4, Developers of SBU or functional plans for the SUBSET (43)

Indiv. subunits,	23	53.49%
Indiv. subunits, CEO,	5	11.63%
Indiv. subunits, CEO, Planning staff,	4	9.30%
Indiv. subunits, Planning staff,	6	13.95%
Indiv. subunits, Planning staff, Ext. consultants,	1	2.33%
Management Executive	1	2.33%
Planning staff,	2	4.65%
We are one unit	1	2.33%
	43	100.00%

QUESTION B) 5, Development of subunit plans for the SUBSET (43)

In relation to subunit plans, the corporate strategic plan is developed...
16 or 37.21% circled BEFORE
11 or 25.58% circled AFTER
14 or 32.56% circled DURING
0 or 0.00% suggested OTHER

QUESTION B) 6, Likely information sources for corp. plans in the SUBSET (43)

Planning step	Corporate	%	Subunit	%	External	%
Mission definition	**40**	**93.02%**	9	20.93%	0	0.00%
Goals & objectives setting	32	74.42%	26	60.47%	0	0.00%
Environmental analysis	28	65.12%	21	48.84%	11	25.58%
Resource analysis	22	51.16%	32	74.42%	3	6.98%
Alternative strategies dev.	28	65.12%	25	58.14%	3	6.98%
Strategy selection	32	74.42%	23	53.49%	0	0.00%
Functional plan prep.	9	20.93%	**39**	**90.70%**	1	2.33%
Implementation monitoring	27	62.79%	32	74.42%	1	2.33%
Plan audit/revising	**37**	**86.05%**	21	48.84%	3	6.98%

Mission definition and the auditing or revising of previous plans lead the list of likely information sources for corporate strategic plans.

QUESTION B) 7, methods & techniques used in strategic plans for SUBSET (43)

Method or technique	Used	%
Analysis of environmental influences	**36**	**83.72%**
Budgeting (capital, revenue, zero based)	**39**	**90.70%**
Business nature/culture/power analysis	20	46.51%
Comparative analysis (history/norms/experienc	32	74.42%
Competitive environment (5 forces)	17	39.53%
Core or distinctive competence	16	37.21%
Cost/benefit analysis	25	58.14%
Decision matrices	6	13.95%
Decision trees	5	11.63%
Direction alternatives	21	48.84%
Feasibility	21	48.84%
Financial ratios	27	62.79%
Flexibility analysis	10	23.26%
Generic strategies (cost leader/differentiati	18	41.86%
Key assumption recognition and testing	12	27.91%
Lifecycle model	6	13.95%
Method alternatives (acquisition/joint develo	16	37.21%
Mission, goals and objectives setting	**38**	**88.37%**
Nature of environment (static/dynamic/complex	21	48.84%
Network analysis (critical path)	8	18.60%
Political risk (human/physical/financial)	11	25.58%
Product portfolio (BCG)	15	34.88%
Profitability (IRR/DCF/NPV/ROCE/payback)	**34**	**79.07%**
Resource audit (human/physical/financial)	24	55.81%
Resource control measures	10	23.26%
Resource utilisation measures	12	27.91%
'Rule of thumb' comparisons	8	18.60%
Sensitivity analysis	22	51.16%

Skills analysis	12	27.91%
Simulation modelling	12	27.91%
Strategic group analysis	10	23.26%
Strategic plan audit	7	16.28%
Synergy (linkage between activities)	14	32.56%
SWOT	30	69.77%
Value chain analysis	5	11.63%
Definitn of Sustaina ble comptetve advtgs		

Perhaps not surprisingly, the leading methods and techniques used in corporate strategic plans were (1) Budgeting, (2) Mission, goals and objectives setting, (3) Analysis of environmental influences, and (4) Profitability analysis. These were closely followed by (1) Comparative analysis, and (2) SWOT analysis.

QUESTION B) 8, The corporate strategic planning process for the SUBSET (43)

The corporate strategic planning process tends to be...

Out of date	1	2.33%
Up-to-date	26	60.47%
Detailed	17	39.53%
General	10	23.26%
Contingency oriented	5	11.63%
Long-term	17	39.53%
Short-term	11	25.58%
Ignored or overlooked	1	2.33%
Flexible	25	58.14%
Inflexible	2	4.65%
Insufficient Attn b4 & after prep.		
Tending short-term		
Provides a unifying process for sublevel s		
Rapidly chg mkt		
Lengthening it's ter m		

QUESTION B) 9, The data and information gathering process for the SUBSET (43)

The information gathering process tends to be...

Out of date	4	9.30%
Up-to-date	30	69.77%
Detailed	18	41.86%
Summarised	13	30.23%
Duplicated	1	2.33%
Inaccurate	3	6.98%
Retained after	13	30.23%
Destroyed after	1	2.33%

We use External Assi
stance for Environme
ntal Analysis
Too historically bas
ed-needs more judgem
ent from inside org.

The same subset - *all those that have a corporate strategic plan* - was also used for the following responses on IT in an attempt to analyse to what extend the concern for strategic management had permeated down to information technology concerns.

QUESTION B) 10, OPINION on IT as competitively important for the SUBSET (43)

23 or 53.49% STRONGLY AGREED with this statement
17 or 39.53% AGREED with this statement
0 or 0.00% DISAGREED with this statement
1 or 2.33% STRONGLY DISAGREED with this statement

QUESTION C) 1, Existing role of IT in organisation for the SUBSET (43)

Information technology...

Is a primary product/service	7	16.28%
Provides crucial internal services	**35**	**81.40%**
Provides non-critical internal support servic	4	9.30%
Is not an essential product or service	0	0.00%

The majority (81%), regarded the existing role of information technology as providing crucial internal services within their organisations.

QUESTION C) 2, Change in attitudes towards IT for SUBSET (43)

Situation five years ago:
6 or 13.95% specified IT as a STRATEGIC RESOURCE
13 or 30.23% specified IT as a BUSINESS RESOURCE
4 or 9.30% specified IT as a BUSINESS EXPENSE
15 or 34.88% specified IT as an ADMINISTRATION EXPENSE
Bus res & exp also
and bus. resource
Also Bus.&Admn. Exps

Current situation:
19 or 44.19% specified IT as a STRATEGIC RESOURCE
19 or 44.19% specified IT as a BUSINESS RESOURCE
2 or 4.65% specified IT as a BUSINESS EXPENSE
0 or 0.00% specified IT as an ADMINISTRATION EXPENSE
Bus res & exp also

Situation expected in five years time:
32 or 74.42% specified IT as a STRATEGIC RESOURCE
8 or 18.60% specified IT as a BUSINESS RESOURCE
0 or 0.00% specified IT as a BUSINESS EXPENSE
0 or 0.00% specified IT as an ADMINISTRATION EXPENSE
Bus res & exp also
and bus. resource
Also Bus. Resource

Changes in attitudes towards information technology was also highlighted by the literature as significant and has been reflected by the responses here, which are produced pictorially in the following graph.

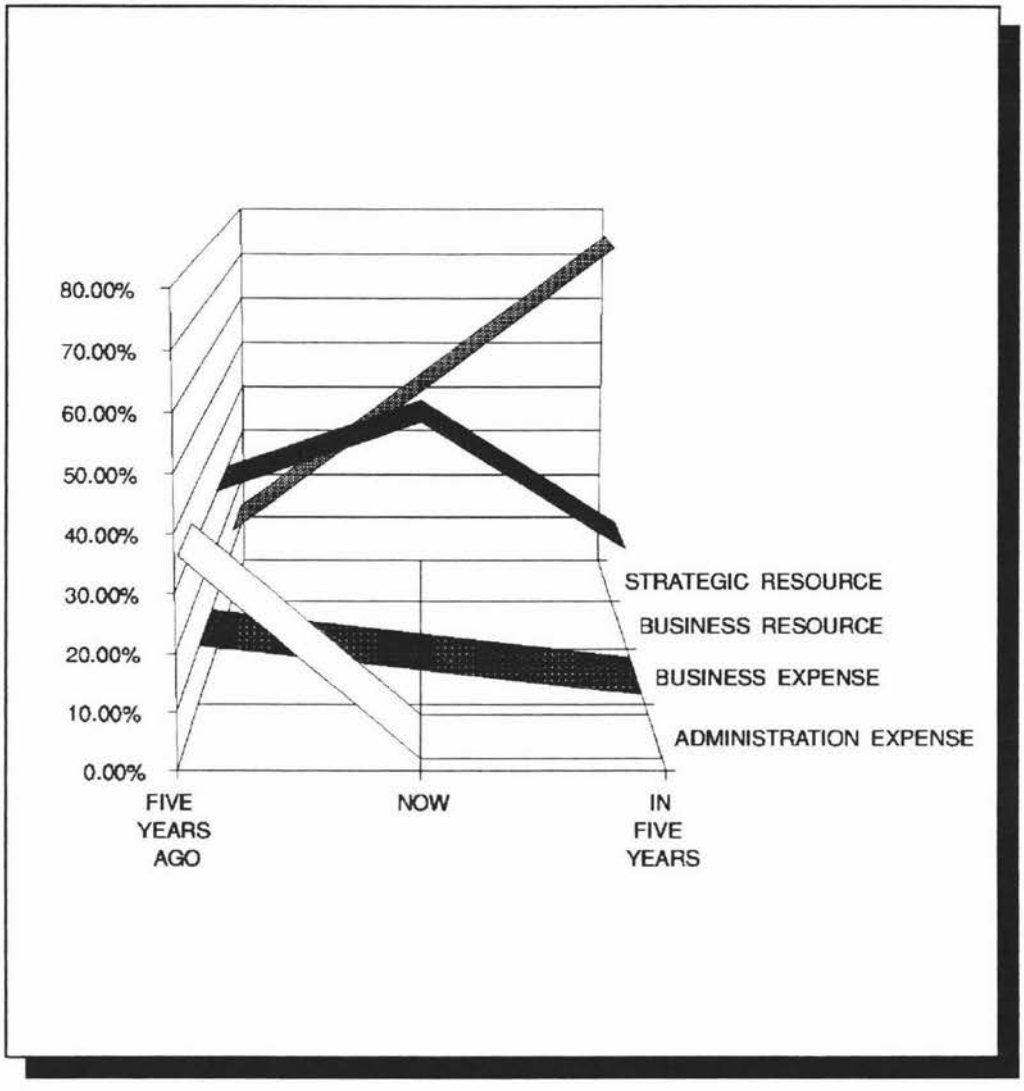

Figure [43]: The change in attitudes toward IT.

QUESTION C) 3, OPINION on increase in strategic IT emphasis for SUBSET (43)

23 or 53.49% STRONGLY AGREED with this statement
15 or 34.88% AGREED with this statement
2 or 4.65% DISAGREED with this statement
1 or 2.33% STRONGLY DISAGREED with this statement

QUESTION C) 4, OPINION on Board interest & awareness of IT for SUBSET (43)

Situation five years ago:
4 or 9.30% specified a VERY HIGH awareness
9 or 20.93% specified a HIGH awareness
20 or 46.51% specified a LOW awareness
7 or 16.28% specified VERY LITTLE awareness

Current situation:
10 or 23.26% specified a VERY HIGH awareness
20 or 46.51% specified a HIGH awareness
9 or 20.93% specified a LOW awareness
2 or 4.65% specified VERY LITTLE awareness

Situation expected in five years time:
14 or 32.56% specified a VERY HIGH awareness
22 or 51.16% specified a HIGH awareness
4 or 9.30% specified a LOW awareness
1 or 2.33% specified VERY LITTLE awareness

QUESTION C) 4, Software used by Board members for SUBSET (43)

Software	5 yrs ago	%	Now	%	In 5 yrs	%
Executive Information System	1	2.33%	8	18.60%	17	39.53%
Electronic Mail/Office Automa	4	9.30%	10	23.26%	14	32.56%
Strategy development tools	1	2.33%	2	4.65%	9	20.93%
Links to other systems	3	6.98%	7	16.28%	14	32.56%
Spreadsheets	8	18.60%	19	44.19%	17	39.53%
Not Known						
None						
Farm Informat/Acc			1		1	
Word processing			1		1	
Word Processing			1		1	
Don't know						
Word Processing	1		1		1	
Specialist Software	1		1		1	
Data Bases			1		1	
N/A						

QUESTION C) 5, OPINION on managers' awareness of IT for the SUBSET (43)

Business line managers in your organisation have become much more IT aware over the last 5 years...
17 or 39.53% STRONGLY AGREED with this statement
24 or 55.81% AGREED with this statement
1 or 2.33% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

Business managers will start to take on IT management responsibilities during the 1990's...
9 or 20.93% STRONGLY AGREED with this statement
25 or 58.14% AGREED with this statement
7 or 16.28% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

Many theorists identified in the survey of the literature suggest that line managers will become much more aware and involved with information technology and contribute much more in future to corporate strategic planning. The questionnaire demonstrates an almost **unanimous agreement** that line managers have become much more IT aware over the past five years with close to 80% agreeing that business managers will start to take on IT management responsibilities during the current decade.

QUESTION C) 6, Statement as to IT representation level for SUBSET (43)

Is the IT function represented at Board level?
Situation five years ago:
8 or 18.60% replied YES
33 or 76.74% replied NO

Current situation:
9 or 20.93% replied YES
33 or 76.74% replied NO

Situation expected in five years time:
15 or 34.88% replied YES
27 or 62.79% replied NO

If not, to whom does the IT function report?

Situation five years ago:

	15
AGM Finance	1
ASM	1
CEO	3
Chief Executive	1
Chief Fin. Officer	1
Commissioner ofWorks	1
Company Secretary	3
DP Manager	1
Decentralised	1
Exec Mgr Marketing	1
Fin. & Planning Dir.	1
Finance Director	3
Financial Controller	2
Financial Director	1
GM - Finance	1
GM Operations	1

General Management	1
General Manager	1
N/A	2
	43

Current situation:

	10
AGM Finance	1
ASM	1
Acc & Finance Dir	1
Assistant GM Ops	1
CEO	3
Chief FinanceOfficer	1
Company Secretary	3
Corporate Services	1
DP Manager	1
Exec Mgr Finance	1
Fin. & Planning Dir	1
Finance Director	3
Financial Controller	2
Financial Director	1
Financial Officer	1
GM Operations	1
General Manager	2
Managing Director	1
Op. Co. MD	1
Secretary/Treasurer	1
Site General Mgrs	1
Site Services Mgr	1
Subsidiary GM	1
Technical Manager	1
	43

Situation expected in five years time:

	11
ASM	1
Acc & Finance Dir	1
Assistant GM Ops	1
Board	1
CEO	4
CFO	1
Chief FinanceOfficer	1
Company Secretary	2
Exec Mgr Finance	1
Finance Director	2
Financial Controller	2
Financial Director	1
General Manager	3
Managing Director	3
Op. Co. MD	1
Secretary/Treasurer	1
Senior Executive	1
Senior NZ Management	1

Site General Mgrs	1
Site Services Mgr	1
Stand Alone Business	1
	43

QUESTION C) 7, Statement on IT strategic benefit opportunity for SUBSET (43)

Has the IT function produced a strategic benefit or opportunity
for competitive advantage over the last 5 years?
36 or 83.72% replied YES
4 or 9.30% replied NO

To what extent has the benefit been exploited...
8 or 18.60% said A LOT
18 or 41.86% said QUITE A LOT
10 or 23.26% said A LITTLE
0 or 0.00% said HARDLY AT ALL
0 or 0.00% said NOT AT ALL

...and was the benefit the result of formal planning?
24 or 55.81% replied YES
3 or 6.98% replied NO
9 or 20.93% replied PARTIALLY

For more than 83% of those organisations that have a formal corporate strategic plan, the information technology function has produced a strategic benefit opportunity for competitive advantage over the past five years. This result is **extremely significant** in itself, but should be considered with the subsequent revelations that 65% of those that said it had produced a benefit did not think that the benefit had been exploited to its fullest extent and only half or 55%, stated that the benefit was the result of a formal planning effort.

Finally, the following are the range of comments received in response to the request for open comment in relation to part one

subsection (C). The comments are from the subset of *all those that completed Part 1.*

QUESTION C) 8, Invitation for OPEN COMMENT for SUBSET (53)

Are there any other key changes affecting the strategic role of IT over the last 5 years?

Organised changes in <company> were revealed in a formal IT group being established in NZ in 1989. This has recently been reviewed, and it's focus some-what realigned; particularly with an Australasian focus.

Need for prompt accurate timely business information for management of business.

On formation of the <company> there was a strategic change to proceed along a decentralised dedicated development path.

Move from mainframe to decentralised systems.

1. "User friendliness" of systems
2. GUI
3. Lower cost

1. Attitudes in NZ to internationally competitive environment we now operate in
2. Potential competitive advantage
3. Need for quick responses
4. Better utilisation of 'people'

1. The need for more team based problem solving.
2. Staff training
3. Reliable networks

Reduction of direct personnel resource by 80%.

Yes - over the last 3 years a substantial number of manual processes have been mechanised. Leads to lower costs and quicker, more accurate service.

Yes
1. Distributed decision-making
2. Vital need for executive information systems
3. Use of information as a strategic weapon

We no longer use an in-house resource to provide specialised software, we have bought in industry standard packages. Costs have fallen dramatically!

Many, many more opportunities present themselves for in-depth comparison through the filtering of responses and the direct matching of IT answers with corporate management responses. That is however, beyond the simple enquiry limits of this study, but presents many opportunities for future development.

2.2 PART 2 - IT Director questionnaire

Part two of the questionnaire targeted the Chief IS Strategist. The following responses in relation to IT requirement, management structure and whether they do or do not have an IT strategy are analysed from the 46 companies that make up the subset of *all those that completed Part 2 of the questionnaire.*

QUESTION A) 3, employees that require weekly IT services for SUBSET (46)

Situation five years ago:
20 or 43.48% specified a 1%-25% requirement
16 or 34.78% specified a 25%-50% requirement
3 or 6.52% specified a 50%-75% requirement
3 or 6.52% specified a 75%-100% requirement

Current situation:

5 or	10.87%	specified a 1%-25% requirement
12 or	26.09%	specified a 25%-50% requirement
13 or	28.26%	specified a 50%-75% requirement
14 or	30.43%	specified a 75%-100% requirement

Situation expected in five years time:

1 or	2.17%	specified a 1%-25% requirement
8 or	17.39%	specified a 25%-50% requirement
5 or	10.87%	specified a 50%-75% requirement
29 or	63.04%	specified a 75%-100% requirement

The trend identified here can best be displayed through the use of a graph as follows.

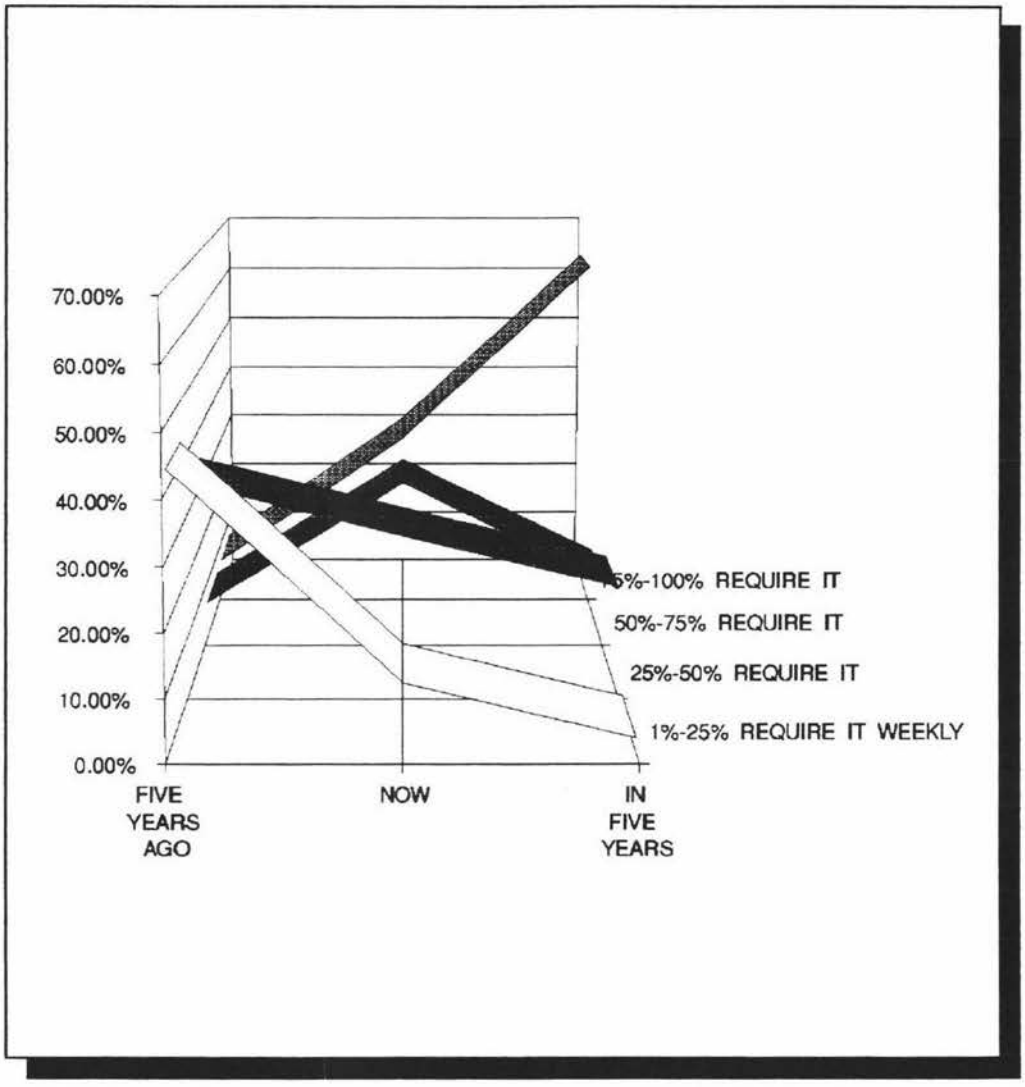

Figure [44]: The perceived changing requirement for weekly IT services.

QUESTION A) 4, IT management structure for SUBSET (46)

Centralised management	=	**37 or**	**80.43%**
Decentralised management	=	9 or	19.57%

The significant result here was that 37 or 80% of those that have an IT strategic plan also have a **centralised** IT management structure.

QUESTION B) 1, Responses to formal IT strategic planning for SUBSET (46)

Do you have a formal IT strategy?:
29 or 63.04% stated YES
12 or 26.09% stated NO
5 or 10.87% suggested their intention to plan

The level of formal IT strategic planning is somewhat below that for corporate strategic planning, signifying that perhaps IT managers are not as proactive in their support of strategic management as the literature would have us believe. The following responses are measured against the smaller subset of *those that have a formal IT strategy*.

QUESTION B) 2, IT planning characteristics for the SUBSET (29)

The IT strategic plan is updated...
18 or 62.07% update their plan ANNUALLY
7 or 24.14% update their plan EVERY 2 YEARS
2 or 6.90% update their plan EVERY 3 YEARS
0 or 0.00% update their plan EVERY 4 YEARS
0 or 0.00% update their plan EVERY 5 YEARS
2 or 6.90% update over ANOTHER period

The IT strategic plan covers...
13 or 44.83% have plans covering 1-2 YEARS
14 or 48.28% have plans covering 3-5 YEARS
2 or 6.90% have plans covering 6-10 YEARS
0 or 0.00% have plans covering MORE THAN 10 YEARS

The IT strategic plan has existed for...
11 or 37.93% have had plans for 1-2 YEARS
11 or 37.93% have had plans for 3-5 YEARS
3 or 10.34% have had plans for 6-10 YEARS
4 or 13.79% have had plans for MORE THAN 10 YEARS

QUESTION B) 3, Developers of IT strategic plans for the SUBSET (29)

Committee	1	3.45%
Corporate & regionalIT managers	1	3.45%
Ext. consultants,	2	6.90%
IT Director,	12	41.38%
IT Director, Business unit Mngrs	1	3.45%
IT Director, CEO,	2	6.90%
IT Director, CEO, Management Team	1	3.45%
IT Director, CEO, Planning staff,	2	6.90%
IT Director, Planning staff,	1	3.45%
IT Director, Planning staff, Parent company	1	3.45%
IT Director, Senior Mngmt Team	1	3.45%
MIS Manager	1	3.45%
Planning staff,	2	6.90%
Steering Committee	1	3.45%
	29	100.00%

QUESTION B) 4, methods & techniques used in IT planning for SUBSET (29)

Method or technique	Used	%
Analysis of environmental influences	19	65.52%
Budgeting (capital, revenue, zero based)	22	75.86%
Business nature/culture/power analysis	12	41.38%
BSP	1	3.45%
Comparative analysis (history/norms/experienc	7	24.14%
Competitive environment (5 forces)	3	10.34%
Core or distinctive competence/CSFs	5	17.24%
Cost/benefit analysis	21	72.41%
Decision matrices	5	17.24%
Decision trees	4	13.79%
Direction alternatives	7	24.14%
Feasibility	17	58.62%
Financial ratios	5	17.24%
Flexibility analysis	3	10.34%
Generic strategies (cost leader/differentiati	4	13.79%
Investment strategy analysis	3	10.34%
Key assumption recognition and testing	3	10.34%
Lifecycle model	3	10.34%
Method alternatives (acquisition/joint develo	6	20.69%
Mission, goals and objectives setting	**23**	**79.31%**
Nature of environment (static/dynamic/complex	14	48.28%
Network analysis (critical path)	7	24.14%
Political risk (human/physical/financial)	1	3.45%
Product portfolio (BCG)	3	10.34%
Profitability (IRR/DCF/NPV/ROCE/payback)	14	48.28%
Resource audit (human/physical/financial)	11	37.93%
Resource control measures	4	13.79%
Resource utilisation measures	8	27.59%
'Rule of thumb' comparisons	3	10.34%

Sensitivity analysis	5	17.24%
Skills analysis	8	27.59%
Simulation modelling	3	10.34%
Stages of growth	2	6.90%
Strategic group analysis	5	17.24%
Strategic plan audit	4	13.79%
Synergy (linkage between activities)	5	17.24%
SWOT	7	24.14%
Value chain analysis	1	3.45%
Direct link to busin ess plan		
Strategic Value Anal ysis and intuition		
Bus. plan which uses a lot of the above		

As with corporate strategic planning, the leading methods and techniques employed are (1) Mission, goals and objectives setting, and (2) Budgeting, with (3) Cost/benefit analysis the third most prevalent.

QUESTION B) 5, Components of the IT strategic plan for the SUBSET (29)

Method or technique	Used	%
Alternative business projections	7	24.14%
Alternative technology projections	17	58.62%
Contingency plans	14	48.28%
Database plans	18	62.07%
Financial projections	20	68.97%
Hardware	**26**	**89.66%**
Organisational data	18	62.07%
Software	**27**	**93.10%**
Staff development	18	62.07%
System development projects	**27**	**93.10%**
Telecommunications plans	20	68.97%
Organisational design	12	41.38%
CASE		
Realisation of busin ess goals		
Security		

The leading components for the IT strategic plan are perhaps not surprisingly (1) Software, (2) System development projects, and (3) Hardware.

QUESTION B) 6, IT strategic planning process for the SUBSET (29)

The IT strategic planning process tends to be...		
Out of date	2	6.90%
Up-to-date	16	55.17%
Comprehensive	8	27.59%
Focused on technology	5	17.24%
Focused on applications	20	68.97%
Ignored	1	3.45%
Overlooked	1	3.45%

Downsizing leads to
continual plan u/dat
Relevant !
Exists as internal
dept. document
Focused on business
plan
Not widely understoo
d
Going through
evaluation.
overtaken by daily
activities of IS
area

All remaining sections for part two of the questionnaire concern general and strategic management issues in relation to the IT function. Whilst this would be usefully considered from many alternative viewpoints (and corresponding subsets), for an emphasis on issues most prevalent within the strategic management of IT, it is necessary to limit the analysis to the subset of *those that have a formal IT strategy*.

QUESTION B) 7, Assimilation of new info. technologies for SUBSET (29)

6 or 20.69% STRONGLY AGREED with this statement
21 or 72.41% AGREED with this statement
2 or 6.90% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

QUESTION C) 1, IT department changes over last 5 years for SUBSET (29)

Increasingly centralised	9	31.03%
Increasingly decentralised	11	37.93%
Fewer employees	17	58.62%
Same number of employees	3	10.34%
More employees	7	24.14%

How has the degree of autonomy in user departments changed?...
Situation five years ago:
4 or 13.79% specified a HIGH level of change
6 or 20.69% specified a MEDIUM level of change
18 or 62.07% specified a LOW level of change

Current situation:
5 or 17.24% specified a HIGH level of change
21 or 72.41% specified a MEDIUM level of change
3 or 10.34% specified a LOW level of change

Situation expected in five years time:
17 or 58.62% specified a HIGH level of change
11 or 37.93% specified a MEDIUM level of change
1 or 3.45% specified a LOW level of change

QUESTION C) 2, Control over IT in user departments for SUBSET (29)

Is IT in user departments centrally controlled and co-ordinated?
8 or 27.59% replied YES
1 or 3.45% replied NO
20 or 68.97% said PARTIALLY

QUESTION C) 2, Methods of control and co-ordination used in the SUBSET (29)

Planning step	5 yrs ago	%	Now	%	In 5 yrs	%
Formal strategic planning	10	34.48%	21	72.41%	23	79.31%
Policy/standards definition	10	34.48%	22	75.86%	21	72.41%
Authorisation of purchases	16	55.17%	26	89.66%	18	62.07%
Information Centre	6	20.69%	10	34.48%	9	31.03%
IT Steering Group	12	41.38%	14	48.28%	13	44.83%
Responsibility devolved to us	3	10.34%	11	37.93%	12	41.38%

Represented pictorially, the changing trends in methods of control and co-ordination are as shown in the following graph.

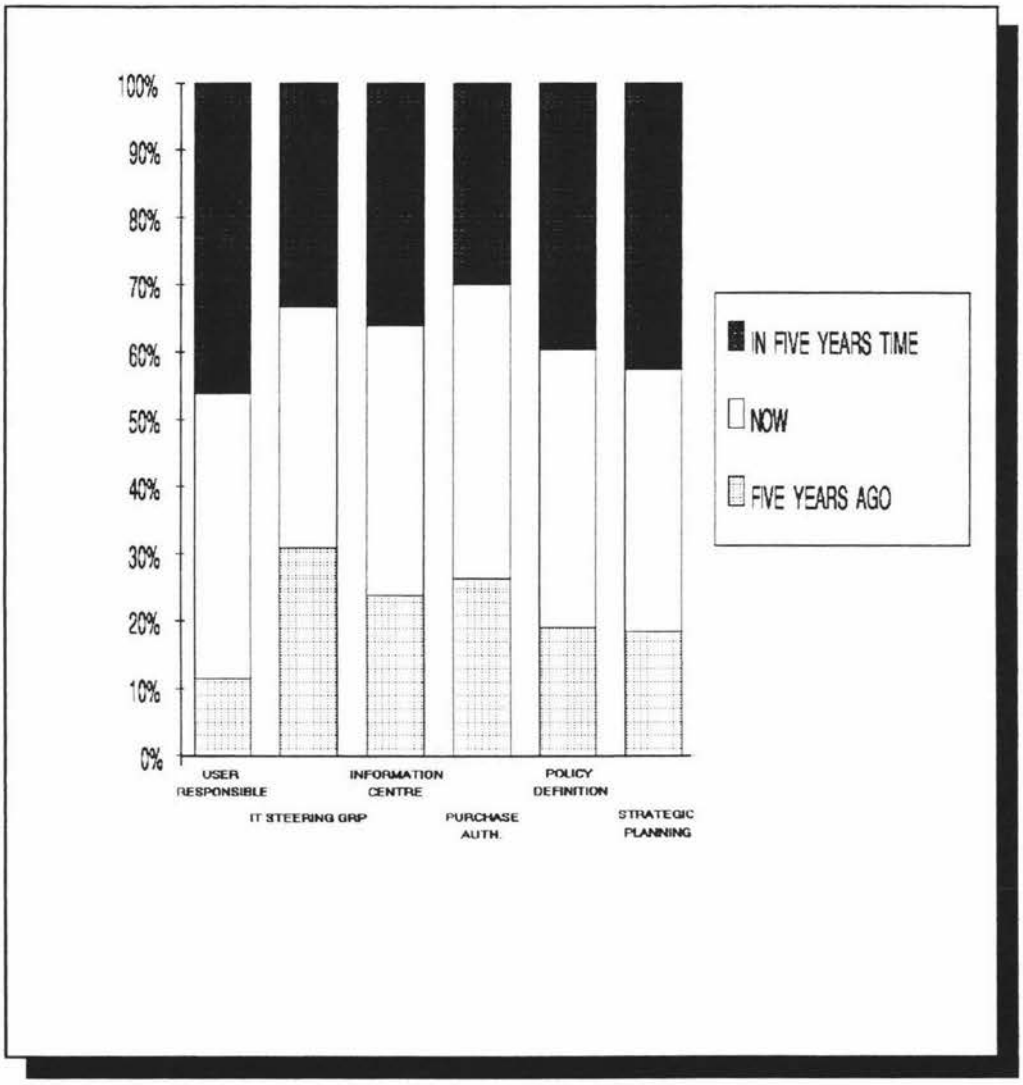

Figure [45]: Trends in methods of control and co-ordination for IT.

QUESTION C) 3, Major differences in IT project funding for SUBSET (29)

Funding controlled by	5 yrs ago	%	Now	%	In 5 yrs	%
Central budget	21	72.41%	18	62.07%	14	48.28%
Departmental budgets	3	10.34%	14	48.28%	14	48.28%
Steering Group	3	10.34%	7	24.14%	8	27.59%
Board/Investment Group	6	20.69%	6	20.69%	4	13.79%
Department's busines s plan						

Method of funding used...

Method of funding	5 yrs ago	%	Now	%	In 5 yrs	%
Purchase	25	86.21%	23	79.31%	21	72.41%
Hire Purchase	1	3.45%	0	0.00%	0	0.00%
Lease	5	17.24%	7	24.14%	9	31.03%
Exchange Hire	0	0.00%	0	0.00%	0	0.00%
Bureaux	3	10.34%	8	27.59%	6	20.69%

The following are the range of comments received in response to the request for open comment in relation to part two subsection (C). The comments are from the subset of *all those that completed Part 2.*

QUESTION C) 4, Invitation for OPEN COMMENT for SUBSET (46)

Have there been any other key changes affecting the organisation of the IT department over the last 5 years?

Formal IT department set up 2 years ago.

Multi-user systems upgrade in 1988.
Ongoing comms linkage of distribution centres.

1. IT dept. size has not changed. Extra resources obtained via outsourcing.
2. Downsizing to LAN/UNIX from MAINFRAME.
3. User controlled application development.

1. 4GLs
2. PC Networks
3. Support staff

Evolution of personal and departmental computing causes growing pains, see above "co-ordination and control".

Quality Control.

Applications decentralised.

Employment of IS manager as opposed to DP Manager, and direct reporting to MD.

MIS Manager employed introduction of standard methodology and planning

The move towards a closer working environment with our <company> sister company.

Use of case tools in system development.

Appointment of an IS manager, primarily tasked with focusing on the internal use of IS.

Communication & Data Processing merged over this last period.

Reduction in staff as well as Business Analysts working directly for product divisions.

1. Decentralisation of input prep.
2. User responsibility for systems.

Move to bureau processing from in-house.

Lack of Financial Resources for on-going development.

Completed 5 year plan end 1990 - Currently in transition.

1. More reliance on IS/IT professionals.
2. Increased role of Telecommunications.
3. Move to profit centre/cost recovery.

Major change away from development to postages.

Subsection (D) is analysed from within the subset of *those that have a formal IT strategy.*

QUESTION D) 2, Greater business orientation in IT for SUBSET (29)

10 or 34.48% STRONGLY AGREED with this statement
15 or 51.72% AGREED with this statement
3 or 10.34% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

The response to this question is in total alignment with similar questions asked of corporate management in that the overwhelming **majority agree** that there is a greater business orientation for information technology now than there has been in the past.

QUESTION D) 2, Criteria used to justify & prioritise IT for SUBSET (29)

Criteria	5 yrs ago	%	Now	%	In 5 yrs	%
Competitive disadvantage	4	13.79%	10	34.48%	11	37.93%
Core competences/CSFs	2	6.90%	6	20.69%	9	31.03%
Cost/benefit	11	37.93%	23	79.31%	21	72.41%
First in first out	4	13.79%	0	0.00%	0	0.00%
Management recommendation	14	48.28%	15	51.72%	13	44.83%
Mandatory projects	12	41.38%	8	27.59%	6	20.69%
Missions, goals and objective	5	17.24%	19	65.52%	20	68.97%
Political factors	7	24.14%	2	6.90%	2	6.90%
Profitability (IRR,NPV etc)	4	13.79%	13	44.83%	15	51.72%
Resource audit measures	1	3.45%	2	6.90%	3	10.34%
Skills shortage	1	3.45%	1	3.45%	1	3.45%
Strategic opportunity	5	17.24%	17	58.62%	22	75.86%
Technical novelty	4	13.79%	0	0.00%	0	0.00%
Value chain linkages/synergy	1	3.45%	2	6.90%	3	10.34%

QUESTION D) 3, Increasing competition for the supply of IT for SUBSET (29)

Situation five years ago:
0 or 0.00% suggested a VERY GREAT increase
8 or 27.59% suggested a GREAT increase
6 or 20.69% suggested a LITTLE increase
0 or 0.00% suggested a VERY LITTLE increase
6 or 20.69% suggested NO increase

Current situation:
2 or 6.90% suggested a VERY GREAT increase
11 or 37.93% suggested a GREAT increase
6 or 20.69% suggested a LITTLE increase
5 or 17.24% suggested a VERY LITTLE increase
5 or 17.24% suggested NO increase

Situation expected in five years time:
7 or 24.14% suggested a VERY GREAT increase
11 or 37.93% suggested a GREAT increase
3 or 10.34% suggested a LITTLE increase
4 or 13.79% suggested a VERY LITTLE increase
4 or 13.79% suggested NO increase

QUESTION D) 4, IT department needs to market its capabilities for SUBSET (29)

4 or 13.79% STRONGLY AGREED with this statement
15 or 51.72% AGREED with this statement
8 or 27.59% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

Do you market your IT services?...
Situation five years ago:
3 or 10.34% replied YES
23 or 79.31% replied NO

Current situation:
8 or 27.59% replied YES
20 or 68.97% replied NO

Situation expected in five years time:
19 or 65.52% replied YES
10 or 34.48% replied NO

If you do, have you...

Option	Used	%
Developed a marketing strategy?	4	13.79%
Established the marketing mix?	2	6.90%
Produced promotional material?	3	10.34%
Prepared IT newsletter or similar?	7	24.14%
IT advice user on outsourcing options		
Informal Held awareness seminars		
Regular reporting to management		

The following are the range of comments received in response to the request for open comment in relation to part two subsection (D). The comments are from the subset of *all those that completed Part 2.*

QUESTION D) 5, Invitation for OPEN COMMENT for SUBSET (53)

Are there any other key changes that have affected the culture of your IT organisation over the last 5 years?

1. Setup of IT group 2 years ago.
2. Change in structure of IT group (IT Manager made redundant) within last month.

Change in demand/supply over last year or two.
Not so easy to find jobs in other organisations so staff more stable,greater productivity.

User driven migration away from mainframe, non-dependence on in-house IT specialists, no major in-house development projects - all outsourced but controlled by IT in-house staff.

Growth of PCs and PC software.

1. End user involvement
2. End user computing
3. Microcomputing

Central IT function will develop away from "doing DP for users" to a more advisory, co-ordination, consulting role.

Quality control.

During that time all areas of the company have been computerised including POS in all branches for selling and stock control.

1. Name and future of <company>.
2. More Industry in NZ.
3. IT becoming a means of obtaining a comparative case.

Widespread introduction of PC's / Lanhave increased user "autonomy" / expectations.

Impact of decentralisation.

Move to vendor independence.

Lack of resources.

The IT organisation is responsible to provide IT services to meet the business needs principally by contracting external parties for development etc.

1. Decentralisation.
2. Business Unit ownership of systems, people, strategy.

1. Move from "generalists" to "specialists" in IS staffing.
2. Increasing rate of business change.
3. Emphasis on QM and customer service.
4. Internal customer has and will have greater choice of alternatives.

We have almost eliminated the IT organisation - it fills a co-ordinating role only.

Subsection (E) is analysed from within the subset of *those that have a formal IT strategy.*

QUESTION E) 1, Agreeing to quality and content of services for SUBSET (29)

Methods	5 yrs ago	%	Now	%	In 5 yrs	%
Workshops	3	10.34%	4	13.79%	7	24.14%
Workgroups	6	20.69%	15	51.72%	17	58.62%
Steering Committees	16	55.17%	15	51.72%	15	51.72%
Individual consultancy	10	34.48%	22	75.86%	21	72.41%
Feedback forms	3	10.34%	1	3.45%	6	20.69%
Questionnaires	5	17.24%	10	34.48%	12	41.38%
Service level agreements	1	3.45%	6	20.69%	10	34.48%
Quality circles	3	10.34%	5	17.24%	9	31.03%
P.I. audits						
Regular Mngmt review						

QUESTION E) 2, Users are more satisfied with IT services for SUBSET (29)

6 or 20.69% STRONGLY AGREED with this statement
18 or 62.07% AGREED with this statement
5 or 17.24% DISAGREED with this statement
0 or 0.00% STRONGLY DISAGREED with this statement

The level of service provided is...
Situation five years ago:
1 or 3.45% said EXCELLENT
4 or 13.79% said GOOD
10 or 34.48% said ADEQUATE
9 or 31.03% said COULD BE BETTER
2 or 6.90% said POOR

Current situation:
2 or 6.90% said EXCELLENT
20 or 68.97% said GOOD
4 or 13.79% said ADEQUATE
3 or 10.34% said COULD BE BETTER
0 or 0.00% said POOR

Situation expected in five years time:
16 or 55.17% said EXCELLENT
9 or 31.03% said GOOD
2 or 6.90% said ADEQUATE
1 or 3.45% said COULD BE BETTER
0 or 0.00% said POOR

QUESTION E) 3, Users' ability to adapt to change for SUBSET (29)

Do users adopt and use new systems more readily compared to 5 years ago?
7 or 24.14% said MUCH MORE QUICKLY
16 or 55.17% said QUICKER
4 or 13.79% said no change - SAME
0 or 0.00% said SLOWER
0 or 0.00% said MUCH MORE SLOWLY

Do users demand new systems or more from existing systems
compared with 5 years ago?
19 or 65.52% said MUCH MORE
9 or 31.03% said QUICKER
0 or 0.00% said no change - SAME
0 or 0.00% said LESS
0 or 0.00% said A LOT LESS

The following are the range of comments received in response to the request for open comment in relation to part two subsection (E). The comments are from the subset of *all those that completed Part 2.*

QUESTION E) 5, Invitation for OPEN COMMENT for SUBSET (46)

Are there any other key factors that have affected the relationship between the IT department and the end users in your organisation over the last 5 years?

1. Setting up of the IT group 5 years ago in competition with weak groups.
2. New staff required training in the business culture.

Decentralised processing and on-line remote users.

PC users become highly specialist such that IT staff cannot support to the required detail therefore outsource appropriate expertise at all times.

Wider spread of computing resources has increased the degree of the relationship.

User have demanded and received more autonomy, but the new rights also carry new responsibilities. this is where some adjustments are required.

Participation in business planning.

Users able to write own simple enquiries/reports.

1. Recognition of IT as crucial to business.
2. Emergence of the "Business Analyst".

Talking.

The increased use of personal computers.

Much greater user experience with computers and awareness of value to the "job".

1. Assimilations of PC in place of terminals.
2. More user involvement in development and greater user expectations.

End users are very much involved during the development of a new system or enhancements. This has improved the relationship a great deal.

1. Good communications.
2. Good personal involvement with users by IT staff.

Credibility through meeting requirements on time and within budget.

1. User education
2. Improvement of services
3. Re-focusing of IT direction/roll

Better joint knowledge and teamwork - less division.

1. Much higher expectations from internal customers.
2. Emphasis on QM techniques.

End user departments have to look after themselves now.

Subsection (F) is analysed from within the subset of *those that have a formal IT strategy.*

QUESTION F) 1, Changes in IT development techniques for SUBSET (29)

How much have the development techniques used in the IT dept. changed?
14 or 48.28% said A LOT
12 or 41.38% said QUITE A LOT
1 or 3.45% said A LITTLE
1 or 3.45% said HARDLY AT ALL
1 or 3.45% said NOT AT ALL

QUESTION F) 2, How has control changed in 5 years for SUBSET (29)

Control issue	A lot more		More		Less		A lot less	
Security	11	38%	15	52%	0	0%	4	14%
Configuration management	4	14%	17	59%	1	3%	4	14%
Capacity control	5	17%	15	52%	0	0%	4	14%
Data management	9	31%	18	62%	0	0%	4	14%
Network management	13	45%	10	34%	1	3%	4	14%
End user computing	17	59%	9	31%	0	0%	4	14%
Uptime								

QUESTION F) 4, The influence of international standards for SUBSET (29)

4 or 13.79% said A LOT
8 or 27.59% said QUITE A LOT
10 or 34.48% said A LITTLE
4 or 13.79% said HARDLY AT ALL
3 or 10.34% said NOT AT ALL

Have you introduced or adopted Open Systems in the last 5 years?
10 or 34.48% said YES
19 or 65.52% said NO

If yes, how much has this affected your operation?
1 or 3.45% said A LOT
5 or 17.24% said QUITE A LOT
4 or 13.79% said A LITTLE
2 or 6.90% said HARDLY AT ALL
3 or 10.34% said NOT AT ALL

In which areas have Open Systems affected your operation?

Open Systems consideration	Number	%
Development methodologies used	5	17.24%
Networking	10	34.48%
Computer supplier	8	27.59%
Operating systems	10	34.48%
Programming languages	3	10.34%
Integration	9	31.03%
Interoperability		
Databases		
Purchase Prices		
N/A		

The following are the range of comments received in response to the request for open comment in relation to part two subsection

(F). The comments are from the subset of *all those that completed Part 2.*

QUESTION F) 5, Invitation for OPEN COMMENT for SUBSET (46)

In what other ways has the IT department responded to changes in business pressures?

Become closer to business e.g. development teams sited with the business.

Removed responsibilities from bureau to in-house facilities because of costs, speed of response to change, better control of the management of change, flexibility.

EDI.

Participation in business planning.

1. More responsive
2. More cost effective
3. IS has become a true part of the business

1. System availability
2. Presentation of information
3. Timing
4. Accuracy
5. Security

New technology.

To be proactive in the management and strategic direction of the business providing timely solutions and competitive advantage.

1. Down size staff numbers
2. Utilization of staff and facilities
3. Provides with some tools to do the job required

Package development to support business charge.

1. More professional in attitude
2. More aware of company's business strategies

1. Embraced TQM
2. Seeking ISO 9001 registration

Quality of information now much better. Systems more efficient - lower staff overhead, better customer service.

By reducing the number of levels.

Focus on business requirements.

Subsection (G) is analysed from within the subset of *those that have a formal IT strategy.*

QUESTION G) 1, Balance of technological & business skills for SUBSET (29)

Situation 5 years ago:

Technical vs Business	Frequency	%
	4	13.79%
10-90	2	6.90%
20-80	1	3.45%
50-50	1	3.45%
60-40	3	10.34%
70-30	3	10.34%
80-20	5	17.24%
90-10	10	34.48%
	29	100.00%

Current situation:

Technical vs Business	Frequency	%
	1	3.45%
10-90	1	3.45%
30-70	4	13.79%
40-60	1	3.45%
50-50	9	31.03%
60-40	8	27.59%
70-30	5	17.24%
	29	100.00%

Situation expected in 5 years time:

Technical vs Business	Frequency	%
	1	3.45%
10-90	2	6.90%
20-80	4	13.79%
30-70	4	13.79%
40-60	3	10.34%
50-50	13	44.83%
60-40	1	3.45%
70-30	1	3.45%
	29	100.00%

QUESTION G) 2, Perspective on importance of qualifications for SUBSET (29)

Methods	More important	%	Less important	%
Academic	7	24.14%	10	34.48%
Business	19	65.52%	1	3.45%
Professional	17	58.62%	4	13.79%
Technical experience	19	65.52%	9	31.03%
Business experience	23	79.31%	2	6.90%

The most important qualification revealed was that of practical business experience, with academic qualification holding the least importance.

QUESTION G) 3, Rate of IT staff turnover for SUBSET (29)

How has the rate of turnover of IT staff changed over the last 5 years?
0 or 0.00% said turnover had INCREASED
20 or 68.97% said turnover had DECREASED
8 or 27.59% said turnover had NOT CHANGED

The following are the range of comments received in response to the request for open comment in relation to part two subsection (G). The comments are from the subset of *all those that completed Part 2.*

QUESTION G) 5, Invitation for OPEN COMMENT for SUBSET (46)

Have there been any other key changes affecting IT staff selection and development over the last 5 years?

1. Probably specialist RDBMS staff only will be required.
2. Business analysts will define needs based on CSF/business requirements.
3. Management will be required for outsourcing and contract control.
4. IT management will keep suppliers "honest".

1. Versatility
2. Personality
3. Ethics
4. Inter Person Skills

There is no shortage of IT staff anymore. In this day and age business and interpersonal skills are the most important attributes.

1. Communication skills
2. Teamwork

1. Business acumen
2. Ability to provide solutions to business demands

More competitive employment market.

Professional attitude.

Maturity, business experience, productivity, personality.

Volatility of business environment requires flexible staffing policies, variable hours, contract staffing.

3 Validity and reliability considerations

Certain questions arose both at the time of design and unfortunately after the first mailing of the questionnaire as to the value and reliability of responses to certain questions. In addition, some mistakes in layout and content were made which, whilst many of these were able to be amended or corrected in time for the second follow-up mailing, will still have caused an

inconsistency and have had an effect upon validity and reliability considerations.

The following describes various factors or errors in the questionnaire that are recognised as likely to have an **adverse effect** upon the validity or reliability of specific questions.

Part 1, B) Question ten seeks a key opinion on information technology (IT) as a competitively important area, and would be most valuable if answered by all respondents. Unfortunately, response to the question is restricted to only those that have formal corporate strategic plans due to an instruction in Part 1, B) Question two that directs those that do not plan, to move on to subsection (C). Analysis of this question will therefore be limited to the reduced subset of those that have formal corporate plans, but this will not overly distort the result.

Part 1, C) Question three, Part 2, D) Question three, Part 2, F) Question one and Part 2, G) Question four, all request the respondent to rank the alternatives provided in order of significance or importance. The responses to this type of question format were extremely varied and whilst many to their credit, followed instructions exactly, others were obviously confused or simply not interested. As a common format could not be determined from the completed questionnaires, these answers were omitted from the results.

CHAPTER V.

SUMMARY AND CONCLUSION

The research study has tackled the topic of the strategic management of information technology within the wider general subject of corporate strategic management. The topic is extremely complex and so the research study has been limited and divided so as to focus upon two specific tasks.

The first task, and the primary purpose of the study is to develop a conceptual overview of the strategic management of information technology which has been accomplished through an extensive review of past and present available literature and is imparted through the understanding derived from a systematic reading of the survey of the literature chapter.

The second task, constituting the secondary purpose of the study is an enquiry into information technology strategy formulation in practice. The enquiry, suitably limited to a select number of large New Zealand businesses, has been accomplished revealing an amazingly high level of interest and involvement by the respondents in the strategic management of IT.

This chapter presents a summary of the research and conclusions in relation to the findings of the study. In addition, a brief final

section is devoted to suggestions for the direction of further research in respect to the enquiry into information technology strategy formulation as practiced in New Zealand.

1 The survey of the literature

To survey the literature emerging from two traditionally separate fields of study in an attempt to present an overview on the evolution of strategic management might be regarded by many, as an overly ambitious task. In retrospect this may be true, but not so much owing to the volume of material, nor even the breadth of the subject. The major hindrance in the undertaking, in the author's opinion, has proven to be the nature of the beast itself, the "strategy" ideal, because the very essence of strategy, is that it be unique.

Therefore, whenever a successful strategic concept is identified and duplicated, it is no longer unique and owing to the nature of the strategy "beast" it becomes less effective, or less "strategic", and the ineffective strategy is subsequently altered or discarded so that a new unique strategy can in effect takes its place.

It has been in particular, when writers and theorists have attempted to dissect, to understand and document strategy, that

strategy has in fact become even less defined, less predictable and least understandable, simply because as soon as you attempt to limit strategy to a selection of possible alternatives or options, someone else will identify a strategic opportunity outside your limits and boundaries defeating your purpose for originally defining those limits and causing you to re-assess your methods and approach. This particular aspect is extremely obvious in the numerous short discourses by contemporary strategic management theorists.

Nevertheless, the method employed for the literature research was merely, (1) To start at a specified point in time gathering together the readily available works for that year or circa that year or time, and (2) To then read the texts and relate simply, the most salient portions in an easily readable review format so that any interested reader might be quickly informed and acquire knowledge on the topic much as anyone might, had they perhaps "grown" with the subject over time.

In respect of this research element, the understanding of the texts, the relating of the identified concepts back through review, and the literature survey in general can all be regarded as having been successfully accomplished, and as a consequence, a conceptual overview can and will be imparted to all and any who might systematically read the relevant chapter.

2 The questionnaire survey

The second requirement for the research study involved a questionnaire survey and enquiry into the level of impact that the strategic management of information technology has had within the professional business environment.

The hypothesis for the survey suggested that the response level for the organisations selected would probably be close to 24% of the mailout number of 200. It was in fact 27.5%, 3.5% greater than that expected and when considered against international expectations of around 8%, a very satisfactory response.

The hypothesis also anticipated that 80% of those organisations that did respond would indicate that their involvement in the strategic management of information technology was minimal and that there would be very few organisations that do actively promote strategic management and planning within both IT and corporate management functions.

The hypothesis was proved to be highly inaccurate. Of those respondents that completed part one of the questionnaire (CEO questionnaire), 81% stated that "Yes" they do have a formal corporate strategic plan and more than 25% also stating that they have had corporate strategic plans for more than 10 years. Of

those respondents that completed part two of the questionnaire (IS Director questionnaire), 63% stated "Yes" they had a formal IT strategic plan with a further 10% expecting to have plans in the near future.

Purposefully restricted to an enquiry only brief, the survey highlighted an overwhelmingly high level of interest and practical application of strategic management within both corporate and IT functions and an equally high level of formal strategic planning most likely to be currently in practice within many of the most successful businesses in New Zealand, assuming the survey sample is representative.

3 Implications and findings

For management academics and practitioners, the key element is information, and their attention should be drawn to the wide ranging emphasis on the "corporate" view of information that is evident in the information technology literature, and its considerable content and alignment with strategic management theory.

For information systems (IS) executives and scholars the key element is the adoption of an holistic attitude to all matters pertaining to information, for they are responsible for a most

important strategic resource in a field that shows no signs of slowing in times of constant change and unforeseeable developments.

Within the following two sections, specific findings from both the literature review and the questionnaire survey are presented. Their implications for academics and educational institutions, and for consultants, practitioners and their business organisations respectively are discussed.

3.1 For academics and educational institutions

The emphasis upon academics and educational institutions is to evaluate strategy formulation experiments by practitioners, methodologies and techniques developed and employed by theorists and consultants alike, and to examine their outcomes for the benefit of all and a personal accumulation of knowledge.

However, before any subsequent work can be started, whether it be a continuation of this study utilising the valuable data already gathered, or a new study seeking new information and responses, a word of warning needs to be imparted to all and any concerned.

The response to the questionnaire survey for this work has been - by international standards - exceptional and in the interests of

all future researchers it would be sensible to try and maintain a mutually beneficial relationship with intended respondents, whether individuals or business organisations. This can be promoted by quality correspondence and if possible the offering of something in return for the respondent's effort. A summary of results is ideal for this purpose.

In particular, and with reference to the comments made by those respondents that did not participate in the survey (page 193), there exits frustration on the part of many large organisations with the volume of questionnaire surveys and similar requests that they receive from educational institutions, and their inability to reply in a fair and helpful manner to all. For many, the only solution has been to decline without exception all such requests in order to alleviate the demand upon their overloaded resources.

In a personal conversation with the author subsequent to the survey, one executive remarked that this particular questionnaire was the third he had received of a similar nature from the same University and that if educational institutions were to better co-ordinate the efforts of their students to "build" upon earlier surveys, there would more likely be a concerted attempt on the part of individuals like himself to better accommodate the various requests.

This important comment has a direct bearing upon any recommendations for future research.

Significant findings from this study as they relate to academics and educational institutions centre on the emerging qualitative as well as quantitative approaches to strategic management. Tomorrow's managers must be able to integrate analysis with intuition. Human direction and motivation in times of uncertainty are often far more necessary and productive than rigid disciplines and tasks.

Quantitative study will still need attention however, but more likely driven by alternative ways of looking at the same requirement. The means-ways-ends approach might shortly replace ends-ways-means.

Information also must have a greater consideration within management study and likewise a corporate viewpoint must be impressed upon students of information systems. One highly emphasised result from the study was the reducing requirement for academic qualifications with preference for business experience taking the lead.

3.2 For practitioners and consultants

To a large extent, the implications concerning academics and educational institutions will also have an impact upon professionals in the field.

The significant issues to be considered by practitioners today are (1) Line management must become more involved in strategic management concerns and the management of information technology at their level, (2) Senior management (in particular CEO's and GM's) must become more aware of information and the capabilities and implications arising from advances in information technology, and (3) Information technology should be harnessed to support the firm's structure, be managed and exploited as a potential strategic weapon and be considered as inseparable from strategy in general.

4 Recommendations for future research

There is a need, and a great opportunity for this study to be extended, (1) Through further questionnaire data collection, (2) Through a more indepth analysis of the results, and/or (3) Through focused study furthering any of the general conclusions that have been made.

Potential researchers are encouraged to consider the analysis, comments and suggestions presented throughout this summary chapter in preparation of any further work in relation to this study as much capital can be gained through either further utilisation and expansion of the recorded information captured on the computerised database system or through the utilisation of this work as a primer for more focused research.

Due to the already high level of involvement of large New Zealand businesses in both corporate strategic management and the strategic management of information technology, there is a substantial lack of focused study on the relative successes achieved by these companies over time and the direct relationship of those successes or failures to formal strategic planning. Individual case studies and reports on these matters are also very hard to find.

The study also highlighted that a majority of respondents regarded IT as having produced a strategic benefit opportunity, with only a few of these confirming that this was the result of formal strategic planning. There is considerable opportunity to further investigate this matter.

This research report will be useful to academics, theorists and practitioners alike and can be utilised as (1) a general annotated bibliography of readily available past literature, (2) a tool for

rapidly reviewing how strategic management has evolved, (3) a source of quick reference for trends and significant findings within N.Z. businesses, or (4) where an individual has not yet encroached the subject, a starting point for their appreciation of the topic.

It will be useful to many individuals for whom it is my desire that this work contribute in some small way toward their considerating information and communication as the essence of our everyday lives, and that therefore the adoption of an holistic approach to each and every means for making information more communicable, more valuable, more accurate, more relevant and appropriate, and more easily and effectively communicated whether through the use of technology or not, is both a logical and a most desirable proposition.

APPENDIX A

MAILOUT - LETTERS & TOP200 N.Z. COMPANIES LIST

Appendix A provides additional reference material in relation to **Chapter III - Research Design**. Two letters and one list are presented;

1. Letter from first mailout dated 7 November 1991.

2. Letter from second mailout dated 7 December 1991.

3. Mailing list of top 200 New Zealand companies in alphabetical order.

Facsimile

MASSEY
UNIVERSITY

Palmerston North
New Zealand
Telephone (063) 69-099

SCHOOL OF
INFORMATION
SCIENCES

Mike Olson
P O Box 11-200,
WELLINGTON.
Ph. (04) 476-3775
Fax (04) 476-3021

7 November, 1991

Dear Sir/Madam,

I am making a study of strategic management and information technology strategy in large New Zealand businesses like yours. Specifically, the study covers the level of management involvement in the on-going development of corporate strategy and the nature and extent of IT consideration.

By using academic 'generics' as a base I hope to correlate theory with working practice.

While most of the information needed in this study can be obtained from the IT director, I am convinced that the results would be lacking a significant dimension if the expectations and the perception of the CEO are ignored. Consequently, I would like to solicit your participation by asking you to complete Part One of the enclosed questionnaire which will require about 10 minutes of your time.

I can assure you that all responses will be kept in the strictest confidence and that the results will ensure that no respondents can be specifically identified. The facsimile number provided is a direct line to a secure office at my residence.

Please pass on Part Two to the IT Director (or equivalent) whom I would like to ask to complete that section which will require about 15 minutes of their time. Please mail or fax the completed questionnaire to the address/fax above before 30 November 1991 if at all possible. If you would be interested in receiving a summary of the results, please indicate so on the last page of the questionnaire.

I want to thank you for helping to enrich our understanding of strategic management in practice as well as helping me to satisfy the dissertation requirements of Massey University's Master of Business Studies (MBS) program.

Yours sincerely,

Mike Olson

John Monin

AHoD, Dept. of Information Systems.

Facsimile

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Mike Olson
P O Box 11-200,
Wellington
NEW ZEALAND
Ph. 64 4 4763775
Fax. 64 4 4763021

7 December, 1991

Dear Sir/Madam,

Further to my letter of 7 November, 1991.

I am making a study of strategic management and information technology strategy in large New Zealand businesses and have mailed the enclosed questionnaire to yourself and the CEOs of all other top 200 New Zealand companies as listed in the Deloitte Ross Tohmatsu survey December, 1990.

To date I have received 60 replies, with 39 completed questionnaires. Of these, 27 have indicated an interest in receiving a summary of the results.

This level of response is well above what would be expected in say, the United States and is just below the New Zealand average however, I am hoping to increase the response to at least 50%, or 100 replies.

As the study investigates corporate strategy development and the nature and extent of IT consideration, if enough completed questionnaires are received for a particular industry, the results could provide some very useful **comparative guide-lines**. From an academic perspective, the University will hopefully be able to better align curriculum with actual business practice.

I can assure you that all responses will be kept in the strictest confidence and that the results will ensure that no respondents can be specifically identified.

Please consider participating by completing Part One of the enclosed questionnaire which will require at most 15 minutes of your time. If this is not possible, I would appreciate a quick note or facsimile. Part Two should be considered by the IT Director (or equivalent) and will require about 20 minutes of their time.

Please mail or fax the completed questionnaire to the address/fax above before 10 January 1992 if at all possible and, if you would be interested in receiving a summary of the results, please indicate so on the last page of the questionnaire.

I look forward to your reply and thank you for helping me in the completion of my MBS degree.

Yours sincerely,

Top 200 New Zealand Companies in Alphabetical Order

1	3M NZ Group (NZ)	AUCKLAND
3	AFFCO NZ	AUCKLAND
4	AMP New Zealand	WELLINGTON
5	ANZ Banking Group (NZ)	WELLINGTON
6	ASB Bank Limited	AUCKLAND 1001
7	AWA (NZ)	PORIRUA
9	Air New Zealand	AUCKLAND
10	Airways Corporation of New Zealand Ltd	WELLINGTON
11	Alcan (NZ)	AUCKLAND
12	Alexander Stenhouse Holdings (NZ)	AUCKLAND
8	Allflex SA Coordination Internationale	PALMERSTON NORTH
13	Alliance Freezing (Southland)	INVERCARGILL
14	Allied Foods (NZ)	AUCKLAND
2	Allied Mutual Insurance Ltd	CHRISTCHURCH
15	Alpine Dairy Company	TEMUKA
16	Amuri Corporation Limited	CHRISTCHURCH
17	Ansett Airlines (NZ)	AUCKLAND
18	Apparel Holdings	AUCKLAND
19	Arthur Barnett	DUNEDIN
20	Asian Properties	WELLINGTON
21	Auckland International Airport Ltd	AUCKLAND
22	BASF (NZ)	AUCKLAND
23	BNZ Finance	WELLINGTON
24	BP New Zealand	WELLINGTON
25	BTR Nylex Limited	AUCKLAND
26	Bank of New Zealand	WELLINGTON
27	Bay Milk Products Limited	EDGECUMBE
28	Bay of Plenty Fertiliser Ltd	MT MAUNGANUI
29	Baycorp Holdings	ROTORUA
30	Bayer New Zealand Ltd	AUCKLAND 1310
31	Brierley Investments	WELLINGTON
32	Britannia Brands NZ Limited	AUCKLAND
33	Broadway Industries	CHRISTCHURCH
34	Burns Philp (NZ)	AUCKLAND
35	C Itoh & Co (NZ)	AUCKLAND
36	Cadbury Schweppes Hudson	DUNEDIN
37	Caltex Oil (N.Z.) Limited	WELLINGTON 1
38	Canterbury Dairy Farmers	CHRISTCHURCH
40	Carter Holt Harvey	AUCKLAND
41	Cavalier Corporation Ltd	SOUTH AUCKLAND
42	Ceramco Corp	AUCKLAND
43	Cerebos Gregg's Limited	AUCKLAND
44	Chelsea Investments	AUCKLAND 1000
45	City Realties Limited	AUCKLAND
46	CoalCorp	WELLINGTON
47	Colgate-Palmolive Limited	WELLINGTON

48	Colonial Motor	WELLINGTON
49	Colonial Mutual Life	WELLINGTON
50	Comalco (NZ)	WELLINGTON
51	Commercial Union General Insurance (NZ)	WELLINGTON
52	Community Pharmacy	HAMILTON
53	Corporate Investments	AUCKLAND
54	Countrywide Bank	AUCKLAND
55	Databank Systems	WELLINGTON
56	Digital Equipment Corporation (NZ) Ltd	AUCKLAND 3
57	Donaghys Limited	DUNEDIN
58	DowElanco (NZ)	NEW PLYMOUTH
59	Du Pont (NZ)	AUCKLAND
60	Elders Resources NZFP	AUCKLAND
61	Electricity Corporation of NZ Ltd	WELLINGTON
62	Ernest Adams Ltd	CHRISTCHURCH 1
63	FAI Metropolitan Life Assurance (NZ)	AUCKLAND
64	Farmlands Trading Society	HASTINGS
39	Fay Richwhite & Co Ltd	WELLINGTON
65	Fernz Corporation Limited	AUCKLAND
66	Firestone (NZ)	CHRISTCHURCH
67	Fisher & Paykel Industries	AUCKLAND
68	Fletcher Challenge	AUCKLAND
69	Foodstuffs (Auckland)	AUCKLAND
70	Foodstuffs (South Island) Ltd	CHRISTCHURCH
71	Foodstuffs (Wgtn) Co-op Society Ltd	WELLINGTON
72	Ford Motor Co of NZ	AUCKLAND
73	Fortex Group	CHRISTCHURCH
74	Freightways Group	AUCKLAND
75	Fulton Hogan	DUNEDIN
76	GCS	WELLINGTON
77	GEC (New Zealand) Ltd	PORIRUA
78	GUS Wholesalers	CHRISTCHURCH
79	General Motors New Zealand Limited	UPPER HUTT
80	Glaxo (NZ)	PALMERSTON NORTH
81	Goodman Fielder Wattie (NZ)	AUCKLAND
82	Government Property Services	WELLINGTON
83	Guardian Royal Exchange	AUCKLAND 9
84	Hallenstein Glasson	AUCKLAND
85	Hewlett Packard (NZ)	WELLINGTON
86	Hoechst (NZ)	AUCKLAND
87	Honda (NZ)	AUCKLAND
88	Hume Industries	AUCKLAND
89	IBM (NZ)	WELLINGTON
90	Independent Newspapers	WELLINGTON
91	Jarden Morgan	WELLINGTON
93	Kingsgate International	AUCKLAND
94	Kiwi Co-op Dairies	HAWERA
95	Kodak (NZ)	AUCKLAND
96	Landcorp	WELLINGTON
97	Lasercorp Holdings	CHRISTCHURCH
98	Lion Nathan	AUCKLAND
99	Lyttelton Port	LYTTLETON
101	Magnum Corp	AUCKLAND

102	Mainzeal Group	AUCKLAND
103	Mair Astley & Co Limited	CHRISTCHURCH
104	Marsh & McLennan	AUCKLAND
105	Mazda Motors (NZ)	AUCKLAND
106	McDonalds (NZ)	AUCKLAND
107	McKechnie Pacific	AUCKLAND
108	Merck Sharp & Dohme (NZ)	AUCKLAND
109	Michael Hill Intl	WHANGAREI
110	Milburn New Zealand Ltd	CHRISTCHURCH
111	Mitre 10 (New Zealand) Ltd	AUCKLAND, 1330
100	Mitsubishi Motors NZ Ltd	PORIRUA
112	Mitsui & Co (NZ)	AUCKLAND
113	Moa-Nui Co-op Dairies	INGLEWOOD
114	Mobil Oil NZ Ltd	WELLINGTON
115	Motor Trade Finances	DUNEDIN
116	Mount Cook Group	CHRISTCHURCH
117	Mutual Pacific Corporation Ltd	CHRISTCHURCH
118	NCR (NZ)	AUCKLAND
119	NZ Dairy Group	HAMILTON
120	NZ Forestry Corp	WELLINGTON
121	NZ Industrial Gases (NZ)	WELLINGTON
122	NZ Lotteries Commission	WELLINGTON
123	NZ Post	WELLINGTON
124	NZ Railways Corp	WELLINGTON
127	National Australia Bank (NZ) Ltd	AUCKLAND
128	National Bank NZ	WELLINGTON
129	National Mutual Life (NZ)	WELLINGTON
130	National Provident Fund	WELLINGTON
131	Nestle New Zealand Limited	AUCKLAND 1
132	New Zealand Light Leathers	TIMARU
126	New Zealand Synthetic Fuels Corp. Ltd	NEW PLYMOUTH
133	Nissan Datsun Holdings (NZ)	AUCKLAND
134	Northland Co-op Dairy	WHANGAREI
135	Northland Port Corp NZ	WHANGAREI
136	Norwich Union Life	WELLINGTON
137	Nuplex Industries Limited	AUCKLAND 6
138	Otis Elevator (NZ)	AUCKLAND
139	Owens Group	AUCKLAND
140	PDL Holdings	CHRISTCHURCH
141	Pacer Kerridge Corporation Limited	AUCKLAND 1
142	Pacific Dunlop Holdings (NZ)	LOWER HUTT
143	Paynter Corp	CHRISTCHURCH
144	Philips (NZ)	AUCKLAND
145	Port Nelson	NELSON
146	Port of Tauranga	MT MAUNGANUI
147	Port of Wellington	WELLINGTON
148	Ports of Auckland	AUCKLAND
149	Primary Producers Co-op Society	DUNEDIN
150	Prudential Assurance	WELLINGTON
151	Pyne Gold Corp	CHRISTCHUCH
152	Rank Group Limited	AUCKLAND
153	Ravensdown Corp	DUNEDIN
154	Reckitt & Colman (N.Z.) Ltd	AUCKLAND

155	Reid Farmers	DUNEDIN
156	Renouf Corp	AUCKLAND
157	Retail Traders Society	AUCKLAND
158	Rheem New Zealand Limited	AUCKLAND
159	Richmond Limited	HASTINGS
160	Robt Jones Investment Group	WELLINGTON
161	Royal Insurance Fire & General (NZ) Ltd	AUCKLAND
92	S C Johnson & Son Pty Ltd	AUCKLAND
162	SIMU Mutual Insurance	CHRISTCHURCH
163	Salmond Smith Biolab	AUCKLAND
164	Sanford	AUCKLAND
165	Security and General Insurance (NZ)	AUCKLAND
166	Shell NZ Holding Company Ltd	WELLINGTON
167	Smiths City Group	CHRISTCHURCH
168	Southern Cross Building Society	AUCKLAND
169	Southland Building & Investment Society	INVERCARGILL
170	State Insurance	WELLINGTON
171	Steel & Tube Holdings	WELLINGTON
172	Stevens KMS Corp	AUCKLAND
173	Sun Alliance Insurance Group	AUCKLAND
174	Sun Alliance Life	WELLINGTON
175	Suzuki (NZ)	WANGANUI
176	TSB Bank	NEW PLYMOUTH
178	Telecom Corporation of New Zealand Ltd	WELLINGTON
179	Television New Zealand	AUCKLAND
177	The Farmer's Co-operative Org. Soc. Ltd	HAWERA
125	The New Zealand Refining Company Ltd	WHANGAREI
180	The Paper House	WELLINGTON
181	Tower Corporation Holdings Limited	WELLINGTON
182	Toyota (NZ)	WELLINGTON
183	Transmark Corp	AUCKLAND
184	Trust Bank Wellington Ltd	WELLINGTON
185	Turners & Growers	AUCKLAND
186	U-Bix Business Machines	AUCKLAND
187	Unilever (NZ)	WELLINGTON
188	Union Shipping Group	AUCKLAND
189	Unisys New Zealand Limited	WELLINGTON
190	United Banking Group	CHRISTCHURCH
191	WEL Energy Group Ltd	HAMILTON
192	Waikato Valley Co-op Dairies	CAMBRIDGE
193	Wang (NZ)	AUCKLAND
194	Weddel Crown Corp	WELLINGTON
195	Westpac (NZ)	WELLINGTON
196	Williams & Kettle	NAPIER
197	Wilson & Horton Ltd	AUCKLAND
198	Wilson Neil	DUNEDIN
199	Works Corporation	WELLINGTON
200	Zendel Industries (NZ)	AUCKLAND

APPENDIX B

QUESTIONNAIRE - PART 1 & PART 2

Appendix B presents a copy of both portions of the questionnaire as distributed during the mailout processes.

Survey Questionnaire

Part 1:

*This section is intended tor the **Chief Executive Officer** or **Chief Strategist** within the organisation.*

Please use a thick pointed pen or pencil (especially if returning by facsimile), thank you.

A) You and your organisation

1. Name: .....

Title: .....

Contact phone number: .....

2. Company: .....

Address: .....

.....

.....

3. In which of the following general industry classifications would you place your organisation?

Please tick the most appropriate box

- Agricultural products ☐
- Automotive ☐
- Banking and finance ☐
- Building products ☐
- Chemicals and pharmaceuticals ☐
- Communications and media ☐
- Computers and office equipment ☐
- Diversified corporates ☐
- Electrical ☐
- Food (processed) ☐
- Insurance ☐
- Investment ☐
- Merchants and agents ☐
- Oil, gas and solid fuels ☐
- Property and construction ☐
- Retailers and wholesalers ☐
- State-owned enterprises ☐
- Transport and tourism ☐
- Other (please specify):

..... ☐

The questions for Part 1 continue over the next four pages, and should only take 15 minutes or so to complete. Please send the entire questionnaire (parts 1 & 2) to the post office box below, or fax to the facsimile number provided. All information received will be kept strictly confidential.

4. Approximate number of employees: .....

Approx. number of 'white collar' employees: .....

5. Existing market is predominantly...

Please circle the appropriate response

National International Both

Your organisation's product structure can best be described as...

Please tick the appropriate box

- Single product ☐
- Several related products, one major ☐
- Several major, related products ☐
- Several unrelated products, one major ☐
- Several major, unrelated products ☐

6. Which best describes your organisation...

Please circle or enter the appropriate response

National Multinational Global Other.....

Corporate management is predominantly...

Please circle the appropriate response

Centralised Decentralised

7. Please specify the number of management layers covering your entire organisation structure...

Number of management layers .....

Your firm's organisational structure is based primarily on...

Please tick the appropriate boxes

- Functions ☐
- Geographical location ☐
- Products ☐
- Other (please specify):

..... ☐

B) Corporate strategy and strategic management

1. How has the predictability of your organisation's environment changed and how is it expected to change in the future?

Please tick one box per time period

Situation of:	5 yrs ago	Now	Expected next 5 yrs
Near certainty	☐	☐	☐
Risk	☐	☐	☐
Uncertainty	☐	☐	☐

2. Do you have a formal corporate strategic plan?

Yes No Planned *If not yes, please move on to C)*

When was the last update of the strategic plan performed?

...../.....
(month & year)

3. The corporate strategic plan is updated...

Please circle or enter the appropriate response

Annually every 2 yrs 3 years 4 years 5 yrs .....
(other)

It generally covers...

Please circle the appropriate response

1-2 years 3-5 years 6-10 years More than 10 years

...and has existed in your organisation for...

Please circle the appropriate response

1-2 years 3-5 years 6-10 years More than 10 years

4. Strategy plans for your organisation's subunits (SBU's, divisions or functions) are developed by...

Please tick the appropriate boxes

Each individual subunit ☐
CEO ☐
Planning staff ☐
External consultants ☐
Others (please specify):

..... ☐

..... ☐

5. In relation to the development of subunit strategy plans, the corporate strategic plan is developed...

Please circle or enter the appropriate response

Before After During .....
(other)

6. In relation to the corporate strategic plan, please indicate the likely generator or source of information for each of the following steps...

Please tick the appropriate boxes

	Corporate	Subunit	External
Mission definition	☐	☐	☐
Goals and objectives setting	☐	☐	☐
Environmental analysis	☐	☐	☐
Resource analysis	☐	☐	☐
Alternative strategies development	☐	☐	☐
Strategy selection	☐	☐	☐
Preparation of functional plans	☐	☐	☐
Monitoring implementation	☐	☐	☐
Audit/revising of plan	☐	☐	☐

7. What methods/techniques do you use in the development of your corporate strategic plan?

Please tick the appropriate boxes

Analysis of environmental influences ☐
Budgeting (capital, revenue, zero based) ☐
Business nature/culture/power analysis ☐
Comparative analysis:
(historical/industry norms/experience curve) ☐
Competitive environment (5 forces model) ☐
Core or distinctive competence ☐
Cost/benefit analysis ☐
Decision matrices ☐
Decision trees ☐
Direction alternatives:
('do nothing', withdraw, consolidate, diversify...) ☐
Feasibility ☐
Financial ratios ☐
Flexibility analysis ☐
Generic strategies (cost leadership, differentiation, focus) ☐
Key assumption recognition and testing ☐
Lifecycle model ☐
Method alternatives :
(acquisition, internal or joint development) ☐
Mission, goals and objectives setting ☐
Nature of environment (static/dynamic/complex) ☐
Network analysis (critical path) ☐
Political risk (stakeholders, game theory) ☐
Product portfolio (BCG) ☐
Profitability (IRR, DCF, NPV, ROCE, payback) ☐
Resource audit (physical, human, financial, intangible) ☐
Resource control measures ☐
Resource utilisation measures ☐
'Rule of thumb' comparison ☐
Sensitivity analysis ☐

7. (Continued...)
Please tick the appropriate boxes

Skills analysis ☐
Simulation modelling ☐
Strategic group analysis ☐
Strategic plan audit ☐
Synergy (linkage between activities) ☐
SWOT ☐
Value chain analysis ☐
Others (please specify):

..... ☐

..... ☐

8. The corporate strategic plan and planning process tends to be...
Please circle the appropriate responses

Out of date	Detailed	Up-to-date
Long-term	General	Short-term
Contingency oriented		Ignored or overlooked
Flexible		Inflexible

Others (please specify):.....

.....

.....

9. The data collection and information gathering process tends to be...
Please circle the appropriate responses

Out of date	Detailed	Up-to-date
Duplicated	Summarised	Inaccurate
Retained after		Destroyed after

Others (please specify):.....

.....

.....

10. In your organisation's competitive environment, information technology (IT) is a competitively important area.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

C) The strategic role and relevance of information technology (IT)

1. How would you describe the existing role of IT within your organisation?
Please tick the appropriate box

Information technology:
Is a primary product/service ☐
Provides crucial internal services ☐
Provides non-critical internal support services ☐
Is not an essential product or service ☐
Other (please specify):

..... ☐

2. How has your organisation's attitudes towards the IT industry changed and how is it expected to change in the future?
Please tick one box per time period

IT is regarded as:	5 yrs ago	Now	In 5 yrs
A strategic resource	☐	☐	☐
A business resource	☐	☐	☐
A business expense	☐	☐	☐
An administration expense	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

3. In your organisation there has been more emphasis placed on the strategy for IT in the last 5 years.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

Where has this emphasis been placed?
Please rank those applicable in order of importance:
1 = most important, 10 = least important

Alignment of IT with the business ☐
Improvement of mgt information ☐
Use of multiple suppliers ☐
Implementation of networks ☐
Reduction of maintenance ☐
Reduction of development backlog ☐
Updating of operational systems ☐
Improvement of quality ☐
Others (please specify):

..... ☐

..... ☐

4. Interest and awareness of IT at Board level...
Please tick one box per time period

	5 yrs ago	Now	Expected next 5 yrs
Very high	☐	☐	☐
High	☐	☐	☐
Low	☐	☐	☐
Very little	☐	☐	☐

The proportion of Board members with PC's on their desks...

	5 yrs ago	Now	In 5 yrs
Proportion (as a fraction):	.....	.....	.....

Software used by Board members
Please tick the appropriate boxes

	5 yrs ago	Now	In 5 yrs
Executive Information System	☐	☐	☐
Electronic Mail/Office Automation	☐	☐	☐
Strategy development tools	☐	☐	☐
Links to other systems	☐	☐	☐
Spreadsheets	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

5. Business line managers in your organisation have become much more IT aware over the last 5 years.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

Business managers will start to take on IT management responsibilities during the 1990's.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

6. Is the IT function represented at Board level?
Please tick one box per time period

	5 yrs ago	Now	Expected in 5 yrs
Yes	☐	☐	☐
No	☐	☐	☐

If not, to whom does the IT function report?

5 years ago .....

Now .....

Expected in 5 years .....

7. Has the IT function produced a strategic benefit or opportunity for competitive advantage over the last 5 years?
Please circle the appropriate response

Yes No

If yes...
To what extent has the benefit been exploited?

A lot Quite a lot Not at all A little Hardly at all

...and was the benefit the result of formal planning?
Please circle the appropriate response

Yes No Partially

8. Are there any other key changes affecting the strategic role of IT over the last 5 years?

.....

.....

.....

.....

.....

.....

This is the end of Part 1. Thank you for taking the time to answer my questions - your help is most valuable.

The entire questionnaire (parts 1 & 2) can be either mailed to the post office box, or faxed to the facsimile number provided below.

Please ensure that your completed questionnaire is returned by 30 November 1991.

All information received will be kept strictly confidential.

Survey Questionnaire

Part 2:

*This section is intended tor the **Director of Information Systems** or **Chief IS Strategist** within the organisation.*

Please use a thick pointed pen or pencil (especially if returning by facsimile), thank you.

A) You and your organisation

1. Name: .....

Title: .....

Contact phone number: .....

2. Company: .....

3. Approximate number of IT employees: .....

Estimated percentage of all your organisation's employees who require IT input or output every week:
Please tick one box per time period

	5 yrs ago	Now	In 5 yrs
1%-25%	☐	☐	☐
25%-50%	☐	☐	☐
50%-75%	☐	☐	☐
75%-100%	☐	☐	☐

4. IT management for the entire organisation is predominantly...
Please circle the appropriate response

Centralised Decentralised

B) The strategic role of IT

1. Do you have a formal IT strategy?

Yes No Planned *If not yes, please move on to C)*

The questions for Part 2 continue over the next two pages, and should only take 20 minutes or so to complete. Please send the entire questionnaire (parts 1 & 2) to the post office box below, or fax to the facsimile number provided. All information received will be kept strictly confidential.

When was the last update of the IT strategy performed?

...../.....
(month & year)

2. The IT strategy plan is updated...
Please circle or enter the appropriate response

Annually every 2 yrs 3 years 4 years 5 yrs .....
(other)

It generally covers...
Please circle the appropriate response

1-2 years 3-5 years 6-10 years More than 10 years

...and has existed in your organisation for...
Please circle the appropriate response

1-2 years 3-5 years 6-10 years More than 10 years

3. Strategy plans for the IT function are developed by...
Please tick the appropriate boxes

Director of IS/IT ☐
CEO ☐
Planning staff ☐
External consultants ☐
Others (please specify):

..... ☐

..... ☐

4. What methods/techniques do you use in the development of your IT strategy plan?
Please tick the appropriate boxes

Analysis of environmental influences ☐
Budgeting (capital, revenue, zero based) ☐
Business nature/culture/power analysis ☐
BSP ☐
Comparative analysis:
(historical/industry norms/experience curve) ☐
Competitive environment (5 forces model) ☐
Core or distinctive competence/CSFs ☐
Cost/benefit analysis ☐
Decision matrices ☐
Decision trees ☐

4. (Continued...)
Please tick the appropriate boxes

Direction alternatives:
('do nothing', withdraw, consolidate, diversify...) ☐
Feasibility ☐
Financial ratios ☐
Flexibility analysis ☐
Generic strategies (cost leadership, differentiation, focus) ☐
Investment strategy analysis ☐
Key assumption recognition and testing ☐
Lifecycle model ☐
Method alternatives :
(acquisition, internal or joint development) ☐
Mission, goals and objectives setting ☐
Nature of environment (static/dynamic/complex) ☐
Network analysis (critical path) ☐
Political risk (stakeholders, game theory) ☐
Product portfolio (BCG) ☐
Profitability (IRR, DCF, NPV, ROCE, payback) ☐
Resource audit (physical, human, financial, intangible) ☐
Resource control measures ☐
Reasource utilisation measures ☐
'Rule of thumb' comparison ☐
Sensitivity analysis ☐
Skills analysis ☐
Simulation modelling ☐
Stages of growth ☐
Strategic group analysis ☐
Strategic plan audit ☐
Synergy (linkage between activities) ☐
SWOT ☐
Value chain analysis ☐
Others (please specify):

..... ☐

..... ☐

5. Which of the following components are incorporated into your IT strategy plan?
Please tick the appropriate boxes

Alternative business projections ☐
Alternative technology projections ☐
Contingency plans ☐
Database plans ☐
Financial projections ☐
Hardware ☐
Organisational design ☐
Software ☐
Staff development ☐
System development projects ☐
Telecommunications plans ☐
Organisational design ☐
Others (please specify):

..... ☐

..... ☐

6. The IT strategy plan tends to be...
Please circle the appropriate responses

Out of date Comprehensive Up-to-date

Ignored Focused on technology Overlooked

Focused on applications

Others (please specify):.....

.....

.....

7. In your organisation's ITenvironment, new information technologies are identified, evaluated and assimilated when needed.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

C) IT and the structure of the organisation

1. How has the IT department changed over the last 5 years?
Please circle the appropriate responses

Increasingly centralised Increasingly decentralised

Fewer employees More employees Same no of employees

How has the degree of autonomy in your user departments changed?
Please tick one box per time period

The autonomy of user departments is:	5 yrs ago	Now	Expected in 5 yrs
High	☐	☐	☐
Medium	☐	☐	☐
Low	☐	☐	☐

2. Is IT in user departments controlled and co-ordinated from the central IT department?
Please circle the appropriate answer

Yes No Partially

Which of the following methods of control and co-ordination have you found necessary and when?
Please tick the appropriate boxes

	5 yrs ago	Now	Expected in 5 yrs
Formal strategic planning	☐	☐	☐
Policy/standards definition	☐	☐	☐
Authorisation of purchases	☐	☐	☐
Information Centre	☐	☐	☐
IT Steering Group	☐	☐	☐
Responsibility devolved to user	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

3. What major differences are there in the way IT projects are funded?
Please tick the appropriate boxes

IT project funding is controlled via:	5 yrs ago	Now	Expected in 5 yrs
Central budget	☐	☐	☐
Departmental budgets	☐	☐	☐
Steering Group	☐	☐	☐
Board/Investment Group	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

Method of funding used:

	5 yrs ago	Now	Expected in 5 yrs
Purchase	☐	☐	☐
Hire Purchase	☐	☐	☐
Lease	☐	☐	☐
Exchange Hire	☐	☐	☐
Bureaux	☐	☐	☐
Other (please specify):			
.....	☐	☐	☐

4. Have there been any other key changes affecting the organisation of the IT department over the last 5 years?

.....

.....

.....

.....

D) The IT services culture

1. How are the major concerns of the IT industry changing?
Please tick the 3 most appropriate boxes per time period to indicate greatest areas of concern

	5 yrs ago	Now	Expected in future
System delivery dates	☐	☐	☐
Productivity	☐	☐	☐
IT standards	☐	☐	☐
Quality	☐	☐	☐
Support	☐	☐	☐
Training	☐	☐	☐
User department autonomy	☐	☐	☐
Alignment with business strategy	☐	☐	☐
Value for money	☐	☐	☐
Need to market services	☐	☐	☐
Obtaining/retaining staff	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

2. The IT department has developed a greater business orientation over the last 5 years.
Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

Which of the following criteria are used to prioritise and justify IT services?
Please tick the appropriate boxes

	5 yrs ago	Now	Expected in future
Competitive disadvantage	☐	☐	☐
Core competences/CSFs	☐	☐	☐
Cost/benefit	☐	☐	☐
First in first out	☐	☐	☐
Management recommendation	☐	☐	☐
Mandatory projects	☐	☐	☐
Mission, goals and objectives	☐	☐	☐
Political factors	☐	☐	☐
Profitability (IRR, NPV etc)	☐	☐	☐
Resource audit/measures	☐	☐	☐
Skills shortage	☐	☐	☐
Strategic opportunity	☐	☐	☐
Technical novelty	☐	☐	☐
Value chain linkages/synergy	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

3. Do you face greater competition for the supply of IT services, and from what sort of organisation?

Please tick one box per time period

The competition for the supply of IT services to your organisation is:

	5 yrs ago	Now	Expected in future
Very great	☐	☐	☐
Great	☐	☐	☐
Little	☐	☐	☐
Very little	☐	☐	☐
None	☐	☐	☐

Competition is from...

Please rank only those applicable in order of importance:
1 = most important, 6 = least important

Software houses ☐
Other internal divisions ☐
User departments ☐
Outsourcing organisations (Bureau, FM) ☐
Others (please specify):

..... ☐

..... ☐

4. The IT department now needs to market its capabilities more effectively.

Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

Do you market your IT services?

Please tick one box per time period

	5 yrs ago	Now	Expected in future
Yes	☐	☐	☐
No	☐	☐	☐

If you do, have you...

Please tick the appropriate boxes

Developed a marketing strategy? ☐
Established the marketing mix? ☐
Produced promotional material? ☐
Prepared IT newsletter or similar? ☐
Others (please specify):

..... ☐

..... ☐

5. Are there any other key changes that have affected the culture of your IT organisation over the last 5 years?

.....

.....

.....

.....

.....

.....

E) The provision of user support

1. What methods do you use to agree with your users the quality and content of the services you provide?

Please tick the appropriate boxes

	5 yrs ago	Now	Expected in future
Workshops	☐	☐	☐
Workgroups	☐	☐	☐
Steering Committees	☐	☐	☐
Individual consultancy	☐	☐	☐
Feedback forms	☐	☐	☐
Questionnaires	☐	☐	☐
Service level agreements	☐	☐	☐
Quality circles	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

2. Users are more satisfied with the level of service they receive now than 5 years ago.

Please circle the appropriate response

Strongly Agree Agree Disagree Strongly Disagree

The level of service provided is...

Please tick one box per time period

	5 yrs ago	Now	Expected in future
Excellent	☐	☐	☐
Good	☐	☐	☐
Adequate	☐	☐	☐
Could be better	☐	☐	☐
Poor	☐	☐	☐

What methods are used to measure user satisfaction?
Please tick one box per time period

	5 yrs ago	Now	Expected in future
Questionnaire/opinion survey	☐	☐	☐
Helpdesk/Hotline complaints	☐	☐	☐
Feedback forms	☐	☐	☐
User Groups	☐	☐	☐
Training workshops feedback	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐

3. Do users adopt and use new systems more readily compared to 5 years ago?
Please circle the appropriate response

Much more quickly Quicker Same Slower Much more slowly

Why? .....

.....

.....

.....

Do users demand new systems or more from existing systems compared with 5 years ago?
Please circle the appropriate response

Much more Quicker Same Less A lot less

4. Which methods of user support have you adopted?
Please tick the appropriate boxes

	5 yrs ago	Now	Expected in future
Helpdesk	☐	☐	☐
Hotline	☐	☐	☐
Information Centre	☐	☐	☐
In-house training	☐	☐	☐
System documentation	☐	☐	☐
On-line system help	☐	☐	☐
Computer-based training	☐	☐	☐
Department support groups	☐	☐	☐
Others (please specify):			
.....	☐	☐	☐
.....	☐	☐	☐
.....	☐	☐	☐

5. Are there any other key factors that have affected the relationship between the IT department and the end users in your organisation over the last 5 years?

.....

.....

.....

.....

.....

F) Responding to business/ technical changes

1. Have the development techniques used in the IT department changed over the last 5 years?
Please circle the appropriate response

A lot Quite a lot Not at all A little Hardly at all

Why?
Please rank those applicable in order of importance:
1 = most important, 10 = least important

Pressures on productivity	☐
User involvement	☐
Tighter deadlines	☐
Strategic nature of developments	☐
New technology available	☐
Quality	☐
Demands for integration	☐
Others (please specify):	
.....	☐
.....	☐

How?
Please rank those applicable in order of importance:
1 = most important, 10 = least important

Use of standards/methodologies	☐
Use of development workbenches	☐
Use of database/dictionary	☐
Change of programming languages	☐
Greater use of participation	☐
Use of packaged software	☐
Prototyping	☐
Delivery of modular applications	☐
Others (please specify):	
.....	☐
.....	☐

2. How have your requirements for operational control changed over the last 5 years?

Please tick the appropriate boxes to show where the emphasis has changed

	A lot more	More	Less	A lot less
Security	☐	☐	☐	☐
Configuration mgt	☐	☐	☐	☐
Capacity control	☐	☐	☐	☐
Data management	☐	☐	☐	☐
Network management	☐	☐	☐	☐
End user computing	☐	☐	☐	☐
Others (please specify):				
.....	☐	☐	☐	☐
.....	☐	☐	☐	☐

3. How has the IT department's business changed?

Please estimate percentage split of effort on core business areas

	5 yrs ago	Now	Expected in 5 yrs
Maintenance	____	____	____
New Developments	____	____	____
Support	____	____	____
Training	____	____	____
Others (please specify):			
.....	____	____	____
.....	____	____	____

4. How have international standards affected your operation over the last 5 years?

Please circle the appropriate response

A lot Quite a lot Not at all A little Hardly at all

Have you introduced or adopted Open Systems standards in the last 5 years?

Please circle the appropriate response

Yes No

If yes...

How has this affected your operation?

A lot Quite a lot Not at all A little Hardly at all

In which areas have Open Systems affected your operation?

Please tick the appropriate boxes

Development methodologies used	☐
Networking	☐
Computer supplier	☐
Operating systems	☐
Programming languages	☐
Integration	☐
Others (please specify):	
.....	☐
.....	☐

5. In what other ways has the IT department responded to changes in business pressures?

.....

.....

.....

.....

.....

.....

G) Human resource development in IT

1. How is the balance between technological and business skills of IT staff changing?

Please circle the appropriate response

5 years ago:

Technical	90	80	70	60	50	40	30	20	10
Business	10	20	30	40	50	60	70	80	90

Now:

Technical	90	80	70	60	50	40	30	20	10
Business	10	20	30	40	50	60	70	80	90

Expected in 5 years:

Technical	90	80	70	60	50	40	30	20	10
Business	10	20	30	40	50	60	70	80	90

2. What types of qualifications have become more or less important in IT staff selection?

Please tick the appropriate boxes

	More Important	Less Important
Academic	☐	☐
Business	☐	☐
Professional	☐	☐
Technical experience	☐	☐
Business experience	☐	☐
Others (please specify):		
.....	☐	☐
.....	☐	☐

3. How has rate of turnover of IT staff changed over the last five years?

Please circle one response

Increased Decreased No change

4. How does the IT department maintain up-to-date IT knowledge?

Please rank in order of significance

	5 yrs ago	Now	In 5 yrs
Training courses			
Product/Technical seminars			
Specific IT seminars			
Periodicals/Computing press			
Supplier sales teams			
Direct mail shots			
Research projects			
Others (please specify):			
.....			
.....			

5. Other key changes affecting IT staff selection and development over the last 5 years and the coming 5 years:

.....

.....

.....

.....

.....

.....

.....

This is the end of Part 2. Thank you for taking the time to answer my questions - your help is most valuable and appreciated as there were quite a few to answer.

The entire questionnaire (parts 1 & 2) can be either mailed to the post office box, or faxed to the facsimile number provided below.

Please ensure that your completed questionnaire is returned by 30 November 1991.

Please indicated with a tick in the box below if you would be interested in receiving a copy of the results when they have been finalised.

☐

All information received will be kept strictly confidential.

Please return by mail to Mike Olson, P O Box 11-200, Wellington or by facsimile to 04 476-3021

APPENDIX C

SYSTEM - OVERVIEW AND LIMITED DOCUMENTATION

Appendix C presents some general statistics and information about the program flow, file structures and source code for the dBase IV database system developed for the data entry and analysis purposes of **Chapters III and IV**. The limited documentation consists of the following;

1. Tree diagram representation of the system.

2. System statistics.

3. Examples of database file structures.

4. Printout of MAINMENU.PRG program code.

Tree diagram representation of the database system

```
MAINMENU.PRG
|   MENU.DBF (database)
|   TOP200.DBF (database)
|   PART_1.DBF (database)
|   PART_2AE.DBF (database)
|   PART_2FG.DBF (database)
|   ANALYS1.DBF (database)
|   ANALYS2.DBF (database)
|   ANALYS3.DBF (database)
|   ANALYSE.DBF (database)
|   RECORD2 (index file)
|   RECORD3 (index file)
|   RECORD4 (index file)
|   RECORD1 (index file)
├──TOP200.FMT
├──PART_1.FMT
├──PART_2AE.FMT
├──PART_2FG.FMT
├──BNALYSER.PRG
|   |   TEMP.DBF (database)
|   |   TEMP (index file)
|   |   TEMP1 (index file)
|   └──BNALYSE1.PRG
|       |   TEMP1.DBF (database)
|       |   TEMP (index file)
|       └──BNALYSE2.PRG
|           |   TEMP (index file)
|           └──BNALYSE3.PRG
|               |   TEMP1.DBF (database)
|               |   TEMP (index file)
|               └──BNALYSE4.PRG
|                   └──BNALYSE5.PRG
|                           TEMP (index file)
├──ANALYSER.PRG
|   |   TEMP.DBF (database)
|   |   TEMP (index file)
|   |   TEMP1 (index file)
|   └──ANALYSE1.PRG
|       |   TEMP1.DBF (database)
|       |   TEMP (index file)
|       └──ANALYSE2.PRG
|           |   TEMP (index file)
|           └──ANALYSE3.PRG
|               |   TEMP1.DBF (database)
|               |   TEMP (index file)
|               └──ANALYSE4.PRG
|                   └──ANALYSE5.PRG
|                           TEMP (index file)
└──CNALYSER.PRG
```

Database system statistics

System: 57.499 Questionnaire/Survey Results Sys.
Author: Mike Olson
02/01/92 14:54:57
System Summary

This system has:
  8959 lines of code
    18 program files
     0 procedure files
     0 procedures and functions
    11 databases
     8 structural index files
     6 index files
     4 format files
     0 binary files
     0 memory variable files
     0 menu files
     0 screen files
     1 other file
     1 cross-referenced token

See the tree diagram for programs, procedures, functions and format files

Databases	Index Files	Report Forms	Label Forms	Memory Files
MENU.DBF				
TOP200.DBF				
PART_1.DBF				
PART_2AE.DBF				
PART_2FG.DBF				
ANALYS1.DBF				
ANALYS2.DBF				
ANALYS3.DBF				
ANALYSE.DBF				
TEMP.DBF				
TEMP1.DBF				

Example file structures for database system

Structure for database: C:\499DBASE\MENU.DBF
Number of data records: 27
Date of last update : 31/01/92

Field	Field Name	Type	Width	Dec	Index
1	MENU_ITEM	Character	46		N
2	MENU_PROG	Character	8		N
** Total **			55		

Structure for database: C:\499DBASE\TOP200.DBF
Number of data records: 200
Date of last update : 31/01/92

Field	Field Name	Type	Width	Dec	Index
1	RECORD_NO	Numeric	5		Y
2	NAME	Character	50		Y
3	OWNERSHIP	Character	50		N
4	ADDRESS_1	Character	50		N
5	ADDRESS_2	Character	50		N
6	POBOX	Character	50		N
7	CITY	Character	50		N
8	PHONE	Character	40		N
9	FAX	Character	40		N
10	CEO	Character	40		N
11	CONFIRMED	Logical	1		N
12	TURNOVER	Numeric	8		N
13	B4TPROFIT	Numeric	8		N
14	ATPROFIT	Numeric	8		N
15	ASSETS	Numeric	8		N
16	ROASSETS	Numeric	8		N
17	SHAREFUND	Numeric	8		N
18	EMPLOYEES	Numeric	6		N
19	BALDATE1	Character	15		N
20	MAILED	Date	8		N
21	REPLY_RECD	Date	8		N
22	P1_COMPLET	Logical	1		N
23	P2_COMPLET	Logical	1		N
24	NOTES	Memo	10		N
25	RESULTS	Logical	1		N
26	MAIL_FAX	Character	1		N
27	MAILED_2	Date	8		N
** Total **			534		

Structure for database: C:\499DBASE\PART_2AE.DBF
Number of data records: 200
Date of last update : 31/01/92

Field	Field Name	Type	Width	Dec	Index
1	RECORD_NO	Numeric	5		Y
2	NAME	Character	39		Y
3	ENTERED	Date	8		N

4	P2_A1_NAM	Character	39	N
5	P2_A1_TIT	Character	39	N
6	P2_A1_PHON	Character	39	N
7	P2_A1_FAX	Character	15	N
8	P2_A2_COM	Character	39	N
9	P2_A3_EMP	Numeric	5	N
10	P2_A3_5AGO	Character	8	N
11	P2_A3_NOW	Character	8	N
12	P2_A3_EXP5	Character	8	N
13	P2_A4_MGT	Character	13	N
14	P2_B1_PLAN	Character	7	N
15	P2_B1_LAST	Date	8	N
16	P2_B2_UPD	Character	11	N
17	P2_B2_UOTH	Character	20	N
18	P2_B2_YRS	Character	18	N
19	P2_B2_FOR	Character	18	N
20	P2_B3_P1	Character	1	N
21	P2_B3_P2	Character	1	N
22	P2_B3_P3	Character	1	N
23	P2_B3_P4	Character	1	N
24	P2_B3_OTH1	Character	20	N
25	P2_B3_OTH2	Character	20	N
26	P2_B4_M1	Character	1	N
27	P2_B4_M2	Character	1	N
28	P2_B4_M3	Character	1	N
29	P2_B4_M4	Character	1	N
30	P2_B4_M5	Character	1	N
31	P2_B4_M6	Character	1	N
32	P2_B4_M7	Character	1	N
33	P2_B4_M8	Character	1	N
34	P2_B4_M9	Character	1	N
35	P2_B4_M10	Character	1	N
36	P2_B4_M11	Character	1	N
37	P2_B4_M12	Character	1	N
38	P2_B4_M13	Character	1	N
39	P2_B4_M14	Character	1	N
40	P2_B4_M15	Character	1	N
41	P2_B4_M16	Character	1	N
42	P2_B4_M17	Character	1	N
43	P2_B4_M18	Character	1	N
44	P2_B4_M19	Character	1	N
45	P2_B4_M20	Character	1	N
46	P2_B4_M21	Character	1	N
47	P2_B4_M22	Character	1	N
48	P2_B4_M23	Character	1	N
49	P2_B4_M24	Character	1	N
50	P2_B4_M25	Character	1	N
51	P2_B4_M26	Character	1	N
52	P2_B4_M27	Character	1	N
53	P2_B4_M28	Character	1	N
54	P2_B4_M29	Character	1	N
55	P2_B4_M30	Character	1	N
56	P2_B4_M31	Character	1	N

57	P2_B4_M32	Character	1	N
58	P2_B4_M33	Character	1	N
59	P2_B4_M34	Character	1	N
60	P2_B4_M35	Character	1	N
61	P2_B4_M36	Character	1	N
62	P2_B4_M37	Character	1	N
63	P2_B4_M38	Character	1	N
64	P2_B4_OTH1	Character	20	N
65	P2_B4_OTH2	Character	20	N
66	P2_B5_P1	Character	1	N
67	P2_B5_P2	Character	1	N
68	P2_B5_P3	Character	1	N
69	P2_B5_P4	Character	1	N
70	P2_B5_P5	Character	1	N
71	P2_B5_P6	Character	1	N
72	P2_B5_P7	Character	1	N
73	P2_B5_P8	Character	1	N
74	P2_B5_P9	Character	1	N
75	P2_B5_P10	Character	1	N
76	P2_B5_P11	Character	1	N
77	P2_B5_P12	Character	1	N
78	P2_B5_OTH1	Character	20	N
79	P2_B5_OTH2	Character	20	N
80	P2_B6_P1	Character	1	N
81	P2_B6_P2	Character	1	N
82	P2_B6_P3	Character	1	N
83	P2_B6_P4	Character	1	N
84	P2_B6_P5	Character	1	N
85	P2_B6_P6	Character	1	N
86	P2_B6_P7	Character	1	N
87	P2_B6_OTH1	Character	20	N
88	P2_B6_OTH2	Character	20	N
89	P2_B6_OTH3	Character	20	N
90	P2_B7_COM	Character	17	N
91	P2_C1_P1	Character	1	N
92	P2_C1_P2	Character	1	N
93	P2_C1_P3	Character	1	N
94	P2_C1_P4	Character	1	N
95	P2_C1_P5	Character	1	N
96	P2_C1_5AGO	Character	6	N
97	P2_C1_EXP5	Character	6	N
98	P2_C1_NOW	Character	6	N
99	P2_C2_CENT	Character	9	N
100	P2_C2_FOR	Character	3	N
101	P2_C2_POL	Character	3	N
102	P2_C2_AUT	Character	3	N
103	P2_C2_INF	Character	3	N
104	P2_C2_IT	Character	3	N
105	P2_C2_RES	Character	3	N
106	P2_C2_AOTH	Character	20	N
107	P2_C2_AO1	Character	3	N
108	P2_C2_BOTH	Character	20	N
109	P2_C2_BO1	Character	3	N

110	P2_C3_CEN	Character	3	N
111	P2_C3_DEP	Character	3	N
112	P2_C3_STE	Character	3	N
113	P2_C3_BOA	Character	3	N
114	P2_C3_AOTH	Character	20	N
115	P2_C3_AO1	Character	3	N
116	P2_C3_BOTH	Character	20	N
117	P2_C3_BO1	Character	3	N
118	P2_C3_PUR	Character	3	N
119	P2_C3_HIP	Character	3	N
120	P2_C3_LEA	Character	3	N
121	P2_C3_EXC	Character	3	N
122	P2_C3_BUR	Character	3	N
123	P2_C3_COTH	Character	20	N
124	P2_C3_CO1	Character	3	N
125	P2_C4_KEY	Memo	10	N
126	P2_D1_SYS	Character	3	N
127	P2_D1_PRO	Character	3	N
128	P2_D1_ITS	Character	3	N
129	P2_D1_QUA	Character	3	N
130	P2_D1_SUP	Character	3	N
131	P2_D1_TRA	Character	3	N
132	P2_D1_USE	Character	3	N
133	P2_D1_ALI	Character	3	N
134	P2_D1_VAL	Character	3	N
135	P2_D1_NEE	Character	3	N
136	P2_D1_OBT	Character	3	N
137	P2_D1_AOTH	Character	20	N
138	P2_D1_AO1	Character	3	N
139	P2_D1_BOTH	Character	20	N
140	P2_D1_BO1	Character	3	N
141	P2_D2_DEV	Character	17	N
142	P2_D2_COM	Character	3	N
143	P2_D2_COR	Character	3	N
144	P2_D2_COS	Character	3	N
145	P2_D2_FIR	Character	3	N
146	P2_D2_MAN	Character	3	N
147	P2_D2_MAND	Character	3	N
148	P2_D2_MIS	Character	3	N
149	P2_D2_POL	Character	3	N
150	P2_D2_PRO	Character	3	N
151	P2_D2_RES	Character	3	N
152	P2_D2_SKI	Character	3	N
153	P2_D2_STR	Character	3	N
154	P2_D2_TEC	Character	3	N
155	P2_D2_VAL	Character	3	N
156	P2_D2_AOTH	Character	20	N
157	P2_D2_AO1	Character	3	N
158	P2_D2_BOTH	Character	20	N
159	P2_D2_BO1	Character	3	N
160	P2_D3_5AGO	Character	11	N
161	P2_D3_NOW	Character	11	N
162	P2_D3_EXP5	Character	11	N

163	P2_D3_P1	Numeric	2	N
164	P2_D3_P2	Numeric	2	N
165	P2_D3_P3	Numeric	2	N
166	P2_D3_P4	Numeric	2	N
167	P2_D3_OTH1	Character	20	N
168	P2_D3_P5	Numeric	2	N
169	P2_D3_OTH2	Character	20	N
170	P2_D3_P6	Numeric	2	N
171	P2_D4_MKT	Character	17	N
172	P2_D4_5AGO	Character	3	N
173	P2_D4_NOW	Character	3	N
174	P2_D4_EXP5	Character	3	N
175	P2_D4_P1	Character	1	N
176	P2_D4_P2	Character	1	N
177	P2_D4_P3	Character	1	N
178	P2_D4_P4	Character	1	N
179	P2_D4_OTH1	Character	20	N
180	P2_D4_OTH2	Character	20	N
181	P2_D5_KEY	Memo	10	N
182	P2_E1_WKS	Character	3	N
183	P2_E1_WKG	Character	3	N
184	P2_E1_STE	Character	3	N
185	P2_E1_IND	Character	3	N
186	P2_E1_FEE	Character	3	N
187	P2_E1_QUE	Character	3	N
188	P2_E1_SER	Character	3	N
189	P2_E1_QUA	Character	3	N
190	P2_E1_AOTH	Character	20	N
191	P2_E1_AO1	Character	3	N
192	P2_E1_BOTH	Character	20	N
193	P2_E1_BO1	Character	3	N
194	P2_E2_SAT	Character	17	N
195	P2_E2_5AGO	Character	15	N
196	P2_E2_NOW	Character	15	N
197	P2_E2_EXP5	Character	15	N
198	P2_E2_QUE	Character	3	N
199	P2_E2_HEL	Character	3	N
200	P2_E2_FEE	Character	3	N
201	P2_E2_USE	Character	3	N
202	P2_E2_TRA	Character	3	N
203	P2_E2_AOTH	Character	20	N
204	P2_E2_AO1	Character	3	N
205	P2_E2_BOTH	Character	20	N
206	P2_E2_BO1	Character	3	N
207	P2_E3_ADO	Character	17	N
208	P2_E3_WHY	Memo	10	N
209	P2_E3_DEM	Character	10	N
210	P2_E4_HEL	Character	3	N
211	P2_E4_HOT	Character	3	N
212	P2_E4_INF	Character	3	N
213	P2_E4_INH	Character	3	N
214	P2_E4_SYS	Character	3	N
215	P2_E4_ONL	Character	3	N

216	P2_E4_COM	Character	3	N
217	P2_E4_DEP	Character	3	N
218	P2_E4_AOTH	Character	20	N
219	P2_E4_AO1	Character	3	N
220	P2_E4_BOTH	Character	20	N
221	P2_E4_BO1	Character	3	N
222	P2_E4_COTH	Character	20	N
223	P2_E4_CO1	Character	3	N
224	P2_E5_KEY	Memo	10	N
** Total **			1490	

Printout of MAINMENU.PRG program code

```
1  *:*****************************************************************
2  *:
3  *:        Program: C:\499DBASE\MAINMENU.PRG
4  *:
5  *:         System: 57.499 Questionnaire/Survey Results Sys.
6  *:         Author: Mike Olson
7  *:      Copyright (c) 1992, Mike Olson
8  *:  Last modified: 02/01/92     11:17
9  *:
10 *:           Uses: MENU.DBF
11 *:               : TOP200.DBF
12 *:               : PART_1.DBF
13 *:               : PART_2AE.DBF
14 *:               : PART_2FG.DBF
15 *:               : ANALYS1.DBF
16 *:               : ANALYS2.DBF
17 *:               : ANALYS3.DBF
18 *:               : ANALYSE.DBF
19 *:
20 *:        Indexes: RECORD2                (tag in ANALYS1.MDX)
21 *:               : RECORD3                (tag in ANALYS2.MDX)
22 *:               : RECORD4                (tag in ANALYS3.MDX)
23 *:               : RECORD1                (tag in ANALYSE.MDX)
24 *:
25 *:      CDX files: TOP200.MDX
26 *:               : PART_1.MDX
27 *:               : PART_2AE.MDX
28 *:               : PART_2FG.MDX
29 *:               : ANALYS1.MDX
30 *:               : ANALYS2.MDX
31 *:               : ANALYS3.MDX
32 *:               : ANALYSE.MDX
33 *:
34 *:        Formats: TOP200.FMT
35 *:               : PART_1.FMT
36 *:               : PART_2AE.FMT
37 *:               : PART_2FG.FMT
38 *:
39 *:      Documented 02/01/92 at 14:53              FoxDoc  version 2.10
40 *:*****************************************************************
41     ***********************************************************************
42     * -- Name........... : MAINMENU.PRG
43     * -- First Created. : 10 November 1991
44     * -- Last Updated.. : 22 November 1991
45     * -- Version....... : 1.0
46     * -- Notes......... : Main menu program for 499 Survey Results System
47     * -- Files Needed.. : Area 1 - TOP200.DBF
48     * --               :        - PART_1.DBF
```

```
49      * --                :        - PART_2AE.DBF
50      * --                :        - PART_2FG.DBF
51      * --                :      5 - MENU.DBF
52      ******************************************************************************
53      CLEAR ALL
54      CLOSE ALL
55      SET FUNCTION f8 TO ";"
56      SET FUNCTION f9 TO ";"
57      SET FUNCTION f10 TO ";"
58      SET FUNCTION shift-f1 TO "set status on;"
59      SET FUNCTION shift-f2 TO "set status off;"
60      SET FUNCTION shift-f3 TO "set talk on;"
61      SET FUNCTION shift-f4 TO "set talk off;"
62      SET FUNCTION shift-f5 TO "!cd"
63      SET FUNCTION shift-f8 TO "do mainmenu;"
64      SET FUNCTION shift-f9 TO ";"
65      SET REPROCESS TO 0
66      SET MESSAGE TO
67      SET TYPEAHEAD TO 30
68      SET STATUS ON
69      SET TALK OFF
70      _PEJECT="NONE"
71      ON KEY
72      DEFINE WINDOW MENU FROM 9,16 TO 17,62
73      USE MENU NOUPDATE IN 5
74      SELECT 5
75      m->menu = .F.
76     ╔DO WHILE .NOT.m->menu
77     ╚   CLEAR
78         *-- Format Page: 1
79         @ 2,4 TO 5,74 DOUBLE COLOR GR+/BG
80         @ 3,5 SAY "              57.499 QUESTIONNAIRE/SURVEY RESULTS SYSTEM
" COLOR W+/BG
81         @ 3,75 SAY " " COLOR W/N
82         @ 4,5 SAY " Mike Olson, P O Box 11-200, Wellington. Ph 4 4763775, Fax 4
4763021 " COLOR W+/BG
83         @ 4,75 SAY " " COLOR W/N
84         @ 5,75 SAY " " COLOR W/N
85         @ 6,5 SAY "
" COLOR W/N
86         @ 8,15 SAY "                                                  " COLOR G/G
87         @ 9,15 SAY "                                                  " COLOR G/G
88         @ 9,64 SAY " " COLOR N/N
89         @ 10,15 SAY "                                                  " COLOR G/G
90         @ 10,64 SAY " " COLOR N/N
91         @ 11,15 SAY "                                                  " COLOR G/G
92         @ 11,64 SAY " " COLOR N/N
93         @ 12,15 SAY "                                                  " COLOR G/G
94         @ 12,64 SAY " " COLOR N/N
95         @ 13,15 SAY "                                                  " COLOR G/G
96         @ 13,64 SAY " " COLOR N/N
97         @ 14,15 SAY "                                                  " COLOR G/G
98         @ 14,64 SAY " " COLOR N/N
```

```
 99     @ 15,15 SAY "                                                  " COLOR G/G
100     @ 15,64 SAY " " COLOR N/N
101     @ 16,15 SAY "                                                  " COLOR G/G
102     @ 16,64 SAY " " COLOR N/N
103     @ 17,15 SAY "                                                  " COLOR G/G
104     @ 17,64 SAY " " COLOR N/N
105     @ 18,15 SAY "                                                  " COLOR G/G
106     @ 18,64 SAY " " COLOR N/N
107     @ 19,16 SAY "                                                  " COLOR N/N
108     SET MESSAGE TO "USE ARROW KEYS TO SELECT OPTION REQUIRED, THEN PRESS <CTRL-
END>"
109     SELECT 5
110     GO TOP
111     BROWSE NOMENU COMPRESS FREEZE menu_item WINDOW MENU
112     SET MESSAGE TO
113     m->action=menu_prog
114     m->item=menu_item
115    ┌IF m->action="EXIT"
116    │   CLEAR
117    │   @1,1 SAY "Exiting Mike Olson's 57.499 Survey Results System ....."
118    │   CLEAR ALL
119    │   CLOSE ALL
120    v═══EXIT
121    ├ELSE
122    │   SELECT 1
123    │   USE
124    │   SELECT 2
125    │   USE
126    │   SELECT 3
127    │   USE
128    │   SELECT 4
129    │   USE
130    │   SELECT 5
131    │ ╒DO CASE
132    │ ╞CASE m->action="E1"
133    │ │   USE top200 ORDER name NOUPDATE IN 1
134    │ │   SELECT 1
135    │ │   CLEAR GETS
136    │ │   SET FORMAT TO top200
137    │ │   EDIT
138    │ ╞CASE m->action="E2"
139    │ │   USE part_1 ORDER name NOUPDATE IN 1
140    │ │   SELECT 1
141    │ │   CLEAR GETS
142    │ │   SET FORMAT TO part_1
143    │ │   EDIT
144    │ ╞CASE m->action="E3"
145    │ │   USE part_2ae ORDER name NOUPDATE IN 1
146    │ │   SELECT 1
147    │ │   CLEAR GETS
148    │ │   SET FORMAT TO part_2ae
149    │ │   EDIT
150    │ ╞CASE m->action="E4"
```

```
151         USE part_2fg ORDER name NOUPDATE IN 1
152         SELECT 1
153         CLEAR GETS
154         SET FORMAT TO part_2fg
155         EDIT
156     CASE m->action="D1"
157         USE top200 ORDER name EXCLUSIVE IN 1
158         SELECT 1
159         CLEAR GETS
160         SET FORMAT TO top200
161         EDIT
162     CASE m->action="D2"
163         USE part_1 ORDER name EXCLUSIVE IN 1
164         SELECT 1
165         CLEAR GETS
166         SET FORMAT TO part_1
167         EDIT
168     CASE m->action="D3"
169         USE part_2ae ORDER name EXCLUSIVE IN 1
170         SELECT 1
171         CLEAR GETS
172         SET FORMAT TO part_2ae
173         EDIT
174     CASE m->action="D4"
175         USE part_2fg ORDER name EXCLUSIVE IN 1
176         SELECT 1
177         CLEAR GETS
178         SET FORMAT TO part_2fg
179         EDIT
180     CASE m->action="A13"
181         CLEAR
182         SET TALK ON
183         SET SAFETY OFF
184         SELECT 2
185         USE part_1 IN 2
186         COPY STRUCTURE TO analys1.dbf
187         USE analys1 IN 2
188         APPEND FROM part_1 FOR RTRIM(p1_b2_plan)<>"Yes".AND.entered>{01/01/90}
189         INDEX ON record_no TAG record2
190         SELECT 3
191         USE part_2ae IN 3
192         COPY STRUCTURE TO analys2.dbf
193         USE analys2 IN 3
194         APPEND FROM part_2ae FOR
RTRIM(p2_b1_plan)<>"Yes".AND.entered>{01/01/90}
195         DELETE FOR .NOT.SEEK(record_no,2)
196         INDEX ON record_no TAG record3
197         PACK
198         SELECT 2
199         DELETE FOR .NOT.SEEK(record_no,3)
200         PACK
201         SELECT 4
202         USE part_2fg IN 4
```

```
203         COPY STRUCTURE TO analys3.dbf
204         USE analys3 IN 4
205         APPEND FROM part_2fg FOR SEEK(record_no,3)
206         INDEX ON record_no TAG record4
207         SELECT 1
208         USE top200 IN 1
209         COPY STRUCTURE TO analyse.dbf
210         USE analyse IN 1
211         APPEND FROM top200 FOR SEEK(record_no,2).OR.SEEK(record_no,3)
212         INDEX ON record_no TAG record1
213         SET SAFETY ON
214         SET TALK OFF
215         SELECT 1
216         DO bnalyser
217       CASE m->action="A12"
218         CLEAR
219         SET TALK ON
220         SET SAFETY OFF
221         SELECT 3
222         USE part_2ae IN 3
223         COPY STRUCTURE TO analys2.dbf
224         USE analys2 IN 3
225         APPEND FROM part_2ae FOR
RTRIM(p2_d2_dev)="Agree".OR.RTRIM(p2_d2_dev)="Strongly agree"
226         INDEX ON record_no TAG record3
227         SELECT 4
228         USE part_2fg IN 4
229         COPY STRUCTURE TO analys3.dbf
230         USE analys3 IN 4
231         APPEND FROM part_2fg FOR SEEK(record_no,3)
232         INDEX ON record_no TAG record4
233         SELECT 2
234         USE part_1 IN 2
235         COPY STRUCTURE TO analys1.dbf
236         USE analys1 IN 2
237         APPEND FROM part_1 FOR entered>{01/01/90}.AND.SEEK(record_no,3)
238         INDEX ON record_no TAG record2
239         SELECT 1
240         USE top200 IN 1
241         COPY STRUCTURE TO analyse.dbf
242         USE analyse IN 1
243         APPEND FROM top200 FOR SEEK(record_no,3)
244         INDEX ON record_no TAG record1
245         SET SAFETY ON
246         SET TALK OFF
247         SELECT 1
248         DO bnalyser
249       CASE m->action="A11"
250         CLEAR
251         SET TALK ON
252         SET SAFETY OFF
253         SELECT 3
254         USE part_2ae IN 3
```

```
255         COPY STRUCTURE TO analys2.dbf
256         USE analys2 IN 3
257         APPEND FROM part_2ae FOR RTRIM(p2_a3_exp5)="75%-100%"
258         INDEX ON record_no TAG record3
259         SELECT 4
260         USE part_2fg IN 4
261         COPY STRUCTURE TO analys3.dbf
262         USE analys3 IN 4
263         APPEND FROM part_2fg FOR SEEK(record_no,3)
264         INDEX ON record_no TAG record4
265         SELECT 2
266         USE part_1 IN 2
267         COPY STRUCTURE TO analys1.dbf
268         USE analys1 IN 2
269         APPEND FROM part_1 FOR entered>{01/01/90}.AND.SEEK(record_no,3)
270         INDEX ON record_no TAG record2
271         SELECT 1
272         USE top200 IN 1
273         COPY STRUCTURE TO analyse.dbf
274         USE analyse IN 1
275         APPEND FROM top200 FOR SEEK(record_no,3)
276         INDEX ON record_no TAG record1
277         SET SAFETY ON
278         SET TALK OFF
279         SELECT 1
280         DO bnalyser
281       CASE m->action="A10"
282         CLEAR
283         SET TALK ON
284         SET SAFETY OFF
285         SELECT 2
286         USE part_1 IN 2
287         COPY STRUCTURE TO analys1.dbf
288         USE analys1 IN 2
289         APPEND FROM part_1 FOR RTRIM(p1_c7_ben)="Yes"
290         INDEX ON record_no TAG record2
291         SELECT 3
292         USE part_2ae IN 3
293         COPY STRUCTURE TO analys2.dbf
294         USE analys2 IN 3
295         APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
296         INDEX ON record_no TAG record3
297         SELECT 4
298         USE part_2fg IN 4
299         COPY STRUCTURE TO analys3.dbf
300         USE analys3 IN 4
301         APPEND FROM part_2fg FOR SEEK(record_no,3)
302         INDEX ON record_no TAG record4
303         SELECT 1
304         USE top200 IN 1
305         COPY STRUCTURE TO analyse.dbf
306         USE analyse IN 1
307         APPEND FROM top200 FOR SEEK(record_no,2)
```

```
308         INDEX ON record_no TAG record1
309         SET SAFETY ON
310         SET TALK OFF
311         SELECT 1
312         DO bnalyser
313       =CASE m->action="A9"
314         CLEAR
315         SET TALK ON
316         SET SAFETY OFF
317         SELECT 2
318         USE part_1 IN 2
319         COPY STRUCTURE TO analys1.dbf
320         USE analys1 IN 2
321         APPEND FROM part_1 FOR
RTRIM(p1_c5_awar)="Agree".OR.RTRIM(p1_c5_awar)="Strongly agree"
322         INDEX ON record_no TAG record2
323         SELECT 3
324         USE part_2ae IN 3
325         COPY STRUCTURE TO analys2.dbf
326         USE analys2 IN 3
327         APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
328         INDEX ON record_no TAG record3
329         SELECT 4
330         USE part_2fg IN 4
331         COPY STRUCTURE TO analys3.dbf
332         USE analys3 IN 4
333         APPEND FROM part_2fg FOR SEEK(record_no,3)
334         INDEX ON record_no TAG record4
335         SELECT 1
336         USE top200 IN 1
337         COPY STRUCTURE TO analyse.dbf
338         USE analyse IN 1
339         APPEND FROM top200 FOR SEEK(record_no,2)
340         INDEX ON record_no TAG record1
341         SET SAFETY ON
342         SET TALK OFF
343         SELECT 1
344         DO bnalyser
345       =CASE m->action="A8"
346         CLEAR
347         SET TALK ON
348         SET SAFETY OFF
349         SELECT 2
350         USE part_1 IN 2
351         COPY STRUCTURE TO analys1.dbf
352         USE analys1 IN 2
353         APPEND FROM part_1 FOR
RTRIM(p1_c3_emph)="Agree".OR.RTRIM(p1_c3_emph)="Strongly agree"
354         INDEX ON record_no TAG record2
355         SELECT 3
356         USE part_2ae IN 3
357         COPY STRUCTURE TO analys2.dbf
358         USE analys2 IN 3
```

```
359         APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
360         INDEX ON record_no TAG record3
361         SELECT 4
362         USE part_2fg IN 4
363         COPY STRUCTURE TO analys3.dbf
364         USE analys3 IN 4
365         APPEND FROM part_2fg FOR SEEK(record_no,3)
366         INDEX ON record_no TAG record4
367         SELECT 1
368         USE top200 IN 1
369         COPY STRUCTURE TO analyse.dbf
370         USE analyse IN 1
371         APPEND FROM top200 FOR SEEK(record_no,2)
372         INDEX ON record_no TAG record1
373         SET SAFETY ON
374         SET TALK OFF
375         SELECT 1
376         DO bnalyser
377       CASE m->action="A7"
378         CLEAR
379         SET TALK ON
380         SET SAFETY OFF
381         SELECT 2
382         USE part_1 IN 2
383         COPY STRUCTURE TO analys1.dbf
384         USE analys1 IN 2
385         APPEND FROM part_1 FOR RTRIM(p1_c2_exp5)="A strategic resource"
386         INDEX ON record_no TAG record2
387         SELECT 3
388         USE part_2ae IN 3
389         COPY STRUCTURE TO analys2.dbf
390         USE analys2 IN 3
391         APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
392         INDEX ON record_no TAG record3
393         SELECT 4
394         USE part_2fg IN 4
395         COPY STRUCTURE TO analys3.dbf
396         USE analys3 IN 4
397         APPEND FROM part_2fg FOR SEEK(record_no,3)
398         INDEX ON record_no TAG record4
399         SELECT 1
400         USE top200 IN 1
401         COPY STRUCTURE TO analyse.dbf
402         USE analyse IN 1
403         APPEND FROM top200 FOR SEEK(record_no,2)
404         INDEX ON record_no TAG record1
405         SET SAFETY ON
406         SET TALK OFF
407         SELECT 1
408         DO bnalyser
409       CASE m->action="A6"
410         CLEAR
411         SET TALK ON
```

```
412     SET SAFETY OFF
413     SELECT 2
414     USE part_1 IN 2
415     COPY STRUCTURE TO analys1.dbf
416     USE analys1 IN 2
417     APPEND FROM part_1 FOR
RTRIM(p1_b10_com)="Agree".OR.RTRIM(p1_b10_com)="Strongly agree"
418     INDEX ON record_no TAG record2
419     SELECT 3
420     USE part_2ae IN 3
421     COPY STRUCTURE TO analys2.dbf
422     USE analys2 IN 3
423     APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
424     INDEX ON record_no TAG record3
425     SELECT 4
426     USE part_2fg IN 4
427     COPY STRUCTURE TO analys3.dbf
428     USE analys3 IN 4
429     APPEND FROM part_2fg FOR SEEK(record_no,3)
430     INDEX ON record_no TAG record4
431     SELECT 1
432     USE top200 IN 1
433     COPY STRUCTURE TO analyse.dbf
434     USE analyse IN 1
435     APPEND FROM top200 FOR SEEK(record_no,2)
436     INDEX ON record_no TAG record1
437     SET SAFETY ON
438     SET TALK OFF
439     SELECT 1
440     DO bnalyser
441 =CASE m->action="A5"
442     CLEAR
443     SET TALK ON
444     SET SAFETY OFF
445     SELECT 2
446     USE part_1 IN 2
447     COPY STRUCTURE TO analys1.dbf
448     USE analys1 IN 2
449     APPEND FROM part_1 FOR RTRIM(p1_b2_plan)="Yes"
450     INDEX ON record_no TAG record2
451     SELECT 3
452     USE part_2ae IN 3
453     COPY STRUCTURE TO analys2.dbf
454     USE analys2 IN 3
455     APPEND FROM part_2ae FOR RTRIM(p2_b1_plan)="Yes"
456     DELETE FOR .NOT.SEEK(record_no,2)
457     INDEX ON record_no TAG record3
458     PACK
459     SELECT 2
460     DELETE FOR .NOT.SEEK(record_no,3)
461     PACK
462     SELECT 4
463     USE part_2fg IN 4
```

```
464         COPY STRUCTURE TO analys3.dbf
465         USE analys3 IN 4
466         APPEND FROM part_2fg FOR SEEK(record_no,3)
467         INDEX ON record_no TAG record4
468         SELECT 1
469         USE top200 IN 1
470         COPY STRUCTURE TO analyse.dbf
471         USE analyse IN 1
472         APPEND FROM top200 FOR SEEK(record_no,2).OR.SEEK(record_no,3)
473         INDEX ON record_no TAG record1
474         SET SAFETY ON
475         SET TALK OFF
476         SELECT 1
477         DO bnalyser
478     CASE m->action="A4"
479         CLEAR
480         SET TALK ON
481         SET SAFETY OFF
482         SELECT 3
483         USE part_2ae IN 3
484         COPY STRUCTURE TO analys2.dbf
485         USE analys2 IN 3
486         APPEND FROM part_2ae FOR RTRIM(p2_b1_plan)="Yes"
487         INDEX ON record_no TAG record3
488         SELECT 2
489         USE part_1 IN 2
490         COPY STRUCTURE TO analys1.dbf
491         USE analys1 IN 2
492         APPEND FROM part_1 FOR entered>{01/01/90}.AND.SEEK(record_no,3)
493         INDEX ON record_no TAG record2
494         SELECT 4
495         USE part_2fg IN 4
496         COPY STRUCTURE TO analys3.dbf
497         USE analys3 IN 4
498         APPEND FROM part_2fg FOR SEEK(record_no,3)
499         INDEX ON record_no TAG record4
500         SELECT 1
501         USE top200 IN 1
502         COPY STRUCTURE TO analyse.dbf
503         USE analyse IN 1
504         APPEND FROM top200 FOR SEEK(record_no,3)
505         INDEX ON record_no TAG record1
506         SET SAFETY ON
507         SET TALK OFF
508         SELECT 1
509         DO bnalyser
510     CASE m->action="A3"
511         CLEAR
512         SET TALK ON
513         SET SAFETY OFF
514         SELECT 2
515         USE part_1 IN 2
516         COPY STRUCTURE TO analys1.dbf
```

```
517         USE analys1 IN 2
518         APPEND FROM part_1 FOR RTRIM(p1_b2_plan)="Yes"
519         INDEX ON record_no TAG record2
520         SELECT 3
521         USE part_2ae IN 3
522         COPY STRUCTURE TO analys2.dbf
523         USE analys2 IN 3
524         APPEND FROM part_2ae FOR entered>{01/01/90}.AND.SEEK(record_no,2)
525         INDEX ON record_no TAG record3
526         SELECT 4
527         USE part_2fg IN 4
528         COPY STRUCTURE TO analys3.dbf
529         USE analys3 IN 4
530         APPEND FROM part_2fg FOR SEEK(record_no,3)
531         INDEX ON record_no TAG record4
532         SELECT 1
533         USE top200 IN 1
534         COPY STRUCTURE TO analyse.dbf
535         USE analyse IN 1
536         APPEND FROM top200 FOR SEEK(record_no,2)
537         INDEX ON record_no TAG record1
538         SET SAFETY ON
539         SET TALK OFF
540         SELECT 1
541         DO bnalyser
542       =CASE m->action="A2"
543         CLEAR
544         SET TALK ON
545         SET SAFETY OFF
546         SELECT 2
547         USE part_1 IN 2
548         COPY STRUCTURE TO analys1.dbf
549         USE analys1 IN 2
550         APPEND FROM part_1 FOR entered>{01/01/90}
551         INDEX ON record_no TAG record2
552         SELECT 3
553         USE part_2ae IN 3
554         COPY STRUCTURE TO analys2.dbf
555         USE analys2 IN 3
556         APPEND FROM part_2ae FOR entered>{01/01/90}
557         INDEX ON record_no TAG record3
558         SELECT 4
559         USE part_2fg IN 4
560         COPY STRUCTURE TO analys3.dbf
561         USE analys3 IN 4
562         APPEND FROM part_2fg FOR SEEK(record_no,3)
563         INDEX ON record_no TAG record4
564         SELECT 1
565         USE top200 IN 1
566         COPY STRUCTURE TO analyse.dbf
567         USE analyse IN 1
568         APPEND FROM top200 FOR SEEK(record_no,2).OR.SEEK(record_no,3)
569         INDEX ON record_no TAG record1
```

```
570         SET SAFETY ON
571         SET TALK OFF
572         SELECT 1
573         DO analyser
574       CASE m->action="A1"
575         CLEAR
576         SELECT 1
577         USE
578         SET TALK ON
579         SET SAFETY OFF
580         SELECT 1
581         USE top200 IN 1
582         COPY STRUCTURE TO analyse.dbf
583         USE analyse IN 1
584         APPEND FROM top200 FOR reply_recd>{01/01/90}
585         INDEX ON record_no TAG record1
586         SELECT 2
587         USE part_1 IN 2
588         COPY STRUCTURE TO analys1.dbf
589         USE analys1 IN 2
590         APPEND FROM part_1 FOR SEEK(record_no,1)
591         INDEX ON record_no TAG record2
592         SELECT 3
593         USE part_2ae IN 3
594         COPY STRUCTURE TO analys2.dbf
595         USE analys2 IN 3
596         APPEND FROM part_2ae FOR SEEK(record_no,1)
597         INDEX ON record_no TAG record3
598         SELECT 4
599         USE part_2fg IN 4
600         COPY STRUCTURE TO analys3.dbf
601         USE analys3 IN 4
602         APPEND FROM part_2fg FOR SEEK(record_no,1)
603         INDEX ON record_no TAG record4
604         SET SAFETY ON
605         SET TALK OFF
606         SELECT 1
607         DO cnalyser
608       ENDCASE
609     ENDIF
610   ENDDO
611   SET STATUS ON
612   SET TALK ON
613   CLEAR
614   QUIT
615   * -- End of Program : MAINMENU.PRG
616   *: EOF: MAINMENU.ACT
```

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