

THE EFFECT OF LEADERSHIP STYLE ON CIO EFFECTIVENESS

by

KISHEN PARTHASARATHY IYENGAR

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ABSTRACT

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While IS researchers have often opined that leadership is important, a theoretical examination of leadership in the CIO context is lacking. We examine Leadership style in the light of the transformational leadership theory and its impact on organizational level variables such as CIO Role Effectiveness and IT ambidexterity, and individual level variables such as Leader-Member Exchange Relationship and the subordinate's general job satisfaction. Results indicate that contingent rewarding style impacted CIO role effectiveness, which in turn predicted IT ambidexterity. Transformational leadership was the strongest predictor of Leader-Member Exchange relationship, which in turn impacted job satisfaction.

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CHAPTER 1

INTRODUCTION

In general, leadership literature has shown strong positive association between desired leadership behavior and subordinate performance, job satisfaction and organizational commitment (Shea, 1999; Yukl, 2006). O'Driscoll et al. (1991) found that a managers effectiveness is influenced by subordinates motivation levels. Guth and Macmillan (1986) examine strategy implementation in firms and middle managers and conclude that middle managers can redirect, delay, reduce the quality or even sabotage a strategy implementation initiative. Other researchers have found similar poor implementation results when middle manager commitment is lacking (Floyd et al., 1992; Wooldridge et al., 1990).

1.1 Leadership in the IT Context

The importance of so called “soft” skills such as communication, political savvy, leadership, managing people etc have often been touted (Summer et al., 2006) but have rarely been empirically tested. The Information Technology Governance Institute (www.itgi.org) lists operational failures and staffing problems to be among the top reasons for the failure of value creation from IT investments. Peterson (2004) concludes, in the light of a case study on IT governance in Johnson and Johnson, that relational IT governance capability is important. Given this realization that relational aspects are important, it is surprising that not many IS research articles tackle the issue.

While it was not even one of the top ten issues until recently, staffing has moved up to occupy the second most critical concern of IT and management executives (Luftman, 2005). Executives are thus investing more in attracting, developing and retaining IT professionals. Leadership may help in increasing the organizational commitment of such staff, since it has been shown that relation-oriented leaders inspire greater levels of organizational commitment behavior (Brown, 2003).

IT staff and related issues have received less attention than other domains in IS research. Bharadwaj (2000) examined the relationship between IT capability and firm performance in the light of the resource based view. She categorizes human IT skills as an important resource with two dimensions of

- a) Technical IT skills (programming, systems analysis and design, competencies in emerging technologies) and
- b) Managerial IT skills (effective management, coordination and interaction with user community, project management and leadership skills).

This leads us to the question, is leadership important in the CIO context? The answer seems to be a resounding yes (DeLisi et al., 1998; Feeny et al., 1992; Onan et al., 2001; Remenyi et al., 2005). Given that the CIO role has been one concerned with the management of the IS functions, and less to do with technical decision making, the importance of leadership skills is crucial to a CIO. Therefore I feel that the proposed study could contribute uniquely to IS research.

1.2 Research Questions

While IS researchers have often opined that leadership is important (DeLisi et al., 1998; Karahanna et al., 2006; Onan et al., 2001; Remenyi et al., 2005), a theoretical examination of leadership in the CIO context has not been done. CIO leadership may be important for many reasons. Firstly, good leadership has been attributed to increase in employees commitment behavior (Brown, 2003), disseminating organizational goals (Berson et al., 2004) team effectiveness (Chia-Chen, 2004), cohesiveness and implementation success (Eric et al., 2005). Also, it has often been said that leading technical people is a challenge that is unique in nature (Glen, 2003; Karahanna et al., 2006; Klenke, 1993). Given that the CIO's primary role is that of a change agent (Drury, 2005; Weiss et al., 2004), effective leadership will help CIOs to garner support from their subordinates to implement their vision. Effective leadership may increase the technical workers commitment and job satisfaction (Dvir, 1998), and thus may lead to citizenship behaviors that positively affect management of IT in the organization.

Secondly, effective leadership may lead to success at the team (Chia-Chen, 2004; Eric et al., 2005; Faraj et al., 2006; Wang et al., 2005a), department or the organization sub-unit level (Shea, 1999; Weaver Jr, 1981), or indeed, at the organizational level (Conger et al., 1998; Lieberman et al., 1972; McClelland et al., 1982; Vroom et al., 1973). In the context of the CIO, the IT department effectiveness in meeting the dynamic needs of business may be contingent on the how effectively the CIO displays leadership (Broadbent et al., 2005).

In this study, we aim to clarify some of the questions regarding effective leadership in the context of the CIO. Specifically, we aim to address the following research questions:

1. What sub-dimensions of the leadership style continuum lead to the perceived role effectiveness of the CIO?
2. Does perceived CIO role effectiveness lead to an IT ambidexterity?
3. What sub-dimensions of the CIO leadership style continuum lead to better exchange relationships with subordinates?
4. Does leader-member exchange relationship predict the general job satisfaction of a technology worker?

1.3 Proposed Contribution

In this thesis, we develop a theoretical framework to examine leadership behaviors of the CIO, and the effect of such behaviors at the individual and the IT department level. In doing so, we aim to contribute to a field of study that has relevance to both practitioners and academicians.

1.3.1 Relevance to Academia

- Our study examines CIO's leadership style, in the light of transformational leadership theory (Bass, 1985), where a theoretically informed and rigorous examination has been lacking.

- We will also clarify the role of the situation (technology workers, business context) and its effect on the claimed ubiquity of the transformational leadership theory (Bass, 1997).
- We also examine the relationship between CIO role effectiveness and the ambidexterity (March, 1991) hypotheses of exploration and exploitation. This will clarify the nature of the CIO's role dimensions and their relationship to using IT for exploration versus exploitation.
- We also examine which leadership sub-dimensions are related to better CIO-subordinate exchange relationships, in the light of the leader-member exchange theory (Graen et al., 1995), and the subordinates job satisfaction. We thus, examine the LMX theory and apply it to technical workers.

1.3.2 Relevance to Practitioners

- This study will clarify the most effective behaviors that need to be exhibited by the CIO (Stokes, 2003; Synnott, 1987; Weaver Jr, 1981; Weiss et al., 2004).
- It will also clarify whether leading technology workers is the same as leading in other contexts, as espoused by many practitioners (Broadbent et al., 2005; Paul, 2003).
- An understanding of the leadership phenomenon may lead to better management of technical personnel, which has been usually characterized

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A review of CIO literature was conducted as a part of the current study. The aim of this literature review is to provide a general understanding of the status of CIO literature. Three distinctive areas seem to have driven CIO literature in the last three decades. The first area of CIO literature was focused on clarifying what the CIO's role was in the organization. The second area dealt with questions about the CIO's attributes and skills necessary to be successful. Lastly, CIO's relationship with superiors and peers, has received much attention.

This review is organized in the following way. The first section deals with the evolution of CIO literature, starting in the late seventies and early eighties, through its various phases. The second section is concerned with CIO literature concerned with leadership. The third section will review general management leadership literature. The fourth section concludes this chapter with a summary and synopsis of leadership issues pertaining to the CIO.

2.2 Historical Origins of the CIO Role

Although Synnott (Synnott et al., 1981) is widely credited with coining the term "Chief Information Officer" (Stephens et al., 1992), the role of the head of information

systems function in the organization had already started to receive attention. Aided by the advent of mainframe computers in the fifties, organizations were already using computers for data processing activities. As technology advanced in the seventies, and more information was available to aid in decision making, the concept of 'information explosion' (too much information) began to emerge. Weaver (1981) lamented on the glut of information and called for the proper management of internal and external information. Remarkably, he also predicted the emergence of the CIO executive role in the organization (p. 25)

“I predict that corporate leaders will, more and more, be adding information management executives as their close associates.”

2.2.1 Defining the Role

By 1990, two fifths of Business Week's top 1,000 companies had CIOs (Business Week, February 26, 1990, p. 78). Although the need to manage information assets was strongly felt and agreed on, there was confusion as to what the role should be (Rockart et al., 1982). Such confusion may well have been a product of multiple definitions of the term CIO (Duam et al, 2004 downloaded from <http://is2.lse.ac.uk/asp/aspecis/20040040.pdf> September 2005). The most popular and enduring definition of the CIO is by Synnott (Synnott, 1987) “.....the highest ranking executive with primary responsibility for information management” (p. 19). PC magazine defines CIO as the “executive officer in charge of information processing in an organization” (www.pcmag.com).

A more comprehensive definition was provided by (Boyle et al., 1991), who developed a matrix that helps classify IS executives based on two dimensions, a) responsibility for technology and, b) corporate reporting level.

Table 2.1 CIO Classification Matrix Adapted from (Boyle et al. 1991)

Responsibility for Technology	Reporting Level in Company	
	Low	High
Information Technology (Broad)	Emerging CIO	CIO
Data Processing (Narrow)	IS Manager	Small Company

Thus, they define the CIO as (p. 177)

“..an executive with broad responsibility for information technology (e.g., data processing, telecommunications and office automation) who reports to a high-level corporate officer (e.g., president or CEO).”

2.3 CIO Role

Clarifying the role of the CIO was among the first issues to receive attention in CIO literature (Benjamin et al., 1985; Emery, 1991; Gupta, 1991; Miller, 1983; Rockart et al., 1982). This clarification of the role of the CIO stemmed, no doubt, not only from differential rates of adoption of technology in organizations (Rockart et al., 1982), but also the fact that organizations varied in the recognition of information systems as a strategic tool.

Rockart et al (1982) present one of the first efforts directed at clarifying the emerging role of the IS executive. According to their causal model, CIO role is shaped by management environment scenario, in turn shaped by relevant trends in business environment, changing technology and knowledgeable and demanding users. They recognize that the evolving role of the CIO will focus on staff rather than line responsibilities and shall be concerned with strategy and policy formulation. They thus predict that the role of CIO will be analogous to that of the CFO in organizations.

A more intuitive opinion was put forth by Miller (1983), who said that the CIO role would emerge to manage the merged disciplines of strategic planning and information processing. This role will also involve imbedding strategic success factors in the information systems and educating management in the strategic use of information.

Similarly, Emery (1991) defines the CIO (p. 9)

“...as a senior executive with both a business and technical perspective, who can contribute actively to the formulation of an effective amalgamation of business and IS strategies.”

Such an opinion of the CIO's role was repeated by many others (e.g., (Gupta, 1991)). Highbarger (1988) defined the CIO's job role similarly, as being in charge of cost effectiveness, technological competitiveness and organizing the IT function (continuity planning and standards).

Drawing an analogy between the CFO and CIO role, Gupta (1991) opines that just as the CFO role was the consequence of recognizing the fact that accounting can be used as a competitive weapon, the CIO role emergence is due to the realization that IT

can be used as a strategic weapon. He recognizes the following three as the main responsibilities of the CIO, based on a literature review.

1. Oversees all technology in the firm
2. Reports to a high-ranking executive
3. Concentrates on long-term strategy planning

2.4 Critical Success Factors – A Side Note

The Critical Success Factors (CSF's) Methodology was proposed by Rockart (1979), geared towards identifying a limited number of areas that are important, such that, satisfactory performance in these factors will lead to success. He proposed this methodology in the context of the chief executive officer. In this methodology, an intensive interview is conducted by the analyst with each subject. A follow up interview is conducted, after the analyst has had time to think about the factors identified in the first interview. The follow up interview is intended to narrow down or “sharpen” factors identified in the first interview. This methodology was later applied in the context of the CIO, first by Martin (1982) and then by Rockart himself (Rockart, 1982).

Martin (1982) used two surveys instead of interviews, with the logic that this will help protect the study from the biases of the researcher. He identified seven critical success factors as:

1. System development
2. Data processing operations
3. Human resource development
4. Management control of the MIS organization

5. Relationship with the management of the parent organization.
6. Support of the objectives and priorities of the parent organization, and
7. Management of change.

Rockart (1982) described the results of a similar study in his Sloan Management Review paper as well as in his presentation in the third ICIS conference. In his interviews of 9 companies, he identified four generic CSF's as

1. Service
2. Communication
3. Human resources, and
4. Repositioning the IS function

Later, Munro(1983) compared the two sets of critical success factors and concluded that they addressed very similar areas of concern. The few differences between Martin's and Rockart's CSF's are explained by the differences in the maturity levels of the organizations used in the two studies. Thus, he finds support for the CSF methodology against arguments that it may not lead to an accurate representation of reality, given the possibility of bias due to interviewer perception.

2.5 Changing Role with Changing Times

With increasing adoption of technology by organizations and advancements in technology itself, it was apparent that the CIO's role in the organization was indeed changing, from managing mundane data processing and other line activities to a more strategic role. Benjamin et al (1985) confirmed through his study that the CIO's job role had decreasing line responsibilities and an increased staff orientation. Using variables

such as who the CIO reports to, and the number of levels he is removed from the CEO, they found that the CIO is responsible for policy and strategy formulation.

Duffy and Jeffery (1987) suggest that an effective CIO passes through different stages of evolution. In the first stage the use of IT as a source of competitive advantage is recognized. In the second stage, the CIOs are given the position and the power to argue for their vision. However, this is blunted by the fact that the CIO reports to second tier executives such as the CFO, as well as the quality of staff. In the third stage, the CIO assembles a team who can effectively implement strategies. The final stage will see the emergence of a strong CIO, who can tap the organization's full potential by enabling the exchange of ideas and innovations.

Further attestation to change in the CIO role came from empirical studies. In their study comparing established CIOs and newly hired ones, Applegate et al (1992) found that newly hired CIOs were external hires with functional experience. Furthermore, new CIOs paid more attention to strategic planning of IT, unlike old CIOs who paid more attention to operations. The study also found that CIOs increasingly reported to the CEO, with more than half actively participating in strategic policy formulation.

Although the role of the CIO was undergoing change with an increasing strategic orientation, there was confusion about the fact that CIO was an executive. Stephens et al (1992) found support for the argument that CIOs are executives and not middle managers. The number of activities per day and the duration of their daily activities made the CIO more similar to CEOs rather than MIS managers.

With additional responsibilities came significant hikes in salaries and bonuses (Fox, 1994). Even the federal government established the CIO role in all executive branch agencies with the Information Technology Management Reform Act (ITMRA, 1996) (McClure et al., 2000). This phenomenon was also quick to travel across international boundaries and spread to other continents (Suh-Kyung, 2001). The increased importance of the CIO position made more firms create the position in the organization (Chatterjee et al., 2001).

Grover et al (1993) examined CIOs in the context of Mintzberg's managerial roles (Mintzberg, 1971) and did not find any support for the difference in importance of managerial roles between IS middle managers and CIOs. Also, sales and manufacturing executives were different from CIOs in the relative importance they place on managerial roles. They however found support for role similarity between the CFO and CIO, and that the more centralized the IS activity in the organization, the more important the CIO.

So, the question arises, what's special about the CIO role? The following quote from Pete DeLisi, academic dean of the Information Technology Leadership Program at Santa Clara University as quoted in Kwak (2001), best answers the question.

“The ideal CIO needs to be a marketer, a strategist, a technologist, a leader, an organizational behaviorist — all these things, that's what makes the job so difficult.”

2.6 CIO Skills

The dictionary defines the word skills as “Proficiency, facility, or dexterity that is acquired or developed through training or experience” (www.Dictionary.com). Many skills have been stressed as being pivotal for the successful CIO including managerial, technical, organizational, communication, and human resource development along with the ubiquitous “people skills” (Gupta, 1991). Rockart et al (1982) opine that the CIO must possess political/organizational skills, Human resource management skills, as well as communication skills. The CIO must also be able to manage technological experts, and be sensitive to the technological impact on individuals, organization and society. The CIO should be skilled in strategic planning of investments for change in the medium and long range.

Pemberton (1992) opined similarly. He stressed on the CIO being someone with business and management skills and one who is knowledgeable about a broad range of information disciplines, services, techniques, and technologies. Also strategic vision, coordinating skills, and communication skills, especially with the CEO are important.

Commenting on the apparent paradox that the top systems job was predominantly being occupied by non-systems executives, Taggart et al. (1979) suggest that a new breed of information systems manager should emerge and that they should have a ‘balanced’ technical and user orientation. They suggest a framework by which the technical and user impact of each incident can be measured.

Rockart et al (1982) opine that in order for the CIO to be effective, he should have had general management experience in various functional areas of the business. This view that the CIO should essentially be a business person in charge of information assets has been repeated even in practitioner oriented publications such as Management Review (1985) and American Banking Journal (Fitch, 1987). Applegate et al (1992) similarly concluded that a broad knowledge of strategy, management and operations are important for the CIO. Anecdotal evidence also suggested that the successful CIO is someone who has a broad business perspective rather than a narrow technical one (Umbaugh, 1993).

Emery (1991) concluded that in order for CIOs to emerge as an influential figures in the organization, they should get their technological house in order, and at the same time, build credibility in other areas of the enterprise.

Earl and Feeny (1995) opine differently. They conclude from their study that the appropriate experience necessary for a successful, value adding CIO, is in the IS function. They found in their study that CIOs transplanted from other functional areas acted as forceful managers instead of facilitators. Apart from IT skills, the successful CIO needs to be someone with integrity, a good communicator, and be motivated to attain goals. They suggest the following actions for the CIO to add value to the firm.

1. Obsessive and continuous focus on business imperatives
2. Interpretation of external IT success stories
3. Establishment and maintenance of IS executive relationships
4. Establishment and communication of IS performance record

5. Concentration of the IS development effort
6. Achievement of a shared and challenging vision of the role of IT

Fiegener and Coakley (1995) conclude that a CIO with limited business knowledge, bad communication skills and a weak track record will not be able to influence the top management teams impression of the IS function.

Romanczuk and Pemberton (1997) stress that a technocrat CIO will only focus on the tools, and not pay enough attention to the information and knowledge aspects. Kwak (2001), reporting on a survey by Enns and colleagues, says that there is no difference in tactics used by CIOs with general management experience and those with technical experience.

2.7 CIO Traits/Attributes

Among the essential traits for CIOs are strategic planning, consensus building, problem solving, ability to motivate, interpersonal skills, and negotiation skills, according to the 1995 HIMSS/Hewlett-Packard Leadership Survey (Physician Executive, (1996)). Level of education was found not to be very important in a survey of Norwegian CIOs (Gottschalk, 1999).

2.8 CIO Relations

2.8.1 *With CEO*

Initial reaction of CEOs to the emergence of the CIO was negative. The ABA Banking Journal (1988) reported that most CEOs were skeptical and resistant to the idea

of a technology executive. Gupta (1991) identifies three problem areas in the CEO-CIO relationship.

- Overblown expectations of the CIO – solve problems quickly, reflect positively on the bottom line in short time, justification of the risk in IT projects
- ‘Old line CEO’ attitudes – Skeptics who are unfamiliar with the nature and capabilities of IT
- Fear of CIO wresting control and domination in the firm

He suggests that the CEO and the CIO take measures to develop a partnership.

Table 2.2 Suggestions to Improve the CEO-CIO Relationship, Source: Gupta (1991)

CEO	CIO
Environmental scanning	Develop knowledge and skills to manage IT as a strategic resource
Determine strategic importance of IT	Recognize and accept change in source of power
Position the CIO, to enable two-way communication	Broaden and adopt the perspectives of the firm
Formulate clear goals and communicate to CIO	Prioritize based on needs of firm and expectations of CIO
Incorporate participative management style	Scan organization and IT environment

Feeny et al (1992) conducted an exploratory study to find the determinants to a successful relationship between the CEO and the CIO, using in-depth interviews. They found that the key to successful relationship is a common understanding of the nature of IT, as an agent of transformation.

Table 2.3 Determinants of Successful CEO-CIO Relationship, Source: Feeny et al (1992)

CEO ATTRIBUTES	ORGANIZATIONAL ATTRIBUTES	CIO ATTRIBUTES
<ul style="list-style-type: none"> • General management and/or marketing background • Change-oriented leadership • Attended IT "awareness" seminars • Experienced IT project success • Perceives IT as critical to the business • Positions IT as agent of business transformation 	<ul style="list-style-type: none"> • Personal/informal executive style • Executive workshops on strategic issues • CIO accepted into executive team 	<ul style="list-style-type: none"> • Analyst background and orientation • Promotes IT as agent of business transformation • Contributes beyond IT function • Accurate perception of CEO views on business and IT • Integrates IT with business planning • Profile stresses consultative leadership and creativity

As IT based systems evolved to get more complex, and project success become more elusive (Long range Planning, (1994)), the CEO-CIO relationship came under strain (Feld et al., 1994). Although IS budgets were increasing (Journal of Accountancy, (1997)), this increase was not being translated into gains for the firm.

Earl and Feeny (1995) reported that most CEOs were tired and skeptical of assertions that IT is a strategic asset. They say that this is due to failing projects and rising costs. Their suggestions to the CEO include involving CIO in executive teams, positioning the CIO as change agent and inspire a constructive climate for IT.

DeLisi et al (1998), in an interview of 6 CEOs, found that CEOs consider the same skills critical for their success as those required by the CIO, except for technical skill. Their findings suggest that the CIO should pursue the following, in order to be successful in the eyes of the CEO:

- Develop a big picture perspective
- Enhance interpersonal skills
- Raise awareness of IT
- Reporting results
- Establishing relationships and increasing visibility
- Become a change agent

Some studies also focused on the rank and reporting level of the IS executive and its impact on the use of IS in the organization. Raghunathan et al. (1989) found in their study that rank of the IS executive significantly impacted IS planning and its role in the organization. Li and Ye (1999) investigated effect of IT investments on firm economic performance. They concluded that the CEO/CIO arrangement significantly impacts this relation. The greater the distance between CEO and CIO, the lower the performance, especially for firms which have an external oriented strategy. Other studies suggested this relationship. For example, Gottschalk (1999) found in his survey of Norwegian CIOs that most reported directly to the CEO.

2.8.2 *With Peers*

Earl and Feeny (1995) found in their study that a successful CIO is one who recognizes the importance of establishing and maintaining executive relationships. They say that this is important because the CIO will not be able to implement initiatives successfully without the cooperation of senior executives (p. 152). Long term

effectiveness hinges on the shared vision of IT not only with the CEO, but the entire executive team.

Fiegener and Coakley (1995) arrive at a similar conclusion. They however say that the CIO's impression management effort with top management executives is influenced by many factors including

- CIO distance from top management
- Ambiguous performance measures, and
- Limited top management understanding of IT

They report that many CIOs resort to strategies like building relations, educating top management in IT and negotiating performance measures, in order to build a shared understanding of IS.

Kwak (2001), reporting on the results of a matched pair survey of 69 CIOs and peer executives by Harvey Enns and his colleagues, reveals that the technology background of the CIO's peer was important in determining whether the CIO's influencing tactics would be successful. Also, CIOs with general management experience and those with a technical background did not differ in the tactics they used to influence peers.

2.8.3 With Subordinates

Duffy and Jeffery (1987) stress on the importance of the quality of CIO subordinates. Information specialists need to act as proxies of the CIO in order to implement the CIO's vision. Nolan (1982) identified many issues including leadership that are critical to the IT managers.

Leadership in the information technology context has also been implicitly recognized as being unique (Paul, 2003). The argument is that technical personnel and work are qualitatively different from any other context and that such workers are not susceptible to power or charisma.

To respond to business and technological changes, CIOs now must build relationships with line managers and assume new and more strategic roles. (Gottschalk, 1999).

2.9 Impact/Value of CIO on the Organization

Li and Ye (1999) found that there was a negative relation between the CEO/CIO distance and firm performance.

Chatterjee et al (2001) investigated market reactions to newly created CIO positions in firms. They found that newly created CIO positions indeed result in an abnormal market return, especially for firms in industries that are undergoing IT driven transformation. Also, it did not matter if the new CIO was external or internal to the company. Their results suggest that the market reacts favorably just to top management's thinking about IT governance.

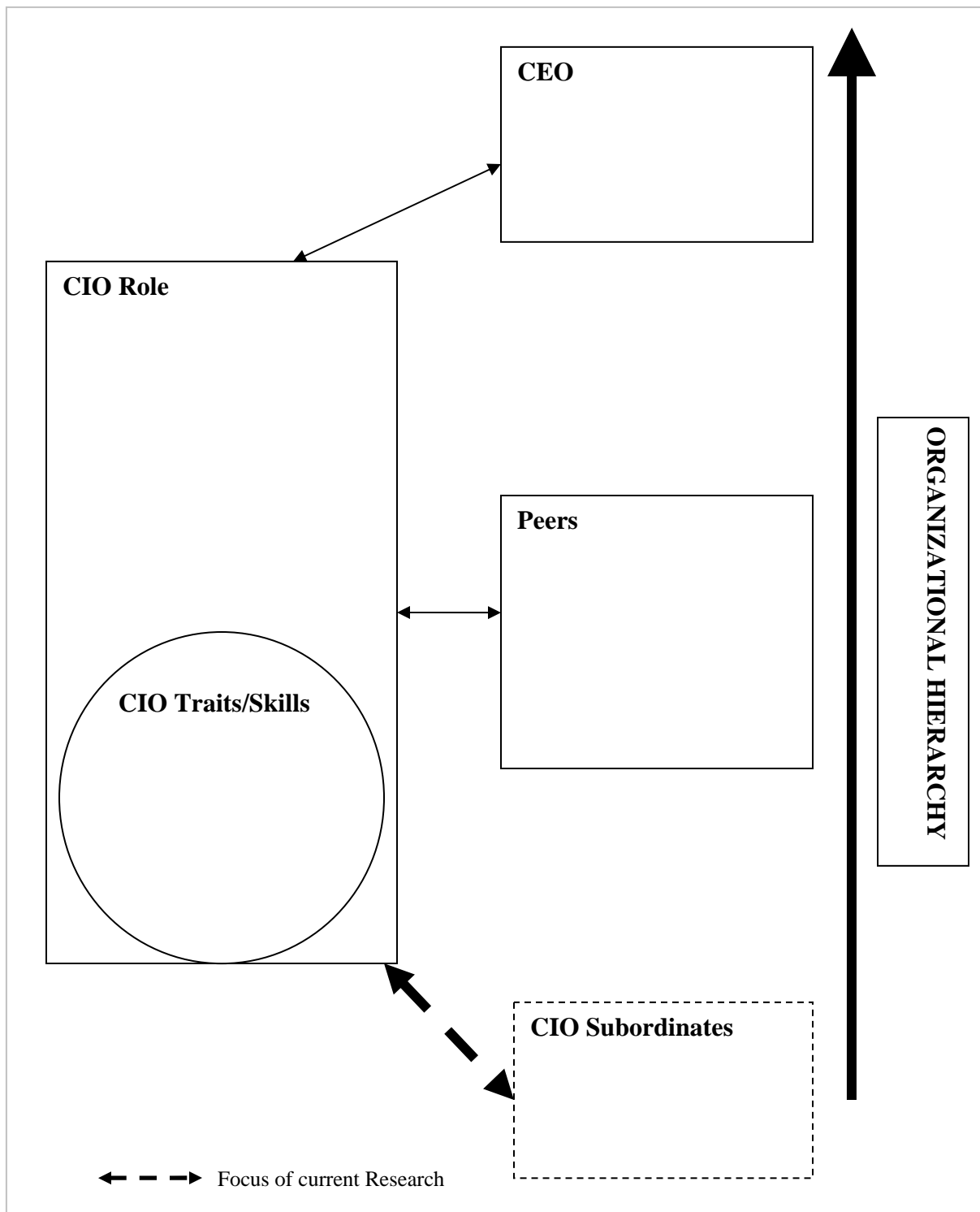


Figure 2.1 CIO Research

2.10 Leadership in the IT Context

While a cogent and theory-informed empirical research effort has been lacking in the context of the CIO (with a few exceptions, (Thite, 1999)), many researchers have commented on leadership and its relative importance in the IT function in general, and the CIO context in particular (Applegate et al., 1992; DeLisi et al., 1998; Feeny et al., 1992; Feeny et al., 1998; Onan et al., 2001; Paul, 2003; Synnott, 1987).

Feeny and Willcocks (1998) stress on the importance of leadership as a core IS capability (see figure.) They view the CIO and leadership to be crucial to exploit IT. Using this framework of Core IS capabilities, Willcocks et al. (2000) argue that the CIO should be a successful leader in order to successfully implement ERP in the organization.

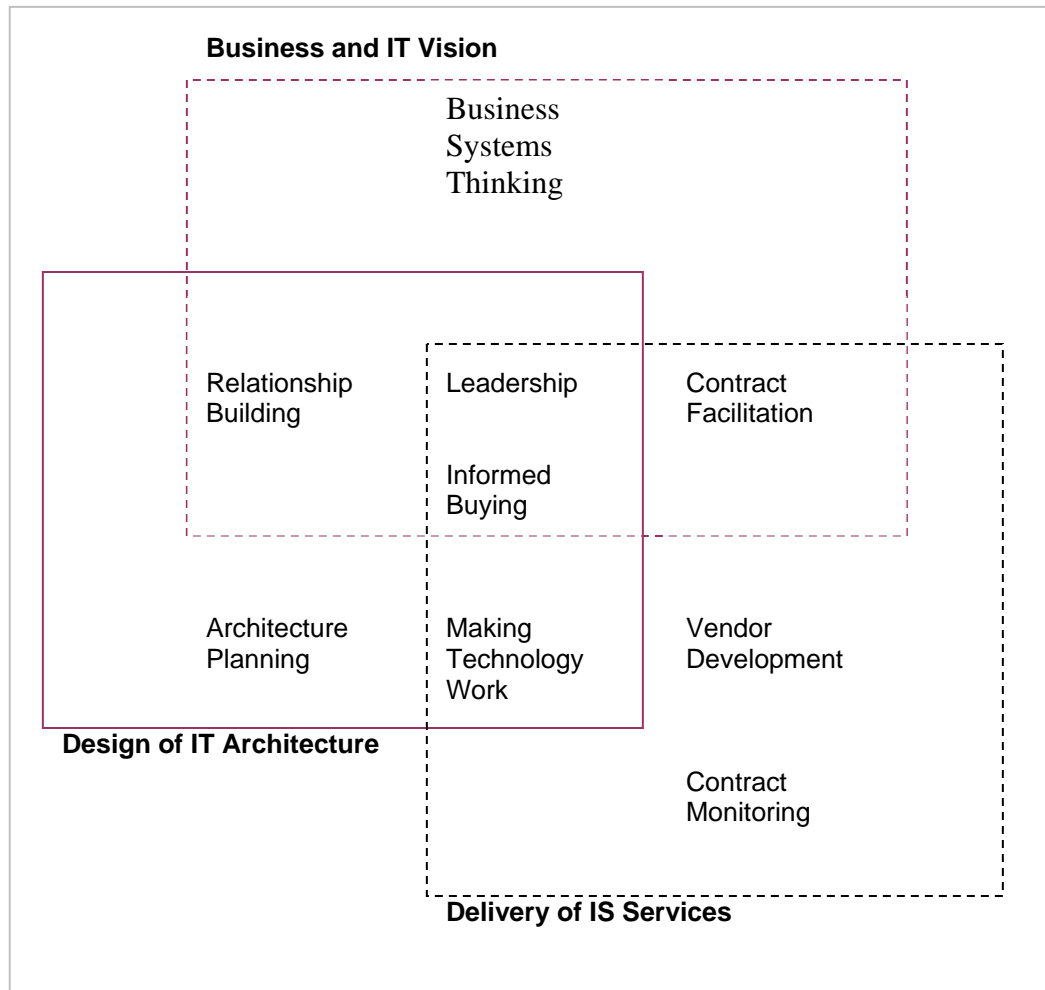


Figure 2.2 Nine Core IS Capabilities (Feeny et al., 1998)

Onan and Gambil (2001) conducted a survey of CIO's and people who hired CIOs and concluded that leadership was the number one desired trait in the CIO for large companies. Leadership was also one of the most important skills for small companies.

Stressing on the importance of leadership, Klenke (1993) argues that IS professionals need to develop new competencies beyond just technical expertise. The need for leadership is due to the fact that most IT management jobs require leadership and not just managerial competencies.

2.11 Leadership Special Issue

Leadership research in the IS context was given special attention in a recent special issue in IEEE Transactions on Engineering Management (Vol. 53, May 2006). Introducing the five articles in the special issue, Karahanna and Watson (2006) make the case for the study of leadership in IS context. According to them, the following aspects of the CIO's job make it distinctive than leadership in any other context.

- Nature of IS – Given that information systems are ubiquitous and pervasive across all functions of business, and given that IS can be malleable in configuration and create strategic opportunity, it requires an individual who is comfortable with technical and business aspects.
- Role of the CIO in the organization – CIOs need a large breadth of skills including social, technical, political, business and IS intelligence in order to be strategically effective.

They conclude that while leadership theories can provide a broad framework, specific studies are required to elaborate unique IS concerns and clarify constructs, processes, relationships and mechanisms and its idiosyncratic challenges.

Li et al. (2006) examined demographic (age, tenure and education level) and personality (openness, extraversion and conscientiousness) characteristics of the CIO and their effect on innovative usage of IT in the organization. Their findings indicate that education level, openness and extraversion were significant predictors of innovative IT usage.

Preston et al. (2006) tested antecedents of CIO/TMT shared understanding using a cross-cultural sample of US and French CIOs. They found that CIO educational mechanisms impact the development of a shared understanding. However, there were some cultural differences. While in the French sample social systems of knowing were key mechanisms, in the U.S. sample structural systems of knowing and relational similarity were key mechanisms of achieving a shared understanding between the CIO and TMT.

Smaltz et al. (2006) examined the relationship between CIO capability, CIO/TMT engagements and CIO role effectiveness in a healthcare context. CIO capabilities (measured as the degree of political savvy, communicative ability, strategic business and strategic IT knowledge) were significant predictors of CIO role effectiveness. They also found that while CIO/TMT engagements were related to CIO capability, they were not direct predictors of CIO role effectiveness. Their analysis showed a mediating relationship between CIO/TMT engagements, CIO capability and CIO role effectiveness.

Another significant contribution of Smaltz et al. (2006), was the development of a scale for CIO role effectiveness. They reviewed literature of CIO role expectations, and developed a 25 item scale. These loaded on to the following six dimensions in their exploratory factor analysis.

1. Strategist
2. Relationship architect
3. Integrator
4. Educator

5. Utilities provider, and

6. Information steward.

Tan and Gallupe (2006) used cognitive mapping techniques to explore the commonalities and individualities in the cognition between business and IS executives. Not surprisingly, they found that cognitive commonality was positively related to higher business-IS alignment.

Faraj et al. (2006) examine the effects of directive and empowering leadership on team performance, in the presence of two moderators, team experience and task uncertainty. While directive and empowering leadership had no direct relation with team performance, their analysis of 69 software development teams showed significant moderating relationship of team experience and task uncertainty, on the relation between empowering leadership and team performance.

While the special issue dealt with many IS specific research questions, none of the papers addressed the pressing need for a theory-based examination of leadership in the IS context. Indeed, only one of the five articles examined leadership explicitly, and not as an implicit construct captured by CIO characteristics.

2.12 Is CIO Leadership Different

Is CIO leadership distinct from leadership in other areas?

Yes!!! “CIO leadership is unique and idiosyncratic in its processual, structural and intellectual challenges” (Karahanna et al., 2006). CIO leadership is critical (Broadbent et al., 2005), (Lane, 2004)

Willcoxson et al. (2006) tested the long held belief that IT managers differ from general managers. In their study of psychological profiles, they found that IT managers and general managers are markedly different in terms of their leadership styles. IT managers are also different with respect to issues of control and task/relationship orientation. While IT managers exhibit a task orientation, general managers demonstrate a people orientation. This, they say, may be the reason why IT managers are less effective in terms of the leadership role. They say that this is in agreement with (Enns et al., 2003) finding that CIOs with a strong technical background are less influential.

A more immediate case for the importance of leadership in IT was made by Sumner et al. (2006). Their study examined the leadership capabilities of IT managers in terms of the leadership Practices Inventory (LPI). They found that the managers of more successful projects exhibit greater positive leadership behavior in the five leadership practices categories:

- a. Model the way
- b. Inspire a shared vision
- c. Challenge the process
- d. Enable others to act
- e. Encourage the heart

They say that

“IT project leaders with superior leadership skills are able to take into account the unique challenges in managing technical employees.”

They opine that the IT profession, due to constant change, has a high rate of problems with role ambiguity and conflict resulting in burnout. This may be the reason for the high levels of turnover and a lack of organizational commitment (Guimaraes et al., 1992; Igbaria et al., 1999).

2.13 Leadership

Leadership has been studied for many decades both in management and organizational behavior literature as well as in psychology, sociology, political science and other contexts. Given the large number of articles and books on leadership (for a quick summary on leadership, see Yukl (1989)) agreement is sparse on what constitutes leadership. The number of approaches and theories used to examine leadership are in direct proportion to the number of research efforts. While it is beyond the scope of this effort to review leadership literature in general, the following section will provide a brief summary of theories and approaches used in leadership literature. We will then elaborate on the transformational leadership theory (Bass, 1985; Burns, 1978).

2.13.1 Defining Leadership

Researchers have defined leadership in many ways, suiting their individual perspective or their phenomenon of interest (Pfeffer, 1977; Stogdill, 1974; Yukl, 1989). Leadership has been defined in terms of individual traits, behaviors, role relationships, follower perceptions and influence on task goals, culture and followers (Yukl, 1989). While many definitions exist, one ubiquitous idea is that leadership involves the process of influence (Vroom et al., 2007). Vroom et al. (2007) define leadership as “as a process

of motivating people to work together collaboratively to accomplish great things.” We therefore define leadership in this study as a potential or capacity to influence subordinates in order to accomplish organizational goals.

2.14 Leadership Theories

While study in leadership has centered around different approaches toward leadership, these can be classified into four basic approaches (Yukl, 1989).

1. Power-influence Approach – Most research under this approach attempt to explain leader effectiveness as a consequence of the power the leader possesses, how he yields it and types of power that the leader has. (French et al., 1959; Hollander, 1978; McCall, 1979).
2. Behavior Approach – This approach emphasizes what leaders actually do on the job, and the relationship of such behavior and effectiveness. (Luthans et al., 1984; Mintzberg, 1973; Stogdill, 1974).
3. Trait Approach – The trait approach emphasizes the personal attributes of the leaders. These approaches are centered around finding leader abilities that predict leader success. (Berman et al., 1985; McClelland et al., 1982; Miner, 1978)
4. Situational Approach – The situational approach emphasizes the importance of contextual factors such as the nature of work, leader’s authority and discretion, external environment etc. Research has focused on leader behavior as dependent on situational factors and also as a moderator of the relationship between leader attributes/behavior and

The most recent development in the area of leadership theories is the advent of transformational and charismatic leadership in the eighties. Transformational leadership refers to the shared process of empowering subordinates to participate in transforming the organization. Transformational leadership refers to the process of influencing major changes in the attitudes and assumptions of organization members and building a commitment for the organizations strategies and vision (Yukl, 1989). A transformational leader is characterized by high levels of trust and respect from subordinates (Bass, 1985). Charismatic leadership is defined as when a leader is perceived to possess a gift that is unique. Many theories have explicitly dealt with studying this aspect of leadership (Burns, 1978; Conger et al., 1987; House, 1977).

While transformational and charismatic leadership theories are relatively new, when compared to older approaches, their utility lies in the fact that they are much broader in scope subsuming traits, power, behavior and situational variables (Yukl, 1989).

2.14.1 Transformational Leadership Theory

Transformational Theory of Leadership was born from the works of Burns (1978) and Bass (1985). Bass characterized leadership behaviors into transformational, transactional and laissez-faire dimensions.

Transformational leadership consists of the following sub-dimensions

- Charisma (Idealized influence) is the degree to which the leader behaves in admirable ways that causes followers to identify with the leader at an emotional level.
- Inspirational motivation is the degree to which the leader articulates a vision and challenges followers with high standards and also provides meaning to tasks.
- Intellectual stimulation is how the leader challenges assumptions, solicits ideas and takes risk to stimulate creativity.
- Individualized consideration is how the leader follows up on each person's needs, acts as coach and mentor.

Transactional leadership consists of the following sub-dimensions

- Contingent reward is how the leader sets up constructive transactions, exchanges, clarifies expectations, establishes rewards etc.
- Management by exception (active and passive) pertains to how leaders monitor performance. Active is when the leader takes corrective actions when deviations occur. passive style is waiting until the problem becomes serious enough to act on.

Laissez-faire is the non leadership component.

- The leader minimizes any exchange with followers, with minimal intervention, feedback or support.

2.15 Transformational Leadership and IT

Examining Charismatic leadership in particular, Wang et al. (2005a) concluded that ERP project leader's charismatic leadership significantly influences team cohesiveness, which in turn affects overall team performance. Ahn et al. (2001) examined the effect of transformational leadership on empowerment and leader effectiveness and found a positive relationship.

Previously, Thite (1999) examined transformational Leadership Theory in an IS environment. He found that transformational leadership behavior, along with technical leadership had a significant impact on project success. He opines that in a technical project environment, subordinates accord greater importance to certain leadership behaviors which may be considered less critical elsewhere.

CHAPTER 3

RESEARCH MODEL AND HYPOTHESES

The previous chapter discussed the evolution of CIO literature and leadership in the IS context. This literature review helped us realize the lack of theory-based examination of CIO leadership and its effect on the organization and CIO's subordinates. We, thus, developed a testable model of the impact of leadership style of the CIO. The impacts of leadership style are hypothesized to influence both organizational and individual outcomes. Figure 3.1 depicts the testable model along with the hypothesized relationships among the constructs.

We recognized a number of outcome variables to examine the effect of leadership style. Our choice for using certain outcomes instead of others is driven by the relative importance of ambidexterity at the organizational level, especially in IT. Also, job satisfaction was chosen since many studies have shown that it has a positive impact on other variables that directly affect the organization, for example, organizational citizenship behavior (Moorman et al., 1993). Table 3.1 provides a list of constructs used in this study and their origins.

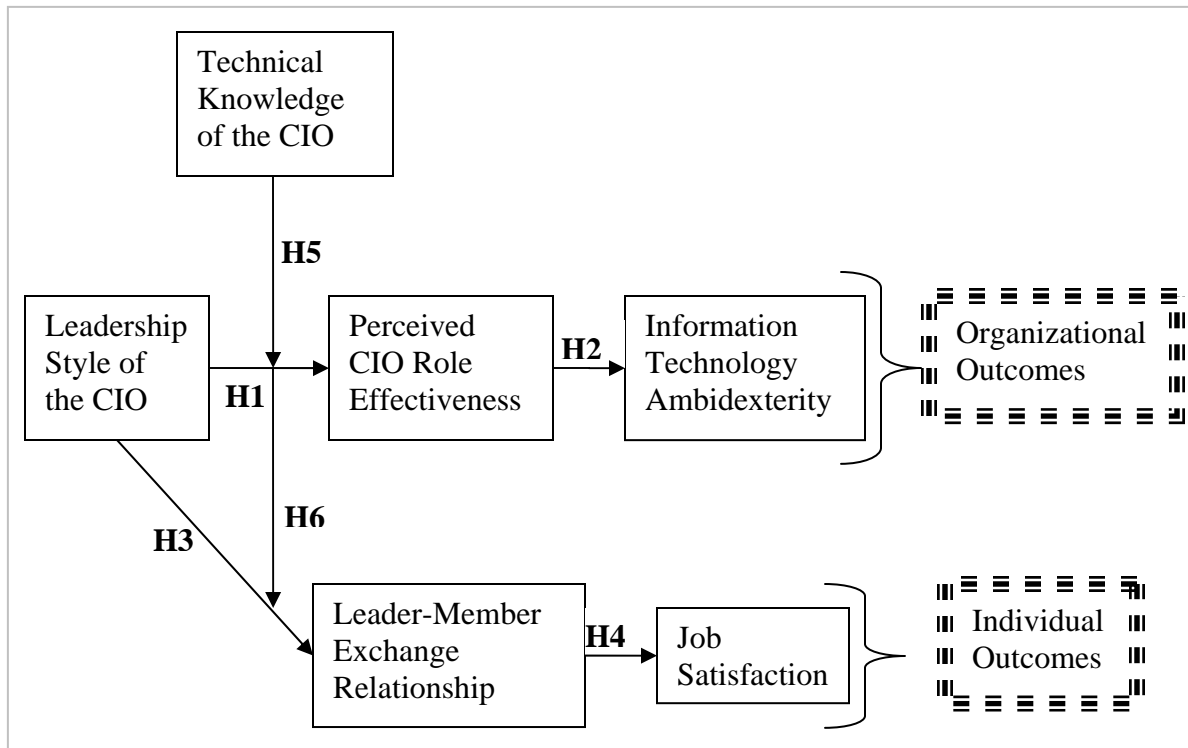


Figure 3.1 Research Model

Table 3.1 List of Constructs

Construct	Origin
Leadership style	(Bass, 1985; Burns, 1978)
CIO Role Effectiveness	(Smaltz et al., 2006)
IT Ambidexterity	(Benner et al., 2003; Gibson et al., 2004; He et al., 2004; Jain, 2007; Lubatkin et al., 2006; March, 1991; Tushman et al., 1996)
Leader-Member Exchange Relationship	(Dansereau et al., 1975; Graen et al., 1995)
Job Satisfaction	(Hackman et al., 1974)
Technical Knowledge	Multiple Origins

3.1 Research Hypotheses

Research hypotheses were developed using the research model shown in figure 3.1. The hypotheses being examined can be categorized under two areas of enquiry: a) leadership style and its impact on organizational level variables such as CIO role effectiveness and IT ambidexterity; and b) impact of leadership style on the leader-member exchange quality and the subordinate's general job satisfaction. The following sections explain the development of the hypotheses and expected relationship among the constructs.

3.1.1 Influence of Leadership Style on Perceived CIO Role Effectiveness

Empirical research using transformational leadership theory has often supported the positive relationship between transformational behaviors of the leader and various outcome measures including leader effectiveness. These results are fairly consistent in various contexts. Hater et al. (1988) found that transformational leadership obtained from their subordinates' ratings significantly differentiated top performing managers from ordinary managers. Spangler et al. (1990) found that transformational leadership and active management by exception have a substantial impact on the performance of audit committees. Doherty et al. (1996) examined leader behaviors of Interuniversity Athletic Administrators and found that coaches' satisfaction with leadership, perceived leader effectiveness and extra effort were positively and strongly associated with transformational leadership and contingent reward behavior, whereas negative relationships were observed for management-by-exception (passive) and non-leadership behaviors.

Lowe et al. (1996) conducted a meta-analysis of transactional and transformational leadership on leader effectiveness. Results of the meta-analysis support the belief that transformational leadership is associated with work unit effectiveness. Higher associations between transformational scales and effectiveness were found than between transactional scales and effectiveness. Similarly, Tracey et al. (1998) found that transformational leadership accounted for a significant proportion of variance in ratings of leader effectiveness. Den Hartog et al. (1999) conducted a cross-cultural study of 62 cultures and found support for the hypothesis that specific aspects of charismatic/transformational leadership are strongly and universally endorsed across cultures.

Judge et al. (2000) found that transformational leadership behavior predicted a number of outcomes reflecting leader effectiveness. In an examination of Norwegian firms, Hetland et al. (2003) found that transformational leadership was strongly associated with the outcome measures in both subordinates' and superiors' ratings, when controlling for the impact of transactional and passive-avoidant leadership. Transformational leadership has also been shown to impact team effectiveness (Chia-Chen, 2004). Berson et al. (2004) found that transformational leaders are more effective in communicating strategic goals. Spreitzer et al. (2005) found support for the positive relationship between transformational leadership and leader effectiveness in their cross-cultural study. Recently, Spinelli et al. (2006) found that the relationship between transformational leadership and the outcome factors were stronger and more positive than

were the transactional and laissez-faire styles for hospital CEOs and their subordinate managers.

In the information systems context, Thite (1999) examined transformational leadership theory in an IS environment. He found that managers of successful projects exhibited greater transformational leadership behavior than those of less successful projects. He concluded that transformational leadership dimensions and contingent reward are positively related to project success. Similarly, Wang et al. (2005a) found that charismatic leadership led to ERP implementation success. Transformational leadership was also found to be positively related to leader effectiveness and employee empowerment (Ahn et al., 2001). While this theory-informed effort was a step in the right direction, Ahn et al. did not measure all the dimensions of leadership. Indeed, CIO effectiveness was measured using items from the MLQ (Bass et al., 1994), thereby ignoring the multidimensionality of the CIO's role as a strategist and a change manager (Smaltz et al., 2006). These issues make the conclusions of this study very narrow. While there is hardly any doubt concerning the positive effects of transformational leadership, a non-trivial question would be the examination of all the dimensions of leadership and their relative effect on the multidimensional role of the CIO.

Overall, there has been strong empirical support for a positive relation between transformational leadership and leader effectiveness. However there is also some proof to the contrary. For example, in a meta-analysis study Judge et al. (2004) found that in a business setting, contingent reward has a higher correlation than transformational leadership qualities. This hints at the Situational leadership theory (Hersey et al., 1969;

Hersey et al., 1988) argument that the situational factors moderate the relationship between leader attributes and behavior and leader effectiveness (Yukl, 1989).

Bass (1997) however disputes the effect of such moderators and says that the effect may be very small. Commenting on the universality of his work, he says that the differences of correlations will be marginal and that transformational leadership is still the most effective in all situations. Given the overwhelming evidence to support transformational leadership in various contexts, we hypothesize that the transformational behaviors of idealized influence, inspirational motivation, intellectual stimulation and individualized consideration will be more positively associated with CIO effectiveness, than transactional leadership behaviors.

H1: Transformational behaviors (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration), when compared with transactional behaviors, will be more positively associated with perceived CIO role effectiveness.

3.1.2 CIO Role Effectiveness and IT Ambidexterity

While exploration and exploitation have been a part of strategy literature for long, the concept of ambidexterity evolved from the works of March (1991) who suggested that the relation between the exploration of new possibilities and the exploitation of old certainties in organizational learning need to be balanced. Organizational learning has to deal with the complicated problem of balancing the competing goals of developing new knowledge and exploiting current competencies (Levinthal et al., 1993). Such a balance, ensuring both exploration and exploitation, has been shown to affect success of a firm

(He et al., 2004). He et al. (2004) found that the interaction between exploration and exploitation predicted sales growth rate among 206 manufacturing firms. They also found that an imbalance between exploration and exploitation negatively predicted sales growth rate. Lubatkin et al. (2006) examined ambidexterity in the context of small businesses and found support that the top management team was pivotal in attaining ambidexterity, and ambidexterity had a positive relation to firm performance.

The works of Tushman and his associates has also served to clarify issues pertaining to ambidexterity (Benner et al., 2003; Nadler et al., 1999; Tushman et al., 1999; Tushman et al., 1996). Tushman et al. (1996) emphasize the importance of ambidexterity for the organization to be truly competitive in the long term. Tushman also suggests strategic imperatives for organizations to achieve ambidexterity (Nadler et al., 1999). Strategic imperatives such as operational flexibility and short strategy lifecycles will help the organization achieve the conflicting goals of exploration and exploitation effectively. Conversely, a high focus on process management may have a negative effect on radical innovation and may also slow down the capability of the organization to adapt in environments characterized by high change (Benner et al., 2003). Given the general environment of change, the importance of effective executive leadership to achieve ambidexterity has also been stressed (O'Reilly et al., 2004). The role of charismatic and instrumental leadership in managing the re-orientation is critical (Nadler et al., 1990).

While ambidexterity has been proposed at the organizational level, recent efforts have applied this concept at different levels of analysis. Gibson et al. (2004) found that ambidexterity had a positive and significant relationship to business unit performance.

Recently, Jain (2007) examined the effect of dynamic IT capability on IT ambidexterity. IT ambidexterity was found to be strongly predicted by organizational dynamic capabilities.

Due to the unique nature of IT, and the strategic imperative it presents to the organization, the CIO should be able manage the function effectively. An effective IS department, will in turn be adept at not only extracting the greatest possible economic rent from existing IT capabilities, but also create new strategic opportunities for the organization. We propose that an effective CIO will be able to explore new strategic IT initiatives, as well as exploit current IT capabilities in the organization.

H2: There is a positive relationship between perceived CIO role effectiveness and IT ambidexterity.

3.1.3 Influence of Leadership Style on Leader-Member Exchange

Relationship

The Leader-Member Exchange Theory evolved from the works of Graen and his associates ((Dansereau et al., 1975; Graen et al., 1995; Liden et al., 1980; Scandura et al., 1984). The core argument of this theory is that some subordinates are given greater influence, autonomy and benefits if they are a part of the in-group. High-quality LMX relationships are characterized by mutual trust, respect, influence, and obligation (Graen et al., 1995). While it is not likely that all subordinates will be treated the same, an effective leader will establish some degree of special relationship with all subordinates, and not just a few favorites (Yukl, 1989).

Researchers have examined the impact of transformational and transactional leadership on the leader-member exchange quality. Deluga (1992) explicitly tested the hypothesis that high LMX was associated with transformational leadership. He found support for individualized consideration and charisma as predictors of LMX quality. Similar positive correlations have been found between transformational and transactional leadership and leader-member exchange quality (Basu et al., 1997; Gerstner et al., 1997; Howell et al., 1999; Kent et al., 2001; Wang et al., 2005b). The results from these studies are consistent that exchange quality is positively related to transformational and contingent reward leadership and negatively to management-by-exception (both active and passive).

In line with the above findings, we expect that transformational and contingent reward behaviors by the CIO will lead to better exchange relationship with the subordinate.

H3: Transformational and contingent reward behaviors will be positively related to leader–follower exchange relationships, whereas management by exception (active and passive) and laissez faire behaviors will be negatively related to leader–follower exchange relationships.

3.1.4 Leader-Member Exchange Relationship and Job Satisfaction

Higher quality of exchange relationships have been shown to have a positive relationship with job satisfaction. Wilhelm et al. (1993) found in their study that LMX quality was significantly related to overall job satisfaction and negatively to turnover intentions. Kacmar et al. (1999) also found that LMX was positively related to general

job satisfaction and organizational commitment. While many measures of job satisfaction exist (Ferratt et al., 1981), and have been used in conjunction with LMX, these measures cannot be discriminated against each other since they tap into the same underlying construct. In a meta-analytic review of LMX literature, Gerstner et al. (1997) found that LMX positively and significantly predicted overall job satisfaction as well as satisfaction with the supervisor. Given the overwhelming evidence of a positive relationship between LMX and general job satisfaction, we hypothesize a similar relationship in the IS context.

H4: The leader-member exchange quality will be positively related to the general job satisfaction of the subordinate.

3.1.5 The Moderating Effect of CIO Technical Knowledge

While CIO literature has summarily rejected the notion of a technocrat CIO's capability to be effective (Romanczuk et al., 1997; Umbaugh, 1993), most imply however that technical knowledge is a necessary but not sufficient skill for the CIO. Pemberton (1992) stressed on the CIO being someone with business and management skills and one who is knowledgeable about a broad range of information disciplines, services, techniques, and technologies. Taggart and Silbey (1979) suggest that a new breed of information systems manager should emerge and that they should have a 'balanced' technical and user orientation. This view that technical and non-technical expertise are both important has been attested by others (Enns et al., 2003; Kwak, 2001).

While technical skills may not per se make a CIO effective, the lack of such technical skills may affect the subordinate's perception of the CIO, and also the

perceptions of the CIO's role effectiveness. Therefore, we hypothesize that technical knowledge will moderate the relationship between:

- a. Leadership style and perceived CIO role effectiveness, and
- b. Leadership style and leader-member exchange quality.

H5: CIO technical knowledge will positively moderate the relationship between leadership style and perceived CIO role effectiveness.

H6: Leader's technical knowledge will positively moderate the relationship between leadership style and leader-member exchange relationship.

Table 3.2 List of Hypotheses

<p><i>H1: Transformational behaviors (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration), when compared with transactional behaviors, will be more positively associated with perceived CIO role effectiveness.</i></p> <p><i>H2: There is a positive relationship between perceived CIO role effectiveness and IT ambidexterity.</i></p> <p><i>H3: Transformational and contingent reward behaviors will be positively related to leader-follower exchange relationships, whereas management by exception (active and passive) and laissez faire behaviors will be negatively related to leader-follower exchange relationships.</i></p> <p><i>H4: The leader-member exchange quality will be positively related to the general job satisfaction of the subordinate.</i></p> <p><i>H5: CIO technical knowledge will positively moderate the relationship between leadership style and perceived CIO role.</i></p> <p><i>H6: Leader's technical knowledge will moderate the relationship between leadership style and leader-member exchange relationship.</i></p>

3.2 Control Variables

Many additional variables were expected to affect the relationship among the above constructs. Since leadership is essentially an attributional phenomenon (Bass et al., 1993; Conger et al., 1987; Yukl, 1989), many characteristics of subordinates may affect their perceptions of the CIO's leadership.

An immediate variable of interest is the career orientation of the subordinate. The career orientations of employees can have important implications for their job satisfaction, commitment, and retention within organizations (Igbaria et al., 1991). The career orientations of MIS personnel have been examined by many researchers (Crepeau et al., 1992; Igbaria et al., 1993; Igbaria et al., 1991). Empirical evidence suggests that among the many dimensions, the most prevalent career orientations of MIS employees were found to be technical and managerial. A technical or managerial orientation could affect the perceptions of the subordinate, and in turn affect the CIO effectiveness ratings.

Tenure could also affect the relationship and the perceptions of the subordinate. We include both, tenure of the CIO and subordinate in this study as control variables. Tenure of the CIO may directly affect the subordinate's perception. If the CIO is relatively new to the job, the subordinate may not have any perceptual evidence of the CIO's effectiveness. Similarly, if the subordinate is relatively new, he would have not made an accurate assessment of the CIO's effectiveness, nor the relationship with the CIO.

Age has been shown to affect perceptions of leadership, and has been used as control variables in various studies of leadership (Barling et al., 2002; Chia-Chen, 2004). We include age of the respondent as a control variable in this study.

In addition to the above controls, we added IT and Non IT/functional experience, department size and organization size as control variables. The expectations from CIOs of large and small companies have been shown to be very different (Onan et al., 2001). In addition to the size of the organization, department size affects not only the resources available, but also the combination of such resources (Teo et al., 2003). This in turn may effect the management of IT resources and perceptions of effectiveness.

CHAPTER 4

INSTRUMENT DEVELOPMENT

Our research model involved the measurement of six constructs. While most of these constructs have well-validated instruments, and thus could be directly adapted, the items for perceived CIO role effectiveness was informed by multiple sources. The following sections outline the measurement of each of the constructs along with the items.

4.1 Leadership Style

The items for measuring leadership style were adopted from the Multifactor Leadership Questionnaire (MLQ) Form 5X (Bass et al., 2000). The MLQ form 5X has often been used and has been shown to have good validity and reliability. A sample of items has been provided below in Table 4.1.

Table 4.1 Sample Measures of Leadership Style

1.	Provides me with assistance in exchange for my efforts
2.	Re-examines critical assumptions to question whether they are appropriate
3.	Fails to interfere until problem becomes serious
4.	Focuses attention on irregularities, mistakes, exceptions and deviations from standards
5.	Avoids getting involved when important issues arise
6.	Talks about his/her most important values and beliefs
7.	Is absent when needed
8.	Seeks differing perspectives when solving problem

4.2 CIO Technical Knowledge

The items for CIO technical knowledge were informed by previous studies (Bassellier et al., 2004; Lerouge et al., 2005). However, since technology is an ever changing field, we added new items to reflect the current status of the field. The items for technical skill measurement are provided in Table 4.2. Respondents were asked to indicate the understanding level of their CIOs, pertaining to each of the items, on a scale ranging from high understanding to no understanding.

Table 4.2 Items Measuring CIO Technical Knowledge

1.	Business Intelligence
2.	Data Mining
3.	Database Management
4.	Systems Development Methodologies
5.	Enterprise Systems (ERP, CRM, etc.)
6.	Networking
7.	Programming Languages (Java, C++, etc.)
8.	Web/Internet technologies

4.3 Leader Member Exchange Relationship

The items for leader-member exchange relationship were adapted from Graen et al. (1995). While there are other instruments that measure LMX, we decided on using Graen et al. (1995) 7-item LMX instrument since it is the most often used and validated version. The items from LMX scale were slightly modified to fit the CIO context. The items have different scales for response. Table 4.3 lists the items including the response scales for each item.

Table 4.3 Items Measuring Leader Member Exchange

1.	Do you know where you stand with your CIO... do you usually know how satisfied your CIO is with what you do?
	Rarely Occasionally Sometimes Fairly Often Very Often
2.	How well does your CIO understand your job problems and needs?
	Not a Bit A Little A Fair Amount Quite a Bit A Great Deal
3.	How well does your CIO recognize your potential?
	Not at All Little Moderately Mostly Fully
4.	Regardless of how much formal authority he/she has built into his/her position, what are the chances that your CIO would use his/her power to help you solve your problems in your work?
	None Small Moderate High Very High
5.	Again, regardless of the amount of formal authority that your CIO as, what are the chances that he/she would "bail you out" at his/her expense?
	None Small Moderate High Very High
6.	I have enough confidence in my CIO that I would defend and justify his/her decision if he/she were not present to do so?
	Strongly Disagree Disagree Neutral Agree Strongly Agree
7.	How would you characterize your working relationship with your CIO?
	Extremely Ineffective Worse than Average Average Better than Average Extremely Effective

4.4 General Job Satisfaction

The items for job satisfaction were adapted from the Job Diagnostic Survey (Hackman et al., 1974; Hackman et al., 1975). Three items measured the general job satisfaction of the subordinate, as listed in Table 4.4. The respondent was asked to rate their agreement with the items.

Table 4.4 Items Measuring General Job Satisfaction

1.	Generally speaking, I am very satisfied with this job.
2.	I frequently think of quitting this job.
3.	I am generally satisfied with the kind of work I do in this job.

4.5 IT Ambidexterity

IT ambidexterity was measured using four items each that tap into explorative and exploitative orientation of the IT department. While items to measure ambidexterity at the organization level exist (Gibson et al., 2004; He et al., 2004; Lubatkin et al., 2006), the development of items to measure IT ambidexterity is a relatively new effort (Jain, 2007). We adapted items from the IT ambidexterity scale used by Jain (2007). Respondents were asked to consider all the IT/IS initiatives that have been attempted under the direction of the current CIO, and then were asked to rate the organizational impact of such initiatives. The items are listed in Table 4.5.

Table 4.5 Items Measuring IT Ambidexterity

1.	Improved the functionality of an existing system
2.	Used proven technology that we had used before
3.	Led to reduced business operating costs
4.	Improved existing business processes/products and services
5.	Used a new technology that we had not used before
6.	Resulted in a new and radically improved system
7.	Led to new products or services
8.	Opened up new markets for our products/services

4.6 Perceived CIO Role Effectiveness

The items for measuring perceived CIO role effectiveness were informed by Smaltz et al. (2006) and Jain (2007). While Smaltz et al. (2006) examined CIO role effectiveness in a healthcare setting, we felt that not all dimensions of this scale would generalize readily to the non-healthcare context. Also, the labels for the six dimensions used would not be pertinent in a non-healthcare context. In addition, we felt that systems development was an important dimension of a CIO's role. The items to measure systems development were informed by Jain (2007). Thus, we measured CIO role effectiveness with seven items that tapped into different dimensions of a general CIO's role. The items are provided in Table 4.6.

Table 4.6 Items Measuring Perceived CIO Role Effectiveness

Strategy Planning Dimension	
	Our CIO develops effective IT strategic plan that supports overall strategic organizational goals
Outsourcing Management Dimension	
	Our CIO negotiates and ensures delivery of outsourcing contracts
Resource Management Dimension	
	Our CIO ensures quality confidentiality and security of organizational data, architecture and systems
Knowledge Management Dimension	
	Our CIO makes sure that we can quickly absorb and apply knowledge gained from functional users, as well as learning from past IT projects
Personnel Management Dimension	
	Our CIO provides constructive performance feedback and incentives for us to upgrade our skills
Change Management Dimension	
	Our CIO effectively communicates with all concerned parties, including top management and users, during implementation
Development of Systems Dimension	
	Our CIO is innovative in developing new systems that meet the changing requirements of the organization

4.7 Control Variables

We adapted six items from the short form measure of the career orientations inventory instrument (Igbaria et al., 1993). Three items measure managerial orientation and technical orientation each. The items are provided in Table 4.7.

Table 4.7 Items Measuring Managerial and Technical Orientation

1.	The process of Supervising, leading and controlling people at all levels is
2.	Remaining in my specialized area as opposed to being promoted out of my area of expertise is
3.	To be in charge of the whole organization is
4.	Remaining in my area of expertise throughout my career is
5.	To rise to a high position in general management is
6.	I will accept a management position only if it is in my area of expertise

All the other control variables were measured using a single item each, asking participants to respond to questions about their age, tenure, organization and department size, IT and Non IT/functional experience and the tenure of the CIO.

CHAPTER 5

DATA COLLECTION AND ANALYSIS

5.1 Survey Technique

Two research survey instruments were developed, one each for organizational outcomes level and the individual outcomes level and are provided in Appendix A and Appendix B. While the independent variable (leadership style) and the moderator (technical skills) are common to both survey instruments, they have different outcome and mediating variables. Respondents who reported directly to the CIO/IS executive were directed to answer the organizational outcomes questionnaire (Appendix A), whereas those who reported to lower levels of the organizational hierarchy were provided the individual outcomes questionnaire (Appendix B).

The survey was conducted online. Online surveys are becoming popular because of the many advantages they offer, as compared to traditional mail surveys (Ilieva et al., 2002). Online surveys are flexible, have a wide geographic reach, are cost effective, and enable efficient resource use. Also, online surveys lead to better data quality (lower missing values), as well as a faster response time and hence may be considered to be better than mail surveys (Bachmann et al., 1996). However many questions persist regarding the equivalence of online and mail based surveys. Primary concerns about online surveys are questions relating to generalizability (Kraut et al., 2004). That is, does the pool of respondents to an online survey represent a random sample of the population?

These concerns emerge from the large demographic differences between users and non-users of the internet, especially during the nineties (Kraut et al., 2004). Other empirical studies have shown that computer anxiety and skills are main factors affecting usage of online surveys (Buchanan et al., 1999; Deutskens et al., 2006; Wilson, 2006). However, the respondents in this study are technical professionals who use computers on their job daily, and thus can be expected to have higher levels of computer self-efficacy. We believe that almost all respondents will have sufficiently high levels of computer self-efficacy, which in turn will control for the single most important factor affecting non-response bias in online surveys.

5.2 Survey Pretest

A pretest of the survey instruments was conducted to check for face validity, before conducting the survey. A total of eight individuals participated in the pre-test. Four academicians (two Assistant professors, two doctoral students) and four individuals working in the software industry in various capacities were shown the surveys and asked to provide their comments. While there were no suggestions to change the wording of the questions themselves, some of the feedback suggested changes to the descriptions and explanations of terms preceding the items in the survey. Suggestions were also made to highlight key words which could help the respondent in answering the questions. Using this feedback, appropriate changes were made to the survey instruments.

5.3 Data Collection

As mentioned previously, two kinds of respondents were targeted to complete the online survey. Respondents to the organizational level model were those who reported to

CIO/CTO/ IS executive. The individual level outcomes model respondents were those who reported to anyone lower in the organization. Recruitment for the study was done in three different ways. First, local CIOs and other top executives were contacted via email with a description of the study and were requested for their cooperation in the research. Second, an email list of IT professionals was obtained from the US Small Business Administration. Finally, messages were posted on online forums detailing the purpose of the study and requesting the reader's participation. All emails and messages carried a link to the online survey. Respondents could click on the survey, which opened an introduction page with the UTA logo and a statement assuring their privacy. Respondents then entered their email in a text box provided on the page, to which a protected link to the survey was sent. This was done to avoid violating copyright laws protecting the MLQ. Both types of respondents were directed to the first page of the survey, and depending on their response to the question, "Who do you report to?", they were directed either to the organizational level outcomes survey (Appendix A) or the individual outcomes survey (Appendix B).

5.4 Choice of Data Analysis Technique

Partial Least Squares (PLS) was used to analyze both the organizational and individual level models. PLS is a structural equation modeling technique that assesses the psychometric properties of the scales used to measure the theoretical constructs and estimates the hypothesized relationships among the constructs (Barclay et al., 1995; Chin, 1998). Although other SEM techniques exist, the choice of PLS was driven by many reasons. Firstly, PLS handles both formative and reflective indicators, whereas other

SEM techniques do not. Secondly, PLS is prediction oriented, whereas other techniques are primarily concerned with parameter accuracy. Thirdly, PLS does not assume multivariate normality unlike SEM techniques like LISREL. Finally, PLS requires lower sample sizes than other techniques (Chin, 1998; Chin et al., 1999). The sample size required is equal to the larger of the following: (1) 10 times the number of indicators on the most complex formative construct, or, (2) 10 times the largest number of independent constructs leading to an endogenous construct. PLSGraph Ver 3 (*courtesy Dr. Wynne W. Chin – University of Houston*) was used to analyze the data.

5.5 Data Analysis

Data collection from the online survey resulted in two data sets, one each for the organizational and individual outcome levels. Each of the two data sets was analyzed separately. The steps involved in testing the models and results are reported in the sections below.

5.5.1 *Organizational Level Outcomes Model*

105 individuals filled the survey for the organizational outcomes level model. Of the 78 questions, any response with more than 8 (10% of 78) missing values was discarded from the data analysis. Seven responses were deemed to be unusable because of a large number of missing responses. Thus, we ended up with a final usable sample size of 98.

5.5.1.1 Data Preparation

Respondents were not forced to answer any questions, except one which asked who they reported to. An answer to this question was necessary to route them to the appropriate questionnaire items. Not forcing the respondents to answer questions is in compliance with the IRB (Institutional Requirements Board) requirements that stipulate that the respondents need to have a choice not to answer a question. There were a total of 16 non-responses in the data set in the variables of interest in the study. These were coded as -1. PLS Graph tool allows the coding of a global missing value. The data was also examined for outliers using the technique suggested by Hair et al (1995), where standardized scores for the variables are examined. A score of 3 or more implies that an outlier is present. We did not find any outliers in the dataset. While technical skills were measured with eight items, we averaged the scores on these items in order to arrive at a score for technical skills. The leadership scale used 36 items to measure nine first order constructs (MLQ 5X), with four items each. The score for each of the nine leadership styles was calculated as the average of the responses to four items, consistent with the scoring guidelines of the MLQ. Thus, we ended up with 25 variables in the final analysis, apart from the control variables.

Table 5.1 Constructs and Indicators

Constructs	Number of Indicators
Technical Skills	1
Leadership Style	9
CIO Role Effectiveness	7
IT Ambidexterity – Exploitation	4
IT Ambidexterity – Exploration	4
Total	25

5.5.1.2 Characteristics of Respondents who Report to Top Management

Following are the characteristics of respondents who report to IT top management.

Table 5.2 Profile of Respondents who Report to Top Management

Measure	Item	Frequency	Percent
Gender	Male	78	79.59%
	Female	20	20.41%
	No Response	0	0.00%
Age	20 – 30	20	20.41%
	31 – 40	41	41.84%
	41 – 50	23	23.47%
	51 – 60	11	11.22%
	60+	2	2.04%
	No Response	1	1.02%
Reporting To	CIO	18	18.37%
	CTO	10	10.20%
	Sr./Executive VP of IS/IT	16	16.33%
	Director	38	38.78%
	CFO, CEO, COO, Other Top Management	16	16.33%
Number Of Years In The IT Profession	1 – 5	17	17.35%
	6 – 10	28	28.57%
	11 – 15	19	19.39%
	16 – 20	14	14.29%
	20 +	15	15.31%
	No Response	5	5.10%
Number Of Years In The Current Job Position	1 – 5	75	76.53%
	6 – 10	15	15.31%
	11 – 15	3	3.06%
	16 – 20	0	0.00%
	21 +	0	0.00%
	No Response	5	5.10%

Table 5.2 – continued

Measure	Item	Frequency	Percent
Number Of Years Of Functional Experience	0	28	28.57%
	1 – 5	37	37.76%
	6 – 10	13	13.27%
	11 – 15	9	9.18%
	16 – 20	5	5.10%
	21 +	6	6.12%
Organization's Primary Industry	Banking/Financial Services	16	16.33%
	Biotechnology and Pharmaceutical	0	0.00%
	Computer Serv./Hardware/Software	25	25.51%
	Consulting Services	8	8.16%
	Engineering/Manufacturing	5	5.10%
	Government	6	6.12%
	Healthcare	8	8.16%
	Manufacturing	1	1.02%
	Retail	0	0.00%
	Telecommunications	7	7.14%
	Transportation and Logistics	2	2.04%
	Other	17	17.35%
	No Response	3	3.06%
Number Of Employees In The Organization	1 – 100	27	27.55%
	101 – 500	11	11.22%
	501 – 1000	7	7.14%
	1000- 2000	7	7.14%
	2001 – 5000	22	22.45%
	5001 – 10000	3	3.06%
	10000 +	16	16.33%
	No Response	5	5.10%
Number Of Employees In The IT Department	1 – 100	53	54.08%
	101 – 500	31	31.63%
	501 – 1000	6	6.12%
	1001- 2000	3	3.06%
	2001 – 5000	1	1.02%
	5001 – 10000	0	0.00%
	10000 +	1	1.02%
	No Response	3	3.06%
CIO Tenure	1 – 5	69	70.41%

Of the 98 respondents who report to top management, 78 (79.59%) were males and 20 (20.41%) were females. Figure 5.1 shows the gender distribution.

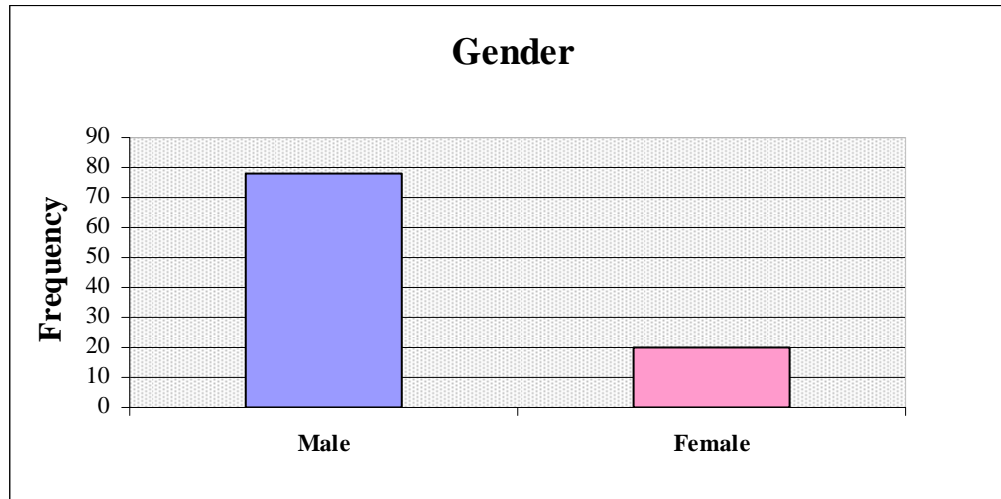


Figure 5.1 Gender Distribution

The respondents' ages ranged from approximately 24 years to 63 years. 20 (20.41%) were between the ages of 20 and 30; 41 (41.84%) were between the ages of 31 and 40; 23 (23.47%) were between the ages of 41-50; 11 (11.22%) were between the ages of 51-60; 2 (2.04%) were above 60 years old, and 1 (1.02%) did not respond to this question. Figure 5.2 shows a graphical representation of the respondents' age distribution.

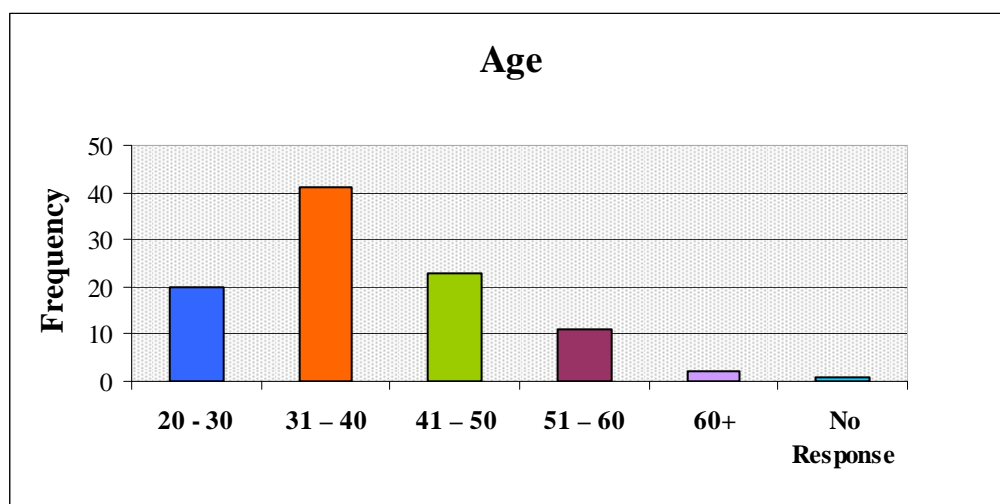


Figure 5.2 Age Distribution

The respondents' reported to the following management designations: 18 (18.37%) reported to the CIOs; 10 (10.20%) to the CTOs; 16 (16.33%) to vice presidents; 38 (38.78%) to directors and 16 (16.33%) to CFOs, CEOs COOs and other top management. Figure 5.3 shows a graphical representation of the distribution of who the respondents report to.

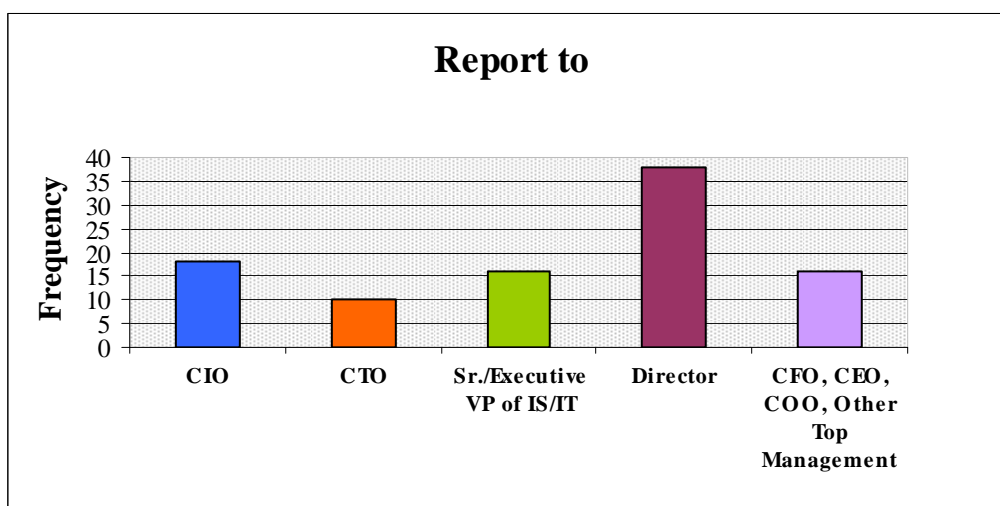


Figure 5.3 Distribution of Designations of Whom the Respondents Report to

The respondents' number of years of total IT experience ranged from approximately 1 year to 42 years. 17 (17.35%) had 1 - 5 years of IT experience; 28 (28.57%) had 6 - 10 years of IT experience; 19 (19.39%) had 11 - 15 years of IT experience; 14 (14.29%) had 16 - 20 years of IT experience; 15 (15.31%) had more than 20 years of IT experience, and 5 (5.10%) did not respond to this question. Figure 5.4 shows a graphical representation of the distribution of the number of years of IT experience that the respondents had.

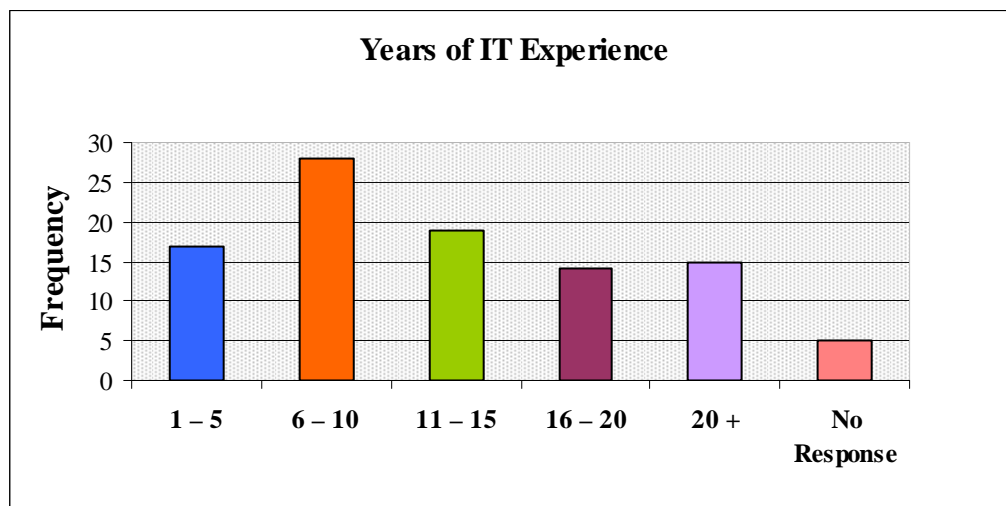


Figure 5.4 Distribution of IT Experience

The number of years that the respondents have been working in their current jobs ranged from approximately 1 year to 12 years. 75 (76.53%) have been working in their current job for 1 - 5; 15 (15.31%) for 6 - 10 years; 3 (3.06%) for 11 - 15 years and 5 (5.10%) did not respond to this question. Figure 5.5 shows a graphical representation of the distribution of the number of years that the respondents have worked in their current jobs.

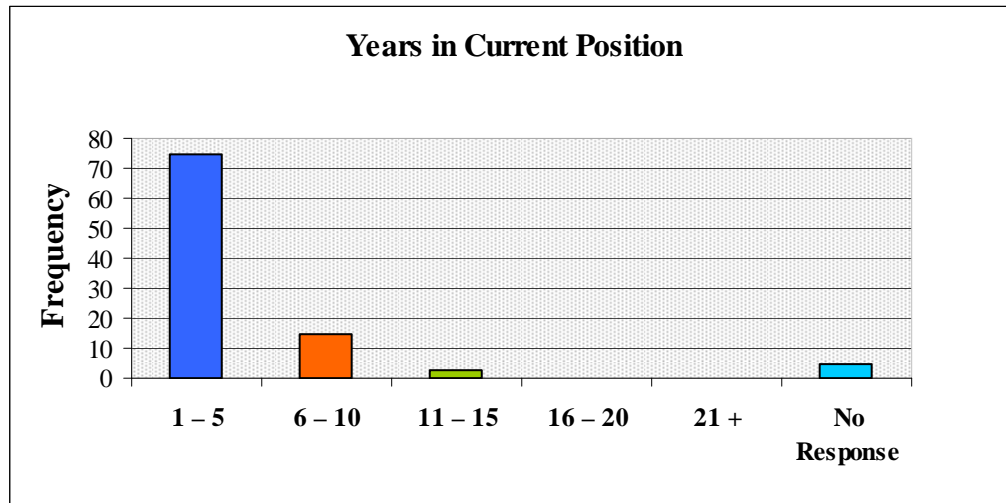


Figure 5.5 Distribution of Number of Years in Current Job

The number of years of functional experience the respondents have ranged from approximately 1 year to 38 years. 37 (37.76%) had 1 - 5 years of functional experience; 13 (13.27%) had 6 - 10 years of functional experience; 9 (9.18%) had 11 - 15 years of functional experience; 5 (5.10%) had 16 - 20 years of functional experience; 6 (6.12%) had more than 20 years of functional experience, and 28 (28.57%) did not respond to this question. Figure 5.6 shows a graphical representation of the distribution of the number of years of functional experience that the respondents had.

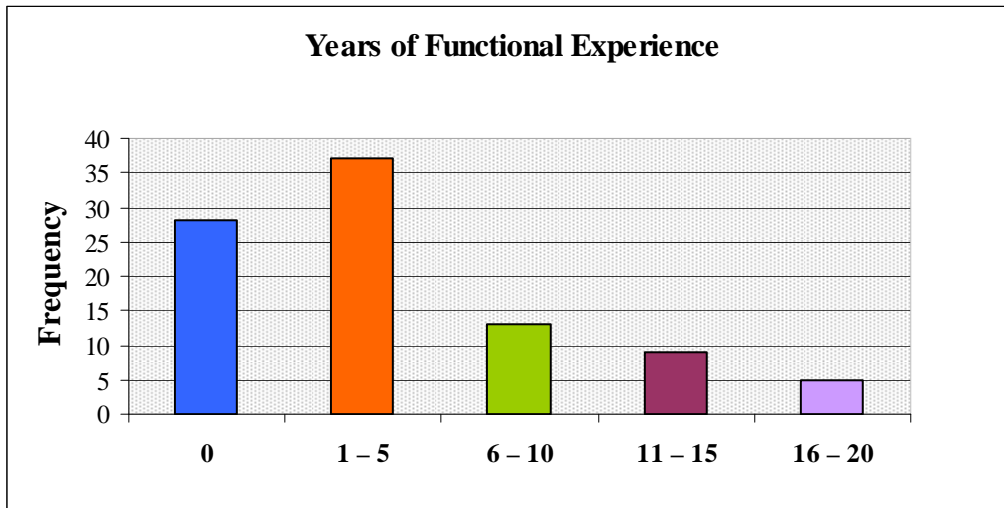


Figure 5.6 Distribution of Number of Years of Functional Experience

16 (16.33%) of the respondents worked in the banking/financial services industry, 25 (25.51%) in computer related industries, 8 (8.16%) in consulting services, 5 (5.10%) in engineering and manufacturing industries, 6 (6.12%) worked in government organizations, 8 (8.16%) in healthcare, 1 (1.02%) in manufacturing, 7 (7.14%) in telecommunications, 2 (2.04%) in transportation and logistics, 17 (17.35%) work in other industries and 3 (3.06%) did not respond to this question. Figure 5.7 shows a graphical representation of the industries that the respondents worked in.

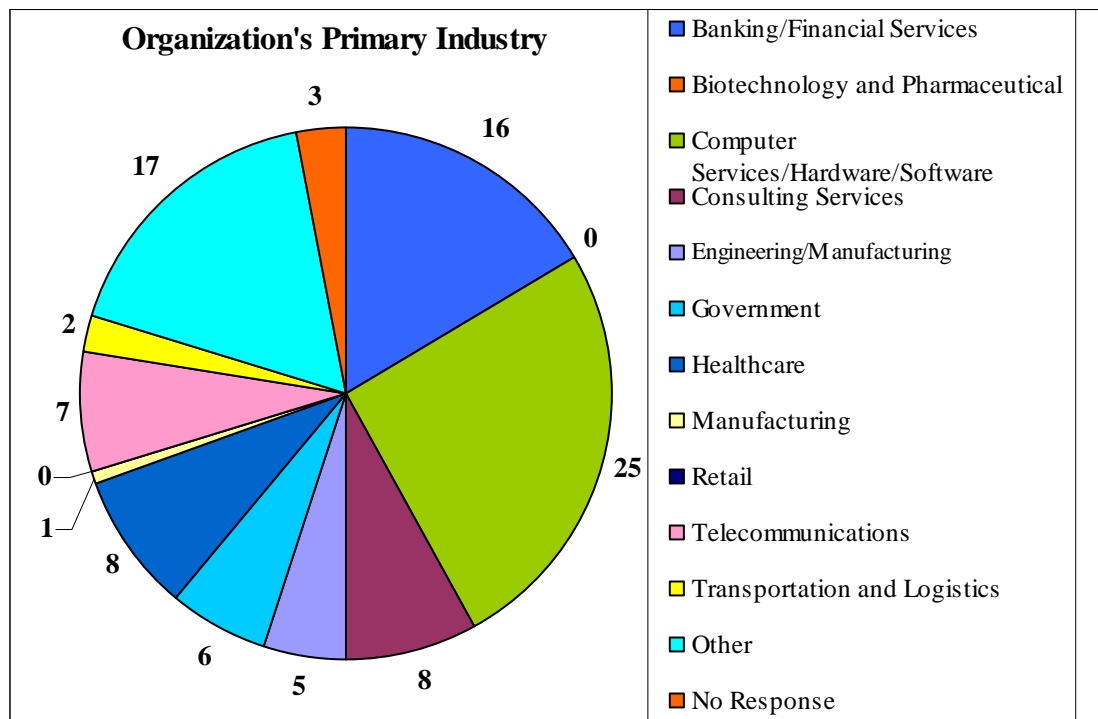


Figure 5.7 Distribution of Respondents' Organization's Primary Industry

27 (27.55%) of the respondents' organization had up to 100 employees, 11 (11.22%) had up to 500 employees, 7 (7.14%) had up to 1,000 employees, 7 (7.14%) had up to 2,000 employees, 22 (22.45%) had up to 5,000 employees, 3 (3.06%) has up to 10,000 employees, 16 (16.33%) had more than 10,000 employees and 5 (5.10%) of the respondents did not answer this question. Figure 5.8 shows a graphical representation of the number of employees that are in the respondent's organization.

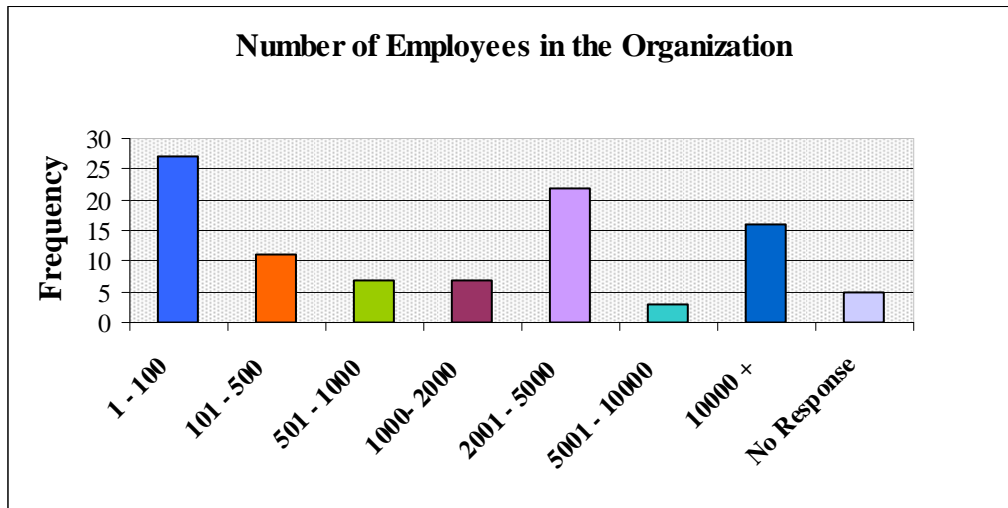


Figure 5.8 Number of Employees in Respondent's Organization

53 (54.08%) of the respondents' organization had up to 100 employees in the IT department, 31 (31.63%) had up to 500, 6 (6.12%) had up to 1,000 employees, 3 (3.06%) had up to 2,000 employees, 1 (1.02%) had up to 5,000 employees, 1 (1.02%) had more than 10,000 employees and 3 (3.06%) of the respondents did not answer this question. Figure 5.9 shows a graphical representation of the number of employees that are in the IT department of the respondent's organization.

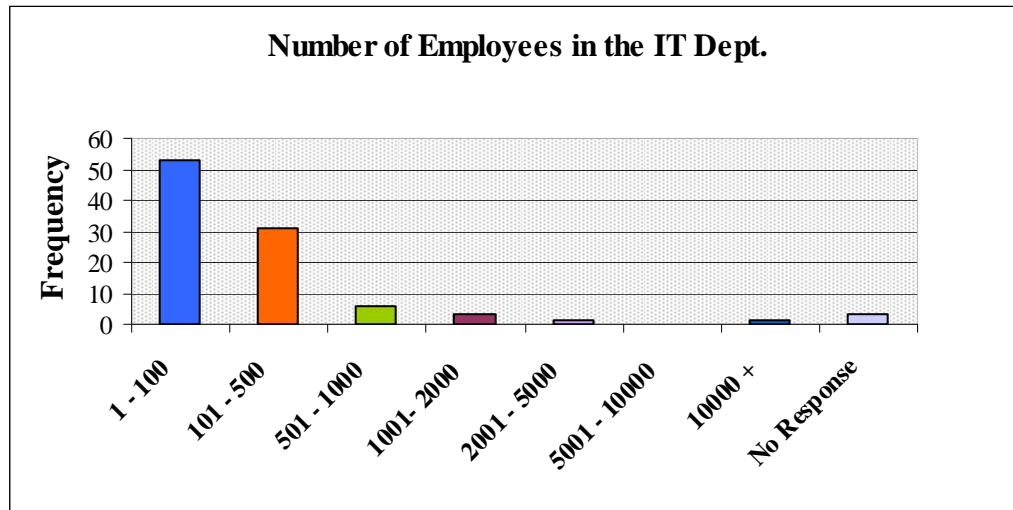


Figure 5.9 Number of Employees in the IT Department

69 (70.41%) of the respondents had CIOs that had been in tenure for up to 5 years in their organization, 8 (8.16%) had tenure of up to 10 years, 4 (4.08%) had tenure of up to 15 years, 1 (1.02%) had tenure of up to 20 years, 2 (2.04%) had more than 20 years and 14 (14.29%) of the respondents did not answer this question. Figure 5.10 shows a graphical representation of the number of years of tenure the CIO has in the respondent's organization.

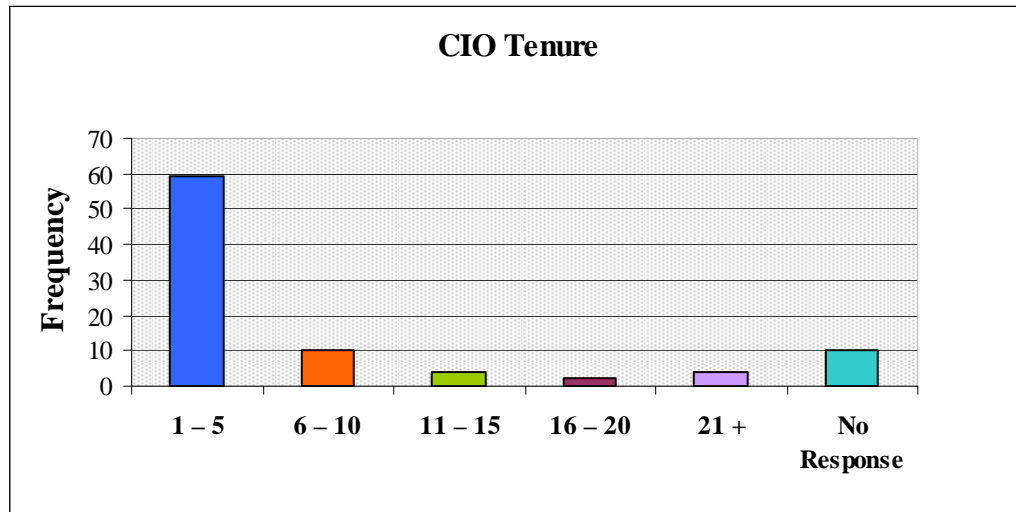


Figure 5.10 CIO Tenure

5.5.1.3 Control Variables Analysis

A total of nine control variables were used to examine the direct effects on CIO role effectiveness. Managerial and technical orientations were calculated as the average of the responses to three items each. All the other control variables were single item responses. PLS Graph was used, and the nine control variables were included as independent variables into the model. None of the control variables were significant at the 0.1 level. The t-values are provided in the table 5.3 below. Since none of the control variables were significant, we dropped them from the final analysis.

Table 5.3 T-Statistics for Control Variables

Control Variable	T-statistic	p-value
Age	0.9134	0.36
IT Experience	0.6359	0.53
Job Tenure	0.3888	0.69
Number of IT Employees	0.9853	0.33
Non IT Experience	0.8614	0.39
Number of Employees in Organization	1.6315	0.11
CIO Tenure	0.9416	0.35
Managerial Orientation	0.1494	0.88
Technical Orientation	0.3534	0.72

5.5.1.4 Analysis of the Organizational Level Model

One new construct, CIO role effectiveness was developed in this study. In order to ascertain its factor structure, we conducted a principal components analysis. A single factor was extracted using all seven indicators measuring CIO role effectiveness. The results of the PCA, Eigen values, and variance extracted are provided below in table 5.4.

Table 5.4 Principal Components Analysis of CIO Role Effectiveness Items

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.251	60.726	60.726	4.251	60.726	60.726
2	.731	10.440	71.167			
3	.661	9.443	80.610			
4	.456	6.516	87.126			
5	.352	5.022	92.148			
6	.294	4.205	96.354			
7	.255	3.646	100.000			

Although we adapted items from the IT ambidexterity scale used by Jain (2007), we conducted a confirmatory analysis of the ambidexterity items to confirm the two factor structure. The results are provided below.

Table 5.5 Confirmatory Factor Analysis of Ambidexterity Items

Factor	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.128	51.597	51.597	3.729	46.612	46.612
2	1.246	15.573	67.170	.816	10.200	56.812
3	.731	9.133	76.303			
4	.561	7.009	83.311			
5	.428	5.344	88.656			
6	.364	4.549	93.204			
7	.310	3.872	97.076			
8	.234	2.924	100.000			

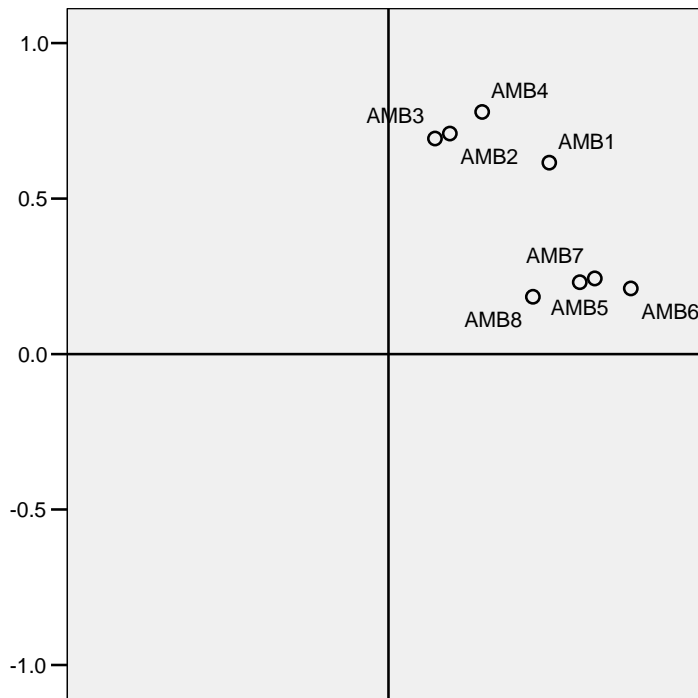


Figure 5.11 Factor Plots of Ambidexterity Items

We followed the recommendations of Hair et al (1998), to assess the measurement model first before assessing the structural model. Measurement model deals with the relationship of indicator variables with the latent constructs they are intended to measure. It is important to establish convergent and discriminant validity in order to assess the measurement model. Where convergent validity indicates the degree to which theoretically similar constructs are highly correlated with each other, discriminant validity indicates the degree to which a given construct is different from other constructs (Chin, 1998; Gefen et al., 2005). Together, these two validities provide some evidence regarding the goodness of fit of the measurement model.

Convergent validity can be assessed when each of the measurement items loads with a significant t-value on its latent construct, at an alpha of 0.05 (Gefen et al., 2005). Partial Least Squares (PLS Graph, version 3.00) was used to assess convergent validity. An initial PLS run with boot strapping procedure (200 resamples) generated weights, loadings, composite reliabilities, average variance extracted (AVE) and t-values for each measurement item in relation to its theorized construct. The loadings for each measurement item were analyzed. Three indicators failed to load at the acceptable levels of 0.7 (Chin, 1998), and these indicators were dropped. The dropped indicators were CIO2, AMB8 and MBEA. The trimmed model was then reanalyzed for convergent validity. The results are tabulated in table 5.6 below.

Table 5.6 Weights and Loadings

Construct	Indicator	Weight	Loading	Standard Error	T-value
Transformational	IC	0.1975	0.867	0.0309	28.0712
	IATTR	0.224	0.8949	0.0265	33.7942
	IBEH	0.2329	0.8958	0.0225	39.7553
	IM	0.2568	0.8978	0.0174	51.6618
	IS	0.2212	0.855	0.0334	25.6299
Transactional	CR	0.724	0.9126	0.0328	27.7827
	MBEP	-0.4502	-0.7536	0.0969	7.7807
CIO Role Effectiveness	CIO1	0.2639	0.7771	0.0387	20.1028
	CIO3	0.216	0.7078	0.0592	11.9463
	CIO4	0.1913	0.7007	0.0805	8.7058
	CIO5	0.2396	0.8441	0.0348	24.2899
	CIO6	0.178	0.6867	0.1092	6.2899
	CIO7	0.2228	0.8239	0.0337	24.4484
Exploitation	AMB1	0.3448	0.8508	0.0608	14.0011
	AMB2	0.2865	0.8167	0.0787	10.3834
	AMB3	0.2116	0.7459	0.0809	9.2155
	AMB4	0.3563	0.8836	0.0403	21.9346
Exploration	AMB5	0.3596	0.8295	0.0556	14.9104
	AMB6	0.4342	0.8999	0.0323	27.8221
	AMB7	0.3729	0.8341	0.0706	11.8147
1. Only those constructs that are made up of two or more indicators are displayed. Single indicator constructs, technical skills and laissez faire leadership have a loading and weight of 1.0. 2. T-values are for Loadings.					

Item loadings of 0.70 or higher imply that more than 50% of the variance is shared between the measurement item and its theorized construct (Barclay et al., 1995).

As can be seen, the loadings for the measurement items are well over the recommended level of 0.70 or higher, except for CIO6 which has a loading of 0.69. Since this value is very close to the recommended value, we decided to keep this indicator in the analysis.

Further, Nunnally (1994) suggested that composite reliabilities greater than 0.8 are a good indicator of internal consistency. Also, an AVE of 0.5 or above is often suggested to be a good indicator of convergent validity (Fornell et al., 1981). The table below lists the composite reliabilities and the average variance extracted for each construct. As can be seen below, the values are above the recommended thresholds.

Table 5.7 Composite Reliability and Average Variance Extracted

Construct	Composite Reliability	Average variance Extracted
Transformational	0.946	0.778
Transactional	0.822	0.7
CIO Role Effectiveness	0.89	0.576
Exploitation	0.895	0.682
Exploration	0.891	0.731

The convergent validity analysis raised one issue. Management by Exception Passive (MBEP) loaded negatively to its theorized construct, transactional leadership. The general weakness of the factor structure of the MLQ has seen much academic debate over the last many years (Antonakis et al., 2003; Avolio et al., 1999; Den Hartog et al., 1997a; Geyer et al., 1998; Goodwin et al., 2001; Heinitz et al., 2005; Yukl, 2006). In order to further evaluate the factor structure, a confirmatory factor analysis was conducted on leadership style (transformational, transactional and laissez faire). EQS 6.1 for Windows software package was used to confirm the factor structure of leadership style. Various factor structures were evaluated for their fit. The results of CFA and the various fit indices are tabulated below.

Table 5.8 Confirmatory Factor Analysis

	Chi-Sq	df	p-value	RMSEA	NFI	NNFI	CFI	GFI	AGFI	RMR
9 factor model	602.65	27	0.81	0.47	0	-0.36	0	0.31	-0.16	0.38
1 factor model	75.38	27	0	0.136	0.88	0.89	0.92	0.86	0.77	0.06
Theoretical model	74.34	4	0	0.15	0.88	0.87	0.91	0.86	0.74	0.06
3 factor Model	23.59	17	0.13	0.06	0.96	0.98	0.99	0.95	0.89	0.02

As can be seen from the above table, the best fit was achieved with a three factor model, when Management by Exception Passive (MBEP) was removed from the theoretical transactional leadership factor and combined with laissez faire leadership. The three factor structure with correlations is consistent with many previous studies (Avolio et al., 1999; Den Hartog et al., 1997b; Heinitz et al., 2005), along with the fact that Management by Exception Passive (MBEP) and laissez faire leadership have been found to load together (Yukl, 2006). We named the three factors extracted as transformational, contingent reward and passive-avoidant leadership.

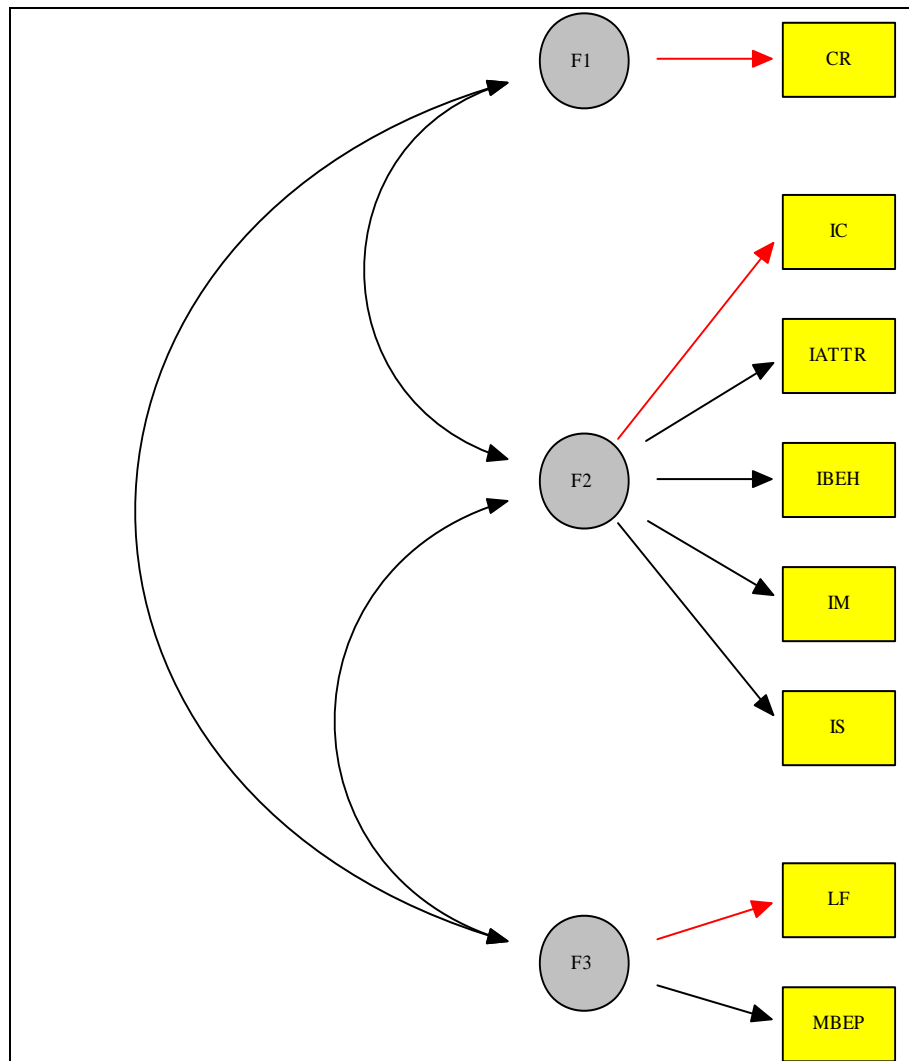


Figure 5.12 Factor Structure for Leadership Style

Discriminant validity is the extent to which one construct is different from all the other constructs in the model. As per the recommendations of Chin (1998) and Gefen et al. (2005), discriminant validity can be assumed when

1. Measures of a construct load more strongly on to it, than other constructs;
- and

2. The square root of the AVE for each construct should be much larger than the variance shared between the construct and other constructs in the model

To determine if measures of a construct load more strongly on it, than other constructs, we computed item-construct loadings using the technique recommended by Gefen et al. (2005). Table 5.9 presents the loadings and cross loadings. Examination of the loadings and cross-loadings indicate that all the items load highly on their own construct than on other constructs.

Table 5.9 Item Construct Loadings and Cross Loadings

	Exploit	Explore	CIO	Contingent	Transform	PassiveAvoidant	TechSkill
AMB1	0.849	0.53	0.336	0.251	0.339	-0.282	0.296
AMB2	0.726	0.333	0.315	0.167	0.252	-0.149	0.196
AMB3	0.614	0.282	0.31	0.22	0.187	-0.227	0.136
AMB4	0.788	0.482	0.382	0.325	0.366	-0.34	0.278
AMB5	0.376	0.76	0.335	0.264	0.31	-0.18	0.345
AMB6	0.477	0.886	0.454	0.341	0.312	-0.28	0.403
AMB7	0.326	0.699	0.329	0.313	0.276	-0.359	0.283
CIO1	0.406	0.448	0.791	0.428	0.444	-0.282	0.42
CIO3	0.412	0.267	0.696	0.317	0.292	-0.318	0.33
CIO4	0.231	0.415	0.772	0.401	0.328	-0.261	0.34
CIO5	0.294	0.352	0.827	0.526	0.515	-0.265	0.282
CIO6	0.294	0.387	0.733	0.343	0.339	-0.232	0.243
CIO7	0.294	0.382	0.832	0.464	0.426	-0.344	0.347
CR	0.307	0.366	0.523	1	0.811	-0.438	0.354
IATTR	0.438	0.376	0.43	0.766	0.889	-0.446	0.383
IBEH	0.402	0.345	0.465	0.702	0.882	-0.442	0.238
IC	0.226	0.26	0.361	0.69	0.868	-0.379	0.309
IM	0.395	0.425	0.489	0.707	0.898	-0.439	0.324
IS	0.27	0.249	0.444	0.692	0.84	-0.476	0.257
LF	-0.281	-0.246	-0.298	-0.406	-0.434	0.86	-0.241
MBEP	-0.296	-0.33	-0.305	-0.416	-0.452	0.911	-0.275
TechAvg	0.321	0.428	0.407	0.354	0.329	-0.255	0.964

Table 5.10 presents the AVE analysis. The bolded diagonal elements in the table represent the square root of the AVE scores. The off-diagonal elements are the correlations between constructs. As can be seen, the square root of AVE values range from 0.76 to 1. Although contingent reward shares a high correlation with transformational leadership (.83), the square root of its AVE 1.00, is far higher. AVE for each construct is significantly larger than any correlations involving the construct. That is all constructs share greater variance with their own measures than with other constructs in the model, thus establishing discriminant validity.

Table 5.10 AVE Analysis

	Transformational Style	Contingent Reward	Passive-Avoidant	CIO Role Effectiveness	Exploit	Explore	Technical skill
Transformational Style	0.88						
Contingent Reward	0.83	1					
Passive-Avoidant	-0.481	-0.449	0.89				
CIO Role Effectiveness	0.484	0.514	-0.355	0.76			
Exploit	0.309	0.208	-0.304	0.38	0.83		
Explore	0.333	0.285	-0.369	0.497	0.569	0.86	
Technical skill	0.405	0.386	-0.313	0.421	0.3	0.46	1

Validation of structural model was accomplished with PLS-Graph version 3.0. The model was setup in PLS as per the guidelines given in the PLS-Graph Users Guide (Chin, 2001). Missing data were replaced with a “-1”. Following Chin (Chin, 1998), bootstrap resampling method (200 iterations) that uses randomly selected sub-samples, was employed to estimate the theoretical model and hypothesized relationships. The sample size recommendation for PLS is 10 times the larger of the following two:

1. The block with the largest number of formative indicators, and
2. The dependent construct with the largest number of independent constructs impacting it.

In our model, the largest number of formative indicators is 5, and the dependent construct with the largest number of independent constructs impacting it is 7. Therefore the sample size required is 70.

Since our model contains interaction effects, we used the steps laid out by Chin et al. (2003) for the product-indicator approach using PLS, in order to test for main effects and interaction effects. The first step involves standardizing the independent and moderator variables. This helps avoid computational errors by minimizing the correlation between the independent and moderator variables and the interaction term (which is calculated as the product of each combination of the independent and moderator variables). In testing for interaction effects using PLS, one needs to follow a hierarchical process similar to that used in multiple regression in which one compares the results of two models, with and without the interaction terms. Thus, in the first step, the independent variables (three leadership styles, transformational, contingent reward and passive avoidant leadership) and the moderator (perceived technical skills of the CIO)

were entered along with perceived CIO role effectiveness and the ambidexterity constructs of exploration and exploitation. The results of the analysis are shown below in figure 5.13

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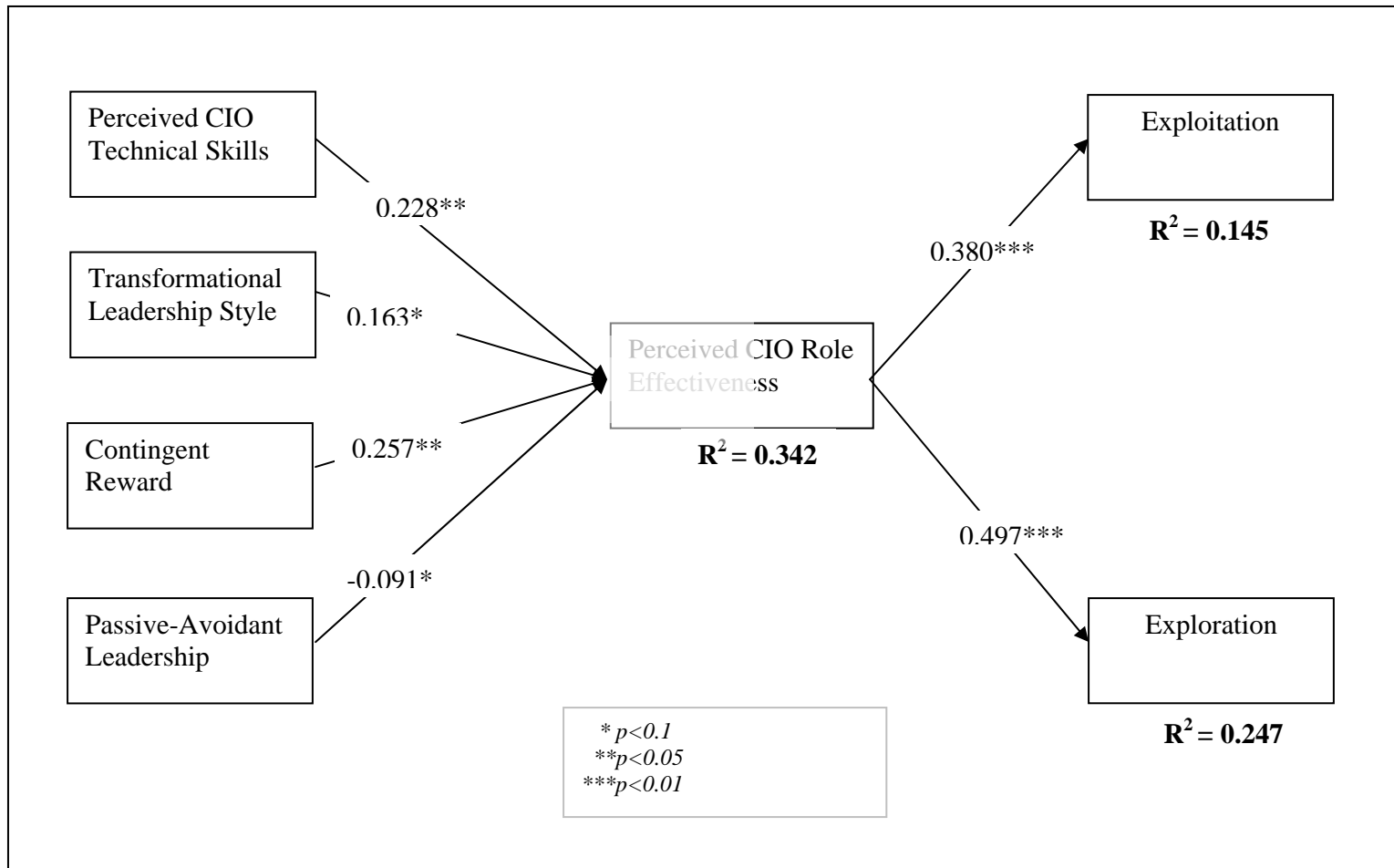


Figure 5.13 Structural Model

The R-Square values, path coefficients, t-value and the significance values are presented in the table below.

Table 5.11 Analysis of Structural Model

Construct	R-Square	Independent Variables	Beta Coefficient	T-value	p-value
Perceived CIO Role Effectiveness	0.342				
		Transformational Leadership	0.163	1.352	0.0898
		Contingent Reward	0.257	2.1623	0.0165
		Passive-Avoidant Leadership	-0.091	1.368	0.0872
		Perceived Technical Skills of CIO	0.228	2.3605	0.0101
Exploitation	0.145				
		Perceived CIO Role Effectiveness			
			0.38	5.66	0
Exploration	0.247				
		Perceived CIO Role Effectiveness	0.497	7.51	0

In the second step, the product interaction terms of the independent variables (three leadership styles, transformational, contingent reward and passive avoidant leadership) and the moderator (perceived technical skills of the CIO) were added to the previous model. The results of the analysis are shown below in figure 5.14

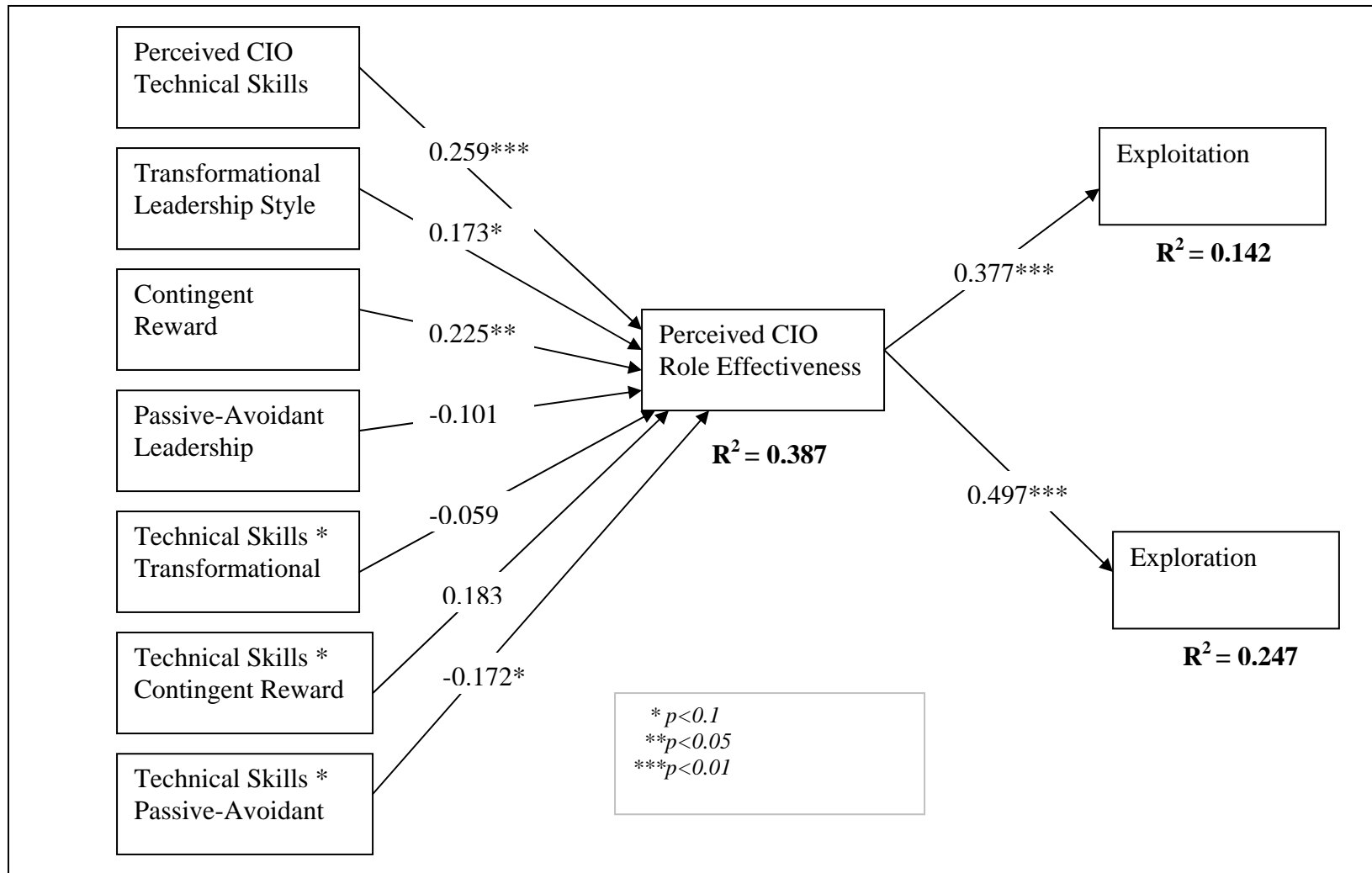


Figure 5.14 Structural Models with Interactions

The R-Square values, path coefficients, t-value and the significance values are presented in the table below.

Table 5.12 Analysis of Structural Model with Interactions

Construct	R-Square	Independent Variables	Beta Coefficient	T-value	p-value
Perceived CIO Role Effectiveness	0.387				
		Transformational leadership	0.173	1.34	0.0917
		Contingent Reward	0.225	1.74	0.0425
		Passive-Avoidant leadership	-0.101	1.24	0.109
		Perceived Technical Skills of CIO	0.259	2.34	0.0107
		Technical Skills * Transformational	-0.059	0.29	0.3862
		Technical Skills * Contingent Reward	0.183	1.01	0.1575
		Technical Skills * Passive-Avoidant	-0.172	1.3	0.0983
Exploitation	0.142				
		Perceived CIO Role Effectiveness			
			0.38	5.31	0
Exploration	0.247				
		Perceived CIO Role Effectiveness	0.497	7.91	0

Test of Hypotheses

The above analysis tested three hypotheses pertaining to the organizational level model, that is, hypotheses 1, 2 and 5.

H1: Transformational behaviors (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration) will be more positively associated with perceived CIO role effectiveness. Transformational leadership ($\beta = 0.163$, t-value = 1.352 (p-value 0.089)) and passive-avoidant leadership ($\beta = -0.091$, t-value = 1.368 (p-value 0.087)) were both weak predictors, whereas contingent reward ($\beta = 0.257$, t-value = 2.16 (p-value 0.0165)) was a stronger predictor of perceived CIO role effectiveness.

H2: There is a positive relationship between perceived CIO role effectiveness and IT ambidexterity. Perceived CIO role effectiveness had a strong positive relation with exploitation ($\beta = 0.38$, t-value = 5.66 (p-value 0)) and exploration ($\beta = 0.497$, t-value = 7.51 (p-value 0)).

H5: CIO technical knowledge will positively moderate the relationship between leadership style and perceived CIO role effectiveness. That is, the effect of leadership style on CIO role effectiveness will be greater when the CIO has higher levels of technical knowledge. None of the interaction terms were significant, except the interaction of technical skills and passive-avoidant leadership which was only mildly significant (p-value of 0.098).

We further examined the interaction of perceived technical skills and leadership styles. As per the suggestion of Chin (2003), we calculated the overall effect size f^2 of the interaction using the formula $f^2 = [R^2 \text{ (interaction model)} - R^2 \text{ (main model)}] / [1 - R^2 \text{ (main model)}]$. The calculation yielded an effect size of 0.07. Effect sizes of 0.02, 0.15 and 0.35 are benchmarks of small, medium and large effects (Cohen, 1988). Thus the

interaction had only a small effect size. The following table summarizes the results of the hypotheses testing.

Table 5.13 Summary of Hypothesis Testing

	Hypothesis	Result
H1	Transformational behaviors (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration) will be more positively associated with perceived CIO role effectiveness.	Not Supported (Contingent Reward more Positive)
H2	There is a positive relationship between perceived CIO role effectiveness and IT ambidexterity.	Strongly Supported
H5	CIO technical knowledge will positively moderate the relationship between Leadership style and perceived CIO role effectiveness.	Not Supported

5.5.2 Individual Level Outcomes Model

92 individuals filled the survey for the individual outcomes level model. Respondents to the individual level outcomes model were IT workers. Of the 73 questions, any response with more than 8 missing values was discarded from the data analysis. None of the responses met this criterion. Thus, we ended up with a final usable sample size of 92.

5.5.2.1 Data Preparation

There were a total of 4 non-responses in the data set in the variables of interest in the study. These were coded as -1. PLS Graph tool allows the coding of a global missing value. The data was also examined for outliers using the technique suggested by Hair et al (1995), where standardized scores for the variables are examined. A score of 3 or more implies that an outlier is present. We did not find any outliers in the dataset.

As with the organizational level model, technical skills were measured with eight items, we averaged the scores on these items in order to arrive at a score for technical skills. The score for each of the nine leadership styles was calculated as the average of the responses to four items, consistent with the scoring guidelines of the MLQ. Thus, we ended up with 20 variables in the final analysis, apart from the control variables.

Table 5.14 Constructs and Indicators

Constructs	Number of Indicators
Technical Skills	1
Leadership Style	9
Leader-Member Exchange Relationship	7
Job Satisfaction	3
Total	20

5.5.2.2 Characteristics of Respondents for Individual Outcomes Model

The following is the profile for respondents for Individual Outcomes Model

Table 5.15 Profile of Respondents for Individual Outcomes Model

Measure	Item	Frequency	Percent
Gender	Male	53	57.61%
	Female	39	42.39%
	No Response	0	0.00%
Age	20 – 30	38	41.30%
	31 – 40	28	30.43%
	41 – 50	14	15.22%
	51 – 60	10	10.87%
	60+	1	1.09%
	No Response	1	1.09%
Reporting To	Project/IT Manager	74	80.43%
	Business/Systems Analyst	1	1.09%
	IT Staff	7	7.61%
	Other	10	10.87%
Number Of Years In The IT Profession	1 – 5	33	35.87%
	6 – 10	32	34.78%
	11 – 15	13	14.13%
	16 – 20	5	5.43%
	20 +	9	9.78%
	No Response	0	0.00%
Number Of Years In The Current Job Position	1 – 5	72	78.26%
	6 – 10	10	10.87%
	11 – 15	6	6.52%
	16 – 20	2	2.17%
	20 +	0	0.00%
	No Response	2	2.17%
Number Of Years Of Functional Experience	0	33	35.87%
	1 – 5	31	33.70%
	6 – 10	9	9.78%
	11 – 15	2	2.17%
	16 – 20	7	7.61%
	21 +	10	10.87%

Table 5.15 - continued

	Item	Frequency	Percent
Organization's Primary Industry	Banking/Financial Services	18	19.57%
	Biotechnology and Pharmaceutical	2	2.17%
	Computer Related	19	20.65%
	Consulting Services	4	4.35%
	Engineering/Manufacturing	4	4.35%
	Government	0	0.00%
	Healthcare	13	14.13%
	Manufacturing	1	1.09%
	Retail	2	2.17%
	Telecommunications	9	9.78%
	Transportation and Logistics	0	0.00%
	Other	20	21.74%
	No Response	0	0.00%
Number Of Employees In The Organization	1 – 100	12	13.04%
	101 – 500	9	9.78%
	501 – 1000	9	9.78%
	1000- 2000	5	5.43%
	2001 – 5000	33	35.87%
	5001 – 10000	3	3.26%
	10000 +	17	18.48%
	No Response	4	4.35%
Number Of Employees In The IT Department	1 – 100	50	54.35%
	101 – 500	31	33.70%
	501 – 1000	2	2.17%
	1001- 2000	3	3.26%
	2001 – 5000	2	2.17%
	5001 – 10000	0	0.00%
	10000 +	1	1.09%
	No Response	3	3.26%
CIO Tenure	1 – 5	61	66.30%
	6 – 10	10	10.87%
	11 – 15	4	4.35%
	16 – 20	2	2.17%
	21 +	4	4.35%
	No Response	11	11.96%

Of the 92 respondents who did not report to top management, 53 (57.61%) were males and 39 (42.39%) were females. Figure 5.15 shows the gender distribution.

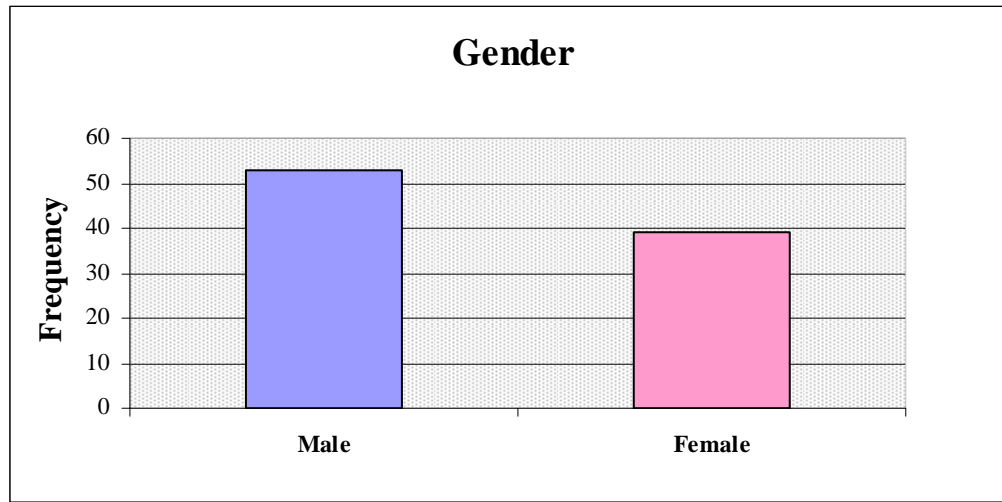


Figure 5.15 Gender Distribution

The respondents' ages ranged from approximately 22 years to 61 years. 38 (41.30%) were between the ages of 20 and 30; 28 (30.43%) were between the ages of 31 and 40; 14 (15.22%) were between the ages of 41-50; 10 (10.87%) were between the ages of 51-60; 1 (1.09%) were above 60 years old, and 1 (1.09%) did not respond to this question. Figure 5.16 shows a graphical representation of the respondents' age distribution.

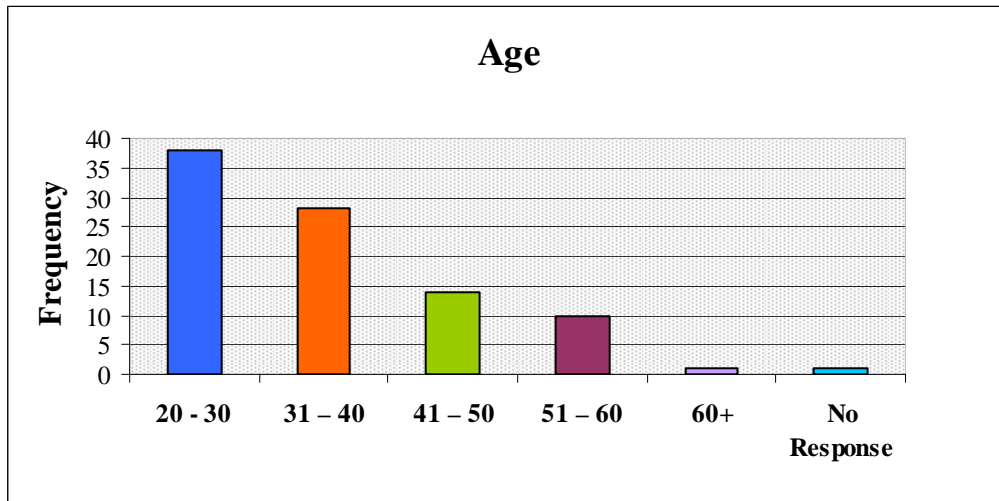


Figure 5.16 Age Distribution

The respondents' reported to the following management designations: 74 (80.43%) reported to the Project/IT manager; 1 (1.09%) to the Business/Systems analyst; 7 (7.61%) to IT staff; and 10 (10.87%) to other designations. Figure 5.17 shows a graphical representation of the distribution of who the respondents report to.

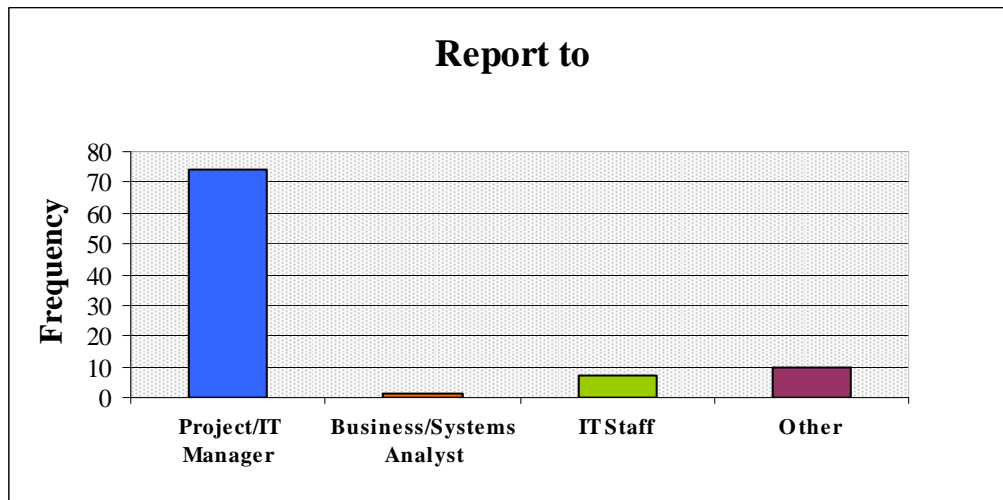


Figure 5.17 Distribution of Designations of Whom the Respondents Report to

The respondents' number of years of total IT experience ranged from approximately 1 year to 37 years. 33 (35.87%) had 1 - 5 years of IT experience; 32 (34.78%) had 6 - 10 years of IT experience; 13 (14.13%) had 11 - 15 years of IT experience; 5 (5.43%) had 16 - 20 years of IT experience and 9 (9.78%) had more than 20 years of IT experience. Figure 5.18 shows a graphical representation of the distribution of the number of years of IT experience that the respondents had.

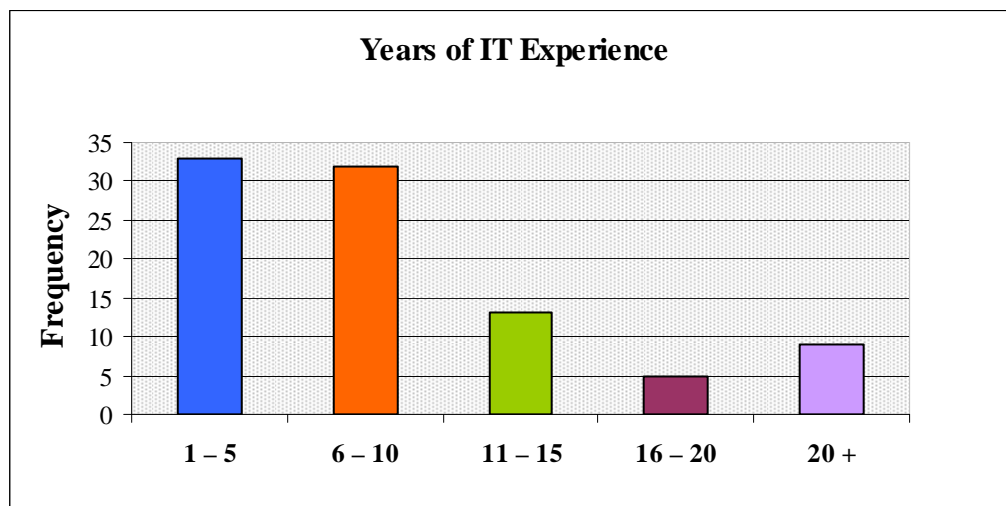


Figure 5.18 Distribution of IT Experience

The number of years that the respondents have been working in their current position ranged from approximately 0.3 year to 19 years. 72 (78.26%) have been working in their current job for 1 - 5; 10 (10.87%) for 6 - 10 years; 6 (6.52%) for 11 - 15 years; 2 (2.17%) for 16 - 20 years and 2 (2.17%) did not respond to this question. Figure 5.19 shows a graphical representation of the distribution of the number of years that the respondents have worked in their current jobs.

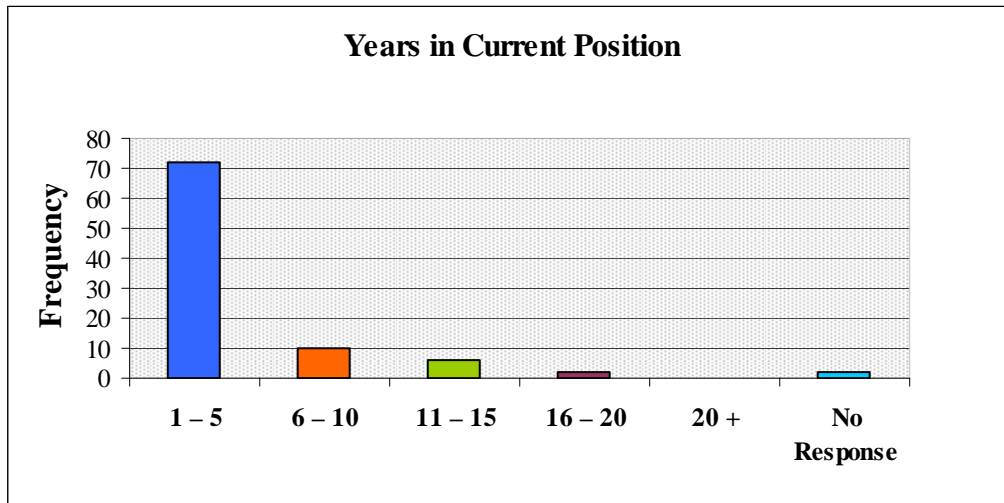


Figure 5.19 Distribution of Number of Years in Current Position

The number of years of functional experience the respondents have ranged from approximately 0 year to 39 years. 31 (33.70%) had 1 - 5 years of functional experience; 9 (9.78%) had 6 - 10 years of functional experience; 2 (2.17%) had 11 - 15 years of functional experience; 7 (7.61%) had 16 - 20 years of functional experience; 10 (10.87%) had more than 20 years of functional experience, and 33 (35.87%) did not respond to this question. Figure 5.20 shows a graphical representation of the distribution of the number of years of functional experience that the respondents had.

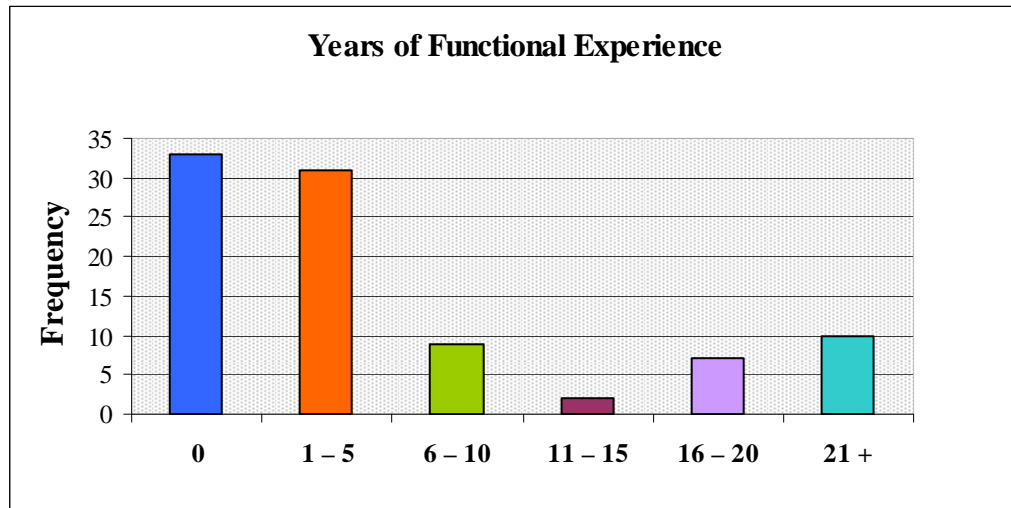


Figure 5.20 Distribution of Number of Years of Functional Experience

18 (19.57%) of the respondents worked in the banking/financial services industry, 2 (2.17%) in biotechnology and pharmaceutical industries, 19 (20.65%) in computer related industries, 4 (4.35%) in consulting services, 4 (4.35%) in engineering and manufacturing industries, 13 (14.13%) in healthcare, 1 (1.09%) in manufacturing, 2 (2.17%) in retail, 9 (9.78%) in telecommunications and 20 (21.74%) worked in other industries. Figure 5.21 shows a graphical representation of the industries that the respondents worked in.

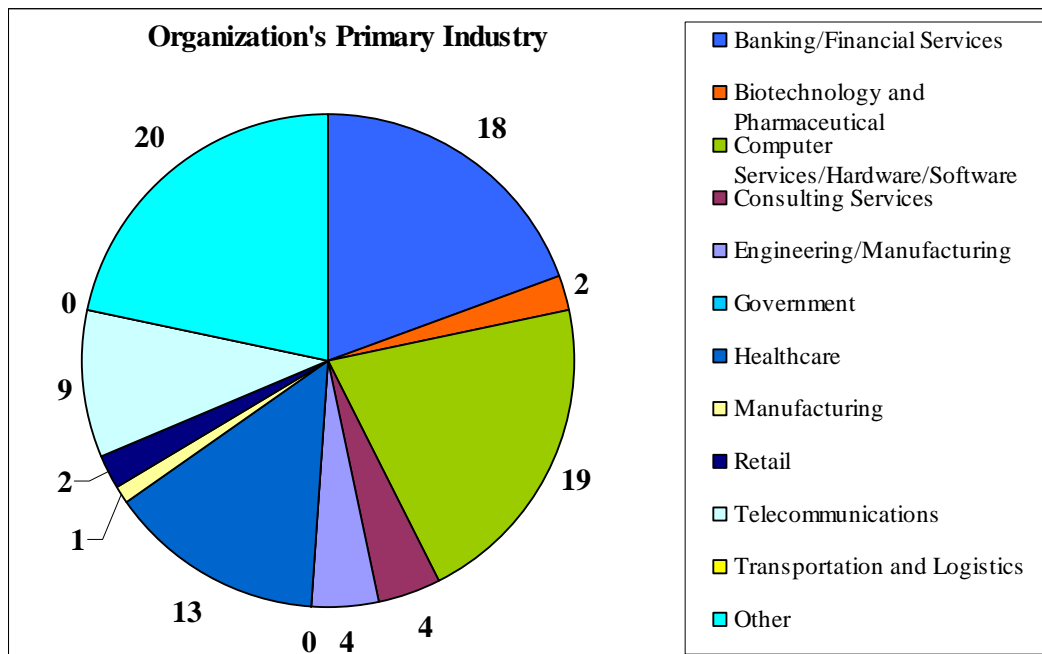


Figure 5.21 Distribution of Respondents' Organization's Primary Industry

12 (13.04%) of the respondents' organization had up to 100 employees, 9 (9.78%) had up to 500 employees, 9 (9.78%) had up to 1,000 employees, 5 (5.43%) had up to 2,000 employees, 33 (35.87%) had up to 5,000 employees, 3 (3.26%) has up to 10,000 employees, 17 (18.48%) had more than 10,000 employees and 4 (4.35%) of the respondents did not answer this question. Figure 5.22 shows a graphical representation of the number of employees that are in the respondent's organization.

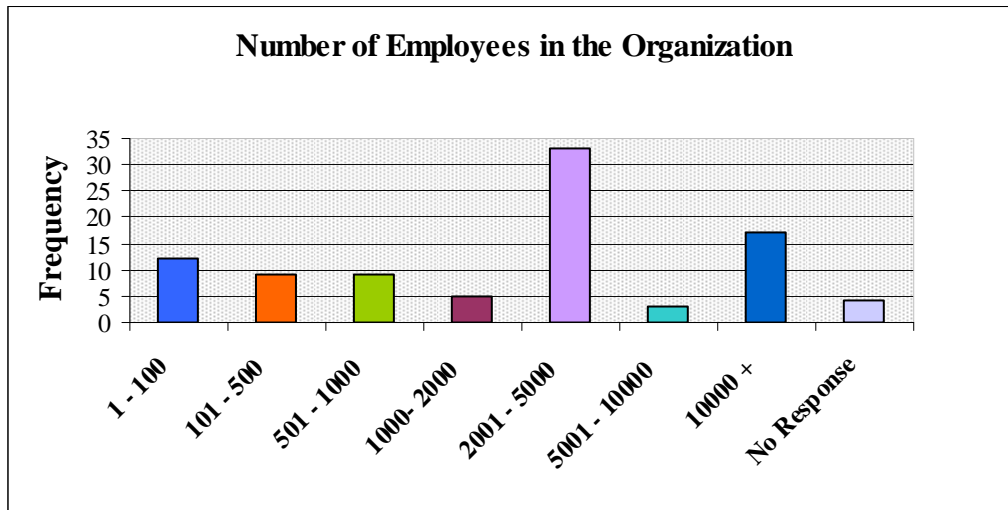


Figure 5.22 Number of Employees in Respondent's Organization

50 (54.35%) of the respondents' organization had up to 100 employees in the IT department, 31 (33.7%) had up to 500, 2 (2.17%) had up to 1,000 employees, 3 (3.26%) had up to 2,000 employees, 2 (2.17%) had up to 5,000 employees and 1 (1.09%) of the respondents did not answer this question. Figure 5.23 shows a graphical representation of the number of employees that are in the IT department of the respondent's organization.

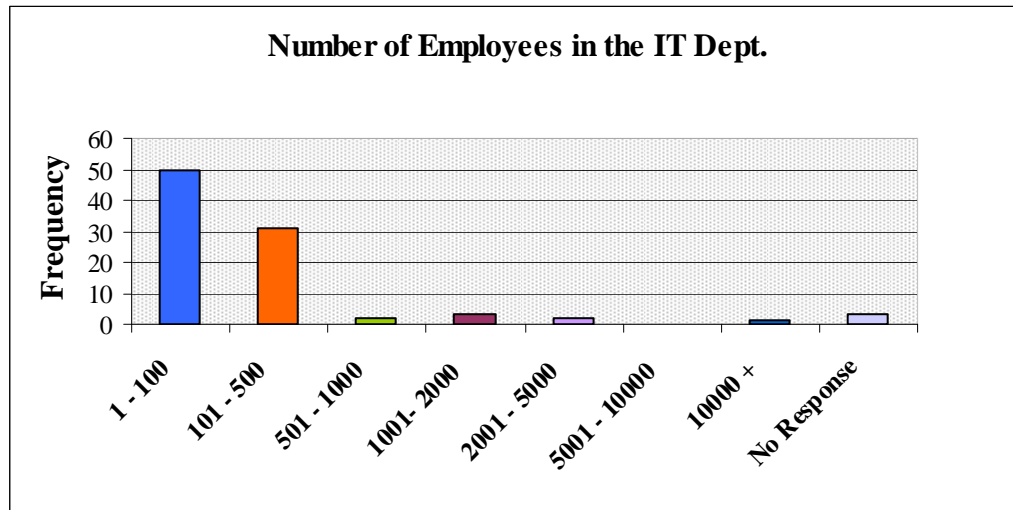


Figure 5.23 Number of Employees in the IT Department

61 (66.3%) of the respondents had CIOs that had been in tenure for up to 5 years in their organization, 10 (10.87%) had tenure of up to 10 years, 4 (4.35%) had tenure of up to 15 years, 2 (2.17%) had tenure of up to 20 years, 4 (4.35%) had more than 20 years and 11 (11.96%) of the respondents did not answer this question. Figure 5.24 shows a graphical representation of the number of years of tenure the CIO has in the respondent's organization.

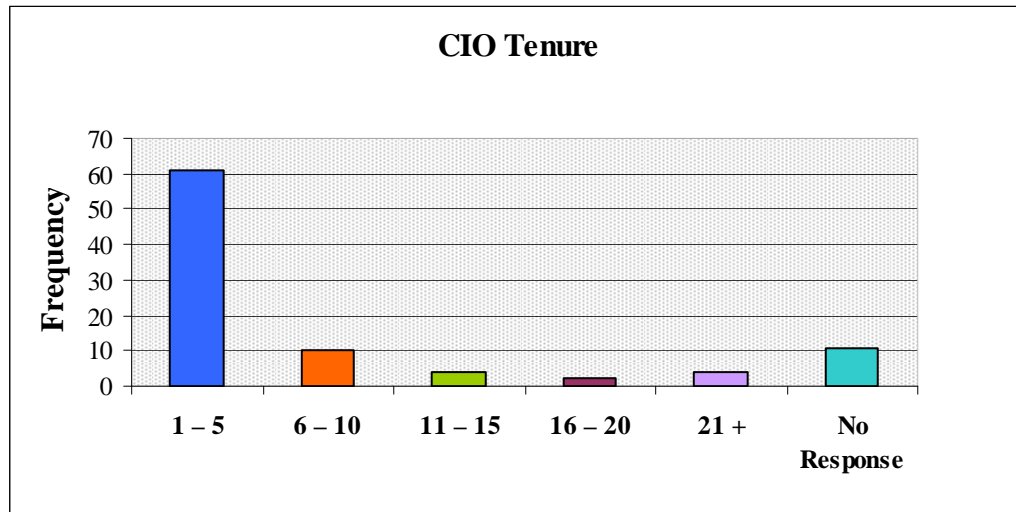


Figure 5.24 CIO Tenure

5.5.2.3 Control Variables Analysis

A total of eight control variables were used to examine the direct effects on leader-member exchange relationships. Managerial and technical orientations were calculated as the average of the responses to three items each. All the other control variables were single item responses. PLS Graph was used, and the nine control variables were included as independent variables into the model. None of the control variables were significant at the 0.1 level, except age which was significant. Thus, only age of the respondent was retained for the final analysis. The t-values are provided in the table below.

Table 5.16 T-Statistics for Control Variables

Control Variable	T-statistic	p-value(2 tail)
Managerial orientation	1.1563	0.25
Technical orientation	1.6154	0.11
Age	2.5592	0.01
IT Experience	1.5398	0.13
Tenure	1.673	0.10
Number of IT employees in Organization	0.2216	0.83
Functional Experience	0.9398	0.35
Number of employees in Organization	0.6947	0.49

5.5.2.4 Analysis of the Individual Level Model

We used the same procedure outlined in the analysis of the organizational level model to assess convergent and discriminant validity. Partial Least Squares (PLS Graph, version 3.00) was used to assess convergent validity. An initial PLS run with bootstrapping procedure (200 resamples) generated weights, loadings, composite reliabilities, average variance extracted (AVE) and t-values for each measurement item in relation to its theorized construct. The loadings for each measurement item were analyzed. Only one indicator, MBEA, was dropped because it failed to meet the acceptable levels of 0.7 (Chin, 1998).

Just as the organizational level model, MBEP weights and loadings were negative when used with contingent reward, and was highly correlated with laissez faire leadership. Therefore, since the factor structure was similar to the organizational model, we decided to use the same three factor structure, after combining laissez faire and MBEP leadership styles. We named the three factors extracted as transformational, contingent reward and passive-avoidant leadership.

Table 5.17 Weights and Loadings

Construct	Indicators	Weights	Loadings	Standard Error	T-value
Leader Member Exchange Relationship	LMX1	0.1383	0.7684	0.0563	13.6522
	LMX2	0.1723	0.8154	0.0367	22.2105
	LMX3	0.181	0.888	0.0218	40.7873
	LMX4	0.1963	0.8744	0.0275	31.7456
	LMX5	0.1605	0.7652	0.0584	13.1008
	LMX6	0.1642	0.8	0.0594	13.4673
	LMX7	0.1854	0.8997	0.0217	41.5361
Transformational	IC	0.2493	0.8872	0.0234	37.9804
	IATTR	0.2687	0.9003	0.0211	42.6248
	IBEH	0.1902	0.8314	0.0384	21.6494
	IM	0.1989	0.8655	0.0277	31.2044
	IS	0.2347	0.8802	0.0361	24.3784
Job Satisfaction	JSAT1	0.5536	0.9272	0.0194	47.7532
	JSAT2	0.4093	0.8143	0.0626	13.0072
	JSAT3	0.2088	0.7346	0.0929	7.9091
Passive-Avoidant	MBEP	0.3932	0.8268	0.0804	10.2874
	LF	0.7102	0.9503	0.019	50.0578
1. Only those constructs that are made up of two or more indicators are displayed. Single indicator constructs, technical skills and contingent reward leadership have a loading and weight of 1.0. 2. T-values are for Loadings.					

The table below lists the composite reliabilities and the Average variance extracted for each construct. As can be seen below, the values are above the recommended thresholds of 0.8 for reliability and 0.5 for the average variance extracted, assuring convergent validity.

Table 5.18 Composite Reliability and Average Variance Extracted

Construct	Composite Reliability	Average variance Extracted
Leader Member Exchange Relation	0.940	0.692
Transformational leadership	0.941	0.763
Job Satisfaction	0.867	0.687
Passive-Avoidant leadership	0.884	0.793

To determine discriminant validity, we computed item-construct loadings using the technique recommended by Gefen et al. (2005). Table 5.19 presents the loadings and cross loadings. Examination of the loadings and cross-loadings indicate that all the items load highly on their own construct than on other constructs.

Table 5.19 Item Construct Loadings and Cross Loadings

	Contingent Reward	Transformational Leadership	Job Satisfaction	LMX	Passive- Avoidant	Technical Skill
CR	1	0.791	0.408	0.658	-0.44	0.293
IATTR	0.67	0.872	0.455	0.735	-0.57	0.606
IBEH	0.655	0.788	0.379	0.511	-0.374	0.449
IC	0.753	0.87	0.398	0.645	-0.497	0.389
IM	0.745	0.843	0.417	0.545	-0.46	0.429
IS	0.665	0.867	0.491	0.64	-0.445	0.479
JSAT1	0.483	0.557	0.889	0.568	-0.291	0.299
JSAT2	0.251	0.347	0.835	0.419	-0.334	0.139
JSAT3	0.303	0.324	0.697	0.241	-0.198	0.126
LMX1	0.482	0.411	0.316	0.768	-0.339	0.348
LMX2	0.581	0.586	0.487	0.809	-0.454	0.374
LMX3	0.494	0.587	0.496	0.856	-0.439	0.335
LMX4	0.65	0.682	0.519	0.86	-0.521	0.383
LMX5	0.451	0.478	0.316	0.6	-0.429	0.279
LMX6	0.495	0.612	0.385	0.778	-0.476	0.402
LMX7	0.621	0.653	0.424	0.879	-0.455	0.369
MBEP	-0.3	-0.356	-0.209	-0.298	0.779	-0.372
LF	-0.42	-0.535	-0.358	-0.54	0.946	-0.256
TechAvg	0.293	0.538	0.239	0.416	-0.337	1

Next, we conducted an AVE analysis shown in Table 5.20. The bolded diagonal elements in the table represent the square root of the AVE scores. The off-diagonal elements are the correlations between constructs. As can be seen, the square root of AVE values range from 0.83 to 1. AVE for each construct is significantly larger than any correlations involving the construct. That is all constructs share greater variance with their own measures than with other constructs in the model, thus establishing discriminant validity.

Table 5.20 AVE Analysis

	Age	Technical Skill	Contingent Reward	Transformational Style	Passive-Avoidant	LMX	Job Satisfaction
Age	1						
Technical Skill	0.069	1					
Contingent Reward	-0.055	0.365	1				
Transformational Style	-0.122	0.596	0.818	0.873			
Passive-Avoidant	0.002	-0.332	-0.37	-0.466	0.891		
LMX	0.057	0.486	0.735	0.765	-0.481	0.832	
Job Satisfaction	0.016	0.297	0.448	0.522	-0.359	0.54	0.83

Validation of structural model was accomplished with PLS-Graph version 3.0. The model was setup in PLS as per the guidelines given in the PLS-Graph Users Guide (Chin, 2001). Missing data were replaced with a “-1”. Following Chin (Chin, 1998), bootstrap resampling method (200 iterations) that uses randomly selected sub-samples, was employed to estimate the theoretical model and hypothesized relationships. The sample for this model was 92, and meets the sample size requirement of 70. Since the individual level model contains interaction effects to be examined, we will use the same procedure outlined in the organizational level model analysis. The results of the analysis are shown below in figure 5.25.

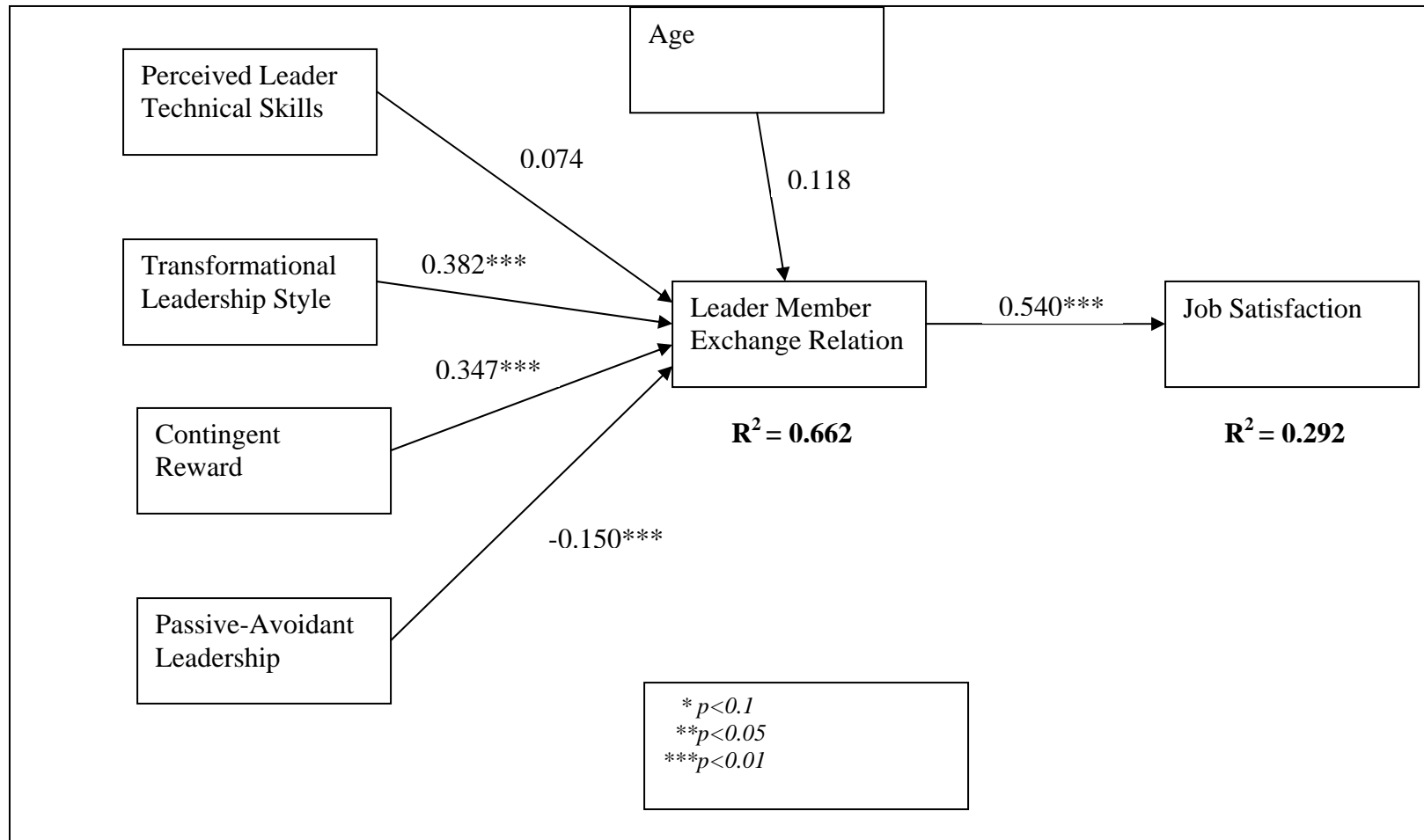


Figure 5.25 Structural Model

The R-Square values, path coefficients, t-value and the significance values are presented in the table below.

Table 5.21 Analysis of Structural Model

Construct	R-Square	Independent Variables	Beta Coefficient	T-value	p-value
Leader Member Exchange Relation	0.662				
		Age	0.118	1.4756	0.143503
		Technical Skill	0.074	0.9694	0.167458
		Contingent Reward	0.347	3.2996	0.000692
		Transformational Style	0.382	2.8436	0.002754
		Passive-Avoidant Style	-0.150	2.5636	0.006
Job Satisfaction	0.292				
		Leader Member Exchange Relation	0.540	7.0188	0

* All p-values are one tail, except for age, which is two-tail

In the second step, the product interaction terms of the independent variables (three leadership styles, transformational, contingent reward and passive-avoidant leadership) and the moderator (perceived technical skills of the leader) were added to the previous model. The results of the analysis are shown below in figure 5.26.

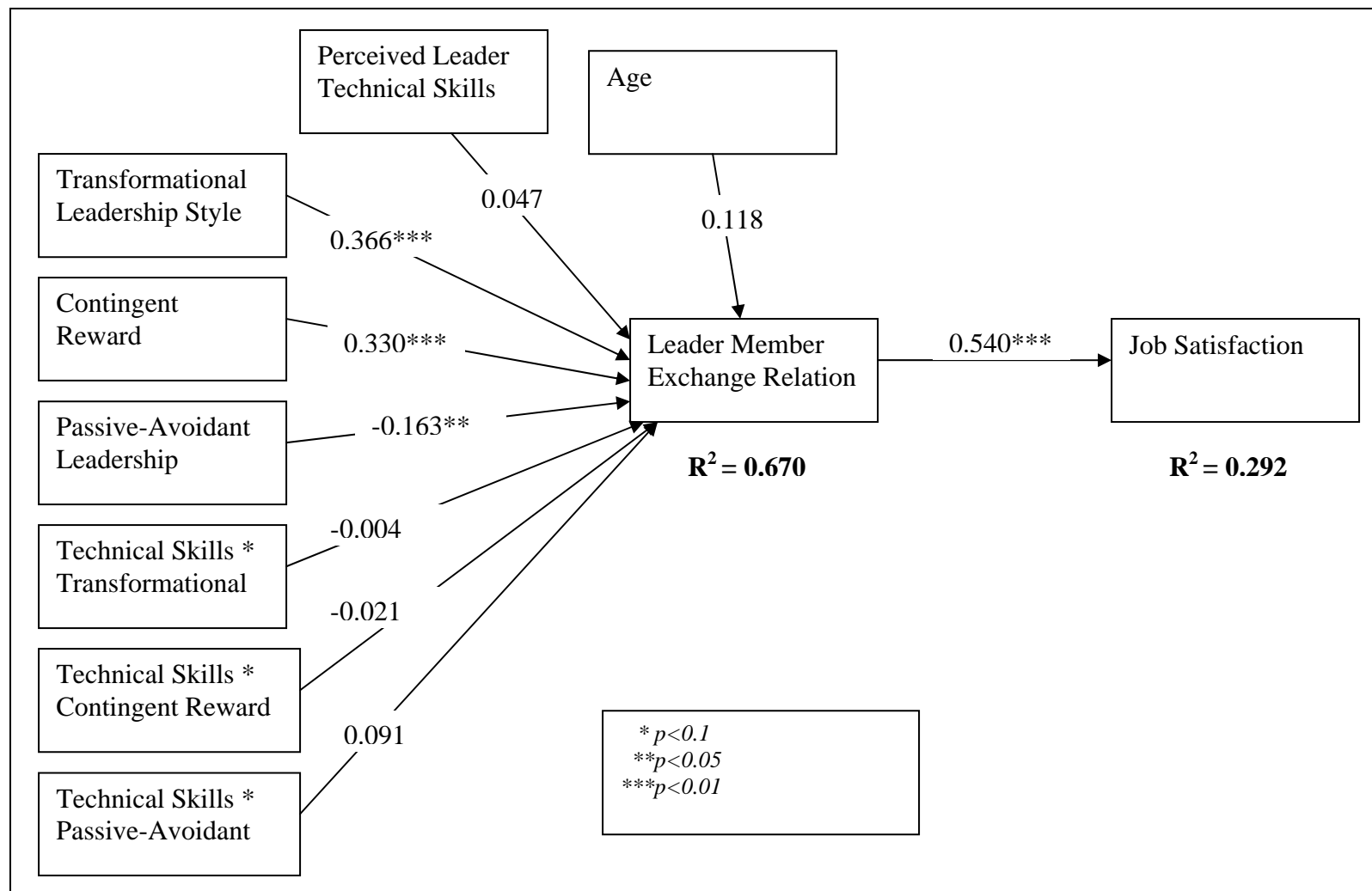


Figure 5.26 Structural Model with Interactions

The R-Square values, path coefficients, t-value and the significance values are presented in the table below.

Table 5.22 Analysis of Structural Model with Interactions

Construct	R-Square	Independent Variables	Beta Coefficient	T-value	p-value
Leader Member Exchange Relation	0.670				
		Age	0.118	1.3117	0.192921
		Technical Skill	0.047	0.5838	0.2804
		Contingent Reward	0.330	2.9277	0.002157
		Transformational Style	0.366	2.5691	0.005912
		Passive-Avoidant Style	-0.163	1.957	0.026706
		Technical Skills * Contingent Reward	-0.021	0.1507	0.440273
		Technical Skills * Transformational	-0.004	0.0239	0.490492
		Technical Skills * Passive-Avoidant	0.091	1.0494	0.148387
Job Satisfaction	0.292				
		Leader Member Exchange Relation	0.540	7.0188	0

* All p-values are one tail, except for age, which is two-tail

Test of Hypotheses

The above analysis tested three hypotheses pertaining to the organizational level model, that is, hypotheses 3, 4 and 6.

H3: Transformational and contingent reward behaviors will be positively related to leader–follower exchange relationships, whereas management by exception (active and

passive) and laissez faire behaviors will be negatively related to leader–follower exchange relationships. Transformational leadership ($\beta = 0.382$, t-value = 2.84 (p-value 0.002)) and contingent reward ($\beta = 0.347$, t-value = 3.29 (p-value 0.000)) were both positive and significant in predicting leader-member exchange relationship. Also passive-avoidant leadership ($\beta = -0.150$, t-value = 2.56 (p-value 0.006)), which comprises laissez faire and Management by Exception Passive indicators, negatively affected leader-member exchange relationship.

H4: The leader-member exchange quality will be positively related to the general job satisfaction of the subordinate. Leader-member exchange relationship ($\beta = 0.540$, t-value = 7.01 (p-value 0.000)) had a strong positive relation to job satisfaction.

H6: Leaders technical knowledge will positively moderate the relationship between leadership style and leader-member exchange relationship. None of the interaction terms between leadership style and leader’s technical skill were significant.

The following table summarizes the results of the hypotheses testing.

Table 5.23 Summary of Hypothesis Testing

	Hypothesis	Result
H3	Transformational and contingent reward behaviors will be positively related to leader–follower exchange relationships, whereas management by exception (active and passive) and laissez faire behaviors will be negatively related to leader–follower exchange relationships.	Strongly Supported
H4	The leader-member exchange quality will be positively related to the general job satisfaction of the subordinate.	Strongly Supported
H6	Leaders’ technical knowledge will positively moderate the relationship between leadership style and leader-member exchange relationship.	Not Supported

CHAPTER 6

DISCUSSIONS AND CONCLUSIONS

6.1 Discussion of the Results

The objective of this research was to examine the effects of leadership style in IT. Specifically, we examined the effects of leadership style of the CIO on perceptions of the CIO's role effectiveness and IT ambidexterity. We also examined the individual outcomes of leadership style on leader-member exchange relationship and job satisfaction, using respondents who report lower in the organization. Transformational leadership theory was used as the primary theoretical lens in this research (Bass, 1988; Bass, 1985; Bass et al., 1990; Bass et al., 1993).

6.1.1 Organizational Level Model

Transformational leadership style and passive-avoidant leadership style were found to have a positive and negative relationship with perceived CIO role effectiveness, respectively. Contingent reward behavior was the strongest and most significant predictor of perceived CIO role effectiveness. All three leadership styles explained 34% of the variance in CIO role effectiveness. Our first hypothesis, which posited that transformational leadership will be the strongest predictor of perceived CIO role

effectiveness, was not supported. Thus, this result contradicts the assertion by Bass that transformational leadership will be effective in all situations (Bass, 1997).

The result supports the conclusions of some researchers who argue that situation may moderate the relationship between leader behavior and effectiveness (Hersey et al., 1969; Hersey et al., 1982; Hersey et al., 1988). This result is also in line with the conclusions of Judge et al. (2004), who found contingent reward to be more effective in business settings. The IT field has been characterized by higher wages and turnover than other fields. In addition, stock options available to IT professionals purportedly make millionaires of software workers overnight. Until various socio-economic factors stabilize salaries to levels that are comparable to other fields, contingent reward may be the strongest indicator of an IT worker's assessment of his leader.

Perceived CIO role effectiveness strongly predicted both ambidexterity constructs of exploration as well as exploitation. The percentage of variance explained in exploration and exploitation was 25% and about 15% respectively. An effective CIO will not only try and use existing capabilities, but will also create and explore new and strategic opportunities. This supports the argument that effective executive leadership will focus on balancing the imperatives of exploiting current capabilities as well as developing new ones (Levinthal et al., 1993).

We hypothesized technical skills to moderate the relationship between leadership style and role effectiveness of the CIO. The results do not support this hypothesis. The effect size of the interaction was small, 0.07. However, perceived technical skills had a significant and direct positive impact on perceptions of CIO role effectiveness. Thus, technical skills seem to be important and necessary for a CIO to be

effective. This is in line with the notion that technical skills are necessary but not sufficient for CIOs to be effective (Enns et al., 2003; Kwak, 2001; Pemberton, 1992; Taggart et al., 1979).

6.1.2 Individual Level Model

Hypothesis 3 posited a positive relationship between transformational and contingent reward leadership styles and leader-member exchange relationship; and a negative relation between management by exception and laissez faire leadership styles, and leader-member exchange relations. The results show strong support for this hypothesis. Furthermore, the amount of variance explained by leadership style in leader-member exchange relation was high, at about 66%.

While all three were significant in the posited direction, transformational leadership was the strongest. The results seem to support the arguments of the transformational leadership theory in general. Thus, a transformational leader may be better at forging high quality exchange relationships with subordinates. This result is consistent with previous findings that have shown a strong positive relation between exchange relationships and transformational leadership behavior (Basu et al., 1997; Gerstner et al., 1997; Howell et al., 1999; Kent et al., 2001).

The results also show a strong relationship between exchange relationship and overall job satisfaction. This is in line with findings in other contexts that have shown a strong positive relation between exchange relationships and general job satisfaction (Gerstner et al., 1997; Kacmar et al., 1999; Wilhelm et al., 1993). Given that LMX has been shown to have a positive impact on citizenship behavior and subordinate

performance (Wang et al., 2005b), and also that transformational leadership significantly predicts LMX, transformational leadership may improve performance among IT employees and may also have a positive impact on the morale of the average IT worker.

We did not find any support for the hypothesis predicting technical skills to moderate the relationship between leadership style and LMX. This result is consistent with the results of respondents who report to the CIO. Further, technical skills do not show even a direct effect on leader-member exchange relationship. Thus, exchange relationships between leader and subordinate may be influenced by leadership behaviors, but not by subordinate perceptions of skills of the leader.

At both levels, the results of the relative effects of technical skills are interesting. Technical skills did not moderate the relationship between leadership style and CIO role effectiveness, as well as the relationship between leadership style and exchange relationships. Technical skills did not have a direct effect on exchange relationships, but had a positive effect on CIO role effectiveness. While the effects of technical skills are studied at two different levels, the results indicate that perceived technical skills only impact ratings of leader effectiveness. Thus, perceptions of low leader technical skills may not hinder the subordinate to forge exchange relationship with the leader.

Transformational leadership was a stronger predictor of exchange relations, compared to contingent reward. However, contingent reward was stronger in predicting CIO role effectiveness. This finding may point to the moderating effect of the level of the subordinate in the organization. Prior research at multiple levels have shown that transformational leadership effects are stronger at all levels (Kane et al., 2000). The findings may have been confounded, since it was conducted in an army setting. Future

research that measures the effect of leadership style on the same dependent variable, across different levels in a business setting may help clarify this issue.

6.2 Contributions

6.2.1 *Contributions to Theory*

The effect of leadership in the organization has been an important area of scholarly research. However, leadership in IT has been largely ignored by researchers. Despite the enormous importance of leadership of the CIO, it has received scant attention in scholarly research. Organizations are encountering hyper-competitive environments, and success seems to hinge on the strategy that they adopt. The importance of IT in such an environment cannot be overstated. Indeed, IT ambidexterity - concurrently pursuing exploitative and explorative IT behaviors - is pivotal in this organizational quest. The importance of CIO leadership has often been stressed (Brown et al., 2003; Feeny et al., 1998). Despite this, there has been very little theory-based, empirical research that examines CIO leadership and its effects.

Research in IT has also ignored the impact of leadership on individual outcomes, such as job satisfaction. Research has consistently shown that job satisfaction often leads to better job performance and citizenship behaviors. An explicit examination of the impact of leadership on individual outcomes has also been lacking in IS research. Since IT workers are knowledge workers, control oriented monitoring measures may be ineffective. Instead, leadership may help increase motivation, thereby increasing effort and citizenship behaviors.

This research contributes to theory and research in the following ways.

- While prior leadership research in IS has looked only at certain subset of leadership behaviors, we examine the impacts of full range of leadership behaviors in the IT context.
- We examine the arguments of transformational leadership theory that transformational leadership behaviors will be effective in all contexts. Our results indicate that contingent reward behavior may be more effective on software professionals who are higher up in the organization, and who report to the IS executive. Our results provide implicit support for the situational leadership theory, in that leadership behaviors may have different impacts depending on the level of the subordinate in the organization.
- We also contribute to research by developing two new scales. New scales were developed in this study for the measurement of CIO role effectiveness and technical skills. While previous scales exist, they are context specific or lengthy. We thus, contribute to research by developing parsimonious scales for the measurement of CIO role effectiveness and technical skills.
- While an effective CIO is desirable, how such effectiveness can be measured is not clear in IS literature. IT ambidexterity may serve to be the yardstick by which to measure effectiveness of the CIO.

6.2.2 *Contributions to Practice*

Leadership in IT is increasingly gaining importance. Today, there are many seminars conducted by practitioners that deal exclusively with leadership in the IT context (e.g., IBM, American Management Association etc.). This indicates the high relevance of leadership in the management of IT in the organization. The results of this study can help practitioners in the following ways.

- The IT field is characterized by high rates of failure. Effective leadership behavior, if employed, can impact this failure rate and may also help to raise the citizenship behavior and morale of the software worker.
- Software workers are knowledge workers. Given that the IT field has high rates of turnover; organizations may be paying a price for this high turnover, which may not be implicitly realized. Transformational leadership can also help reduce the high levels of turnover among software professionals.
- Managers need to forge high quality exchange relationships with subordinates. This will have a positive impact on the subordinate's task accomplishment and citizenship behavior.
- Contingent reward has shown a strong effect at both levels in this study. IT departments need to make sure that the remuneration and expectations of the subordinates match. Bad paymasters may indeed lead to underperforming or unmotivated workers.

- Technical skills are important for the CIO to be perceived as being effective. Thus, CIOs need to be skilled not only in management and business issues, but must also keep up with technical issues.

6.3 Limitations

As is true for most research, this study has some limitations. These limitations arise due to many factors including measurement and choice of methodology. The study used cross-sectional data. Inferring causality therefore, is a problem. However, the study is based in well-grounded theory and thus, the risk of inferring causality is acceptable. Also, we conducted our survey online. Although online surveys are resource efficient, some criticisms include the fact that there may be a possibility of non-respondent bias. This argument mainly stems from the general populations' lack of computer self efficacy. However, since the respondents to this survey are software professionals, this may not be a factor in this study. Responses were collected from single respondents, and therefore the existence of common method bias cannot be ruled out.

Perceptions of effective leadership behavior may be impacted by culture. This study was conducted only in the United States, and thus may not be generalizable to other cultures. Finally, we used PLS to analyze the data. PLS allows for lower sample sizes to be used without the loss of power. However, a larger sample size could have made it possible for covariance based methods such as LISREL to be used.

6.4 Future Directions

Future studies should look at the impacts of leadership styles on leader effectiveness at various levels in the same organization. This will clarify the contention of

situational leadership theory. Another interesting question is the impact of IT ambidexterity on firm performance. An IT department that explores new opportunities, as well as exploits existing ones may contribute strategically to the organization.

Although the positive effects of leader-member exchange relations and job satisfaction on citizenship behaviors have been examined in other contexts, these need to be replicated in the IT area. Case studies need to be conducted to gain deeper insight into the leadership phenomenon in IT.

6.5 Conclusions

The IT area is unique in the challenges it faces as evidenced by the high rates of failure of software projects. While better management and strategy may help, positive leadership may hold the greatest promise in reducing such problems. Although both researchers and practitioners have stressed on the importance of leadership in the IS context, what is lacking is an effort that identifies effective leadership.

We conducted this study in order to clarify the role of leadership in IT, and its effects on the individual and the organization. We used the transformational leadership theory, which measures the full range of leadership behaviors, and examined its impact on two levels. Using a field survey of 190 respondents at two levels, we examined the effect of transformational, contingent reward, and passive leadership behaviors. Positive leadership behavior, such as transformational and contingent reward, impact not only individual outcomes such as job satisfaction, but also organizational variables such as IT ambidexterity. An absence of leadership has been shown to have negative implications.

Overall, this study set out to examine leadership in the IT context. The results advance our understanding of the issue of managing software professionals. Also, the result of this study has implications for CIOs. The CIO position is characterized by a great degree of challenge. CIOs need to ensure adequate commitment from their subordinates, in order to implement their strategic vision. Positive leadership may do just that. Also, CIOs need to ensure that they are perceived to possess technical knowledge by the subordinates. Failure to do so may impact buy-in of the subordinates into the strategic vision of the CIO.

By examining the effects of leadership style at the individual and organizational level, our research model has served to develop a comprehensive understanding of leadership in IT, yielding useful insights to researchers and practitioners. These insights could be used to improve the management of software professionals by IS managers in general, and CIOs in particular.

APPENDIX A

QUESTIONNAIRE FOR RESPONDENTS WHO REPORT TO TOP MANAGEMENT



Thank you for participating in this survey. Your knowledge and opinions are highly valued.

To be entered in the drawing for one of the **five iPod Shuffles**, you must complete the entire survey by July 8th.



All responses will be kept completely confidential. Responses will be saved in a manner where there will be no way to link responses to specific individuals (you may contact the Office of Research Compliance 817-272-3723 at University of Texas- Arlington regarding confidentiality.) ; ;

If you have any questions please contact Kishen Iyengar by calling 817-272-3584 or e-mailing kiyengar@uta.edu

Please enter your email address below so we can immediately send you a link to the protected survey. Please check your email NOW to receive the link, click on it, and start the survey. Thank you very much!

The link to the survey is being sent to your email to conform to university regulations. Your email will neither be stored, nor linked to your responses in any way.



An Email has been sent to the address specified. Please use the [link](#) in the email to access the Survey.



Survey of Leadership in Information Technology

Directions: Please answer the following questions regarding yourself, your job and your organization. The term "Organization", is defined as the business unit that your IT department is serving.

1	Age	<input type="text"/>	Years
2	Gender	Male	<input type="button" value="v"/>
3	Job Title	<input type="text"/>	
4	Who do you report to? *	Select -	<input type="button" value="v"/>
5	Is the person you report to, the lead role in charge of IT in your organization?	Yes	<input type="button" value="v"/>
6	How many years have you been in the IT profession?	<input type="text"/>	Years
7	How many years have you been in the current job position?	<input type="text"/>	Years
8	Approximately how many employees are in your IT department?	<input type="text"/>	
9	How many years of functional (non IT) experience do you have?	<input type="text"/>	Years
10	What is your Organization's primary industry?	Select -	<input type="button" value="v"/>
11	Approximately how many employees are in your Organization?	<input type="text"/>	
12	What is the tenure of the CIO in your organization?	<input type="text"/>	Years
13	On an average per day, how often do you interact with your CIO?	0-2 times	<input type="button" value="v"/>
<input type="button" value="Go to Survey"/>			

Directions: For the person you report to, please indicate the **level of understanding** he/she has of each of the following types of information technologies by selecting one of the responses. We define "understanding" as broad-based general knowledge (rather than specific "hands-on" skill) that facilitates his/her ability to apply IT strategically in the organization.

Knowledge/understanding of the following areas:		High Understanding	Moderate Understanding	Neutral	Less Understanding	No Understanding
1	Business Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Data Mining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Database Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Systems Development Methodologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Enterprise Systems (ERP, CRM, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	Programming Languages (Java, C++, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	Web/Internet Technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Directions: Below is a series of statements that broadly describe the career orientations of an individual. Please indicate **the importance of the statement as it applies to you** by selecting the appropriate response.

Importance of career orientation:		Not Important	Neutral	Very Important
1	The process of supervising, leading and controlling people at all levels is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Remaining in my specialized area as opposed to being promoted out of my area of expertise is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	To be in charge of the whole organization is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Remaining in my area of expertise throughout my career is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	To rise to a high position in general management is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Not True	Neutral	Very True
6	I will accept a management position only if it is in my area of expertise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Directions: The following are general expectations that apply to a CIO/IS executive's role. Based on your observation, please indicate the **extent to which your CIO is meeting these expectations**

	Outstanding	Excellent	Satisfactory	Could be better	Expectations not met
1 Our CIO develops effective IT strategic plan that supports overall strategic organizational goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Our CIO negotiates and ensures delivery of outsourcing contracts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Our CIO ensures quality, compatibility and security of organizational data, architecture and systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Our CIO makes sure that we can quickly absorb and apply knowledge gained from functional area users, as well as learning from past IT projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Our CIO provides constructive performance feedback and incentives for us to upgrade our skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Our CIO effectively communicates with all concerned parties, including top management and users, during implementation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Our CIO is innovative in developing new systems that meet the changing requirements of the organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Directions: For the following questions, please **consider all completed projects, directed by the current CIO** over the last 5 years which you are familiar with. For these projects, please answer the questions using the scale provided.

The projects I am familiar with.....	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 Improved the functionality of an existing system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Used proven technology that we had used before	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Led to reduced business operating costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Improved existing business processes/products and services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Used new technology that we had not used before	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Resulted in a new and radically improved system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Led to new products or services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 Opened up new markets for our products/services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<div>Continue</div>					

80% Completed



Directions: Below is a series of statements that broadly **describe the behavior of a leader**. Please indicate whether you agree or disagree with the statement **as it applies to the person you report to**, by selecting the appropriate response.

The person I report to...	Not At All	Once in a while	Sometimes	Fairly Often	Frequently if not Always
1 Provides me with assistance in exchange for my efforts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Re-examines critical assumptions to question whether they are appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Fails to interfere until problem becomes serious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Focuses attention on irregularities, mistakes, exceptions and deviations from standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Avoids getting involved when important issues arise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Talks about his/her most important values and beliefs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Is absent when needed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 Seeks differing perspectives when solving problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Talks optimistically about the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Instills pride in me for being associated with him/her	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 Discusses in specific terms who is responsible for achieving performance targets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 Waits for things to go wrong before taking action	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

90% Completed



Directions: Below is a series of statements that broadly **describe the behavior of a leader**. Please indicate whether you agree or disagree with the statement **as it applies to the person you report to**, by selecting the appropriate response.

	The person I report to...	Not At All	Once in a while	Sometimes	Fairly Often	Frequently if not Always
13	Talks enthusiastically about what needs to be accomplished	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	Specifies the importance of having a strong sense of purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	Spends time teaching and coaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	Makes clear what one can expect to receive when performance goals are achieved	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	Shows that he/she is a firm believer in "If it ain't broke, don't fix it."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	Goes beyond self-interest for the good of the group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	Treats me as an individual rather than just as a member of a group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	Demonstrates that problems must become chronic before taking action	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21	Acts in ways that build my respect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22	Concentrates his/her full attention on dealing with mistakes, complaints and failures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23	Considers the moral and ethical consequences of decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24	Keeps track of all mistakes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

100% Completed



Directions: Below is a series of statements that broadly **describe the behavior of a leader**. Please indicate whether you agree or disagree with the statement **as it applies to the person you report to**, by selecting the appropriate response.

The person I report to...	Not At All	Once in a while	Sometimes	Fairly Often	Frequently if not Always
25 Displays a sense of power and confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26 Articulates a compelling vision of the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27 Directs my attention toward failures to meet standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28 Avoids making decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29 Considers me as having different needs, abilities and aspirations from others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30 Gets me to look at problems from many different angles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31 Helps me to develop my strengths	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32 Suggests new ways of looking at how to complete assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33 Delays responding to urgent questions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34 Emphasizes the importance of having a collective sense of mission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35 Expresses satisfaction when I meet expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36 Expresses confidence that goals will be achieved	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue



Thank You for completing the survey

To be entered in the drawing for the iPod Shuffles, please enter your e-mail address below. This email address will be kept confidential and will only be used to contact the winners of the iPod Shuffle Drawing. It will in no way be linked to your survey responses.

Email :

Submit

APPENDIX B

QUESTIONNAIRE FOR RESPONDENTS WHO DO NOT REPORT TO TOP MANAGEMENT



Thank you for participating in this survey. Your knowledge and opinions are highly valued.

To be entered in the drawing for one of the **five iPod Shuffles**, you must complete the entire survey by July 8th.



All responses will be kept completely confidential. Responses will be saved in a manner where there will be no way to link responses to specific individuals (you may contact the Office of Research Compliance 817-272-3723 at University of Texas- Arlington regarding confidentiality.) ; ;

If you have any questions please contact Kishen Iyengar by calling 817-272-3584 or e-mailing kiyengar@uta.edu

Please enter your email address below so we can immediately send you a link to the protected survey. Please check your email NOW to receive the link, click on it, and start the survey. Thank you very much!

The link to the survey is being sent to your email to conform to university regulations. Your email will neither be stored, nor linked to your responses in any way.



An Email has been sent to the address specified. Please use the [link](#) in the email to access the Survey.



Survey of Leadership in Information Technology

Directions: Please answer the following questions regarding yourself, your job and your organization. The term "Organization", is defined as the business unit that your IT department is serving.

- 1 Age Years
- 2 Gender
- 3 Job Title
- 4 Who do you report to? *
- 5 Is the person you report to, the lead role in charge of IT in your organization?
- 6 How many years have you been in the IT profession? Years
- 7 How many years have you been in the current job position? Years
- 8 Approximately how many employees are in your IT department?
- 9 How many years of functional (non IT) experience do you have? Years
- 10 What is your Organization's primary industry?
- 11 Approximately how many employees are in your Organization?
- 12 What is the tenure of the CIO in your organization? Years
- 13 On an average per day, how often do you interact with your CIO?

[Go to Survey](#)

Directions: For the person you report to, please indicate the **level of understanding** he/she has of each of the following types of information technologies by selecting one of the responses. We define "understanding" as broad-based general knowledge (rather than specific "hands-on" skill) that facilitates his/her ability to apply IT strategically in the organization.

Knowledge/understanding of the following areas:		High Understanding	Moderate Understanding	Neutral	Less Understanding	No Understanding
1	Business Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Data Mining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Database Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Systems Development Methodologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Enterprise Systems (ERP, CRM, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	Programming Languages (Java, C++, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	Web/Internet Technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Directions: Below is a series of statements that broadly describe the career orientations of an individual. Please indicate **the importance of the statement as it applies to you** by selecting the appropriate response.

Importance of career orientation:		Not Important	Neutral	Very Important
1	The process of supervising, leading and controlling people at all levels is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Remaining in my specialized area as opposed to being promoted out of my area of expertise is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	To be in charge of the whole organization is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Remaining in my area of expertise throughout my career is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	To rise to a high position in general management is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Not True	Neutral	Very True
6	I will accept a management position only if it is in my area of expertise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Directions: For the following 7 descriptive statements about **your relationship with the individual you report to**, please select the appropriate answer using the given scales.

- 1 Do you know where you stand with your leader... do you usually know how satisfied your leader is with what you do?
☐ Rarely ☐ Occasionally ☐ Sometimes ☐ Fairly Often ☐ Very Often
- 2 How well does your leader understand your job problems and needs?
☐ Not a Bit ☐ A Little ☐ A Fair Amount ☐ Quite a Bit ☐ A Great Deal
- 3 How well does your leader recognize your potential?
☐ Not at All ☐ Little ☐ Moderately ☐ Mostly ☐ Fully
- 4 Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve your problems in your work?
☐ None ☐ Small ☐ Moderate ☐ High ☐ Very High
- 5 Again, regardless of the amount of formal authority that your leader has, what are the chances that he/she would "bail you out" at his/her expense?
☐ None ☐ Small ☐ Moderate ☐ High ☐ Very High
- 6 I have enough confidence in my leader that I would defend and justify his/her decision if he/she were not present to do so?
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
- 7 How would you characterize your working relationship with your leader?
☐ Extremely Ineffective ☐ Worse than Average ☐ Average ☐ Better than Average ☐ Extremely Effective

Continue

Directions: Please answer the following questions regarding **your current job**, using the scale given below

Job Satisfaction:	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1 Generally speaking, I am very satisfied with this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I frequently think of quitting this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I am generally satisfied with the kind of work I do in this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

80% Completed



Directions: Below is a series of statements that broadly **describe the behavior of a leader**. Please indicate whether you agree or disagree with the statement **as it applies to the person you report to**, by selecting the appropriate response.

The person I report to...	Not At All	Once in a while	Sometimes	Fairly Often	Frequently if not Always
1 Provides me with assistance in exchange for my efforts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Re-examines critical assumptions to question whether they are appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Fails to interfere until problem becomes serious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Focuses attention on irregularities, mistakes, exceptions and deviations from standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Avoids getting involved when important issues arise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Talks about his/her most important values and beliefs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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10 Instills pride in me for being associated with him/her	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Continue

90% Completed



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16	Makes clear what one can expect to receive when performance goals are achieved	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	Shows that he/she is a firm believer in "If it ain't broke, don't fix it."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Continue

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Continue



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Email :

Submit

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BIOGRAPHICAL INFORMATION

Kishen Iyengar is a doctoral candidate in the information systems area at the University of Texas at Arlington. He received his masters in information systems from the University of Texas at Dallas. Prior to that, he received an MBA with dual specialization in marketing and information systems from Osmania University in India. He also earned a bachelor's degree in mathematics and computer science from the same institution. He has taught information systems and statistics at the University of Texas at Arlington for a period of two years. His research interests include CIO/IS executive, IT outsourcing and Knowledge management.