

MEASURING THE ALIGNMENT OF INFORMATION TECHNOLOGY STRATEGY IN SMALL-TO-MEDIUM SIZED ORGANISATIONS THAT USE ACCOUNTING PACKAGES

by

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ABSTRACT

The alignment of information technology (IT) strategies with organisational factors has been a critical management issue since 1980s. Studies conducted to date have however focused on alignment in large sized organisations, and little has been done to assist the small-to-medium sized organisations to successfully align their software package implementations. There is also lack of comprehensive frameworks that these organisations could rely on to predict, or audit, the outcome of their effort to implement these packages.

In this research, a framework was developed to guide the measurement of the extent to which small-to-medium sized organisations aligned their IT strategies with selected organisational factors during the implementation of accounting packages. These factors are: the business objectives; structural factors; social factors; cultural factors; and information system factors. These were selected because they influence the success of IT implementation in small-to-medium sized organisations.

There were 155 participants in the study from 75 different organisations. These were surveyed using a questionnaire and telephone interviews. The results were first analysed to determine the consistency between the IT strategy and each of the above selected organisational factors (the dimensions of alignment).

Further analysis was then conducted to test a structural model that examined the relationships between the dimensions of alignment, IT strategy alignment and the success of the accounting package implementation. (The construct *IT strategy alignment* refers to the overall consistency of the choices or decisions adopted in the implementation of the accounting package with the above selected organisational factors).

The findings indicate that small-to-medium sized organisations do not align their information technology strategies with the selected organisational factors, except for the cultural factors. It was also revealed that each dimension of alignment has a positive and significant influence on the *IT strategy alignment*, and the *IT strategy alignment* also has a positive and significant influence on the success of the accounting package implementation.

The findings emphasise the need for small-to-medium sized organisations to ensure that IT strategies are consistent with at least all the above organisational factors if successful accounting package implementations are to be achieved. Recommendations for researchers and practitioners are provided in the last chapter of this thesis.

CHAPTER 1

INTRODUCTION

1.1 Problems experienced in implementation of software packages

The approaches to the implementation of computer-based systems in organisations has received significant attention in recent years, Checkland and Scholes (1999), Iivari and Ervasti (1994).

In most studies of the implementation process, writers have concentrated on the “normal” case in which organisations are designing, developing and implementing custom systems for their own use. Limited studies have however been done on the increasingly common method involving implementation of software packages. A *software package* may be defined as a program or set of programs purchased off-the-shelf and designed in a standardised way for applications which are common to many users, and the term *software package implementation* refers in this study to the acquisition and deployment of these packages.

While many organisations are adopting this approach, Plato (1997), researchers such as Sherer (1993); Iivari and Ervasti (1994); and Cale and Eriksen (1994) identify a number of problems that preclude successful implementation of these systems. These are:

- . Failure to identify the correct user requirements;
- . Failure to identify the correct organisational requirements;
- . Difficulty in selection of the right software package and hardware;
- . Failure of the software package to meet organisational objectives;
- . Difficulty in out-sourcing experts and IT services;

Inadequate training and support.

They suggest that most of these problems result from the failure to align the factors involved in the implementation of these packages. The notion of alignment, which has also been referred to as *fit* by Venkatraman (1989); *co-ordination* by Lederer and Mendelow (1989); and *linkage* by Reich and Benbasat (1996), has spanned the literature on system implementation since the 1980s. It is assumed in these studies that the best way to organise IT implementation within the organisation is contingent upon internal and external factors specific to that organisation. In his implementation model (see Figure 1.1 below), Ginzberg (1980) demonstrated that successful implementation of information systems depends on the alignment of characteristics of designers, users, the system and those of the organisation. He suggested that through such alignment, the developer or implementer comes to understand the needs and capabilities of users, management and the organisation, and consequently implement systems which closely fit these needs. Additionally, end-users also come to understand the nature and reasons for any limitations in the system implemented and become increasingly committed to its success.

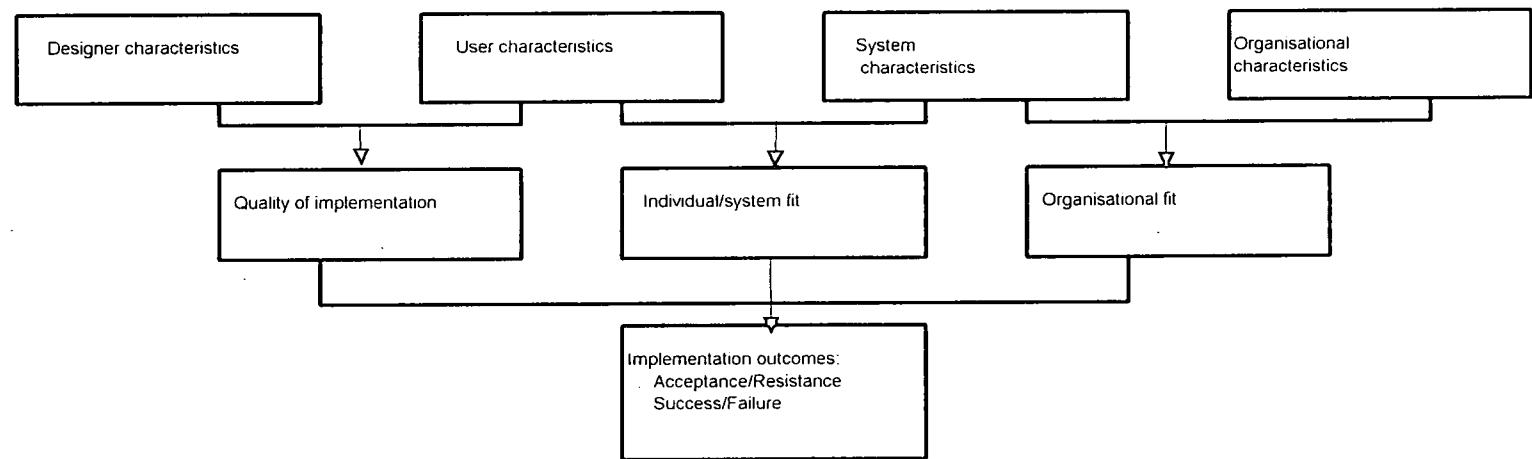


Figure 1.1 Model of information system implementation (adopted from Ginzberg 1980)

Unfortunately, in the case of software package implementation, all the factors involved cannot easily be brought into alignment. For instance, the potential implementer of the package has little, if any, contact with the package developer and there is limited working relationship between the package developer and the end-users, Sherer (1993); Iivari and Ervasti (1994); Raymond (1990a), (1990b).

While the need to ensure proper alignment of software package implementation has been recognised by the above writers, these studies only focus on package implementation in large sized organisations. Little has been done to assist the small-to-medium sized organisations (the main users of software packages in South Africa, Plato, 1997), to successfully manage the process of software package implementation. In addition, given the increasing problems experienced by organisations adopting these packages, there is lack of comprehensive frameworks organisations could rely on to predict the likely outcome of their effort to implement software packages or to audit the outcome of these implementations. Successful implementation of software packages and other technologies is particularly crucial to the small-to-medium sized organisations since they are increasingly dependent on them for survival and also to support economic developments. For instance, Philips (1993) and Schmidt (1996) report that as corporate employment wanes in the face of on going political and economic uncertainties in the southern region of Africa, small-to-medium sized organisations supported by such technologies provide opportunities for employment, innovation and managerial skills. In addition, Igbaria, et. al. (1997) also argue that, where these systems have been implemented successfully, they have enabled many small firms to compete successfully, and to provide better services to customers.

1.2 Study objectives

In this study, the researcher developed a framework to guide measurement of alignment (see Table 2.3 on page 37). This framework was then used in the measurement of the extent to which the choices or decisions adopted by small-to-medium sized organisations during the implementation of their accounting packages (*IT strategies*¹), were consistent with each of the selected organisational factors that influence IT implementation. These factors are: business objectives; structural factors; social factors; cultural factors; and information system factors.

It is the view of the researcher that these factors influence simultaneously IT implementations and it would be necessary to determine the impact of the overall consistency (referred to in this study as *IT strategy alignment*²), on the success of the accounting package implementation. The view to consider the collective effect of multiple factors when investigating alignment is also shared by Brown and Magill (1994), in their study of the alignment of the information system function with the enterprise. The alignment model investigated in this study is presented in Figure 1.2 below. Here the researcher measured the impact of each (factor-IT strategy consistency) on the IT strategy alignment, and subsequently, that of the IT strategy alignment

¹ IT strategy embodies the choices companies make about acquiring, developing and deploying technology to help reach the goals of the organisation, Alder (1989)

² IT strategy alignment as used in this study refers to the *overall consistency* between the choices or decisions adopted in the implementation of the accounting package and the selected organisational factors (considered collectively).

on the success of the accounting package implementation. The research questions addressed are as follows:

- a) Do small-to-medium sized organisations align their information technology strategies with: (i) business objectives; (ii) structural factors; (iii) social factors; (iv) cultural factors; and (v) information system factors, during the implementation of their accounting packages?
- b) Does such alignment increase chances of successful accounting package implementation?

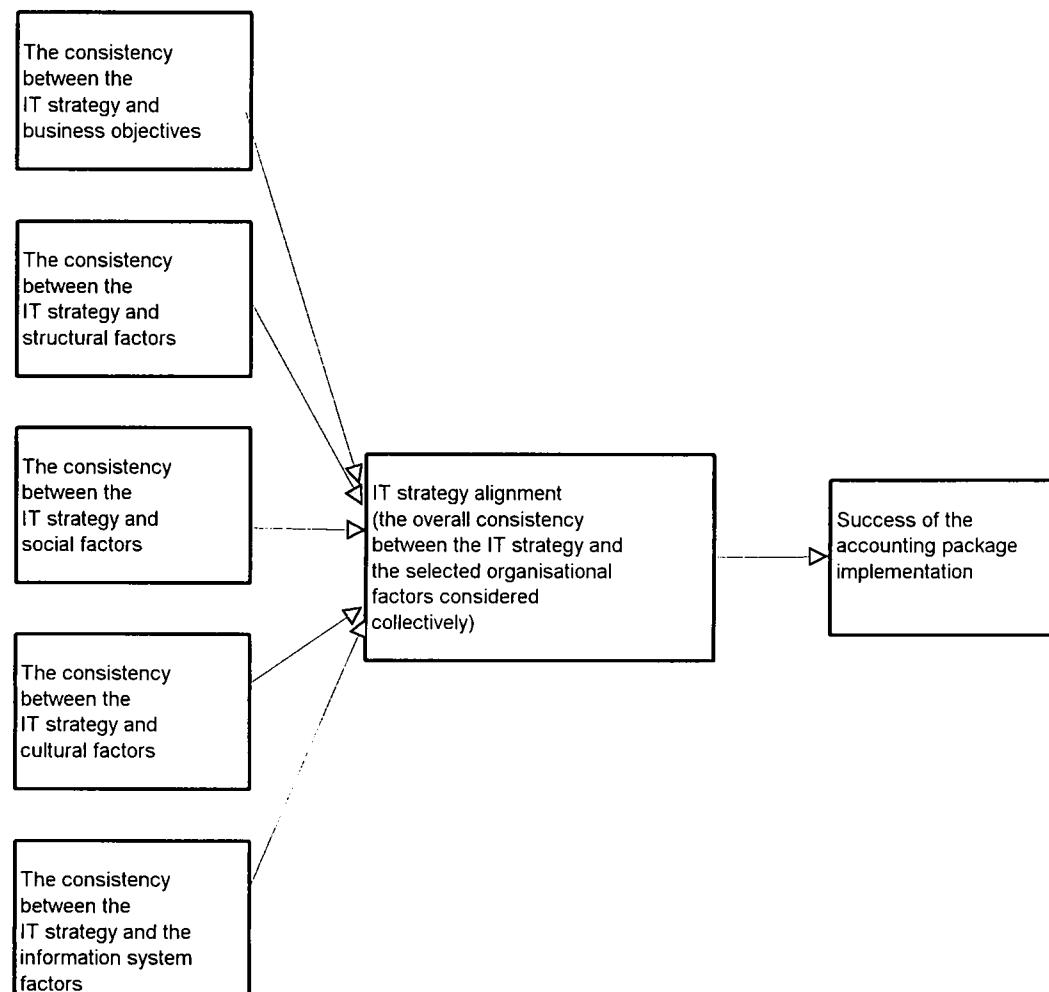


Figure 1.2 The alignment model investigated in this study

Note: IT strategy = The choices or decisions adopted during the implementation of the accounting package

1.3 Contribution of the study to knowledge

This study contributes to knowledge in a number of ways. Firstly, it is an attempt to measure empirically, IT strategy alignment in the small-to-medium sized organisations. The alignment of IT strategies or functions is a much discussed topic in literature, Nath (1989); Henderson and Venkatraman (1991), (1993); Morton (1991); and Miller (1993), but rarely attempted in the small to medium sized organisations using software packages. Proper implementation of software packages is crucial to the small-to-medium sized organisations which are increasingly depending on them for survival and also to facilitate economic developments.

Secondly, it offers a multi dimensional conceptualisation of the IT strategy alignment construct by measuring the construct from number of perspectives. This is a departure from prior studies that mainly examined alignment from a single dimensional perspective, e.g., the alignment of IT strategy and business goals. In addition, the multidimensional framework developed in this study (see chapter 3, page 37), also addresses other issues in the measurement of alignment. While alignment has been measured from the perspective of outcomes of the alignment process, for instance, the extent to which items in the information technology plans reference those in the business plans, Henderson and Sifonis (1988); the level of commitment, Reich and Benbasat (1996); and the relationship between information technology managers and business managers, Nath (1989), limited consideration has been given to factors that influence the alignment processes. For instance, approaches adopted in formulation of information technology and business objectives; the composition of linking mechanisms such as committees and task forces; the extent to which objectives were communicated to concerned parties; and approaches adopted

in the selection, acquisition and installation of software packages. Incorporation of such factors in this measurement would provide more comprehensive assessment of the level of alignment. The framework and the measurement tool used in this study could be used by organisations to conduct effective alignment audits of their accounting system implementations.

Thirdly, structural modelling techniques were effectively used to measure and to confirm theoretical predictions of the influence dimensions of alignment have on IT strategy alignment, and subsequently the impact of IT strategy alignment on the success of the accounting package implementation. By adopting these techniques, it was possible to provide statistical evidence which confirmed that the stronger the consistency between the IT strategy and each of the selected organisational factors that influence successful accounting package implementation, the stronger would be the IT strategy alignment. Subsequently, the stronger the IT strategy alignment, the more successful would be the accounting package implementation.

1.4 Organisation of the study

- Chapter 2 : reviews relevant literature concerning alignment, identifies the domains of the construct *IT strategy alignment*, and provides definitions of the dimensions used to measure it. It presents the framework to guide the measurement of information technology strategy alignment;
- Chapter 3: presents the research model for the current study;
- Chapter 4: describes the methodology and the instruments used to measure the dimensions of alignment, provides justification for use of these techniques and presents the data gathering process;
- Chapter 5: presents the methods used in the analysis of the data collected;
- Chapter 6: discusses the results obtained from the analyses in the context of literature review;
- Chapter 7: summarises the findings of the study, provides their implications and discusses further works indicated by the results. The recommendation for the organisations and the strength and weaknesses of the study are also presented.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to review the literature regarding alignment, identify the domains of the *IT strategy alignment* construct and propose its dimensions.

2.1 The IT strategy alignment construct: Domain and Dimensions

According to Venkatraman (1989), strategy related constructs are particularly complex given the wide array of differences in terminology, disciplinary orientation and underlying assumptions. He argues that conceptualisation of a theoretical construct requires proper specification of its boundaries. In this section, the domains of the alignment construct are specified. This would also help identify the perspective to be adopted in the current study, and the dimensions to be used in the measurement of the information technology strategy alignment.

Different perspectives of alignment have been adopted in the strategic management and information technology literature. These vary in their degree of specificity of the theoretical relationships between variables, and in the number of variables in the relationships, Venkatraman (1989). Aldrich (1979), for instance, argues that alignment is achieved when there is a favourable match in resource allocation between interdependent organisational groups. The perspective adopted here considered alignment as the internal consistency in resource allocation.

Research on diffusion of technology considers the alignment of relationships between technology and its potential adapter. Roger and Shoemaker (1971) surmise that there are characteristics of technologies that should be consistent with the expectations of users, implementers and the organisation, before the technology is finally accepted. For example, they state that technology should have relative advantage over the practices it is to supersede, it should mesh (or be compatible) with current practices, procedures and norms of the adapter, it should not be complex and should be easier to understand, and the benefits of adopting the technology should be visible and apparent to the subordinates, peers and superiors of the adopter.

Venkatraman and Camillus (1984) provide a broader perspective of alignment. They identify key perspectives of alignment based on whether the elements to be aligned are: (a) internal to the firm, e.g., the alignment between strategy and organisational structure; (b) external to the firm, e.g., the alignment between the firm's strategy and its environment; or (c) an integrated combination, wherein the formulation and implementation of strategy are considered to be interactive elements.

Venkatraman (1989) summarised the perspectives of alignment as follows:

1. Alignment (or fit) as a match between two theoretically related variables (e.g., strategy and structure);
2. Alignment as internal consistency (e.g., degree of internal consistency in resource allocation);

3. Alignment as the degree of internal coherence among a set of theoretical attributes;
4. Alignment as the degree of adherence to a specified profile of theoretically related variables;
5. Alignment as moderation. For instance, the impact that a predictor variable has on a dependent variable is dependent on the level of a third variable, which is the moderator;
6. Alignment as mediation or intervention. This would be the case where a significant intervening mechanism (e.g., an indirect effect), exists between an antecedent variable and a consequent variable.

Miller (1988); Henderson and Venkatraman (1991) and Brown and Magill (1994) stress the need to avoid limiting the focus of alignment to bivariate relationships as this could lead to implementation problems. Henderson and Venkatraman (in Morton 1991) argue that while some organisations have been successful in achieving particular patterns of alignment, e.g., IT strategy and business objectives, the role played by the organisational infrastructure and management processes in translation of strategies into action is not emphasised. They proposed a strategic alignment model linking business and information technology at strategy level and at the level of infrastructure and processes. They recommended that there should be consistency in the organisation's decisions relating to IT strategy, business objectives, organisational issues and information systems requirements. The alignment process proposed by Henderson and Venkatraman (1991) is depicted in Figure 2.1 below

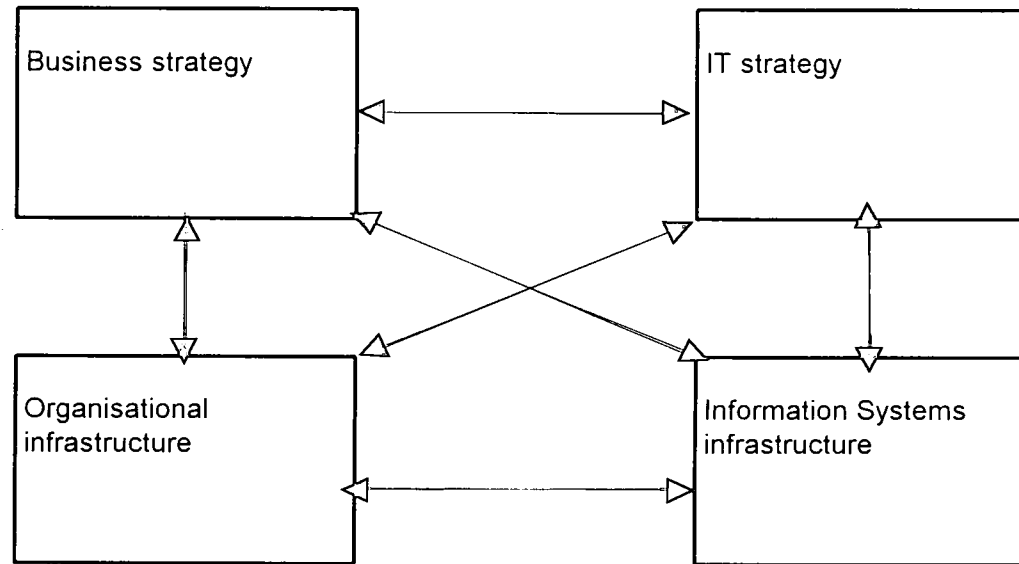


Figure 2.1 Strategic alignment process

The perspective adopted in the current study is similar to that of Henderson and Venkatraman (1991), that is, alignment is considered as the degree of consistency among a set of theoretically related variables. While all elements in Figure 2.1 should be considered during the alignment process, the current study has only examined the direct relationships between the IT strategy and business objectives; structural factors; social factors; cultural factors and information system factors (see Figure 2.2 below).

More specifically, the study measured the extent to which choices or decisions taken in the implementation of the accounting packages ensured:

- . consistency with the business objective to achieve efficiency in internal operations;
- . the establishment of efficient linking mechanisms to support the package utilisation (structural factor);
- . mutual understanding and commitment to business, IT, and user objectives (social factor);
- . the establishment of a stable organisational culture (cultural factor);
- . user reliance on the package for current and future information needs (information system factor).

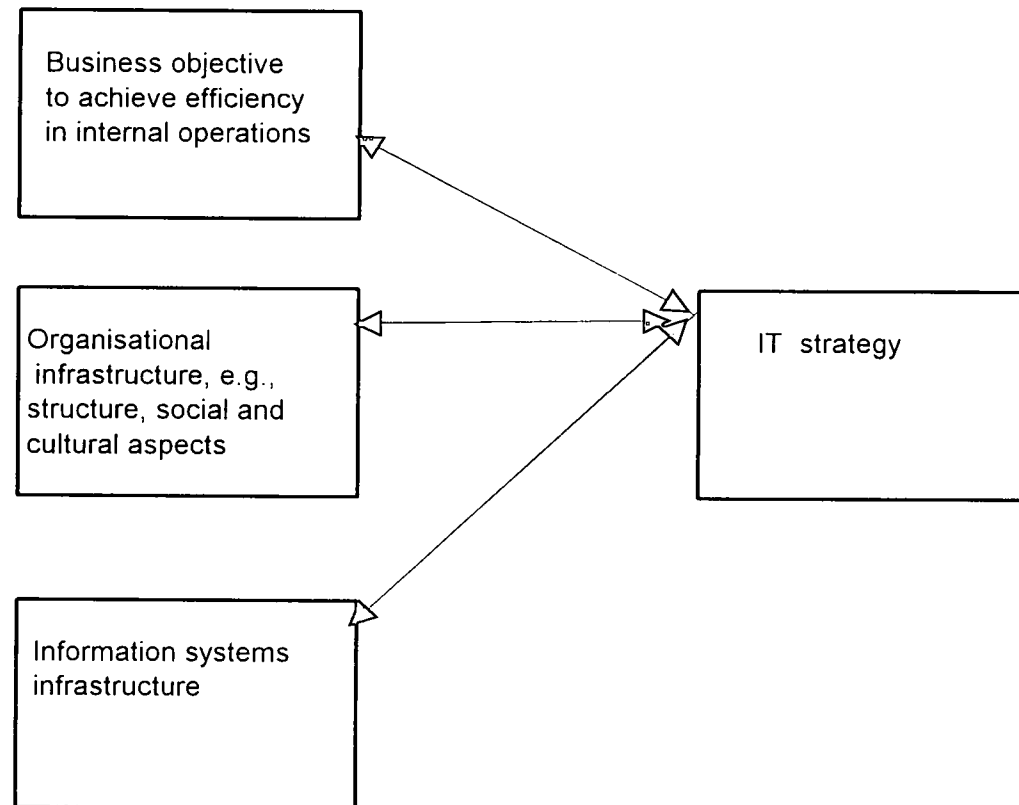


Figure 2.2 The perspective of alignment considered in the current study

2.2 Identifying the dimensions of IT strategy alignment

In choosing dimensions and variables to measure the IT strategy alignment, this study has relied on past literature as discussed in the following sections. An alternative would be to ask experts what they regarded as typical dimensions of IT strategy alignment (a technique adopted by Neumann, Ahituv and Zviran (1992) in a study that developed a measure for strategic relevance of information systems). This alternative was rather difficult to adopt given the problems of identifying experts, and that of ensuring their participation and commitment to the study.

The construct of IT strategy alignment was conceptualised in terms of five main dimensions outlined below. For each of these dimensions, measurement was then made from the perspectives of the organisational processes leading to alignment (such as timing, relationships, approaches and methodologies used) and the outcomes of the processes (such as contents of plans, level of understanding, reliance on the package and level of support).

i) *The business objective dimension of alignment*

This dimension refers to the extent to which the choices or decisions adopted in the implementation of the accounting package ensured consistency with the business objective to achieve efficient internal operations. This dimension was measured by examining the approaches adopted by organisations in formulation of IT and business objectives and the extent to which these objectives were consistent.

ii) *The structural dimension of alignment*

This dimension refers to the extent to which choices or decisions adopted in the implementation of the accounting package ensured the establishment of effective linking mechanisms to support the utilisation of the accounting package. Measurement of this dimension involved assessment of the nature and composition of linking mechanisms such as groups, teams and task forces involved in the implementation of the package, and the extent to which they facilitate effective utilisation of the package.

iii) *The social dimension of alignment*

This dimension refers to the extent to which the choices or decisions adopted in the implementation of the accounting package ensured mutual understanding and commitment to business, IT, and user objectives. Measures of this dimension involved the assessment of the level of communication and understanding of business, IT and user objectives, and the extent to which social problems were solved jointly by those involved in the implementation.

iv) *The cultural dimension of alignment*

This dimension refers to the extent to which the choices or decisions adopted in the implementation of the accounting package ensured the existence of a stable organisation culture. This was measured by examining respondents' beliefs in the potential of the package to solve measurement and control problems, and the extent to which the package supports the stability culture of the organisation.

v) *The information system dimension of alignment*

This dimension refers to the extent to which the choices or decisions adopted in the implementation of the accounting package ensured reliance on the package for the provision of current and future information needs. This was measured by assessing the approaches adopted in the selection, acquisition and installation of the packages, as well as the extent to which the package could be relied upon to provide current and future information requirements.

As indicated in the following sections, these dimensions were selected because they represent key factors that influence the success of IT implementations in small-to-medium sized organisations, Igbaria, et. al. (1997); Delone (1988); Raymond and Bergeron (1992); Raymond (1990b), and Griesse, et.al. (1985). The following sections review in detail the literature relating to these dimensions and their relevance to the alignment process.

2.2.1 The business objective dimension of alignment

This section reviews literature relating to the need to ensure consistency between IT objectives and business objectives. For instance, the business system planning model, IBM (1975), provides attempts to help organisations manage alignment during the planning processes. The fundamental tenet of this model is that an information technology strategy for an organisation must be integrated with its business objectives. This methodology requires that the implementer gains the commitment of those involved as a first step, then defines the business processes and business data. Based on these findings, the information architecture is defined and current system support analysed. Finally the IT strategy is designed and implemented.

Maddison (1984) also emphasises the need for information technology strategy to be guided by business objectives. He provides the following steps:

1. Describe organisation objectives;
2. Identify the Critical Success Factors that ensure achievement of the objectives;
3. Then, identify the information system requirements that will make the achievement of the above factors possible.

The Critical success factor methodology by Rockart (1979) was also intended for use by information systems managers to respond to the needs of business managers. This methodology was necessary because of the recognition of the chasm between business managers and those heading the information technology departments. It was considered that business managers had

little knowledge of information systems, had limited ability to express requirements and were business orientated. Information technology managers on the other hand, had little knowledge of business, needed detailed specification to conduct their work and were technically orientated, Beaumont and Sutherland, (1994).

Zahra and Covin (1993) studied the relationship among selected business objective dimensions, information technology policy dimensions and firm performance in the manufacturing-based firms. They observed that coordination of strategic business choices and technological choices must take place before investment in the development of IT systems could lead to superior financial performance. Porter (1983), (1985); Henderson and Venkatraman (1993); Keen (1993); McFarlan (1984) and Bakos and Treacy (1986) provide evidence in support of the view that coordination of business and information technology decisions ensure improvements in organisational performance, both at the internal and external strategy levels. For instance, information technology can be utilised as a competitive tool to maintain the organisation's overall cost leadership, Porter (1983); it can reduce cost of product design development, McFarlan (1984); or improve the internal and inter-organisational efficiency, Bakos and Treacy (1986).

Failure to align information technology objectives with business objectives could therefore increase the probability of implementing systems that are incapable of meeting the organisation's objectives, management may not be aware of the capabilities of their information systems, and business opportunities may be missed. The achievement of operational efficiency is the business objective under consideration in this study. This is considered because it is a fundamental objective for many small-to-medium sized organisations, which are often faced with financial

constraints and lack of technical expertise to effectively manage their implementations, Soh, et.al (1992); Igbaria, et.al. (1997).

2.2.2 The structural dimension of alignment

This section reviews literature relating to the structural aspects and their influence on the IT implementation process.

Bedian and Zammuto (1991) define organisational structure as follows:

“The pattern of coordination and control, work flow, authority and communication that channel the activity of organisational members. “

This definition highlights the significant role structure plays in supporting interdependencies between groupings or systems in the organisation. Classically, organisation theory has viewed structure in terms of design parameters such as job specialisation, behaviour formalisation, training and indoctrination, unit grouping, unit size, planning, control systems, liaison devices and centralisation, Mintzberg (1979). These parameters affect the outcomes of information systems implementations. High degree of behaviour formalisation may result in failure to recognise contingent problems, and a system developer distanced from top management may be constrained in the possible solutions available to him because of lack of support, Sauer (1993).

Some degree of centralisation or control is necessary during software package implementations. Centralisation is the degree to which the right to make decisions and evaluate activities is

concentrated, King and Sabherwal (1992). While some of these packages can easily be obtained off-the-shelf by any potential buyer, if the responsibility for their acquisition is left to individual departments, this could result in a situation whereby many incompatible packages, purchased from different vendors are introduced in the organisation. It would also make it more difficult to coordinate the implementation task, training and support costs may be duplicated, standard operational procedures would not be formulated and consolidated management information would be difficult to generated. Therefore, management should exercise some level of control to ensure that the correct software packages were implemented.

Dray and Yelsey (1985) undertook a survey of 110 large companies with information technology departments, of which 75 percent were experiencing problems. They identified factors which caused problems and factors shared by those enjoying success. Structural and social problems were: lack of inter-departmental co-ordination and manager/employee communication during implementation; inadequate resources for training and education; lack of involvement by human resource specialists; lack of attention to ergonomics and low level of employee involvement in implementation. Shared success factors were: attention by top management to issues relating to new technology; attention to coordination of functions; creation of expert staff units to guide technology implementation; establishment of formal employee involvement programmes and support for education and training.

Lind, Zmud and Fischer (1989) studied the impact of organisational structure on microcomputer adoption and proposed the following linking mechanisms that facilitate relationships among organisational units: news letters; internal consultants; user liaison; information centres; training sessions; steering committees; task forces; technology assessment groups and other user groups.

They suggest that in order for users to make effective use of micro computers, linking mechanisms should be established and measured.

Though studies by Dray and Yelsey (1985) and Lind, Zmud and Fischer (1989) were conducted in large organisations, similar structural problems have been identified in small organisations. Raymond (1985), (1990b), argues that organisational aspects of small businesses (e.g., the structure and resource availability), greatly condition the computerisation process and requires solutions in form of information technology, management policies, methodologies and techniques to be matched with this context. Innovations in information technology have solved some of the structural problems experienced by information technology users in both large and small sized organisations. For example, network systems facilitate linkage between functional units, just-in-time inventory systems facilitate closer buyer-supplier linkage that allow firms to operate as a virtual organisation, and the integration of databases with communication systems make it desirable for functional units to share information.

Delone (1988); Raymond (1990b); Cervený and Sanders (1987) and Griesse and Kurpicz (1985) have also identified similar structural factors as critical to successful implementation of computerised systems in small organisations. For instance, Griesse and Kurpicz (1985) found that software support had a major influence on the buyers' decision to introduce information systems in small-to-medium sized organisation. In addition, Cervený and Sanders (1987) concluded that user involvement and support were the key factors that received consistent support from their investigations on implementation success.

A number of structural elements such as behaviour formations, centralisation/decentralisation,

groups/departmental relationships, capabilities of liaison groups and task forces, communication and decision making techniques, influence, and are influenced by, the information systems. Those considered in the current study, which are relevant to small-to-medium sized organisations, include liaison groups, task forces, steering committees, communication channels, support groups or task forces.

2.2.3 The social dimension of alignment

This section reviews literature relating to social aspects and their influence on the IT implementation process.

Numerous investigations into IT implementation have attributed poor performance of IT systems to too much concern for technical issues and insufficient attention to social factors. The following quotation is typical:

"The track record for information technology implementation is not very good, MIT's Management in the 1990s program concluded that the benefits of information technology are not being realised because investment is heavily biassed towards technology and not towards managing changes in processes and organisational structure, culture (and social factors)." Benjamin and Levinson (1993).

The notion that firms should merge technology with human dimensions is not new. Its roots could be traced to the 'social-technical' framework developed at London's Tavistock Institute over 40 years ago, (Trist and Bamforth, (1951); Miller and Rice (1967)). Here, the 'social-

technical' framework was developed as a reconciliation of human, organisational and technological needs, and it is argued that maximized technological performance requires simultaneous optimization of an organisation's social and technological subsystems. Subsequently, leading organisational researchers working in the 1960's and 1970's (e.g., Woodward (1965); Child and Mansfield, (1972)) showed that technologies performed poorly in the absence of proper alignments with structures and cultures, conclusions that have received consistent support throughout the so-called 'human relations' school (McGregor, 1960) and 'contingency' school, (Lawrence and Lorsch, 1967) and more recent research linking organisations and technology (e.g., Huber, 1990; Orlikowski and Gash, 1992). Horovitz (1984) identifies social aspects of the strategic planning process as those consisting of factors such as: the choice of actors (e.g., managers); their degree of involvement; and the methods adopted in communication and decision making. Fidler and Rogerson (1995) state that research has identified several social factors that influence the success of information technology development. They argue that information systems implementation could have implications for the power structure within the organisation, whereby some would gain or lose status and power. It could also affect the social groupings within the organisation or lead to 'social isolation' of some members of the organisation. On the other hand, social relationships could also hinder or enhance system implementation. The support of senior management would ensure availability of human, technological and financial resources required for development, IFAC (1998). Chief executive officer's commitment for example, can enhance information technology success by making resources available for implementation, integrating information technology with business strategy and processes, and ensuring continuity in information technology investments over time, Henderson and Venkatraman (1993); Neo (1988); International Federation of Accountants (IFAC) report (1998).

The social factors considered in the current study are: understanding and commitment to business, IT and user requirements or objectives by organisational members, the extent to which these objectives were communicated to those concerned during the implementation, and the extent to which social problems experienced during the implementation of the package were solved jointly by users, section heads and implementers.

2.2.4 The cultural dimension of alignment

Organisational culture has been defined by Cooper (1994) as the social or normative glue that holds an organisation together and expresses the values, social ideas and beliefs which organisation members come to share. According to Baligh (1994) culture can be defined in terms of components and parts. For instance, technology may be defined in terms of the properties of technologies known; value put on mastering technologies; beliefs in its controllability; and beliefs in manageability of time. These parts of culture are depicted in Figure 2.2.1 below.

COMPONENTS	PARTS		
	Technology	Business and economics	Government and politics
Beliefs	High control	Less government influence	Democracy
	Management of time	Efficiency	
Values	Mastering technologies	profit	group over individuals

Figure 2.2.1 Inside a culture (adopted from Baligh 1994)

Rom, Pliskin, Weber and Lee (1991) argue that information system implementations should ensure their technical and organisational validity. They define technical validity as the ability of the system to provide, e.g., satisfactory response times, screen layout and support facilities. Organisational validity on the other hand concern the interaction between the organisation and the information system. An implementation is organisationally valid when users are involved in the implementation and are familiar with the tasks; channels of communication are established; and there is consistency with the organisational culture. They argue that organisational culture presents a particularly difficult challenge and that implementations fail when the cultural assumptions embedded within the management information system (MIS) design conflict the culture of the organisation. They warn that the longer it takes to resolve such cultural conflicts, the heavier would be the losses and perhaps, this would threaten the survival of the organisation.

Cooper (1994) also shares similar views. He used a number of cultural archetypes to demonstrate theoretical linkages among various cultures and different information systems. These include the survival, productivity, stability and human relations cultures. He adds that MIS are in accord with the survival culture to the extent that they support organisational survival in a complex, turbulent, and politicized environment. MIS capabilities he identifies as useful in this sense include: the ability to scan the environment looking for problems and opportunities, and filtering out extraneous information. He also argues that MIS are in accord with the productivity culture to the extent that they support management by facilitating organisational planning, directing, and goal setting. MIS capabilities he identifies as useful here include those associated with operations research, sensitivity analysis and forecasting.

Cooper argues that MIS are in accord with the human relations culture to the extent that they support member dialogue, participation, and development. It is expected that management deal with multiple and diverse goals or values, in an attempt to achieve cohesion and commitment. He suggests that MIS capabilities should enhance interpersonal communication and cooperation through systems such as teleconferencing, e-mail and group decision support. Cooper's suggestion may be valid, since these technologies are currently used by organisations to facilitate group processes by removing barriers to interaction. Other facilities not mentioned by Cooper, such as windows, icons and pull down menus, are also used to support participation and to make the software more user friendly.

Finally, MIS are in accord with the stability culture to the extent that they support organisational measurement and control. The stability culture exists when an organisation is in control of its internal operations and most of the tasks to be done are known and done repetitively. Management in this culture recognises and emphasises technical issues such as the significance of adopting technological methods. Key objectives include ensuring security, stability and order in operations. Cooper (1994) identified the following accounting-oriented activities to be in accord with this culture: those involving internal monitoring and control, such as cost variance reporting, budgeting and record keeping.

Of particular interest in the current study is the match between the stability culture and the cultural assumptions embedded in the design or implementation of accounting systems. According to Baligh (1994) culture can be defined in terms of its parts, components or properties. Hence the cultural assumptions embedded in the implementation of a technology such as an accounting package are: the beliefs in its ability to record accurately and measure performance;

the beliefs in its ability to facilitate control and monitoring, e.g., by providing cost variance reports and audit trail of operational activities, Leitch and Davis (1983), Vidyadaran (1995), Jones and McNamara (1988). A match between these cultural assumptions and the stability of the organisation would ensure cultural alignment.

2.2.5 The Information system dimension

According to Henderson and Venkatraman (1991) some of the factors to be considered in this dimension comprise:

- . The technology platform (e.g., the hardware, network connections the organisation uses or should use);
- . Application infrastructure (e.g., the software applications run and databases maintained);
- . Distinctive capabilities possessed by the organisation (e.g., skills in implementing systems and applications to support the organisation);
- . Standards by which the systems are developed and operated in the organisation.

Alignment of information strategy with information system requirements would involve effort to ensure that appropriate hardware and software is provided, users of the system are supported, the organisational competencies in developing systems are developed, and standards are followed in the development and implementation of the systems.

Unfortunately, the technologies adopted by some organisations could hinder the implementation process. Ewusi Mensah and Przasnyski (1994) examined factors that contributed to unsuccessful

information technology implementations in 500 companies in the United States of America. The technological inadequacies they identified are:

- . The incompatibility of the organisational design systems with available hardware and software;
- . Lack of suitable hardware and software needed to complete the implementation;
- . Technical feasibility of the implementation not proven before starting the implementation.

Sherer (1993) investigated different components of risks involved in software purchase and identified numerous technical problems that should be addressed during the implementation process. These are: failure of the package to operate satisfactorily in the user environment; the package may be incapable of being properly maintained, the package could not be enhanced or changed or may not be transferable to different configurations. Sometimes changes to the package may lead to loss of functionality which could limit the package usefulness.

Some organisations lack capabilities or skilled personnel and this affects their ability to implement systems. Igbaria, et. al.(1997) state that smaller firms usually cannot afford to employ internal staff with specialised computer expertise because of the limitations in financial resources and management problems. In an earlier study, Igbaria, Smith and Meridith (1994) examined factors that determine the intention of information systems employees to stay with their organisation. This study was conducted among 112 information system employees in South Africa and the results revealed job dissatisfaction as the main cause.

Allingham and O'Connor (1992) conducted a study on management information system success as perceived by different users. A common complaint was on the inadequacy of training and documentation provided to users. Technical staff felt that training was bias towards the needs of administrative staff, and limited areas relevant to their (technical users) work was not emphasised. These findings are consistent with those of Conrath and Mignen (1990).

There is need to ensure that standards or procedures are followed in the development and implementation of information systems. Standards are rules or procedures that guide staff in the development, implementation and operation of information system, Anderson (1987). They minimise the likelihood of errors and misunderstandings in the development and operation of computer systems. For instance, the existence of standards for documentation establishes the need to document a system and its operations. They give people operating a system some where to look up, learn the system's operating requirements faster and to provide continuity after staff changes.

The acquisition and implementation of software packages requires that proper procedures are followed in evaluation of potential vendors. Vidyadaran (1995) recommends the following as necessary in the evaluation of computerised accounting packages:

- . It should be easy to use and flexible to operate from the user's point of view;
- . It should be working efficiently and process results accurately;
- . Maintenance throughout its life must be assured;
- . Upgrades should be made available and enhancements to software possible;
- . It should have adequate and effective built in controls so as to be sure it is auditable and

will work in a controllable environment.

Sherer (1993) recommends the following:

- . Analysis of costs and benefits when selecting the package;
- . Selected systems should meet user requirements and provide minimal risk of failure in the new environment;
- . Functional capabilities must be analysed in the context in which the system operates;
- . Review of the system in operation at other installations to confirm its compatibility;
- . Requirements should be reviewed to ensure that they fit existing technology;
- . Formal methods such as scoring models or weighted ratings can be used to choose among competing software packages;
- . Development of an installation plan.

It is therefore important to ensure that appropriate hardware and software are in place to support current and future information processing. Standards should be adhered to during implementation and skilled staff should be secured.

2.3 Developing the framework to guide measurement of information technology strategy alignment

While the above dimensions have been identified as crucial in this measurement, earlier attempts to dimensionalise alignment in accounting literature suggest the content, time and personnel dimensions. Shank, Niblock and Sandalls, (1973) argue that business plans and budgets could be tightly or loosely aligned depending on three characteristics of alignment:

1. Content alignment, which relates to the correspondence between the data presented in the plan document and that presented in the budget;
2. Timing alignment, which concerns the sequencing of annual planning and budgeting cycles;
3. Organisational alignment, which focus on the relationships between the units responsible for planning and budgeting (people doing the planning and budgeting).

This suggests that alignment could be measured from the perspective of organisational processes leading to it (e.g., causes of alignment) as well as from the perspective of outcomes of these processes,(effects). The later has been the perspective adopted by earlier researchers, Reich and Benbasat (1996). Reich and Benbasat (1996) measured the consistency between the processes adopted in the formulation of information technology plan and those used to develop the business plan. They also measured alignment as an outcome of processes, by the extent to which information system plans made reference to items in the business plan. The significance of this distinction is that alignment is not only measured by examining the outcomes (e.g., the plans) but also by considering the processes that lead to its formulation. It is possible, for instance, that a single manager could have created a business plan with high levels of cross reference to IT factors, but fails to share his/her insights with concerned departments, which would affect their commitment to the plan. The proposed approach would therefore provides a more comprehensive assessment of alignment. Results obtained in the process-based assessment may be compared with those obtained in the outcome-based assessment.

In the current study, the researcher integrated the *cause/effect* distinction in the framework that guided the measurement of the information technology strategy alignment. Alignment was measured on a number of dimensions (e.g., business objectives, structural dimension; social dimension; cultural dimension and information system dimension). For each of these dimensions, measurement was made from the perspectives of (i) the organisational processes leading to alignment (such as timing, relationships, approaches and methodologies used) and (ii) the outcomes of the processes (such as contents of plans, level of understanding, extent of reliability and level of support). By placing the dimensions of alignment, such as business objectives, structural, social, cultural and information system dimensions on one axis and the cause/effect distinction on another, a framework to guide measurement of information technology strategy alignment is developed (Table 2.3). In the following chapter, the research model for this study is presented.

Table 2.3

Framework to guide the measurement of IT strategy alignment

Dimensions of Alignment			Measurement from the perspective of the processes (Causes)	Measurement from the perspective of outcomes (Effects)
	1	Business objectives dimension	Approaches adopted in the formulation of IT and business objectives	The extent to which IT and business objectives are consistent
	2	Structural dimension	Nature and composition of linking mechanisms (such as groups, teams, task forces) involved in the implementation of the package	The extent to which linking mechanisms facilitate effective utilisation of the package
	3	Social dimension	Extent to which the objectives were communicated to concerned parties and social problems were solved jointly	The extent to which IT managers, business managers and users understand, and are committed to each others objectives
	4	Cultural dimension	The beliefs in the potential of the package to solve measurement and control problems	The extent to which the accounting package supports the stability culture of the organisation
	5	Information system dimension	Approaches adopted in the selection, acquisition and installation of the accounting package	The extent to which the package can be relied upon to provide current and future information requirements

Description of the dimensions

The extent to which the choices or decisions adopted in the implementation of the package:

- 1 ensured consistency with the business objective to achieve efficient internal operations
- 2 ensured the establishment of effective linking mechanisms to support package utilisation
- 3 ensured mutual understanding and commitment to business, IT and user objectives
- 4 ensured the existence of a stable organisation culture
- 5 ensured reliance on the package for provision of current and future information needs

CHAPTER 3

RESEARCH MODEL

This chapter presents the research model for this study, the hypotheses and the rationale for the hypothesized structural relationships.

3.1 Research Model

In order to determine the relationship between the dimensions of alignment, IT strategy alignment and the success of the accounting package, a structural model was developed and tested using structural equation modelling techniques. These techniques provide a method of dealing with multiple relationships simultaneously (for instance, those examined in the current study), and Venkatraman (1989) recommends that they are appropriate for testing of models where alignment is perceived as internal consistency among sets of variables. The structural model of IT strategy alignment is depicted in Figure 3.1 below.

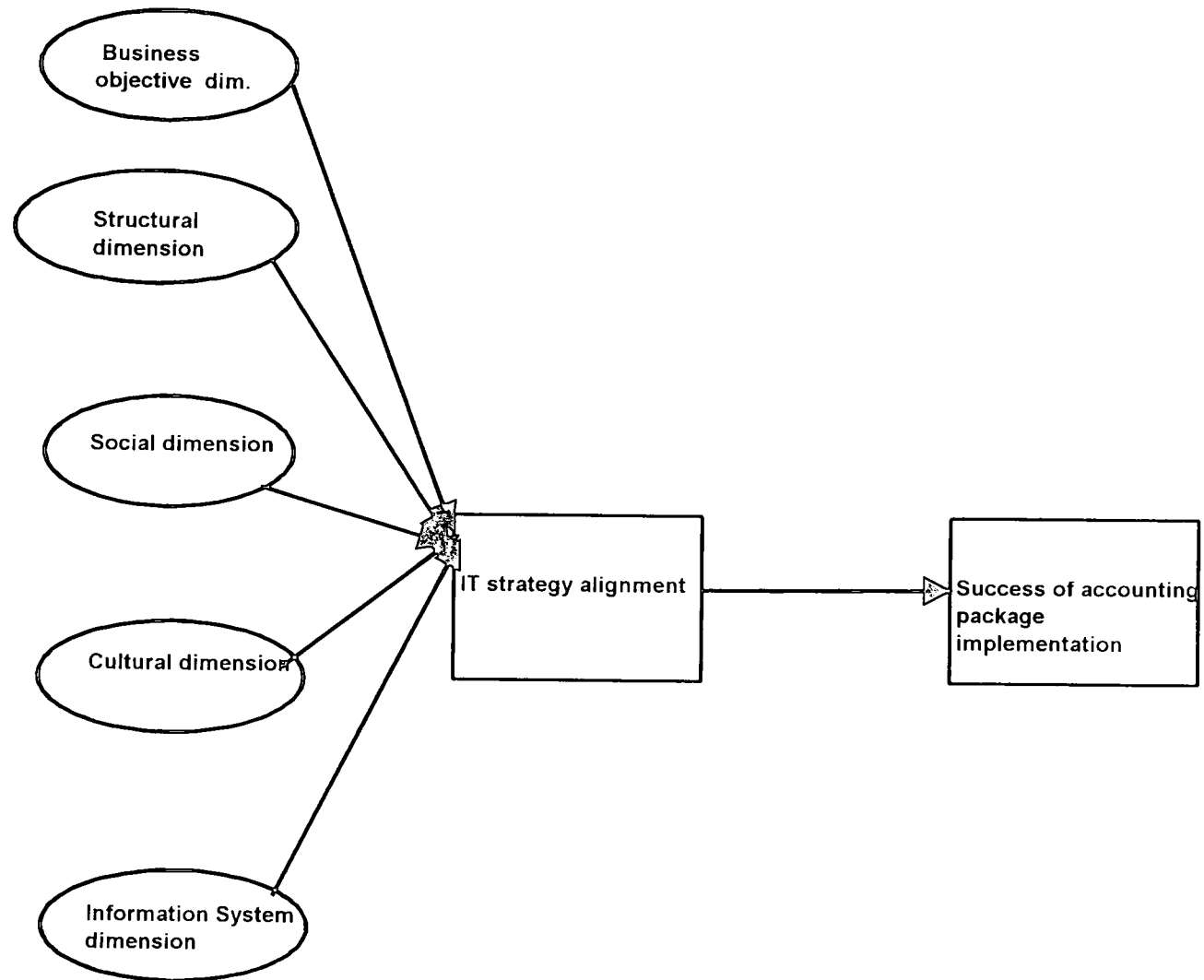


Figure 3.4 IT strategy alignment model

In this model the following are examined:

- a) The influence of each of the dimensions of alignment (Table 2.3, page 37) on the IT strategy alignment (the overall consistency of the accounting package implementation decisions with selected organisational factors that influence IT implementation);
- b) The influence of the IT strategy alignment on the success of the accounting package implementation.

It is hypothesised that:

H1:

- a) The more the choices or decisions adopted in implementation of the accounting package are consistent with the business objective to achieve efficiency in internal operations, the more coherent would be the IT strategy alignment;
- b) The more the choices or decisions adopted in the implementation of the accounting package ensure the establishment of effective linking mechanisms (such as, groups, committees, task forces) to support the utilisation of the accounting package, the more coherent would be the IT strategy alignment;

- c) The more the choices or decisions adopted in the implementation of the accounting package ensure mutual understanding and commitment to business, IT and user objectives, the more coherent would be the IT strategy alignment;
 - d) The more the choices or decisions adopted in the implementation of the accounting package ensure the achievement of a stable organisational culture, the more coherent would be the IT strategy alignment;
 - e) The more the choices or decisions adopted in the implementation of the accounting package ensure reliance on the package for current and future information requirements, the more coherent would be the IT strategy alignment.
- H2: The more coherent the IT strategy alignment, the more successful would be the implementation of the accounting package.

The rationale for the above hypothesised structural relationships is based on a number of information technology implementation models, some of which have been discussed in the previous sections. For instance, the implementation model by Ginzberg (1980), where it is claimed that success in information technology implementation is determined by the alignment of characteristics of designers, users, the system and the organisation. The model to evaluate effectiveness of information technology plan by Premkumar and King (1994), also provide support for the notion that successful information technology strategy depends on the ability of the developer to co-ordinate integration mechanisms in the planning process, ensure effective communication between information system and business managers, encourage participation of

information system and business managers in the planning process. Zahra and Covin (1993); Porter (1980),(1985); Keen (1993); and Bakos and Treacy (1986) provide support for the view that co-ordination of business objectives, structural, social, cultural and information system factors precede superior performance and successful deployment of technology. The social-technical model developed by Tavistock institute (Trist and Bamforth, (1951); Miller and Rice (1967)), indicates that simultaneous optimisation of social and technological subsystems lead to effective technological implementations.

The information technology strategy alignment is measured by user perception of the levels of consistencies between the information technology strategy and the selected factors that influence successful IT implementation. In the following chapters, the methodology, data gathering and measurement processes are presented, which is then followed by statistical analyses and presentation of the findings.

CHAPTER 4

METHODOLOGY AND DATA COLLECTION

4.1 The questionnaire

4.1.1 The structure of the questionnaire

To measure respondents' perception of the extent of alignment, a questionnaire was developed (see appendix 1). This questionnaire consisted of two parts. The first part aimed at collecting basic information about the organisation and its characteristics e.g., size, annual revenue, number of employees, package used. This information would help determine whether the organisations could be classified as small-to-medium in size, and also the nature of the accounting software used had to be of the type purchased off-the-shelf. This part was completed by a senior manager in each organisation since they are expected to have such details about the organisation.

The second part (part b) of the questionnaire was completed by all respondents. Section 002 of part (b) of the questionnaire collected general information about the respondent's job title, involvement in package implementation and usage of the package. This information would help in the analysis of responses per category of respondents, determine whether or not they participated in the implementation and also to ensure that only those with relevant experience in using the package formed the sample for this study. Only those organisations that used the

accounting packages for one or more years were involved in the study. It is the view of the researcher that a period of at least a year would be sufficient for a user to understand clearly the operations of relevant accounting modules.

Section 003 of part (b) of the questionnaire asked the respondents to rank their perception of the extent to which there was alignment between decisions to implement the accounting packages and the organisational factors that influence IT implementations. The items were phrased as questions on a five-point Likert-type scale. They were anchored at the end with the terms “strongly disagree” and “strongly agree”. These questions were coded as follows:

Questions A31 to B32 measured the alignment between IT objectives and business objectives;

Questions A41 to B42 measured the alignment between IT strategy and structural factors;

Questions A51 to C52 measured the alignment between IT strategy and social factors;

Questions A61 to A62 measured the alignment between IT strategy and cultural factors;

Questions A71 to H72 measured the alignment between IT strategy and information system factors.

According to the framework developed in the previous chapter, which was used in the development of the questionnaire, it was proposed that alignment should be measured from the perspective of processes leading to it, as well as from outcome of this process. Therefore, questions that ended with the number “1”, such as A31, A51, measured alignment from the perspective of outcome, while those that ended with “2”, such as B32, H72, measured alignment as a process.

Section 004 of the questionnaire assessed the respondent's perception of the overall degree to which the approach adopted in the implementation of the accounting package was aligned with the selected organisational factors that influence IT implementation. Section 005 assessed the respondent's perception of the level of success of the accounting package implementation. Section 006 asked the respondent to provide personal details and other contact details.

4.1.2 Measures of the dimensions of IT strategy alignment used in the questionnaire

The following sections discuss the items used in sections 003, 004 and 005 of the questionnaire to measure each of the dimensions of alignment, the IT strategy alignment, and the success of the accounting package implementation.

4.1.2.1 Measures of the business objectives dimension

This dimension is defined as the degree to which the strategy adopted in the implementation of the accounting package was consistent with the business objective to achieve efficiency in the internal operations. Many researchers have proposed a number of criteria for determining relationships between business and information technology choices. Premkumar and King (1994) developed and empirically validated a model to evaluate the information system plans. They suggest that existence of the following integration mechanisms should be established: effective communication between business and information systems managers, participation of information systems managers in business planning and use of inter-organisational systems to support continuous flow of information. Earl (1993) examined strategic information system planning processes in 27 companies and concluded that the organisational approach ensures

effective planning. This approach involves collective learning across the organisation, use of teams, task forces or workshops, to tackle business problems, and the information system function working in close partnership with the rest of the organisation, e.g., by having information system managers on task forces.

Henderson and Sifonis (1988) claim that existence of relationships between business and information technology objectives could also be established by measuring the internal and external consistency of business and information technology planning outputs. They argue that information technology mission, objectives and plans chosen, should be consistent with stated business mission and objectives, and that these plans should be balanced with respect to external business and information technology environment to ensure that they are externally valid. This is true because the main objective in introducing IT is to support the business direction of the organisation. IT missions or plans should therefore identify IT requirements, resource requirements and benefits that organisations can achieve from these implementations. The need to balance IT and business plans with external factors is crucial. Plans are often based on assumptions which are influenced by environmental factors. For instance, if a selected technology becomes obsolete, or changes take place in the organisation's competitive position, it would be necessary for the organisation to immediately evaluate its business and IT plans and ensure that appropriate revisions are made.

Cresap, McCormick and Paget (1983) measured alignment by asking respondents to identify the extent to which "the business plan states information systems needs; the information system plan makes reference to items in the business plan; line and staff managers participate actively in information system planning and the business/information system planning calendar are

carefully synchronised.”

A similar approach was adopted in the current study, whereby the researcher measured the business objectives dimension by looking for cross references between information technology and business objective, as evidence of alignment. The items on which the cross references were based (see below), were provided by the researcher in order to ensure a common base for comparison of respondents perceptions. Reich and Benbasat (1996) used open-ended questions and self reporting methods which resulted in unstructured and unfocused responses that hampered their ability to precisely assess the degree of congruence. To avoid similar problems, questions were structured and closed. An alternative to measuring this dimension would be to examine physically the organisation's written documents, plans, etc. However, this would not be possible where the researcher was unknown. Few organisations would allow an outsiders to examine their plans. This approach would also prove to be more difficult in situations where managers have their plans in their heads. Detailed written plans, particularly for small organisations, are not often produced, Lederer and Mendelow (1986), (1989).

The business objective to ensure efficiency in internal operations was considered in this study. Operational efficiency, as defined by McFarlan (1984) refers to attempts to reduce cost of product design, development, sales and other operations. This represents a fundamental objective for many small organisations, which are often faced with financial constraints, lack of technical expertise, and face volatile environment, Soh, et. al. (1992), Igbaria, et. al. (1997). The following items were used to measure this dimension:

- A31. The extent to which the business plan identifies the contribution the accounting package can make in ensuring operational efficiency (e.g., through better control

of purchasing activities, inventory control and debtor management).

It is suggested that software packages identified for supporting business objectives should be carefully evaluated by management, in order to determine their capabilities to meet organisational goals, Anderson (1987). This ensures that systems with the right capabilities are implemented, and management understanding of these information systems is enhanced.

- B31. The extent to which the business plan identifies the risk to business objectives, (e.g., achievement of operational efficiency) which may be caused by the non compliance of the accounting package with the Year 2000 (Y2K) requirements. Non-compliance with Y2K requirements by accounting systems would have serious practical consequences for many organisations. Organisations have been warned of this problems over along period of time. It is anticipated that in extreme cases, this may call into question the ability of the organisation to continue in operation. Organisations are expected to address the implications of these risks and uncertainties on business objectives. Abstract 20 on Year 2000, published by the Auditing Standards Board, and reported in the management accountant journal, (CIMA, 1998), requires that organisations should disclose these implications in their plans or reports. It is envisaged that such disclosure would reflect the commitment of management in addressing Y2K system problems, and help users distinguish between organisations that have taken measures to remedy the problem.

- C31. The extent to which the IT plan states the main business objectives the accounting package is intended to support.

The International Federation of Accountants (IFAC) exposure draft on implementation of IT plans, June (1998), recommends that an IT plan should be supportive of the business objectives. It is suggested that business targets should be clearly specified in the IT plans and the focus of the IT planning process should be directed towards achievement of these objectives.

- A32. The extent to which heads of non-IT sections were involved in planning for the implementation of the accounting package.
- B32. The extent to which the head of the IT section was involved in the development of business plans and objectives.

Management knowledge of computers and their involvement in the planning for these implementations has facilitated successful computing in small-to-medium sized organisations, Delone (1988); Igbaria et.al., (1995). IT researchers argue that business and IT managers need to integrate IT planning and business planning in order to develop successful systems that meet organisational objectives, Keen (1993); Premkumar and King (1994).

4.1.2.2 Measures of the structural dimension

The structural dimension is defined as extent to which the choices or decisions adopted in the implementation of the accounting package ensured the establishment of effective linking

mechanisms, (such as support teams and committees) to support the implementation and utilisation of the accounting packages. Dray and Yelsey (1985); Lind, Zmud and Fischer (1989); Earl (1993); Premkumar and King (1994) provide evidence in support of the view that support groups, effective communication, and expert staff ensure effective utilisation of IT systems. Many small sized organisations, however, rely on forms of support such as that provided by other users, training manuals, purchased books and help screens. While these are useful, more formal mechanisms such as internally trained support groups, making arrangement with suppliers to help when users get into problems or setting up user groups or information centres, should be considered. There are critical stages in implementation of the accounting package where the assistance of experienced personnel is particularly necessary, for example during file conversion from existing manual file records.

Cale and Eriksen (1994) also report that even in cases where a package fits well with user needs, long term viability is dependent upon the competence and capability of the support teams. In their study of factors affecting the implementation of software packages, they found a number of instances in which the support personnel simply did not have the experience or training to adequately perform their duties. They recommended that technical capabilities of available staff should be assessed during the selection and package implementation. The structural dimension was measured by asking the respondents to indicate the existence, composition and effectiveness of support teams. The measure consisted of the following items :

- A41. Existence of a specific person (or group) that effectively supports package users;
- B41. The extent to which support groups review requirements of package users;
- A42. The extent to which support groups represent departments affected by the

implementation of the package;

B42. The extent to which support groups possess skills in accounting and/or IT.

4.1.2.3 Measures of the Social Dimension

This dimension is defined as the extent to which the choices or decisions adopted in the implementation of the accounting package ensured mutual understanding, and commitment to business objectives, IT objectives and users objectives, by members of the organisation. It is argued that absence of top management support, IFAC (1998); social isolation, Fidler and Rogerson (1995); lack of understanding of current objectives and non existence of shared vision for utilisation of IT, Reich and Benbasat (1996) would influence the degree of social alignment.

The levels of mutual understanding of objectives were measured by asking the respondents to indicate knowledge of current objectives of their department and those of others (see items A51 (understanding of business objectives) to C51 (understanding of user requirements). Item G51 (Accounting package will enhance accountability and resource utilisation), measured the extent to which respondents shared the same vision of the role and contribution of the accounting package to the long term success of the organisation. Based on tools used by Reich and Benbasat (1996) and Neumann, et. al. (1992), respondents were asked to indicate their expectation of future usefulness of the package.

Commitment in this study was conceptualised and measured as user involvement. Hartwick and Barki (1994) discuss the relationship between user involvement and attitudes, whereby, it is claimed that user involvement affects user attitude which is a predictor of system usage. Fishbein

and Ajzen (1975) define attitude as the amount of affect one feels for or against some object such as the IT plan and strategies. User involvement refers to the extent to which a person believes an object is important and of personal relevance, Hartwick and Barki, (1994). Using this concept, for instance, a high level of commitment on part of non-IT section heads to the package implementation, was considered to indicate the importance or relevance of the accounting package to them.

In addition, it was also necessary to measure the extent to which requirements and objectives were identified and communicated to those involved in the selection and implementation of the package. The importance of this during implementation is that it ensures broad understanding of the problems and facilitates the selection of the correct package. The introduction of any new system brings change and there seems to be a common human reaction to resist change, until it can be shown to be to an individual's advantage. Adverse reactions from people can arise from various factors such as: fear of redundancy, fear of reduction in status, fear of changes in organisational setup, implementation seen as criticism of past efforts. Such problems can be minimised when personnel concerned are involved from the beginning, they are invited to contribute to the implementation by making suggestions which should be acknowledged, seek their cooperation in solving social problems, and demonstrate to them that elimination of some routine work will improve job satisfaction. The extent to which cooperation and involvement of staff was ensured was also measured. The items used to measure the social dimension are:

- A51. Understanding of business objectives;
- B51. Understanding of IT objectives;
- C51. Understanding of other users' requirements;

- D51. The commitment of non-IT section heads to IT developments;
- E51. The commitment of IT teams to business and user needs;
- F51. The extent to which users report software and hardware faults to management;
- G51. Extent to which the package would enhance accountability and utilisation of resources;
- A52. The extent to which business, IT and user requirements were communicated to those concerned with the implementation;
- B52. The extent to which heads of sections were involved in communication of objectives;
- C52. The extent to which social problems experienced during implementation were solved jointly by users, IT and business management.

4.1.2.4 Measures of the cultural dimension

This dimension is defined as the extent to which choices or decisions adopted in the implementation of the accounting package ensured the establishment of a stable organisational culture. According to Cooper (1994), in this culture the interest of management is focussed inwards upon ensuring control, efficiency and stability. He argues that stability in organisational operations is supported by activities such as internal monitoring, cost variance reporting, accounting or record keeping. Individuals were asked to indicate the extent to which their accounting package supported activities like monitoring of internal operations, budgeting, accounting and forecasting. In addition, it was also necessary to determine the reasons that lead to the implementation of the accounting packages in these organisations. This would in a way

indicate the problems or the culture that existed prior to implementation of the packages and the beliefs in the capability of accounting packages to provide solutions to these problems. The following items measured this dimension:

- A61. monitoring of internal operations;
- B61. budgeting ;
- C61. accounting;
- D61. forecasting;
- A62. The accounting package was implemented to solve measurement and control problems in the organisation.

4.1.2.5 Measures of the information system dimension

This dimension is defined as the extent to which the choices or decisions adopted in the implementation of the accounting package ensured reliance on the package to meet the current and future information requirements. Acquisition and implementation of the accounting packages involves significant risks which should be identified and their consequences evaluated. Lyytinen (1988); Igbaria and Nachman (1990); Sherer (1993); and others identify a number of issues that should be considered in package implementation. These issues have been presented in section 2.2.5 above. In addition, international quality standards (e.g., ISO 9004) emphasise the need for quality in purchasing. Accounting packages are purchased off-the-shelf and like other purchases, the process of their acquisition should be planned and controlled by well established procedures.

ISO 9004 provide the following procedures as a minimum:

- . clear specification of what is to be purchased;
- . selection of acceptable vendor. (The method of establishing the vendor's capability can include on-site evaluation of the product samples; evaluation of vendor's past history with similar product, experience in dealing with the product);
- . ensuring that there is an agreement on quality assurance;
- . making provisions for settlement of disputes.

The items that measured this dimension were developed from tools used in prior studies and the requirements above. Items A71-C71 measured the confidence user had in the accounting package, their satisfaction with the nature of output and the extent to which they felt that it operated effectively. Items D71-E71 measured the efficiency of the support provided and the extent of reliance on the vendor. Items A72 - G72 measured alignment from the perspective of processes leading to alignment. For instance, it is expected that users should be provided with adequate training, should be involved in the selection and implementation of the system, and the system should be tested for Year 2000 compliance. Users should be involved in these activities in order to create realistic expectations about the system capabilities and greater levels of acceptance of the system. The items used to measure this dimension are listed below:

- A71. There is loss of user confidence in the package;
- B71. Output provided by the package is unsatisfactory;
- C71. Interruptions in processing are increasing;
- D71. There are delays in support provided to users;

- E71. Reliance on vendor is increasing;
- F71. There is loss of data confidentiality;
- A72. The package is not Y2K compliant;
- B72. The reliability of the vendor was assessed;
- C72. Y2K compliancy tests were conducted on the hardware and software;
- D72. Users were involved in the selection and implementation of the packages;
- E72. Processing capabilities of the package were evaluated;
- F72. The package was compared to others on the market;
- G72. Users were provided with adequate training;

4.1.2.6 Measures of information technology strategy alignment

Information technology strategy alignment is defined in this study as the overall consistency of the decision or choices adopted in the implementation of the accounting package with the selected organisational factors that influence IT implementation in small-to-medium sized organisations. It is the view of the researcher that many organisational factors, such as those discussed in this study, influence the decisions to implement accounting packages successfully. Therefore, the degree of alignment is an outcome of the effects of many of these factors acting together or simultaneously, a view shared by Brown and Magill (1994) in their study of alignment of information functions with the enterprise. One way to measure this would be to ask the respondents to give their overall opinion of the alignment when all influencing factors are taken into consideration.

IT strategy alignment was therefore measured by asking the respondents to indicate their agreement or disagreement with the following statement:

A81 Overall, the information technology plan was aligned with organisational issues, business objectives and information system requirements

4.1.2.7. Measures of accounting package success

Scown and Thompson (1993) claim that there are complexities in measuring the effectiveness or success of information systems. They argue that information systems are social systems since they have an impact on the organisation operations, and therefore involve complex and dependent relationships which makes it difficult to devise clear objective measures. They also argue that even if one was to base measurements on the value of information, it is difficult to put an objective value on the information provided by these systems because the value is determined in part by who uses it and how it is used. They therefore recommend that evaluation of information systems should involve assessment of user's perception.

The success of the accounting package was measured by assessing user satisfaction with the package and its implementation. Lyytinen (1988); Igbaria and Nachman (1990); Conrath and Mignen (1990); Remenyi and Money (1991), all support the view that user satisfaction is a surrogate measure for the success of information systems. Igbaria and Nachman (1990) claim that user satisfaction has been the most popular approach and

used this method to examine the effect of an individual, organisation and system factor on the success of end-user computing. Conrath and Mignen (1990) also confirmed that determination of the level of user satisfaction with products and services of management information systems has existed for many years whereby researchers have correlated successful usage with user satisfaction with those services. They argue that:

"If you do not know how a user perceives computer based services and their delivery, and why, you do not have a basis for changing their perception or improve the system."

Gatian (1994) also states that:

" user satisfaction was initially advocated as a surrogate measure for the utility or success of an information system by Nolan and Seward. Subsequently the list of researchers advocating development and employment of user satisfaction measures has become extensive."

Gatian (1994) however cautions on the danger of misinterpreting the meaning of high or low scores from the user satisfaction questionnaires in research and practice. She states that:

" those concerned with the possible misinterpretation of user satisfaction scores emphasise that high levels of user satisfaction do not guarantee changes in user behaviour or system effectiveness."

In this study the success of the accounting package implementation was measured by asking the respondents to indicate their satisfaction with the implementation, extent to which the package

met their requirements and those of the organisation. The following items were used:

- A91. The accounting package was implemented successfully;
- A92. The accounting package meets most of the organisation's requirements;
- C92. The accounting package meets most of my requirements.

4.2 Pilot testing

A preliminary version of the questionnaire was discussed with scholars and managers and was pilot tested with 15 respondents. The objective was to provide feedback regarding the wording of items, to assess respondents' understanding of the questions and the overall organisation of the instrument. Some questions were reworded and the original structure of the questionnaire was amended.

4.3 Sampling and data collection

The sample was obtained from two sources: (i) the Lesotho business directory, currently the only business directory in Lesotho. This yielded a list of 55 firms, and (ii) Braby's Commercial Directory of Southern Africa (73rd Edition, Vol 1, 1997), which yielded a list of 60 firms. These firms were initially contacted by phone to determine whether they used accounting packages and to confirm their willingness to participate in the study. 35 firms from the Lesotho business directory and 40 firms from the Braby's Commercial Directory confirmed that they used accounting packages and indicated their willingness to participate in the study. A letter explaining the purpose of the study, and formally requesting each company to participate in this

study, together with 4 copies of the questionnaire (Appendix 1), and a postage paid return envelope were mailed to the organisations. A total of 300 questionnaires were mailed. This was necessary because the structural model adopted in the analysis of the findings requires a sample size of between 100 to 200 subjects, Hair, et. al. (1995). In addition, since responses were required from business managers, IT section heads, Non-IT section heads and users, at least 4 questionnaires had to be sent to each organisation.

The size of the firm and annual revenue had to be addressed. Philip (1993) argues that there is no internationally recognised delimitation of the small enterprise. He states that often quantitative measures such as employment and output levels are used. Small-to-medium firms in this research were demarcated as those generally employing up to 200 employees, with annual revenue of up to 15 million Rands, Parthasarthy and Sethi (1993), Philips (1993).

Target respondents were senior business managers, heads of the Information Technology (IT) sections, heads of non Information Technology (non-IT) sections and key package users. This choice was considered the most appropriate, since these people are usually involved in planning for the implementation and operation of information systems. It is also acknowledged that use of such multiple respondents enrich data and eliminates some bias and inaccuracies in the data provided, Miller (1996). A number of other studies have also relied on senior management to gather data regarding IT-related studies, e.g., Zmud (1987), Remenyi and Whittaker (1995), Miller (1996).

One hundred and sixty eight (168) questionnaire responses were received, the rest declined to participate in the study. Out of these, 13 responses were unusable. These belonged to 3

respondents from organisations with employees exceeding 300 in number, 8 respondents who indicated that they were not involved in the implementation of their packages, and 2 respondents who indicated that they had accounting experience of less than one year. Thus, the effective response rate was approximately 52%. Table 4.3 details the characteristics of the respondents, the organisations and the accounting packages studied.

Telephone interviews were then conducted with those who were interested in further discussions with the researcher on a number of implementation problems. Others were contacted by the researcher to seek further clarification on their responses. The technique of telephone interview was used by the researcher for two main reasons. Firstly, some respondents had difficulty in identifying suitable times for face to face interviews due to pressure of work. Secondly, the respondents are located in different parts of Lesotho, and the Orange Free State province of South Africa. The option to visit all respondents was not cost effective.

Table 4.3 Characteristics of the study sample

Profile of respondents actually involved in the study

<i>Respondents</i>	<i>Number</i>	<i>% of total respondents (excluding those rejected)</i>
Business managers	24	15
Heads of IT sections	31	20
Heads of Non-IT sections	68	45
Users of the packages	31	20

Respondents excluded from the study

3 respondents from organisations with total employees exceeding 300;
8 respondents not involved in actual implementation of the packages;
2 respondents with accounting package experience of less than one year.

Accounting packages used: Acc Pac = 13; Brilliant = 10; Impact = 28; Pastel = 47; others = 2

CHAPTER 5

DATA ANALYSIS AND RESULTS

This chapter presents the statistical analyses and findings of the study. These are:

- a) Analysis of the ratings on the degree of consistency between the choices or decisions adopted in the implementation of the accounting package and each of the selected organisational factors that influence IT implementation;
- b) Analysis of the structural model of the information technology strategy alignment.

5.1 Analysis of ratings on the consistency between the information technology strategy and selected internal organisational factors that influence IT implementation

This section presents an analysis of the respondents' ratings on the consistency between the decisions adopted in the implementation of accounting packages and the selected factors that influence IT implementation in small sized organisations. Since responses were collected on ordinal scales, it was meaningful to use median scores in the analysis of these ratings, Siegel (1956). Ratings per category of respondents are displayed in figures 5.1.1 to 5.1.7.

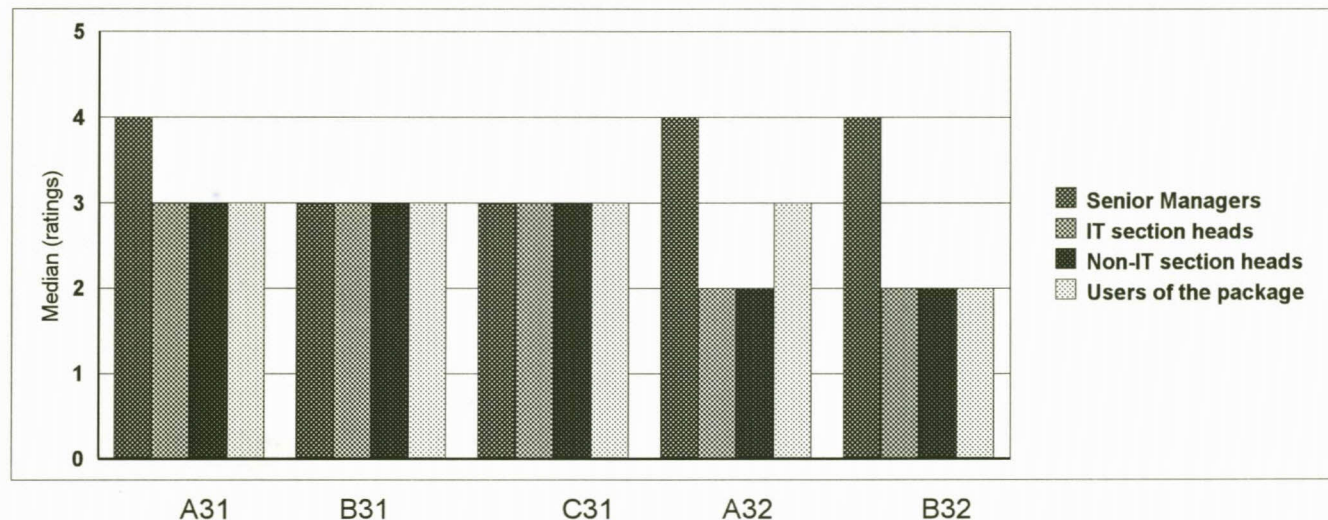


Figure 5.1.1 Ratings on the consistency between IT strategy and the business objective to achieve efficiency in internal operations

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3= Uncertain; 4 = Agree to some extent
5 = Strongly agree.

- | | |
|-----|---|
| A31 | The business plan identifies the contribution the accounting package would make in ensuring operational efficiency |
| B31 | The business plan identifies risks to business objectives posed by non compliance of accounting package with Year 2000 requirements |
| C31 | The IT plan states business objectives the accounting package is intended to support |
| A32 | Involvement of non-IT section heads in implementation of accounting package |
| B32 | Involvement of IT section heads in business planning |

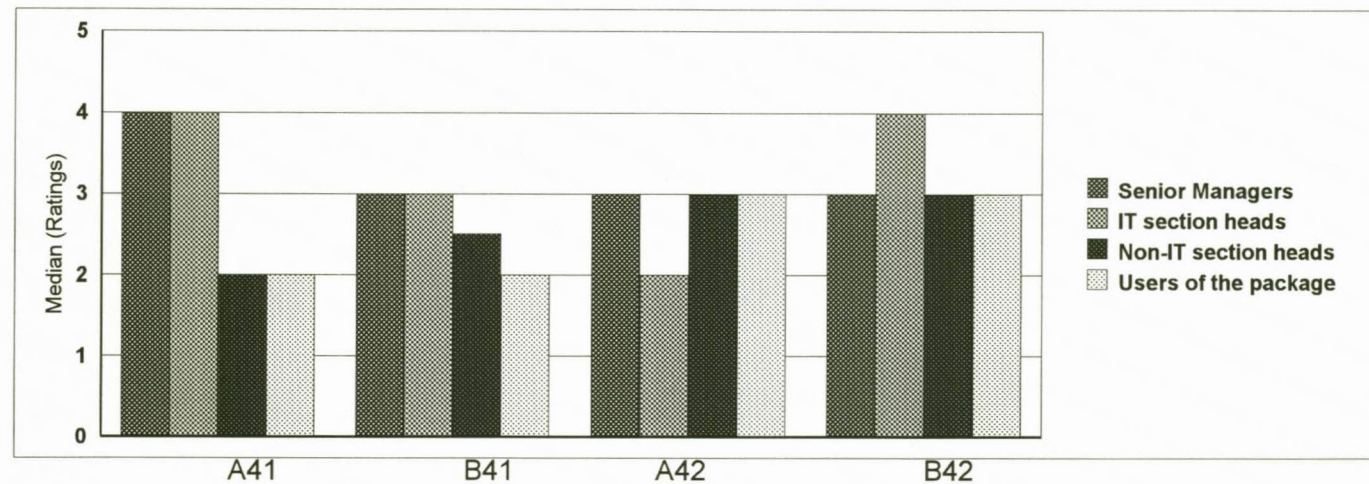


Figure 5.1.2 Ratings on the consistency between IT strategy and structural factors

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3= Uncertain; 4 = Agree to some extent
5 = Strongly agree

A41	A specific person (or group) provides effective support
B41	Support groups meet to review user requirements
A42	Support groups were drawn from departments affected by the implementation
B42	Support groups possess skills in Accounting and/or IT

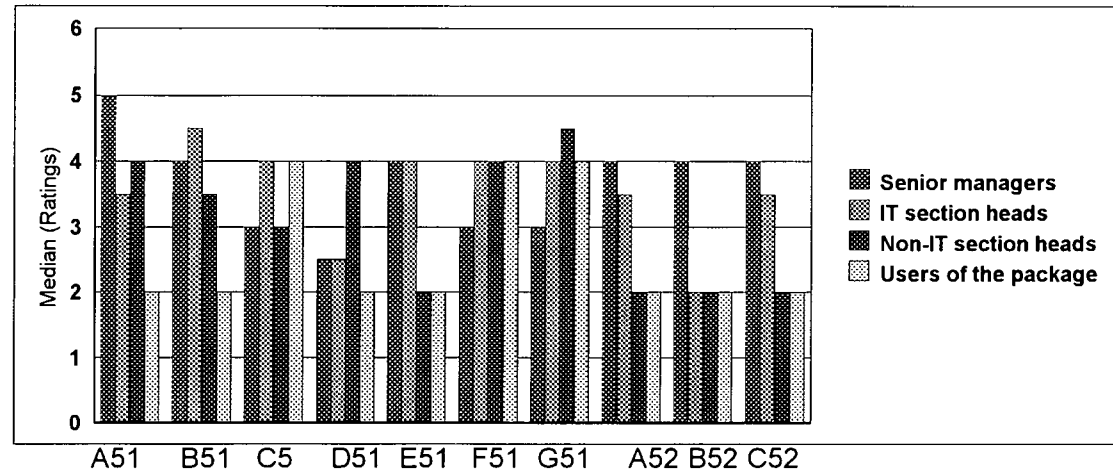


Figure 5.1.3 Ratings on the consistency between IT strategy and social factors

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3= Uncertain; 4 = Agree to some extent
5 = Strongly agree

A51	Understanding of business objectives
B51	Understanding of IT objectives
C51	Understanding of user requirements
D51	Commitment of Non-IT heads to IT developments
E51	Commitment of IT teams to business and user needs
F51	Users report software/hardware problems promptly
G51	Accounting package will enhance accountability and resource utilisation
A52	Communication of business, IT and user requirements
B52	Heads of departments played a key role in communication of objectives
C52	Social problems were solved jointly by users and department heads

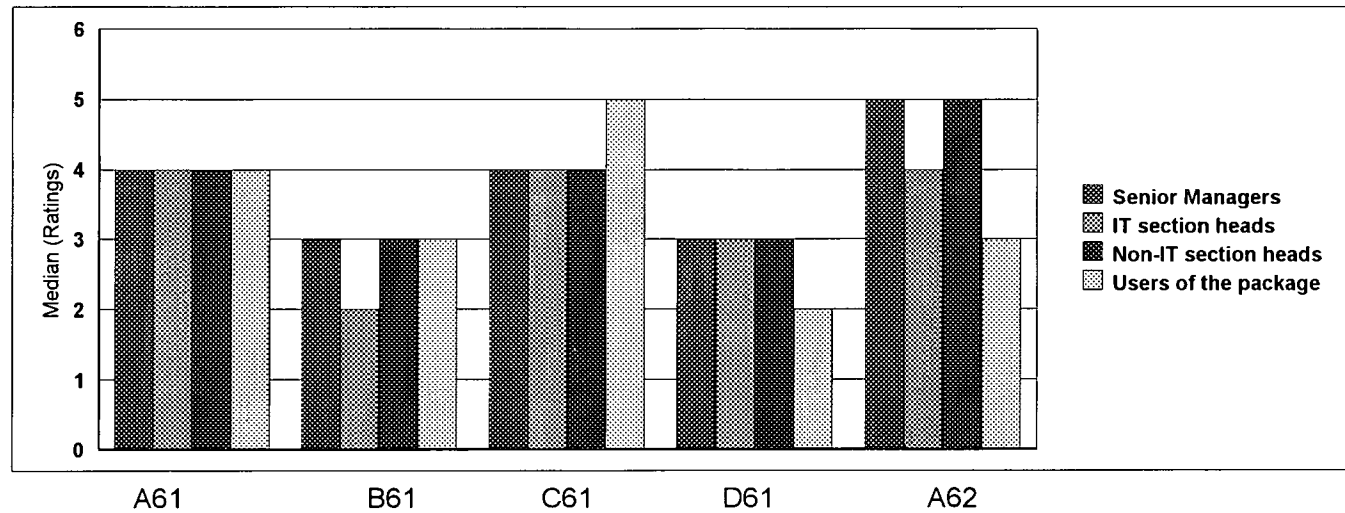


Figure 5.1.4 Ratings on the consistency between IT strategy and Cultural factors

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3= Uncertain; 4 = Agree to some extent
5 = Strongly agree

A61	Package used to support monitoring of internal operations
B61	Package used for budgeting
C61	Package used for Accounting
D61	Package used for forecasting
A62	The package was implemented to solve measurement and control problems that existed in the organisation

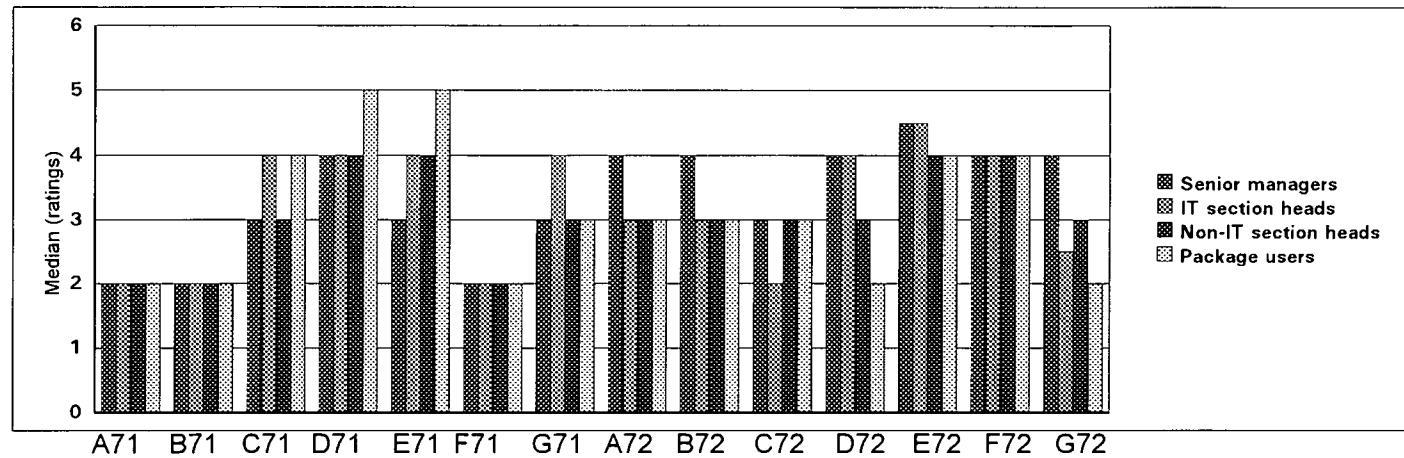


Figure 5.1.5 Ratings on the consistency between IT strategy and IS factors

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3= Uncertain; 4 = Agree to some extent
5 = Strongly agree

A71	Loss of confidence in the package
B71	Output unsatisfactory
C71	Interruptions increasing
D71	Delays in support provided to users
E71	Reliance on vendors increasing
F71	Loss of data confidentiality
G71	Non compliancy with Year 2000 requirements
A72	Background information obtained before purchase
B72	Reliability of vendor assessed
C72	Year 2000 compliancy tests conducted
D72	Users involved in package selection
E72	Processing capabilities evaluated
F72	Package compared to others on the market
G72	Users provided with adequate training

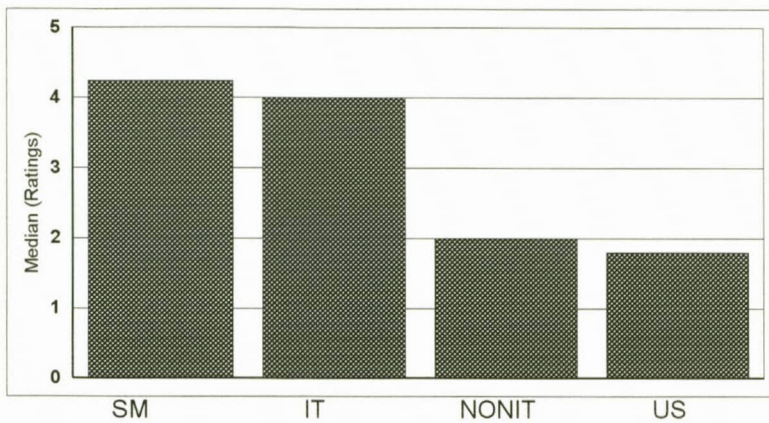


Figure 5.1.6 Ratings on IT strategy alignment

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree to some extent
5 = Strongly agree

SM = Senior managers (15% of total respondents)
IT = IT section heads (20% of total respondents)
NONIT = Non-IT section heads(45% of total respondents)
US = Users of the package (20% of total respondents)

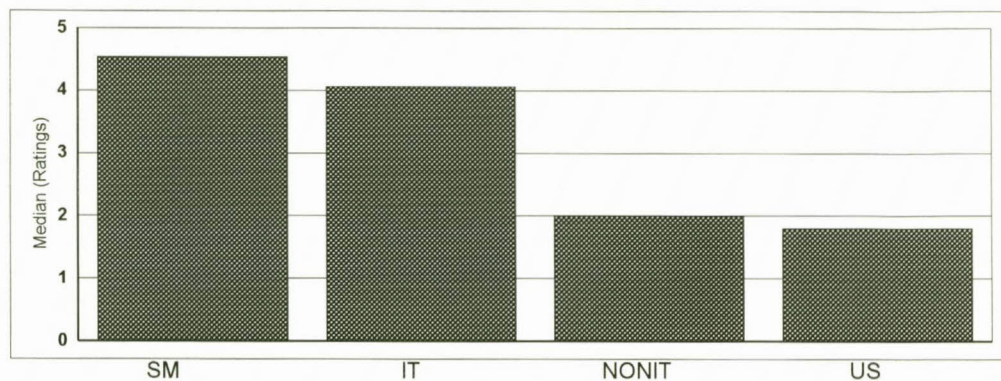


Figure 5.1.7 Ratings on the success of accounting package implementation

Rating scale : 1 = Strongly disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree to some extent
5 = Strongly agree

SM Senior managers (15% of total respondents)
IT IT section heads (20% of total respondents)
NONIT Non-IT section heads(45% of total respondents)
US Users of the package (20% of total respondents)

5.2. Analysis of the structural model of the information technology strategy alignment

The next step in this analysis was to test a structural model that examined the relationships between each of the dimensions of alignment and the IT strategy alignment, and also that between the IT strategy alignment and the success of the accounting package implementation.

The research model introduced in Figure 3.1, page 39, was analysed using the structural modelling technique "SEPATH" of the "STATISTICA" package, Version 6. This tool was chosen because of its capability to estimate a series of interrelated relationships simultaneously. Such tools have been identified as appropriate in measurement of studies similar to the current one by Venkatraman (1989). This tool tests properties of scales used to measure variables, and estimates parameters of a structural model such as the strength and direction of the relationships among model variables. It embodies two sets of equations. The structural equations, which represent the paths among the constructs (e.g., paths among dimensions and IT strategy alignment, and that between IT strategy alignment and the success of the accounting package), and the measurement equations, which represent the relationships between the indicators (items that measure the dimensions) and the variables that they measure (in this case, the dimensions).

A number of validity tests were conducted to test the model, e.g., the unidimensionality test; reliability test; and discriminant validity test, as recommended by Venkatraman (1989). Unidimensionality test ensure that all items measure the underlying construct of interest. Reliability test indicates the degree to which measures are free from error, and therefore yield consistent results. Discriminant validity is demonstrated when a measure does not correlate very

highly with another measure from which it should differ. Venkatraman (1989) argues that:

“ measurement is an intellectual and empirical activity that provides meaning to the theoretical variables..... In absence of a systematic basis to evaluate the adequacy of measurements, confidence in research results is considerably eroded, which implies that the managerial implications derived from such results may be questionable.”

5.2.1 Testing the measurement model

5.2.1.1 Unidimensionality test

First, items for inclusion in the measurement model were identified using the factor analysis procedure. Factor analysis is a statistical approach that can be used to analyse interrelationships among a large number of variables, and explains these variables in terms of their common underlying dimensions (factors). A factor loading is the correlation of a variable with a factor, Hair, et. al. (1995).

The factors were extracted using correlation matrices and the method of principal component. Guidelines recommended by Hair, et. al. (1995) were used to determine the appropriate minimum loading required for inclusion of an item within a scale. Factor loadings greater than 0.30 are considered significant; loadings greater than 0.40 are considered more important; and loadings 0.50 or greater are considered to be very significant. A number of items with factor loading less than 0.30 were dropped from subsequent analysis. According to Kline (1994), a factor loading between 0.30 and 0.40 may be considered appropriate when the sample is at least 100 subjects.

Table 5.2.1 presents the standardised factor loadings for all items. Those used in the model are marked with asterisks.

It should be noted that items (B72 and F72) were discarded because they loaded fairly high on more than one dimension. Item F72 (package compared with others on the market) loaded 0.51 on the Information system dimension and 0.47 on the business objectives dimension. Item B72 (Reliability of vendor assessed) loaded 0.35 on the Structural dimension, and 0.33 on the Information system dimension. According to Anderson (1987), loadings should display unique or simple structures. He recommends that factors with complex structures should not be included in the model.

Table 5.2.1
Factor loadings on dimensions of alignment

Item	Dimensions				
	Business Objectives	Structural	Social	Cultural	Information System
A31*	0.53	0.15	0.21	-0.2	0.06
B31*	0.78	0.08	0.11	0.05	0.02
C31*	0.87	0.02	0.05	0.04	0.06
A32*	0.82	0.21	0.03	0.04	0.18
B32*	0.87	0.26	0.05	0.06	0.16
A41*	0.19	-0.84	0.04	0.08	0.07
B41*	0.15	-0.63	0.01	0.03	0.24
A42*	0.17	-0.59	0.19	-0.27	-0.13
B42	-0.16	-0.18	0.17	0.07	0.16
A51*	0.18	0.02	0.36	0.18	0.25
B51*	0.14	0.13	0.43	-0.03	0.13
C51	0.05	0.12	0.07	-0.05	0.28
D51	0.13	0.04	0.07	0.03	0.05
E51	0.14	0.18	0.01	-0.03	0.04
F51*	0.08	0.04	0.72	0.02	-0.08
G51*	0.07	-0.17	0.58	0.04	-0.07
A52*	0.16	0.06	0.77	-0.05	0.16
B52	0.08	0.13	0.29	0.08	0.14
C52*	0.15	0.28	0.54	0.08	0.05
A61	0.09	-0.11	0.13	0.22	-0.24
B61	0.18	-0.07	0.3	0.2	0.13
C61*	0.07	0.07	0.18	0.3	-0.13
D61	0.08	-0.06	0.19	0.2	-0.15
A62*	0.17	0.06	-0.2	0.48	0.13
A71	-0.23	0.15	0.16	0.26	0.15
B71	0.24	0.03	-0.23	0.08	0.11
C71	-0.14	0.07	-0.03	0.04	0.12
D71*	0.13	-0.2	0.2	-0.15	0.75
E71*	0.27	0.03	0.08	-0.07	0.74
F71	-0.14	0.19	0.2	0.17	-0.22
G71	0.14	0.26	0.19	0.13	-0.25
A72	0.05	0.13	0.19	0.13	0.01
B72	0.09	0.05	0.28	-0.16	0.21
C72*	0.13	0.05	-0.13	0.05	0.82
D72*	-0.12	0.09	0.01	0.07	0.86
E72	0.05	0.05	0.08	-0.07	0.05
F72	0.27	-0.2	-0.18	0.06	0.22
G72*	-0.13	0.08	0.12	-0.22	0.78

* Item included in the model

The factor loadings presented in Table 5.2.1, suggest that five distinct constructs are measured by the instrument, and provide factorial validity of the five scales used. These include:

1. Alignment with business objectives (items A31,B31, C31, A32, B32);
2. Alignment with structural factors (items A41, B41 and A42);
3. Alignment with social factors (A51, B51, F51, G51, A52, C52);
4. Alignment with cultural factors (C61 and A62);
5. Alignment with information system factors (D71, E71, C72, D72 and G72).

5.2.1.2 Reliability test

The Cronbach's alpha for each scale was determined as a measure of reliability. This indicates whether all items used to measure a particular dimension are reliable and measure the same thing. Values range from 0 to 1, whereby a coefficient equal to 1, suggests perfect reliability. Results in Table 5.2.1. 2 reflect high levels of construct reliability.

Table 5.2.1.2 - Reliability coefficients for measures of IT strategy alignment

<u>Dimension</u>	<u>Cronbach's alpha</u>
Business objectives	0.90
Structural	0.72
Social	0.83
Cultural	0.63
Information system	0.88

5.2.1.3 Discriminant validity test

To assess discriminant validity of the measures, e.g., the degree to which items differentiate among measures, or measure distinct concepts. The correlations between items constituting each dimension were examined. If the items associated with a measure correlate more highly with other items of the same measure in the model (Fornell et. al. 1982), the measure is determined to have adequate discriminant validity. Results are presented in Table 5.2.1.3 below. The inter-correlations among items associated with a measure were in most of the cases stronger, and significant at $p < 0.05$, than their correlations with items representing other measures. There were, however, cases where items in a group had fairly high correlation coefficients with other items in a different group. For instance, the inter-correlations between:

- a) Item A31 (business plan identifies the contribution the accounting package would make to ensure operational efficiency) and (i) B51 (understanding of IT objectives) at 0.40, (ii) D72 (users involved in the selection and implementation of the package) at 0.38;
- b) Item A51 (I understand my organisation's business objectives) and D72 (users involved in the selection and implementation of the package) at 0.21.

Except for the unexpected cases above, the rest of the results suggest that the measure has fairly adequate discriminant validity. In general, the tests of the measurement model suggest that measures adopted are distinct, unidimensional, reliable and to some extent discriminant.

Table 5.2.1.3

Inter-correlations among study variables

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 A31	1.00																				
2 B31	0.72	1.00																			
3 C31	0.58	0.72	1.00																		
4 A32	0.54	0.67	0.69	1.00																	
5 B32	0.45	0.70	0.79	0.85	1.00																
6 A41	0.12	0.18	0.25	0.03	0.21	1.00															
7 B41	0.08	0.20	0.25	0.02	0.23	0.55	1.00														
8 A42	(0.03)	0.02	0.10	0.27	0.19	0.46	0.50	1.00													
9 A51	0.26	0.10	(0.06)	(0.14)	(0.08)	(0.03)	(0.22)	(0.31)	1.00												
10 B51	0.40	0.28	0.18	0.20	0.32	(0.28)	(0.04)	(0.31)	0.39	1.00											
11 F51	0.30	0.30	0.33	0.29	0.03	(0.09)	(0.19)	(0.23)	0.30	0.64	1.00										
12 G51	0.18	0.25	0.04	0.03	0.04	0.05	(0.15)	(0.22)	0.38	0.45	0.72	1.00									
13 A52	0.15	0.24	0.08	0.04	0.02	(0.01)	(0.02)	(0.22)	0.29	0.53	0.74	0.79	1.00								
14 C52	0.24	0.21	(0.02)	(0.05)	(0.12)	(0.24)	(0.05)	(0.27)	0.37	0.39	0.24	0.39	0.74	1.00							
15 C61	0.13	0.18	0.14	0.06	0.06	0.15	0.03	0.06	0.12	0.14	0.04	0.05	0.03	(0.19)	1.00						
16 A62	(0.06)	0.01	0.09	0.08	0.06	(0.01)	0.05	0.07	(0.13)	(0.08)	(0.02)	0.00	0.08	0.08	0.53	1.00					
17 D71	0.32	0.11	0.31	0.04	0.32	0.25	0.04	0.25	0.04	0.09	0.17	0.23	0.12	0.04	0.24	0.37	1.00				
18 E71	0.09	0.01	0.01	0.28	0.26	0.17	0.04	0.17	0.14	0.10	0.03	0.12	0.04	(0.06)	0.21	0.21	0.70	1.00			
19 C72	0.03	0.20	0.25	0.14	0.19	0.17	0.26	(0.08)	0.33	0.20	(0.07)	0.14	0.06	0.33	0.25	0.11	0.74	0.63	1.00		
20 D72	0.38	0.23	0.06	0.00	0.06	0.14	0.21	0.14	0.21	(0.18)	0.05	0.11	(0.04)	0.07	0.04	0.15	0.60	0.55	0.82	1.00	
21 G72	0.05	0.06	(0.05)	(0.08)	0.02	0.03	0.02	0.02	0.02	0.13	0.00	0.19	(0.01)	0.21	0.04	0.19	0.55	0.49	0.51	0.58	1.00

Note: The values of correlation > 0.15 are significant at 0.05 or lower
Negative coefficients are in parentheses

Item Nos: 1-5 measured the business objective dimension
6-8 measured the structural dimension
9-14 measured the social dimension
15-16 measured the cultural dimension
17-21 measured the information system dimension

5.3 Testing the structural model

The test of the structural model included the estimation of the path coefficients using the criteria of Generalised Least Squares. The following path influence were tested. The influence on the information technology strategy alignment of :

- . The business objectives dimension;
- . The structural dimension;
- . The social dimension;
- . The cultural dimension;
- . The Information system dimension.

The following measures were used to test the path influences in the research model.

- . The Chi-Square test;
- . Chi-Square/ Degree of freedom (DF);
- . Goodness-of-Fit Index (GFI);
- . Advanced GFI (AGFI);
- . Root Mean Square Error of Approximation (RMSEA).

According to Hair, et. al. (1995), structural equation modelling has no single statistical test that best describes the “strength” of the model’s predictions. Instead, researchers have developed a number of goodness-of-fit measures which may be used in combination to assess the results.

a) The likelihood-ratio Chi-square statistics

This is a measure of the overall fit. A large value of Chi-square relative to the degree of freedom signifies that the observed and estimated matrices differ considerably. The statistical significance level indicates the probability that these differences are due solely to sampling variations. Thus low Chi-square value, which result in significance levels greater than 0.05 or 0.01, indicates that the actual and predicted input matrices are not statistically different.

b) Goodness-of-Fit Index (GFI) and (AGFI)

GFI also measures the overall degree of fit. It is the result of squared residuals from prediction compared with the actual data. The higher values indicate better fit, but no absolute threshold levels for acceptability have been established, GFI greater than 0.90 has been adopted, Hair, et. al. (1995). The Adjusted Goodness-of-Fit is an extension of the GFI, adjusted by the ratio of degrees of freedom for the proposed model to the degree of freedom for the null model. A recommended acceptance level for AGFI is a value greater than or equal to 0.80, Hair, et. al. (1995).

c) Root Mean Square Error of Approximation (RMSEA).

The value is representative of the goodness-of-fit that can be expected if the model was estimated in the population, not just the sample drawn for the estimation. According to Steiger (1995), RMSEA values above 0.10 indicate an inadequate fit, while values below 0.05 indicate a very good fit. Hair, et.al., (1995) state that values not greater than 0.08 are acceptable.

Table 5.3 indicates fit measures for the structural equations that test the path influences in the IT strategy alignment model. The data is based on a relatively large sample (155 total observations). The probability level of the Chi-square falls within the recommended level, $p < 0.05$. The value of Chi-square divided by degree of freedom is approximately 2.3, which is less than the cutoff value of 3.0, as recommended by Hair, et. al. (1995) and Segars and Grover (1993). The GFI and AFGI are also within the recommended range. However, the RMSEA index is very close to the threshold value.

Table 5.3 - Fit measures for the IT strategy alignment model

Chi-square = 507.20

Degree of freedom (DF) = 225

Measure	Recommended	IT strategy alignment
Chi-square	$p < 0.05$	$p < 0.001$
Chi-square/DF	< 3.0	2.33
GFI	> 0.90	1.00
AGFI	> 0.80	1.00
RMSEA index	< 0.1	.093

In summary, except for the RMSEA index which is very close to the threshold, the rest of the statistics for the structural model appear to reflect an acceptable, structural model fit. Figure 5.3 on page 84 represent the estimates for the relationships between items and the dimensions measured, the path coefficient values linking the dimensions to the IT strategy alignment and the influence of the IT strategy alignment on the success of the accounting package.

The procedures for drawing path diagrams outlined in "STATISTICA" software package by Steiger (1995) and in Structured Equation Modeling by Hair et.al. (1995), were used to draw Figure 5.3. This diagram represents two sets of models. The measurement model which represents the relationship between the indicators (items) and the variables they measured (e.g., the dimensions). It also represents the structural model which represents the paths among constructs (in this case, the paths between the dimensions and the IT strategy alignment and that between the IT strategy alignment and the success of the accounting package implementation).

Two types of variables are shown in Figure 5.3. Those variables measured directly are represented in boxes and those measured indirectly, such as the dimensions, are represented by oval symbols. The relationship between a dimension and each item used to measure it is represented by an arrow originating from the dimension, pointing to the item. Each path also involve two variables connected by an arrow. All independent variables have arrows pointing to the dependent variable. The weighting coefficient for each relationship is placed below in proximity to the arrow.

Most of the items used in the measurement model are shown to have statistically significant relationships with the dimensions they measured except for item A51 (I understand my organisation's business objectives) at 0.19 and item C52 (Social problems experienced during the implementation of the package, were solved jointly by system users and those heading sections) at -0.06. Path relationships between the dimensions and the IT strategy alignment, and that between the IT strategy alignment and the success of the accounting package implementation were all positive and statistically significant at $p < 0.05$.

Table 5.4 shows, the estimate for the each parameter, the standard error, a T statistic and the probability level. Similar information is shown in Table 5.5 for each item that measured the dimensions of alignment. According to Steiger (1995) page 3557, when the "SEPATH" structural modelling technique is used, a parameter with a probability level below 0.05 indicates a significant relationship.

Table 5.4

IT strategy alignment - Path estimates

Path	Parameter Estimate	Standard Error	T-statistics	Probability Level
1 Bus-IT align	0.34*	0.087	3.856	0.000
2 Stru-IT align	0.36*	0.116	3.099	0.002
3 Soc-IT align	0.36*	0.089	4.001	0.000
4 Cult-IT align	0.66*	0.171	3.854	0.000
5 IS-IT align	0.21*	0.079	2.602	0.009
6 IT align-Succ	0.65*	0.055	11.9	0.000

* Significant at $p < 0.05$

Path 1 Business objective dimension/IT strategy alignment

Path 2 Structural dimension/IT strategy alignment

Path 3 Social dimension/IT strategy alignment

Path 4 Cultural dimension/IT strategy alignment

Path 5 Information system dimension/IT strategy alignment

Path 6 IT strategy alignment/Success of the accounting package

Table 5.5

Estimates of items that measured the dimensions of alignment

Item	Parameter Estimate	Standard Error	T-statistics	Probability Level
A31	0.77*	0.1	7.706	0.000
B31	0.47*	0.099	4.763	0.000
C31	0.27*	0.134	1.979	0.048
A32	0.87*	0.076	11.461	0.000
B32	0.8*	0.103	7.786	0.000
A41	0.49*	0.137	3.54	0.000
B41	0.62*	0.138	4.491	0.000
A42	0.52*	0.142	3.686	0.000
A51	0.19	0.121	1.565	0.118
B51	0.28*	0.133	2.111	0.035
F51	0.59*	0.084	7.063	0.000
G51	0.94*	0.06	15.606	0.000
A52	0.79*	0.065	12.303	0.000
C52	-0.06	0.121	-0.518	0.604
C61	0.43*	0.13	3.3	0.001
A62	0.44*	0.137	3.199	0.001
D71	0.64*	0.076	8.442	0.000
E71	0.57*	0.084	6.772	0.000
C72	0.36*	0.155	2.344	0.019
D72	0.4*	0.167	2.398	0.016
G72	0.93*	0.072	12.988	0.000

* Significant at $p < 0.05$

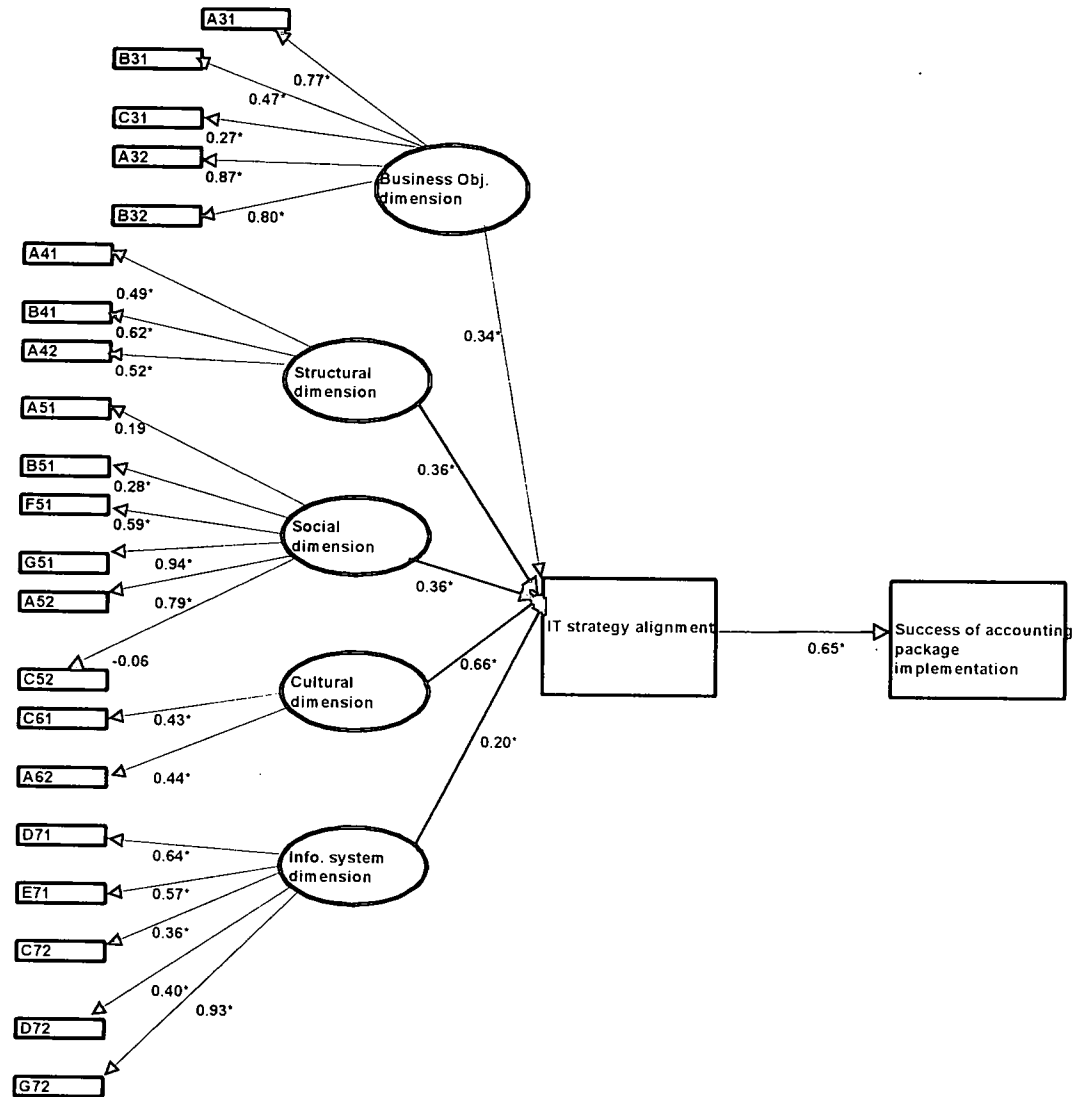


Figure 5.3 - IT strategy alignment model - structural equation results

* = significant at $p < 0.05$

CHAPTER 6

DISCUSSION OF FINDINGS

This study measured the extent to which small-to-medium sized organisations aligned their IT strategies during the implementation of their accounting packages. This involved assessment of the consistency between the IT strategy and selected organisational factors that influence successful IT implementations in small-to-medium sized organisations. A structural model was also proposed and tested to determine the relationship between dimensions of alignment and the IT strategy alignment (the overall consistency of the accounting package implementation decisions with the selected factors that influence the success of IT implementation). Finally, the impact of the IT strategy alignment on the success of the accounting package implementation was also determined.

The results presented in Figure 5.3, on page 84 and summarised in Tables 5.4 and 5.5 on page 82-83 above, confirm the existence of strong relationships among most of the model variables and indicate the factors worthy of consideration in the implementation of accounting packages. The relationships between the dimensions and IT strategy alignment were positive and statistically significant at $p < 0.05$, thereby supporting the view that the IT strategy should be aligned not only with business objectives, but also with structural, social, cultural, and information system factors. Hypotheses 1(a), (b), (c), (d), (e) and Hypothesis 2 are therefore supported. These findings are discussed in more detail in the following sections.

6.1 The effect of the business objective dimension of alignment on the IT strategy alignment

The business objective dimension of alignment measured the consistency between business and IT objectives. Analysis of results in Table 5.4 indicates that this dimension has a positive and significant effect of (0.34) on the IT strategy alignment, thereby supporting hypothesis 1(a), e.g., the more the choices or decisions adopted in implementation of the accounting package are consistent with the business objective to achieve efficiency in internal operations, the more coherent would be the IT strategy alignment. All items that measured this dimension were statistically significant at $p < 0.05$. Items A32 (involvement of non-IT staff in the implementation of the accounting package) at 0.87, and B32 (involvement of IT staff in business planning) at 0.80 had very high coefficient values. They measured alignment from the perspective of processes leading to it. This emphasises the importance of ensuring proper alignment of the IT and business planning processes.

Responses in Figure 5.1.1 suggest that important IT requirements were not identified by business managers during the planning process. All respondents were uncertain that their business plans identified the risks to business objectives posed by the non compliance of the accounting package with Y2K requirements (B31). Most respondents were also uncertain that their business plans identified the contribution the accounting package would make to ensure operational efficiency (A31), and discussions with IT section heads confirmed that there were no formal IT plans in most organisations. These findings could be explained by the non involvement of section heads in planning processes. IT and Non-IT section heads indicated that Non-IT section heads were not involved in the planning process (A32). In addition, most of the respondents indicated also that

IT staff were not involved in the business planning process (B32). It is vital that representatives of sections affected by IT implementations are involved at the planning stages in order to assist business managers identify the crucial requirements before the implementation. This need has been emphasised by many bodies, (e.g., Central Computer and Telecommunication Agency (<http://www.open.gov.uk/ccta>; Year 2000 Support Centre - <http://www.support2000.com>).

Plausible reasons for non involvement of IT personnel in planning could be that decisions to implement IT systems, particularly in smaller organisations, are mainly taken by senior business managers. This could be caused by the need for control over limited financial resources faced by these organisations, Igbaria, et. al. (1997). In addition, IT heads in small organisations are likely to be relatively junior to influence development decisions and the IT departments are relatively undeveloped, to the extent that they still operate as subsystems of accounting, administration or finance functions. They do not directly participate in strategy formulation processes, ACCA(1998). Oosthuizen (1996), surveyed the hierarchy of strategies in service organisations in the Western cape province of South Africa, and confirmed that strategy formulation and action in small firms are vested in relatively limited members of senior management. It seems that non alignment of IT with business objective will continue to be a major problem for many organisations in South Africa. Unfortunately, as concluded by Remenyi and Whittaker (1995), this issue is given less consideration by South African managers. It is therefore necessary that further studies be conducted to find ways to solve this problem.

6.2 The effect of the structural dimension of alignment on the IT strategy alignment

The structural dimension of alignment measured the consistency between the IT strategy and structural factors (such as support teams). In Table 5.4, all items that measured this dimension showed significant relationships with it. The dimension also had a positive and significant effect of 0.36 on the IT strategy alignment, thereby supporting hypothesis 1(b) e.g., the more the choices or decisions adopted in the implementation of the accounting package ensure the establishment of effective linking mechanisms, the more coherent would be the IT strategy alignment.

Ratings in Figure 5.1.2 indicate that the support provided to most of the organisations was inadequate. Although business managers and IT section heads agreed to some extent that effective support was provided (A41), non-IT section heads, and users who are expected to experience most of the operational problems, clearly indicated their disagreement. In addition, users disagreed that their requirements were reviewed by the support groups (B41), and most of the respondents were uncertain about the composition and the skills possessed by the support groups (A42, B42). This suggests that these groups were not drawn from these respondents' departments. It was in fact confirmed by IT section heads that support groups were not drawn from the departments affected by the implementation (A42), although they agreed to some extent that these groups possess skills in accounting and IT (B42).

Explanation given by package users in Lesotho indicates that support firms are located in Bloemfontein, 140 km away and as such could not respond to their needs promptly. Some

respondents claimed that supporters deliberately wait until there are a number of sites to support before they could travel to Lesotho. Soh, et. al.(1992) caution implementers that engagement of consultants does not guarantee successful computerisation. They observed that small businesses often overestimate the impact of consultants or vendors' support and in the process underestimate the importance of developing their own support teams. Gable (1989) identified lack of commitment, lack of demonstrated expertise and use of non methodical approaches as some of the common concerns with consultants or vendor performance. These findings suggest that attributes of consultants or vendors and their proximity need to be carefully assessed before their engagement, if success in implementation is to be achieved. The impact of external support on the success of accounting systems implementation should therefore be studied further.

6.3 The effect of the social dimension of alignment on the IT strategy alignment

The social dimension of alignment measured the consistency between the IT strategy and social factors (such as understanding of objectives, communication and commitment to these objectives). It is indicated in Table 5.4 that there exists a positive and significant structural relationship between this dimension and the IT strategy alignment (coefficient value = 0.36, $p < 0.05$). Hypothesis 1(c) is supported, e.g., the more choices or decisions adopted in the implementation of accounting package ensure mutual understanding and commitment to the business, IT and user objectives, the more coherent will be the IT strategy alignment. Most of the items that measured this dimension were positive and significant, except for item A51 (understanding of business objectives) at 0.19 and item C52 (social problems solved jointly by users and department heads) at -0.06. No clear explanation could be given for this by the

researcher. This should be examined further in future research.

Results in Figure 5.1.3 suggest that there was lack of mutual understanding and commitment to business, IT and user objectives or requirements by organisation members. For example, while business managers understood business objectives (A51), they only agreed to some extent that they understood IT objectives (B51). On the other hand, IT section heads understood IT objectives but their rating on understanding of business objectives was just mid-way between “uncertain” and “agree to some extent”. Users clearly indicated that they did not understand both business and IT objectives, while the rating of non-IT section heads on their understanding of IT objectives was mid-way between “uncertain” and agree to some extent”. It is surprising to find that only IT section heads and users indicated that they understood to some extent user requirements (C51). Business managers, who were mainly involved in the implementation of the packages, were uncertain about users’ requirements. Many researchers and writers such as Ginzberg (1980); Raymond (1990a); Sherer (1993) and most recently Checkland and Scholes (1999), emphasise the importance of ensuring that user requirements are clearly identified and integrated in the system implementation process. This would ensure that more user friendly systems are implemented, users are convinced that the goals of the introduced system will not conflict with their own goals, which would lead to their acceptance and support for the system.

In addition, it also appears from the findings in Figure 5.1.3 that most respondents indicated that there was lack of commitment to business, IT and user objectives and that these objectives were not communicated promptly to those concerned. Business managers and IT section heads rated item D51 (commitment of non-IT section heads to IT development) mid-way between “uncertain” and “disagree”, non-IT section heads agreed only to some extent, while users

indicated their disagreement with this statement.

It is not surprising to find that most respondents did not agree that there was commitment by non-IT section heads to IT developments (D51) and by IT teams to business and user needs (E51) since they were not involved in the planning processes and the objectives were not promptly communicated to them. For example, only business managers agreed to some extent that business, IT and user requirements were communicated (A52). IT section heads rated this item between "uncertain" and "agree to some extent", while the rest of the respondents disagreed. In addition, while business managers and IT section heads agreed to some extent that IT teams were committed to business and user needs (E51), the rest of the respondents disagreed with this statement. Most respondents disagreed also that heads of departments played significant role in communicating the objectives (B52), and almost similar responses were obtained for item C52, where users and non-IT section heads felt that social problems were not solved jointly.

While senior managers were uncertain about the future potential of the accounting package (G51), the rest of the respondents had similar visions of the usefulness of the package in enhancing accountability and resource utilisation. Discussions with section heads suggest that they shared the view that the accounting packages would generally lower their operating costs. Possible explanations for the differences in views could be that most accounting packages are mainly used for low level transaction processing, rather than for high level decision support required by senior managers for planning and forecasting. Since senior managers do not use the accounting packages often, this could explain why they were uncertain about its future potential.

6.4 The effect of the cultural dimension of alignment on the IT strategy alignment

The cultural dimension measured the extent to which the decisions or choices adopted in implementation of the accounting package ensured proper measurement and control of internal operations - (the stability culture). This dimension has a positive and significant influence on the IT strategy alignment, which indicates that hypothesis 1(d) is supported, e.g., the more the choices or decisions adopted in the implementation of the accounting package ensure the achievement of a stable organisation culture, the more coherent would be the IT strategy alignment. Table 5.4 reveals that this dimension has the highest influence on the IT strategy alignment (0.66). Perhaps this could be explained by the findings in Figure 5.1.4, where it was indicated that most organisations had experienced problems in their manual accounting systems (A62), which led to the implementation of the accounting packages. It was also confirmed that most organisations selected the right packages, e.g., those that supported accounting functions and could be used for monitoring of internal operations (A61, C61). The processes that led to the selection of the right packages could have been assisted by the involvement of the vendors who have expertise and experience of the accounting problems in different small sized organisations. It should be noted that almost 50% of the organisations studied use one type of package (e.g., Pastel, see Table 4.3 on page 61). Further support for existence of cultural alignment is provided in Figure 5.1.3. Here, most respondents had similar visions of the usefulness of their packages in enhancing accountability and utilisation of resources (G51).

6.5 The effect of the information system dimension of alignment on the IT strategy alignment

The information system dimension of alignment measured the consistency between the IT strategy and information system factors. Table 5.4, on page 82 indicates a positive and significant relationship between this dimension and the IT strategy alignment (coefficient value = 0.20, $p < 0.05$). Hypothesis 1(e) is supported, e.g., the more choices or decisions adopted in the implementation of the accounting package ensure reliance on the package for current and future information requirements, the more coherent would be the IT strategy alignment.

Results in figure 5.1.5 indicate that these organisations currently experience problems in using their packages, thereby suggesting that these packages can not provide fully the necessary and comprehensive information required. Though all respondents disagreed that there was loss of confidence in the packages (A71), and that output was unsatisfactory (B71), IT section heads and users indicated that interruptions during operations were increasing (C71). In addition, all respondents agreed that there were delays in support provided to users (D71), and IT section heads, non-IT section heads and users also agreed that their organisations were increasingly relying on vendors (E71).

IT section heads agreed to some extent that their packages were not compliant with Year 2000 requirements (G71) and disagreed that Year 2000 compliance tests were conducted (C72). This suggests further that these organisations will not rely on their packages in future unless they address the Y2K problem. The responses also suggest that most respondents were not involved

in the selection of their packages. They were not certain that background information about the packages (A72) and the vendors (B72) was obtained. Though business managers and IT section heads agreed to some extent that users were involved in the selection of the packages, users disagreed with this statement (D72). The importance of involving users and others during the implementation is to ensure that systems met their requirements, and were acceptable to them. It is therefore inevitable that these organisations experience problems in utilising their packages. In addition, users indicated that they were not provided with adequate training (G72). Discussions held with some users indicated that they were trained on a number of modules (e.g., debtors, creditors, general ledger, stock control) over a very short period of time. This could not allow them sufficient time to master the operations of the package adequately.

It is suggested, however, that basic assessments of the packages were at least conducted. All respondents agreed that processing capabilities were evaluated (E72) and that the packages were compared with others on the market (F72). This could be explained by responses in Figure 5.1.4, where it was indicated that most organisations had experienced problems in their manual systems (A62), therefore they ensured that the right packages were selected.

It is interesting to note, however, that most users indicated that the packages would enhance accountability and resource utilisation, Figure 5.1.3 (G51) , yet they were not involved in the selection process, Figure 5.1.5 (D72) and were provided with inadequate training, Figure 5.1.5 (G72) . This could perhaps be explained by the concept of “Paradox of negative experience”, explained by Griffith and Northcraft (1996). According to Griffith and Northcraft (1996), the paradox of negative experience is built on the idea of exploration-based learning, rather than

instruction-based learning. Exploration-based learning entails providing novices with only enough understanding of something to begin using information technology and to begin discovering the limitations of that understanding. Implementers provide users with an initial understanding of technology, and users' initial experiences with technology then helps them begin to restructure and adopt their understanding of technology. Discussions conducted with users in Lesotho indicate that some taught themselves the packages by trial and error. They however pointed out that this is a long process that requires sufficient time. In addition, it is the view of the researcher that those adopting this methods should have the intellectual ability and discipline to do so, otherwise, this may turn out to be a costly exercise for the organisation. Training problems may have also resulted from the failure by management to identify the right people for training and their training needs. Some felt that the accounting modules they were trained in were not relevant to their daily tasks.

6.6 The effect of the information technology strategy alignment on the success of the accounting package implementation

This path measured the relationship between the IT strategy alignment and the success of the accounting package implementation. Results in Figure 5.3 indicate that there exists a positive and statistically significant relationship between these two variables (coefficient value = 0.65, $p < 0.05$). Hypothesis 2 is supported, e.g., the more coherent the IT strategy alignment, the more successful would be the implementation of the accounting package.

Figure 5.1.6 and Figure 5.1.7 indicate that while senior managers and IT section heads (representing 35 % of the total respondents) agreed to some extent, that overall, the choices or decisions adopted in the implementation of accounting packages were consistent with the organisational factors, Non-IT section heads and users, forming 65% of the respondents, clearly disagreed that consistency between these variables existed. Almost similar results were obtained in Figure 5.1.7. IT section heads and business managers agreed to some extent that their packages were implemented successfully, while the rest of the respondents (65%) indicated that the implementation was unsuccessful.

Considering the problems identified above, it was inevitable that users and non-IT section heads were led to this conclusion. This is because they were not involved in the selection of the packages, and therefore denied the opportunity to examine the ability of the packages to meet their requirements, Figure 5.1.5 (D72). Support provided to them was inadequate, Figure 5.1.5 (D71) and support groups could not review their requirements, Figure 5.1.2 (B41), which would have allowed for necessary updates to be made to make the packages more useful to them. The objectives were not properly communicated, Figure 5.1.3 (A52) to create awareness of others' needs, and it was claimed that the training was also inadequate. Some users had to learn the packages the hard way, Figure 5.1.5 (G72).

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 Concluding comments and recommendations

This study measured the extent to which small-to-medium sized organisations aligned the information technology strategies during the implementation of their accounting packages. Furthermore, the effect of such alignment on the success of accounting package implementation was also determined. The results of the structural model indicate the existence of positive and statistically significant relationships between the dimensions of alignment and the IT strategy alignment, and also between the IT strategy alignment and the success of the accounting package implementation. Analysis of the responses to the questionnaire (Figures 5.1.1 - 5.1.5), and the discussions conducted with business managers, section heads and users suggest that, except for cultural dimension, where support for existence of cultural alignment is provided (Figure 5.1.3), small to medium sized organisations do not align their IT strategies with business objectives, structural factors, social factors, and information system factors. Results in Figure 5.1.6 and 5.1.7 also indicate that most respondents (65%) felt that their organisations did not implement their accounting packages successfully. In the following sections, the conclusions and recommendations are presented.

7.1.1 The business objectives dimension

Findings:

The business objective dimension of alignment has a positive and significant effect on the IT strategy alignment, which supports the view that business and IT decisions must be co-ordinated during the implementation of accounting packages in order to achieve coherent IT strategy alignment. The analysis of responses provides limited evidence to suggest that small-to-medium sized organisations align their IT objectives with business objectives during accounting package implementations. Business managers only agreed to some extent that business plans identified the contribution of accounting package in ensuring operational efficiency. In addition, they were uncertain that these plans identified the risks to business objectives posed by the non compliance of the accounting package with Y2K requirements. This is a critical issue that could affect the operations of the organisation and one would expect management to have given it serious consideration. Most respondents were uncertain about the contents of their business and IT plans, which suggests that they were not involved in the planning processes, and their views on package implementation were possibly not taken into consideration.

Recommendations:

Coordination of business managers' decisions with those of IT section heads is apparently hampered by the fact that IT section heads hold junior positions in these organisations and as such, do not have the capability to influence IT development decisions, ACCA (1998). Accounting packages provide important financial and accounting information on which many functions of the organisation depend, therefore the involvement of IT personnel is vital. For

instance, the production function requires information on raw materials and equipment costs, the personnel function requires pay information from the payroll system, financial and accounting information is often provided to various external users such as customers, suppliers, income and sales tax departments. This task can not be handled by business managers only, if they have limited IT skills. IT personnel have an important role to play in this implementation and their full participation, and commitment to such projects can only be obtained by involving them at the start of the projects. Nath (1989), and Beaumont and Sutherland (1994) also recognise the importance of involving IT personnel in the planning process as a way of ensuring proper alignment of IT objectives with business objectives.

7.1.2 The structural dimension

Findings:

The structural dimension of alignment also has a positive and statistically significant influence on IT strategy alignment. This supports the view that implementers of the accounting package must ensure the establishment of effective linking mechanisms, in order to achieve coherent IT strategy alignment.

Analysis of responses suggest that the structural dimension was not aligned with the IT strategy alignment. Many respondents were dissatisfied with the support provided to them, and users clearly indicated that their requirements were not reviewed.

Recommendations:

During the selection of support teams, consideration should not only be given to capability, or experience. Other issues such as proximity and commitment of supporters should be assessed. While the researcher acknowledges the importance of outsourcing to the small sized organisations, which often lack the resources to develop their strong support teams, there are many reported cases whereby the engagement of consultants or vendors has not guaranteed successful implementation of IT systems, Gable (1989); Soh, Yap and Raman (1992). Management in small-to-medium sized organisations should not, therefore, underestimate the role their own staff can play in providing appropriate support. Over-dependence on the software vendors, regardless of where they reside, is not recommended. There should be teams within organisations to provide immediate support. Similar recommendations have been made by earlier researchers such as Dray and Yelsey (1985). Support teams should be set up by identifying those who are competent in using accounting modules and perhaps having technical skills. These should then work with users and external consultants to provide advice and information about the best ways to solve problems. It is expected that, once these teams are in place, they can offer basic training and support to users, while tasks that require more advanced expertise could be out-sourced.

7.1.3 The social dimension

Findings:

The social dimension of alignment also has a positive and statistically significant influence on IT strategy alignment, thereby supporting the view that implementers of the accounting package must ensure mutual understanding and commitment to business, IT and user objectives or requirements by organisational members in order to achieve coherent IT strategy alignment. The analysis of responses suggests that there was lack of mutual understanding and commitment to business, IT and user objectives. It was revealed that business managers understood IT objectives only to some extent, IT section heads were to some extent uncertain about business objectives, users did not understand both the business and IT objectives, business managers were uncertain about user requirements, most respondents indicated that non-IT heads were not committed to IT development and that IT teams were not committed to business and user needs. In addition, it was also indicated by some respondents that objectives were not communicated promptly, and that social problems experienced during the implementation were not resolved jointly. These findings confirm claims by Benjamin and Levinson (1993), Woodward (1965) and Horovitz (1984), that insufficient attention is often given to social factors during IT implementations.

Recommendations:

It is the view of the researcher that knowledge of user requirements and those of other parties involved in the implementation is important in ensuring successful implementation of accounting packages. This is recognised by other researchers such as Allingham and O'Connor

(1992); Neo (1988); Fidler and Rogerson (1995); and Roger and Shoemaker (1971). Roger and Shoemaker (1971) argued that characteristics of technologies should be consistent with the expectation of users, implementers and the organisation before the technology is finally accepted. It is important therefore, that user requirements are clearly understood and met by the packages implemented. Users and others affected by the implementation should be made aware of the objectives and benefits to be derived from the implementation in order to alleviate fear, and possibility of resistance.

Commitment by senior managers, and those involved in the implementation is vital. This has also been emphasised by earlier writers, e.g. Sauer (1993), and IFAC (1998). Appropriate resources such as funds and skilled staff are only likely to be available on a timely basis if there is support and commitment of management. Furthermore, IT implementations are often hindered by unforeseen impediments and management intervention is necessary to circumvent these difficulties. Participation of management could take many other forms, such as , involvement in identification of potential vendors, development of maintenance agreements and assessment of the skills acquired by staff after training sessions.

7.1.4 The cultural dimension

Findings:

The cultural dimension had a highly positive and significant effect on the IT strategy alignment, thereby supporting the view that implementers of accounting packages should ensure a stable organisational culture in order to achieve coherent IT strategy alignment. This dimension has the strongest effect on the IT strategy alignment in this study and results presented in Figure 5.1.3 provide support for existence of cultural alignment in small-to-medium sized organisations.

Perhaps this could be explained by the fact that most organisations studied had experienced problems with their manual systems and had high hopes in the capability of the accounting packages to solve most of these problems. It may also be argued that the vendors may have also played a key role in ensuring that these organisations selected the right packages that addressed their accounting problems.

Recommendations:

Precautions should however be taken to ensure that the packages are thoroughly examined . Vendors often influence user's expectations in order to sell their products by parading the positive features of their wares and down-play issues such as system conversion or compatibility.

7.15 Information system dimension

Findings:

This dimension has a positive and significant influence on the IT strategy alignment. This supports the view that implementers of the accounting package must ensure that users rely on the package for current and future information requirements, in order to achieve coherent IT strategy alignment. Most respondents indicated that there were delays in the support provided to users, the organisations were increasingly relying on the vendors, users indicated that they were not involved in the selection of the packages, and also felt that the training provided to them was inadequate. Most respondents were uncertain that background information about the packages and the vendors was obtained. However, there were indications that at least processing capabilities were assessed and comparison of the packages with others on the market were conducted.

Recommendations:

Involvement of users in the selection and implementation of the package provides an opportunity to determine whether the package is easy to use and flexible to operate as recommended by Vindyadaran (1995), Sherer (1993). In addition, ISO 9004 also requires that on-site evaluation of the product and evaluation of the vendors past history with the product should be conducted. Apparently, these procedures were not followed by some of the organisations investigated. It is important these procedures are observed in future implementation. Such procedures ensure that quality accounting packages are acquired. They guide the implementation processes, minimise likelihood of errors, misunderstandings or conflicts in the deployment of the packages.

It was reported that training courses for users were not conducted adequately. For example, many users were introduced to many accounting modules over a short period of time. Training users on accounting packages should be done after identification of their requirements or tasks first, identification of those who should be trained, determination of the levels of training required and the mode of training. It is equally important to ensure that the right trainers are selected and guided on what the staff should be trained in. This task should not be left to the vendors or trainers alone. Management has key contribution to make here.

The issue of the accounting package compliance with Year 2000 requirements causes much concern. Apparently, few people in small-to-medium sized organisation in South Africa, and elsewhere seem to be aware of the danger it poses on the operation of their accounting systems, Harding (1998). There is therefore need for these organisations to ensure that their existing accounting systems, or those to be implemented meet the requirements for Year 2000.

7.1.6 IT strategy alignment and the success of accounting package implementation

The relationship between the IT strategy alignment and the success of the accounting package was positive and statistically significant. This supports the view that the more coherent the IT strategy alignment, the more successful would be the accounting package implementation. Results in Figure 5.1.6 and 5.1.7 indicate that most of the respondents (65%) felt that, overall, their IT strategies were not properly aligned with the organisational factors and that their accounting package implementations were unsuccessful. It may be concluded that the small-to-medium sized organisations investigated in this study did not align their IT strategies with organisational factors, except for the cultural factors. Subsequently, this affected the success of their accounting package implementations.

7.2 Strength of the study

With the increasing trends towards use of accounting packages by small-to-medium sized organisations, and the problems experienced in their implementation, this study and its findings will serve a useful purpose. It shows some ways of conceptualising and measuring alignment in small-to-medium sized organisations, and through statistical modelling, it brings to light important factors influencing the success or failure of the adoption of accounting packages in these organisations, such as those identified in the above chapters.

The framework developed in this study could be used in conducting alignment audits of accounting package implementations. It ensures that alignment is measured from a number of dimensions and for each of these dimensions, measurement is done from the perspective of the

processes leading to alignment, and also from the outcomes of alignment. This approach is different from those adopted in prior studies which mainly focussed on outcomes of alignment. It therefore provides a more comprehensive assessment of alignment, whereby the investigator could also compare the results obtained in the process-based assessment with those obtained in the outcome-based assessment. For instance, lack of involvement by IT staff in business planning and non involvement by senior managers in identification of IT requirements are possible causes of the inconsistency between the IT strategy and business objectives. In the same way, failure to communicate IT, user and business requirements might have lead to respondents' failure to understand others' objectives.

The questionnaire designed using this framework would also be a useful tool in establishing how close small-to-medium sized organisations aligned their accounting package implementations. It assesses the extent to which crucial factors, necessary to achieve successful package implementation were taken into consideration by these organisations. For instance, it measures the perceptions of different respondents regarding the extent to which the package meets business objectives, is Y2K compliant, measures the adequacy of the support provided to users during implementation and after, and the commitment of implementers to the implementation objectives. It also assesses the quality of the package, e.g., whether it possesses better measurement and control functions and could provide useful information. The questionnaire also measures respondent's perception of the degree of alignment and the level of implementation success. The questions were designed in closed form to facilitate efficient quantification and analysis of the responses. These responses may be analysed using common statistical packages, but in order to determine the relationships between the dimensions, the IT strategy alignment and the success of the accounting package implementation, statistical packages with structural

modelling facilities are recommended. This questionnaire should be completed by those involved in the accounting package implementation and those who have used the package for at least one year.

Statistical modelling techniques were used to bring to light important factors influencing the success or failure of the adoption of accounting packages in small-to-medium sized businesses. They measured the relationships between the dimensions of alignment, IT strategy alignment and the success of the accounting package implementation. Structural equation modelling estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural model used by the statistical program.

These techniques require that the researcher first draws upon theory, prior experience and the research objectives in order to distinguish which independent variables predict each dependent variable. In the current study, for example, the researcher first measured the influence of the dimensions of alignment on IT strategy alignment, and subsequently the impact of IT strategy alignment on the success of accounting package implementation. Thus, the dependent variable (IT strategy alignment), became an independent variable in the subsequent relationship giving rise to the interdependent nature of structural model. The structural model expresses the relationship among independent and dependent variables, even when a dependent variable becomes an independent variable in other relationships. The proposed relationships are then translated into a series of structural equations for each dependent variable which are then analysed. The results obtained from this analysis could then be used to confirm the theoretical predictions. This method, however, requires an acquaintance with structural modelling techniques.

7.3 Limitations of the study and recommendations for future research

This study has the following limitations. First, the questionnaire asked respondents to comment on their written plans. It appears from the responses that such plans never existed or the respondents had limited awareness of the contents of these plans. Other methods involving the study of more available documents such as minutes of meetings or agendas, should have been considered. Another alternative would be to conduct in-depth interviews with key respondents. Unfortunately, this was not possible due to financial constraints and the fact that the respondents are located in different parts of South Africa and Lesotho.

Second, the study only considered the views of senior managers, IT section heads, non-IT section heads and users of the packages. Views of vendors, for instance, should have been examined as well since they have a key role to play in software package implementation. In addition, there are concerns with these consultants that have been identified in this study which also need to be addressed further. Assessment of vendors' views, and their influence on successful accounting package implementation should be considered in future studies.

Third, there are a number of structural, social, culture and technological aspects of IT implementation which have not been considered in this study. For example, Fidler and Regerson (1995) state that implementation of IT could have implications for power structure within the organisation (e.g., implications of restructuring of tasks and responsibilities), and this could affect social groupings. These should be considered in future studies.

In addition, a distinction was not made between packages running on network systems and those on stand alone computers, or that between the versions of the packages used. These are likely to differ in format, presentations, help facilities and also in the operational problems they present to users. These factors would influence the success/failure of the implemented system.

It is suggested in section 6.1 on page 86, that some important IT needs were not addressed by business managers during the planning stage. It was also suggested that this could have been caused by the non involvement of the IT personnel in the planning process due to their junior positions in these organisations. Business managers, however, have limited IT skills to handle this implementation successfully without the assistance of IT personnel. Unfortunately, Remenyi and Whittaker (1995) claim that the issue of ensuring that IT objectives were aligned with business objectives is given less consideration by business managers in South Africa. It is therefore necessary that future research address this problem to find ways that would ensure proper alignment of these objectives.

The model developed in this study (Figure 2.2, page 16) did not include all the aspects of alignment suggested in Figure 2.1, page 14. The researcher acknowledges that all these aspects would be relevant to the alignment process, e.g., other dimensions also need to accommodate the business objective, which embodies the reason for any company's existence. Thus the findings in this study might not represent the complete picture. Future studies should be extended to cover these areas as well.

8. SUMMARY

The alignment of IT strategies with organisational factors is critical to the success of software package implementation. While studies on alignment have been conducted in large sized organisations, little has been done to assist the small-to-medium sized organisations (e.g., the main users of software packages in South Africa and who depend on them for survival) to successfully manage the process of implementing these packages. For instance, given the increasing problems that preclude successful implementation of these packages, there is need for comprehensive frameworks these organisations could rely on to predict the likely outcome of their effort to implement the packages or to audit the outcome of these implementations.

In the current study, the researcher developed a framework to guide the measurement of alignment in small-to-medium sized organisations. In this framework, alignment is measured from a number of dimensions (business objectives, structural, social, cultural and information system dimensions) and each is assessed from the perspective of organisation processes leading to alignment, and also from the outcomes of alignment. This framework was then used to measure the extent to which choices or decisions taken in the implementation of the accounting packages ensured:

- . consistency with the business objective to achieve efficiency in internal operations;
- . the establishment of efficient linking mechanisms to support the package utilisation (structural factor);
- . mutual understanding and commitment to business, IT, and user objectives (social

factor);

the establishment of a stable organisational culture (cultural factor);

user reliance on the package for current and future information needs (information system factor).

It was also necessary to determine the impact of alignment on the success of the accounting package implementation. This was achieved by first measuring the overall consistency between the decisions taken during the package implementation and the selected organisational factors (considered here collectively because they do not operate in isolation). Subsequently, the researcher measured the impact of the overall consistency on the success of the accounting package implementation. This overall consistency is referred to in this study as IT strategy alignment.

In order to determine the relationships between the dimensions of alignment, IT strategy alignment and the successful implementation of accounting package, a structural model was developed and tested using structural equation modeling techniques. To do this, the researcher collected data from groups of employees in a pre-specified sample of small-to-medium sized business, in specific geographical areas of Southern Africa. Questionnaires were used to ask respondents to indicate their feeling about the way the accounting packages were implemented and how they were currently being used in their organisations. One hundred and sixty eight responses were received from 300 questionnaires. This data was first analysed to determine the consistency between the IT strategy and each of the dimensions of alignment. Further analysis was then conducted using structural modeling techniques to determine the relationships between the dimensions of alignment, IT strategy alignment and the success of the accounting package

implementation.

The results obtained from the analysis of responses and those from the structural equation modeling led the researcher to the following conclusions and recommendations.

8.1 The business objectives dimension

The business objective dimension has a positive and significant effect on the IT strategy alignment, thereby supporting the view that business and IT decisions must be coordinated during the implementation of the accounting package in order to achieve coherent IT strategy alignment. The small-to-medium sized organisations studied did not align their IT objectives with business objectives. Analysis of responses suggest that important IT requirements were not addressed by business managers during the planning stage. This could have been caused by non involvement of the IT staff in the planning process, as was indicated by most respondents. It was also suggested that IT section heads in small-to-medium sized organisations hold junior positions that they may not influence important IT decisions. The researcher emphasised the importance of involving IT section heads in planning for the implementation of accounting packages. This task can not be handled by business managers alone. Many functions in the organisation, and external bodies rely on the information generated by these systems.

8.2 The structural dimension

This dimension also has a positive and statistically significant influence on IT strategy alignment. This supports the view that implementers of accounting packages must ensure the establishment of effective linking mechanisms in order to achieve coherent IT strategy alignment. The analysis of responses indicated that this dimension was not aligned with the IT strategy alignment. Many respondents were dissatisfied with the quality of support provided to them, and users clearly indicated that their requirements were not reviewed. It was recommended that small-to-medium sized organisations should avoid the risk of over-dependence on software vendors or consultants by establishing their own internal support teams to provide the basic and immediate support. External consultants should be engaged to conduct more complicated tasks that cannot be handled by the internal teams. Their capability, commitment, and proximity should, however, be carefully assessed before engagement.

8.3 The social dimension

This dimension also has a positive and statistically significant influence on the IT strategy alignment, thereby supporting the view that implementers of accounting packages must ensure mutual understanding and commitment to business, IT and user objectives or requirements by organisational members in order to achieve coherent IT strategy alignment. The analysis of the responses revealed that there was lack of mutual understanding and commitment to these objectives. Business managers only understood IT objectives to some extent, IT section heads were uncertain about the business

objectives and users did not understand both business and IT objectives. Some respondents indicated that these objectives were not communicated promptly and social problems experienced during the implementation were not solved jointly. Implementers of accounting packages must understand user requirements and ensure that these requirements are met by the package deployed. Users and others concerned should be made aware of the objectives and the benefits of implementing the package. This would alleviate the danger of resistance, reduce fear and ensure the acceptance of the system by the users. The commitment and participation of senior management is vital if appropriate resources are to be made available to ensure successful completion of such projects.

8.4 The cultural dimension

The cultural dimension has a highly positive and significant effect on the IT strategy alignment, thereby supporting the view that implementers of accounting packages should ensure a stable organisational culture in order to achieve coherent IT strategy alignment. Analysis of responses provide support for the existence of cultural alignment in small-to-medium sized organisations. This could be explained by the fact that most organisations studied had experienced problems with their manual systems and had high hopes in the capability of the accounting packages to solve most of these problems. It is also suggested that vendors might have also played a key role in ensuring that these organisations selected the right packages that addressed their accounting problems. Precautions should however be taken to ensure that the packages are thoroughly examined . Vendors may sometimes influence user's expectations in order to sell their products by parading the positive features of their wares and down-play issues such as system conversion or

compatibility.

8.5 Information system dimension

This dimension has a positive and significant influence on the IT strategy alignment. This supports the view that implementers of the accounting package must ensure that users rely on the package for current and future information requirements, in order to achieve coherent IT strategy alignment. Analysis of responses indicate that there were delays in the support provided to users, users disagreed that they were involved in the selection of the packages, users felt that the training provided to them was inadequate and many respondents were uncertain that background information about the package and the vendors was obtained.

Involvement of users in the selection and implementation of the package provides an opportunity to determine whether the package is easy to use and flexible to operate. On-site evaluation of the product and evaluation of the vendors past history with the product should be conducted. These ensure that quality accounting packages are acquired, they guide the implementation processes, minimise likelihood of errors, misunderstandings or conflicts in the deployment of the packages. Training users on accounting packages should be done after identification of their requirements or tasks first, identification of those who should be trained, determination of the levels of training required and the mode of training. It is equally important to ensure that the right trainers are selected and guided on what the staff should be trained in. This task should not be left to the vendors or trainers alone. Management has key contribution to make here.

Apparently, few people in small-to-medium sized organisation in South Africa, and elsewhere seem to be aware of the danger posed by the non-compliance of the accounting package with Year 2000 requirements. There is therefore need for these organisations to ensure that their existing accounting systems, or those to be implemented meet the requirements for Year 2000.

8.6 IT strategy alignment and the success of accounting package implementation

The relationship between the IT strategy alignment and the success of the accounting package was positive and statistically significant. This support the view that the more coherent the IT strategy alignment, the more successful would be the accounting package implementation. The analysis of responses indicated that 65% of the respondents felt that, overall, their IT strategies were not properly aligned with the organisational factors and that their accounting package implementations were unsuccessful. This led the researcher to conclude that the small-to-medium sized organisations investigated in this study did not align their IT strategies with organisational factors (except for the cultural factors) and subsequently, this affected the success of their accounting package implementations.

This study serves a useful purpose by showing some ways of conceptualising and measuring alignment in small-to-medium sized organisations. Through statistical modeling, it brings to light important factors influencing the success or failure of the adoption of accounting packages in these organisations. The framework and the questionnaire developed in this study could be used in conducting alignment audits of accounting package implementations.

This study did not however address some of the following issues: the relationship between the business objectives (which embodies the reason for any company's existence) with structural, social, cultural, and information system factors. It did not also consider the views of vendors who play a key role in the implementation of the accounting packages, and the implications of restructuring of functions, tasks or responsibilities on social groupings, which may be inevitable following the implementation of the packages. These issues should be integrated in future studies.

9. APPENDIX 1

9.1 Letter to respondents

The Managing Director

.....

.....

Dear Sir/Madam,

Subject : Survey on implementation of Accounting software Packages

Your organisation may be one of the many that are increasingly adopting accounting software packages in the development of information systems. These include Pastel , Impact, Brilliant, Acc Pac, and many others which are easily obtained from a number of software vendors. The fact that many companies are investing in these packages suggest the potential value these systems have for our organisations.

Unfortunately, some companies experience problems that preclude the achievement of the full potential of these accounting packages. Example of problems are inadequate planning for package implementation, failure to identify suitable packages and vendors, difficulty in out sourcing of experts and inadequate training of users.

As part of this survey, useful information is needed from you, which will elicit the critical issues to be considered in the implementation of such software. The information gathered will be summarised and recommendations of new concepts or methods that will lead to improvements

in these development will be made to you. These will also be recorded at the University of Orange Free State, Bloemfontein, as part of my thesis. The approaches you have adopted in implementation of your accounting package, as well as your ideas and thoughts, will contribute greatly to this survey.

The enclosed questionnaire has two parts. I request that Part A be completed by you or one of your senior managers. Part A is only four questions on one page and should not take much time to complete. Only one copy of Part A is enclosed. I request that several members of your organisation complete Part B; four copies are enclosed. If your schedule permits, I would appreciate your completion of Part B. In addition, I suggest Part B be completed by those heading your finance, accounting, and information technology functions, plus one member of your operating staff who frequently uses the accounting software package. If you wish to ask others to also respond, that would be appreciated.

Your responses by 30th March 1999 latest, would be timely in order to be included in the findings analysis. The information supplied by you will be treated with utmost confidence and your favour by answering the questionnaire is very much appreciated.

Thank you for your assistance and your time in this research.

KYOBÉ MICHAEL

9.2 Questionnaire

PART A

(To be completed by a senior manager)

Please provide the following general information which will assist us in the evaluation of your responses to this survey.

A11 Name of your organisation: _____

B11 What is the primary business activity of your organisation?

C11 How many people are employed in your organisation ? (Tick appropriate answer)

Up to 50 employees
More than 50, but less than 100 employees
More than 100 employees

D11 Approximately, what is the annual revenue of your organisation? (Tick appropriate answer)

Up to 0.9 million Rands
1 to 3 million Rands
More than 3 million Rands

E11 Indicate the type of accounting package currently used by your organisation, and the period it has been in use

Accounting Package
(Tick appropriately)

Duration
(Enter number of years)

_____ Acc Pac
_____ Brilliant
_____ Impact Award
_____ Pastel
_____ Other, (Specify).....

PART B

(To be completed by all respondents)

001. The purpose of this study is to measure your feelings about the implementation, and utilisation of your accounting software package. On the following pages, you will find statements on many issues relating to implementation and utilisation of accounting systems. Please indicate your disagreement or agreement with the statements by CIRCLING the number corresponding to your evaluation.

The following scale is applicable to all questions, except where otherwise specified:

1	2	3	4	5
---	---	---	---	---

- 1 = Strongly disagree;
2 = Disagree;
3 = Uncertain;
4 = Agree to some extent;
5 = Strongly agree.

The following example illustrate the meaning of a scale position:

Package users were involved in the implementation of the accounting package:

1	2	3	4	5
---	---	---	---	---

According to the response, **position 2** is circled. This indicates that the respondent disagrees with the statement, (i.e., Package users **were not** involved in the implementation of the package).

INSTRUCTIONS:

1. Read the statements in the following sections very carefully;
2. Then **CIRCLE** only **ONE** number to indicate your agreement or disagreement with the statement;
3. **DO NOT** circle between numbers on the scale;
4. Complete all scales.

Thank you very much for your cooperation

[P.T.O]

002. **General information**

A21 What is your current job title? _____

B21 Were you involved in the implementation of the accounting package?
(Tick appropriately)

_____YES _____NO

C21 Approximately, how long do you use the package daily? (Tick appropriately)

[____ Up to 2 hours]; [____ More than 2 hours]; [____ Not at all]

D21 How long have you been using the current accounting package? (Tick appropriately)

[____ Up to 1 year]; [____ More than 1 years]; [____ Not at all]

003. **Please indicate your disagreement or agreement with the following statements:**

A31 The business plan identifies the contribution the accounting package would make in ensuring operational efficiency, (i.e., through better control of purchasing activities, inventory control and debtor management)

1	2	3	4	5
---	---	---	---	---

B31 The business plan identifies the risks to business objectives, which may be caused by the non compliance of the accounting package with Year 2000 requirements

1	2	3	4	5
---	---	---	---	---

C31 The Information Technology (IT) plan states the main business objectives the accounting package is intended to support

1	2	3	4	5
---	---	---	---	---

1 = strongly disagree; 2 = disagree; 3 = uncertain; 4 = agree to some extent; 5 = strongly agree
[P.T.O]

A32 Those heading non IT departments were involved in planning for implementation of the accounting package, (IT = Information Technology)

1	2	3	4	5
---	---	---	---	---

B32 Those heading the IT department were involved in the development of business plans and objectives

1	2	3	4	5
---	---	---	---	---

A41 A specific person (or group, i.e., liaison group, user group, training team), provides users of the package with effective support

1	2	3	4	5
---	---	---	---	---

B41 Support groups often meet to review requirements of package users

1	2	3	4	5
---	---	---	---	---

A42 Support groups were drawn from departments affected by the implementation of the package

1	2	3	4	5
---	---	---	---	---

B42 Members of support groups possess skills in accounting and/or Information Technology

1	2	3	4	5
---	---	---	---	---

A51 I understand my organisation's business objectives

1	2	3	4	5
---	---	---	---	---

B51 I understand my organisation's IT objectives

1	2	3	4	5
---	---	---	---	---

C51 I understand other system users' requirements

1	2	3	4	5
---	---	---	---	---

D51 Those heading departments (other than IT) are committed to IT developments

1	2	3	4	5
---	---	---	---	---

1 =strongly disagree; 2 = disagree; 3 = uncertain; 4 =agree to some extent; 5 = strongly agree
[P.T.O]

E51 *IT support teams are committed to the achievement of business and user needs*

1	2	3	4	5
---	---	---	---	---

F51 *Users report software and hardware problems to management promptly*

1	2	3	4	5
---	---	---	---	---

G51 *The accounting package will enhance the accountability and utilisation of resources*

1	2	3	4	5
---	---	---	---	---

A52 *Business, IT and User requirements were communicated to those concerned with the package implementation*

1	2	3	4	5
---	---	---	---	---

B52 *Heads of departments played a key role in communicating the objectives of implementing the accounting package*

1	2	3	4	5
---	---	---	---	---

C52 *Social problems experienced during the implementation of the package, were solved jointly by system users and those heading IT and non IT departments*

1	2	3	4	5
---	---	---	---	---

1 = strongly disagree; 2 = disagree; 3 = uncertain; 4 = agree to some extent; 5 = strongly agree

[P.T.O]

Our accounting package is often used to support the following functions:

A61 Monitoring internal operations

1	2	3	4	5
---	---	---	---	---

B61 Budgeting

1	2	3	4	5
---	---	---	---	---

C61 Accounting

1	2	3	4	5
---	---	---	---	---

D61 Forecasting

1	2	3	4	5
---	---	---	---	---

A62 The accounting package was implemented to solve the problems experienced in measurement and control of the organisation's internal operations.

1	2	3	4	5
---	---	---	---	---

A71 There is loss of user confidence in the package

1	2	3	4	5
---	---	---	---	---

B71 Output provided by the package is unsatisfactory

1	2	3	4	5
---	---	---	---	---

C71 Interruptions in processing are increasing

1	2	3	4	5
---	---	---	---	---

D71 There are delays in support provided to users

1	2	3	4	5
---	---	---	---	---

E71 Reliance on vendors is increasing

1	2	3	4	5
---	---	---	---	---

F71 There is loss of data confidentiality

1	2	3	4	5
---	---	---	---	---

G71 The package is not compliant with Year 2000 requirements

1	2	3	4	5
---	---	---	---	---

1= strongly disagree; 2 = disagree; 3 = uncertain; 4 = agree to some extent ; 5 = strongly agree
[P.T.O]

A72 Background information was obtained before the purchase of the package

1	2	3	4	5
---	---	---	---	---

B72 The reliability of the vendor was assessed

1	2	3	4	5
---	---	---	---	---

C72 Year 2000 compliance tests were conducted on the hardware and the package

1	2	3	4	5
---	---	---	---	---

D72 Users were involved in the selection of the package

1	2	3	4	5
---	---	---	---	---

E72 Processing capabilities of the package were evaluated

1	2	3	4	5
---	---	---	---	---

F72 The package was compared to others on the market

1	2	3	4	5
---	---	---	---	---

G72 Users were provided with adequate training

1	2	3	4	5
---	---	---	---	---

004 This section assess your overall perception of the degree to which the approach adopted in implementing your accounting package, was aligned with business objectives, organisational issues, and IT/IS requirements. Indicate your disagreement or agreement with the following statement:

A81 Overall, our IT plan (strategy) for implementation of the package was aligned with organisational issues, business objectives and IT/IS requirements

1	2	3	4	5
---	---	---	---	---

(IT = Information Technology, IS = Information system)

1= strongly disagree; 2 = disagree; 3 = uncertain; 4 = agree to some extent; 5 =strongly agree

[P.T.O]

005. This section assess your perception of the level of success of your accounting package.
Indicate your disagreement or agreement with the following statements:

A91 The accounting package was implemented successfully

1	2	3	4	5
---	---	---	---	---

B91 The accounting package meets most of the organisation's requirements

1	2	3	4	5
---	---	---	---	---

C91 The accounting package meets most of my requirements

1	2	3	4	5
---	---	---	---	---

D91 Overall, I'm satisfied with our accounting package (Tick appropriately)

_____YES _____NO

1= strongly disagree; 2 = disagree; 3 = uncertain; 4 = agree to some extent; 5 = strongly agree

006. Please provide the following details:

Your Name : _____

Position held _____

Address: _____

Phone _____

Fax _____

Email _____

If you have any questions, please contact:

Michael Kyobe

Address: P.o.box 660, Ladybrand 9745, South Africa

Tel: 09266-314257/324204

Fax: 09266-310407

Email: mike@adelfang.co.za

(Completed questionnaires should be returned to the above address)

9.3 References

1. ACCA (1998)
"Information Analysis, Certificate Paper 5." BPP Publishing, 6th ed. June 1998
2. Adler, P. (1989)
"Technology strategy: Guide to the literature," in R.S. Rosenbloom and R.A. Burgelman (eds), Research on Technology innovation, Management and Policy, JAI Press, Greenwich, CT, pp. 1-25.
3. Aldrich, H.E. (1979)
"Organisation and environment." Prentice Hall, Englewood Cliffs, N.J
4. Allingham, P. and O'Connor, M. (1992)
"MIS success: Why does it vary among users?" Journal of Information Technology, (1992), 7, pp. 160-168.
5. Alpar, P. and Ein-Dor, P. (1991)
"Major IS concerns of entrepreneurial organisations," Information and Management, North-Holland, 20, pp. 1-11.

6. Anderson, J. (1987)
"An approach for confirmatory measurement and structural equation modelling of organisational properties," *Management Sciences*, 33, (4), pp. 525-541.
7. Anderson, R. (1987)
"Data processing Volume 2. Information systems and Technology." Pitman Publishing, UK.
8. Bakos, J. and Treacy, M. (1986)
"Information technology and corporate strategy: a research perspective", *MIS Quarterly*, 10(2), pp. 107-119.
9. Baligh, H. (1994)
"Components of culture: Nature, Interconnections, and Relevance to the decisions on the organisation structure," *Management science*, Vol. 40, No1, January 1994
10. Bedian, G. and Zammuto, F. (1991)
"Organisations theory and Design." the Dryden Press, Orlando, FL 32887
11. Benjamin and Levinson (1993)
"A framework for managing IT-enabled change," *Sloan Management Review*, Summer, 12, pp.24.

12. Beumont, R. and Surtherland, E. (1994)
“Information Resources Management.” Butterworth - Heinemann Ltd., UK, 1994.
13. Brown and Magill (1994)
“Alignment of the IS functions with the enterprise: Towards a model of Antecedents,”
MIS Quarterly, Vol 18, No.4, 1994
14. Cale, E. and Eriksen, S. (1994)
“Factors affecting the implementation outcome of a mainframe software package: A
longitudinal study,” Information and Management, North Holland, 26, pp. 165-175
15. Cerveney, R. and Sanders, G. (1986)
“Implementing and Structural variables,”
Information and Management, North Holland, 11, pp. 191-198.
16. Checkland, P. and Scholes, J. (1999)
“Soft Systems Methodology in Action.” John Wiley and Sons, Ltd, England
17. Child, J. and Mansfield, R. (1972)
“Technology, size, and organisation structure,” Sociology, 6, pp. 369-393.

18. CIMA (1998)
"Abstract 20 Year 2000,"
Management accounting, Vol. (76), No 4 April 1998.
19. Clemon, E. (1989)
"Information systems and business strategy: Mini Track on current research,"
Proceedings of the 1989, Hawaii international conference on system sciences, pp. 181-183.
20. Clemons, Weber and Brennen (1990)
"Components of risk in strategic IT programs: Implications and risk management",
proceedings of the conference on strategic information architectures, Wharton school,
University of Pennsylvania
21. Cooper, R. (1994)
"The inertial impact of culture on IT implementation,"
Information and Management, 27, pp. 17-31.
22. Conrath, D. and Mignen, P. (1990)
"What is being done to measure user satisfaction with EDP/MIS," Information and management, 19, pp. 7-19.

23. Cragg, P. and King, M. (1993)
"Small-firm computing: Motivators and inhibitors,"
MIS Quarterly, March 1993, pp. 47-60
24. Cresap, McCormick and Paget Company (1983)
"Information system planning to support business objective: A survey of practices."
Cresap, McCormick and Paget Co., New York
25. Delone, W. (1988)
"Determinants of Success for Computer Usage in Small Firms, "
MIS Quarterly (12:1), March 1988, pp. 51-61.
26. Dray, S., and Yelsey, A. (1985)
"Impact of information and communication technology on Honey-well culture,
organisation and people." Internal white paper, Honey-well inc, Minneapolis
27. Earl, M.. (1989)
"Management strategies for information technology". Prentice Hall, Hemel Hempstead,
1989.

28. Earl, M. (1987)
“Information systems strategy formulation,” in Boland and Hirschheim (eds.), Critical Issues in information system research, J. Wiley
29. Ein-Dor, P. and Segar, E. (1978)
“Organisational context and the success of MIS,”
Management science, (24:6) June, pp. 1067-1077.
30. Ewusi, M. and Przasnyski (1994),
“Factors contributing to the abandonment of IS development projects,” Journal of Information Technology, (1994) 9, pp.185-201.
- 31.. Fidler, C. and Rogerson, S. (1995)
“Strategic management support systems.” Pitman publishing
32. Fishbein, M. and Ajzen, I. (1975)
“Belief, Attitude, intentions and Behaviour. An introduction to Theory and Research.” Addison-Wesley, Reading. MA, 1975.

33. Fornell, C.R, Tellis, G.L., and Zinkhan, G.M. (1982)
"Validity Assessment: A Structural Equation Approach using partial least squares," in An Assessment of marketing Thought and Practice, B.J. Walker et. al. (eds.), America Marketing Association, Chicago, 1982, pp. 405 -409.
34. Gable, G. (1989)
"Consultant Engagement for first time computerisation : problems and Issues,"
Proceedings of the International conference on organisations and information systems,
Bled, Yugoslavia, September, pp.13-15.
35. Galliers, R., (1988).
"IT strategies Today: The UK experience," in Earl, M (ed.), Information management: The strategic dimension, Claredon Press, Oxford, 1988.
36. Ginzberg, M. (1980)
"An organisational contingencies view of accounting and information system implementation," Accounting, organisations and society, Vol 5, No. 4, pp. 369-382.
37. Griesse, J. and Kurpicz, R. (1985)
"Investigating the buying process for the introduction of data processing in small and medium-sided firms," Information and Management, (8), pp. 41-51.

38. Griffith, T. and Northcraft, G. (1996)
"Cognitive elements in implementation of New technology: Can less information provide more benefits?" MIS Quarterly, March, pp. 99
39. Hair, J., Anderson, R., Tatham, R., and Black, W. (1995)
"Multivariate data analysis," (4th ed.), Prentice Hall, inc. Englewood Cliffs, N.J.
40. Hartwick, J. and Barki, H. (1994)
"Explaining the role of user participation in information system use," Management science, (40:4), pp. 440-465
41. Henderson, J. and Sifonis, J. (1988)
"Understanding the value of IS planning" understanding consistency, validity and IS markets," MIS Quarterly, (12:2), June, pp. 187-200.
42. Henderson, J. and Venkatraman, N. (1993)
"Strategic alignment: Leveraging information technology for transforming organisations," IBM systems Journal, Vol 32, No 1.
43. Horovitz, J. (1984)
"New perspective on strategic management," Journal of business strategy, (4:3), Winter, pp. 19-33.

44. Huber, G. (1990)
"A theory of the effects of advanced information technologies on organisational design, intelligence, and decision-making, " Academy of management Review, 15(1), pp. 47-71.
45. Igbaria, M., Meredith, G., and Smith, D. (1994)
"Predictors of intention of IS professionals to stay with the organisation in South Africa," Information and Management, 26, pp. 245-256.
46. Igbaria, M. and Nachman, S. (1990)
"Correlates of user satisfaction with end user computing," Information and management, 19, pp. 73 - 82.
47. Igbaria, M., Zinatelli, N., Cragg, P. and Cavaye, A. (1997)
"Personal computing Acceptance Factors: A structural Equation Model," MIS Quarterly, September 1997, pp. 279-299.
48. Iivari, J. and Ervasti, I. (1994)
"User information satisfaction: IS implementability and effectiveness" Information and Management, 27, pp. 205-220.

49. International Business Machines (1984)
"Business systems planning: Information systems planning guide." IBM, Atlanta, 1984
50. International Federation of Accountant (1998)
"Managing information technology planning for business impact." June, IFAC.
51. ISO 9004
"Quality management and Quality system elements, Part 1, Guidelines,"
British standards, BS EN ISO 9004 - 1, (1994)
52. Joyce, W., Slocum, J., and Glinow, M. (1982)
"Person-situation interaction: competing models of Fit,"
Journal of occupational behaviour, (3:4), pp. 265-280 (1982).
53. Keen, P. (1993)
"Information technology and the management difference: A fusion map,"
IBM systems Journal, Vol 32, No 1, pp. 17-33.
54. King, W. and Sabherwal, R. (1992)
"The factors affecting strategic information systems applications,"
Information and Management, North-Holland, 20, pp. 217-235

55. Kline, P. (1994)
"An easy guide to Factor analysis." Routledge, New York.
56. Lawrence, P. and Lorch, J. (1967)
"Organisation and Environment: Managing Differentiation and Integration." Irwin,
Homewood, IL.
57. Lederer, A. and Mendelow, A. (1993)
"Information systems planning and the challenge of shifting priorities,"
Information and Management, 24, pp. 319-328.
58. Leitch, R. and Davis, K. (1983)
"Accounting information systems." Prentice-hall, Inc., Englewood cliffs, New Jersey.
59. Lind, M., Zmud, R. and Fischer, W. (1989)
"Microcomputer Adoption - The impact of organisational size and structure,"
Information and Management, North Holland, 16, pp.157-162.
60. Lucas, H. (1975)
"Why Information systems fail." Columbia University Press, N.Y.

61. Lyytinen, K. (1988)
"Expectation failure concept and System analyst's view of information systems failures: Results of an exploratory study," Information and Management, 14, pp 45-56
62. McFarlan, F. (1984)
"Information technology changes the way we compete," Harvard business review, 62 (3), pp. 98-103.
63. McGregor, D. (1960)
"The human side of Enterprise." McGraw-Hill, New York.
64. Miller, J. (1993)
"Measuring and aligning information system with the organisation,"
Information and Management, North-Holland, pp 217-228.
65. Miller, D. (1988)
"Relating Porter's business strategies to environment and structure: Analysis and performance implications," Academy of management Journal, Vol. 31., No. 2, pp 280-308

66. Miller, E. and Rice, A. (1967)
"Systems of Organisation: The control of task and sentient boundaries." Tavistock,
London.
67. Mintzberg, H. (1979)
"The structuring of organisations." Prentice-Hall, Englewood Cliffs, N.J., 1979.
68. Morton, M. (1991)
"The corporation of the 1990's: information technology and organisational transformation," Oxford University Press, Oxford, 1991, pp. 123-158
69. Nath, R. (1989)
"Aligning MIS with the Business Goals,"
Information and Management, 16, pp. 71-79.
70. Neumann, S., Ahituv, N., and Zviran, M. (1992)
"A measure for determining the strategic relevance of IS to the organisation,"
Information and Management, North Holland, 22, pp. 281-299.

71. Neo, B. (1988)
"Factors facilitating the use of information technology for competitive advantage: An exploratory study," Information and management, 15, pp. 191-201.
72. Oosthuizen, H. (1996)
"Environment, business strategy, marketing strategy implications and organisational performance: an exploratory survey in the Western Cape of South Africa,"
S.A. Jnl. Entrepreneurship and Small Business, May 1996, pp. 23-34.
73. Orlikowski, N. and Gash, D. (1992)
"Changing frames: Understanding technological change in organisations," Centre for information system research, working paper, Massachusetts Institute of Technology.
74. Parthasarthy, R., and Sethi, S. (1993)
"Relating strategy and structure to flexible automation: A test of Fit and performance implications,"
Strategic Management Journal, Wiley and Sons, Ltd, Vol. 14, pp. 529-549.
75. Philips, B. (1993)
"Small firms and technological innovation: a South African perspective,"
S.A. Jnl. Entrepreneurship and Small Business, November 1993, pp. 1-10.

76. Plato, B (1997)
"Accounting for Accounting packages,"
Computer Reseller News (SA), 28, September, pp. 59-60.
77. Porter, M. (1985)
"Competitive advantage," Free Press, N.Y.
78. Porter, M. (1983)
"Technological dimension of competitive strategy," In R.S. Rosenbloom (ed.), Research on Technological innovation, management and policy, 1, JAI Press, Greenwich, CT, pp. 1-33.
79. Porter, M., and Millar, V. (1985)
"How information gives you competitive advantage," Harvard Business Review, July - August, 1985
80. Premkumar, G. and King, W. (1994)
"The evaluation of strategic information system planning,"
Information and Management, 26, pp. 327-340.

81. Raymond, L. (1993)
"Computerisation as a factor in the development of young entrepreneurs,"
International Small Business Journal, 11 (1) pp.23-34
82. Raymond, L. (1990a)
"Organisational context and IS success,"
Journal of management information systems, (6:4), pp. 5-20.
83. Raymond, L. (1990b)
"End-user computing in the small business context: Foundations and directions for research," Database (20:4), pp. 20-26.
84. Raymond, L., and Bergeron, F. (1992)
"Personal DSS success in small enterprises," Information and management, pp. 301-308.
85. Reich, B., and Benbaset, T. (1996)
"Measuring the linkage between Business and IT objectives," Management Information System Quarter, March 1996.
86. Remenyi, D. and Money , A (1991)
"A user-satisfaction approach to IS effectiveness measurement," Journal of Information Technology, 6 pp. 162-175

87. Remenyi, D., and Whittaker, L. (1995)
"Management of information technology in South Africa: initiatives in the mid-1990s"
S.Afr.Bus.Management, 26 (4), pp.144-152.
88. Rockart, J. (1979)
"Chief executives define their own data needs", Harvard business review, 57 (2), pp. 81-93.
89. Roger, E., and Shoemaker, F. (1971)
"Communication of innovations: Across-cultural approach." Free Press, New York, 1971
90. Romm, T., Pliskin, N., Weber, Y. and Lee, A. (1991)
"Identifying organisational culture clash in MIS implementation"
Information and Management, 21, pp. 99-109
91. Sauer, C. (1993)
"Why information systems fail: A case study approach." Alfred Walter Ltd, UK, 1993.
92. Schmidt, K. (1996)
"Technology transfer and innovations in the SME-sector, "
S.A. Jnl. Entrepreneurship and Small Business, November 1996, pp. 47-61.

93. Scown, P. and Thompson, P. (1993)
“System evaluation and control.” Certified Accountants Educational Projects Ltd, (1993),
UK.
94. Shank, R., Niblock, E., and Sandalls, W. (1973)
“Balance Creativity and Practicality in Formal Planning,” Harvard Business Review
(51:1), January/February 1973, pp. 87-95.
95. Segars, E., and Grover, S. (1993)
“Re-examining perceived ease of use and usefulness : a confirmatory factor analysis,”
MIS Quarterly, 17, pp. 517-525.
96. Sherer, S. (1993)
“Purchasing software systems,”
Information and Management, North-Holland, 24, pp. 257-266.
97. Soh, P., Yap, C., and Raman, K. (1992)
“Impact of consultants on computerisation success in small businesses,”
Information and Management, North Holland, 2, pp. 309-319.

98. Steiger, J. (1995)
"Structural Equation Modeling," STATISTICA user manual, pp. 3539-3688, Statsoft, 1995.
99. Thong, J., Yap, C., and Raman, K. (1996)
"Top management support, external expertise and IS implementation in small businesses," Information systems Research (7:2), June 1996, pp. 248-267.
100. Trist, E., and Bamforth, K. (1951)
"Some social and psychological consequences of the longwall method of coal-getting," Human relations, 4, pp.3-38.
101. Venkatraman, N. and Camillus, J. (1984)
"Exploring the concept of "Fit" in strategic management," Academy of management Review, 9 (3), pp. 513-525.
102. Venkatraman, N. (1989)
"Strategic orientation of business enterprises: the construct, dimensionality and measurement," Management Science, August 1989 Vol. 35. No 8, pp 942-962.

103. Vidyadaran, J. (1995)

“Application software: Total approach to it’s audit. Journal of the Institute of Chartered Accountants of India. Vol XL111, No.7, January 1995, pp 885-890.

104. Woodward, J. (1965)

“Industrial Organisation: Theory and practice.” Oxford Press, London.

105. Zahra, S., and Covin, J. (1993)

“Business strategy, technology policy and firm performance”

Strategic Management Journal. Vol. 14, pp. 451-478.

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