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# IT governance in small and medium enterprise post Sarbanes Oxley

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# IT GOVERNANCE IN SMALL AND MEDIUM ENTERPRISES POST SARBANES OXLEY

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## DEDICATION

This manuscript is dedicated to my children: Landrii Marie, Carlos Mayo, and Taylor and my ancestors who were not afforded the opportunity to attain a formal education. While your engineering degree may have eluded you, John Stilly Mayo, this doctorate will not! This is for you granddaddy. I realize that I have been tasked with the responsibility to build upon the foundation laid by my maternal grandparents and mother. I accept that responsibility and challenge the future generations of my family to exceed the expectations Kerii and I have for them. Never, never, never let anyone determine your limitations. *You* be the master of your fate!

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## ABSTRACT

The history of IT governance research has been dichotomous in that research either focused on the IT governance structural arrangements or the contingencies that affect IT organizational decisions. Weill and Ross's (2004) seminal text on IT governance represents a synthesis of these two streams of research and thus establishes a new trajectory in the discourse related to IT governance. Their study included analysis from both survey data and case studies. However, the case study sites included were of large capitalized companies. Moreover, the cases were conducted prior to the mandated implementation of Section 404 of Sarbanes Oxley (SOX), which oversees the requirements for companies to ensure they have adequate controls in place to safeguard financial data and reporting. Compliance efforts with SOX have disproportionately impacted the finances of small publicly traded companies; consequently, the compliance efforts of small and medium publicly traded companies may differ from that of large companies.

Most small companies have taken SOX seriously and complied with the requirements mandated by the legislation by implementing the controls that demonstrate that the organization has reasonable assurance of governance over the company's IT function. Still other small companies have chosen to use SOX as a catalyst for systemic change throughout the company's IT function. While the latter may seem the logical progression of a company's IT governance effort, that is not always the case. This study seeks to understand the reasons behind why some companies extend compliance efforts to invoke positive systemic change while others only do enough to comply with regulatory requirements. Using a multiple-case methodology, this study attempts to build upon the existing body of IT governance research by examining how the aforementioned IT governance concepts discussed by Weill and Ross are manifest in small and medium publicly traded companies. Additionally, the reason(s) why or why not those concepts may be present is examined using the theoretical lens of institutional theory. Findings of the study include an identification of

differences small and medium publicly traded companies and large publicly traded companies in establishing enterprise-wide IT governance.

# CHAPTER 1
# INTRODUCTION

## 1.1 Introduction

Information technology governance (IT governance) is defined as, "…the framework for decision rights and accountabilities to encourage desirable behaviors in the use of IT," (Weil and Ross, 2004). From a research perspective, the evolution of IT governance can be defined by three overarching phases: *IT governance structures*, *IT governance contingency influences*, and an amalgamation of the two aforementioned phases characterized as *contemporary IT governance frameworks* (Brown and Grant, 2005).

The first two streams of IT governance share similarities as well as contrasts in the topics they address. The IT governance structure stream of research focused mainly on the IT decision-making structures and mechanisms used by organizations. Topics in this stream of research focused on the decision-making dichotomy of centralized versus decentralized loci of IT decision making. Subsequent research attempted to extend the centralized/decentralized dichotomy by identifying additional factors related to the decision making process (Brown and Grant, 2005). While companies understood that centralization was the ultimate scenario in IT governance, the reality was that some degree of autonomy would need to be given to allow input from managers in IT decisions. The result often was a federated approach to IT governance where both centralized and decentralized advantages were leveraged by allowing some decisions to be made at the division level and others to be made by a governing body tasked solely with the responsibility of managing the IT function of the organization including governance.

The second stream of IT governance research, focused on which option is best for an organization given a set of organizational and environmental factors (Brown and Grant, 2005). This

stream focused on identifying contingency factors that affect individual IT governance success. Those contingencies included: organization size, psychological climate, organizational structure, quality of user/implementer relationships, business strategy, and type of industry. Later research identified antecedents to the four IT governance forms of highly centralized IT governance, highly decentralized IT governance, hybrid IT governance, and re-centralized IT governance. Those ten interacting antecedents included corporate vision, corporate strategy, overall firm structure, culture-business unit autonomy, strategic roles, senior management of IT, satisfaction of management of technology, satisfaction with use of technology, strategic grid of current/future applications, and locus of control for system approval/priority (Brown and Magill 1994).

Contemporary IT governance frameworks differ from earlier iterations of IT governance by two definitive research realizations: 1) there is agreement that contingency factors related to IT governance choices are fully identified (Brown and Magill 1994; Sambamurthy and Zmud, 1999) and 2) IT governance is not just a function of organizational design (Sambamurthy and Zmud, 2000). Weill and Ross's IT Governance Framework (2004) is an example of a contemporary IT governance framework that incorporates both the contingency factor in IT governance design and the refutation of IT governance being merely a function of organizational design.

In their framework, Weill and Ross extend the conventional thinking that the IT governance structure of an organization can only be centralized, decentralized, or a hybrid of the two. Instead, they assert that there are six governance structures available to companies:

- Business Monarchy- where IT decisions are made by executive level managers in the firm and excludes IT executives acting independently;
- IT Monarchy- where corporate IT professionals make the IT decision;
- Feudal- where business unit are autonomous in making decisions;

- Federal- where a hybrid decision making process includes input from executive management and business units;
- IT Duopoly- where IT executives and one other business group make IT decisions; and
- Anarchy- where each individual user makes her/his IT decisions (p. 59).

Weill and Ross (2004) demonstrate how organizational archetypes are assessed and characterized based on six key decisions including: IT decisions, IT principles, IT architect, IT infrastructure strategy, business application needs, and IT investment and prioritization. Additional factors identified by Weill and Ross (2004) for determining IT governance structure include strategic and performance goals, organizational structure, governance experience, size and diversity of the firm, and industry and regional differences (pp. 71-72). The intent of this study is to contribute to the body of knowledge dealing with IT governance by examining IT governance structures of publicly traded small and medium capitalized companies since the enactment of Sarbanes Oxley and identifying the drivers behind their choice of contemporary IT governance structure.

## 1.2 Problem Statement

The history of IT governance research has been dichotomous in that research either focused on the IT governance structural arrangements or the contingencies that affect IT organizational decisions. Weill and Ross's (2004) seminal text represents a synthesis of these two streams of research and thus establishes a new trajectory in the discourse related to IT governance. Their study included analysis from both survey data and case studies. However, the case study sites included were of large capitalized companies. Moreover, the cases were conducted prior to the mandated implementation of Section 404 of Sarbanes Oxley (SOX), which oversees the requirements for companies to ensure they have adequate controls in place to safeguard financial data and reporting. Compliance efforts with SOX have disproportionately impacted the finances of small publicly

traded companies. According to a survey conducted by the organization Financial Executives International (2007), during 2004 U.S. companies with revenues exceeding $5 billion spent 0.06% of their revenue on SOX compliance, while companies with less than $100 million spent 2.55% of revenue on SOX compliance efforts. After the initial compliance efforts, governmental entities were heavily lobbied to address the disproportionate financial burden felt by small companies; nevertheless, compliance standards were still mandated, especially those related to IT and data security. Noncompliance with SOX may result in a number of sanctions against a publicly traded company including stiff financial penalties for the company's executives as well as possible jail time for noncompliance or falsification of information. Ultimately, noncompliance may result in the company losing the confidence of investors, market share, and possibly being delisted from stock exchanges.

Most small companies have taken SOX seriously and complied with the requirements mandated by the legislation by implementing the controls that demonstrate that the organization has reasonable assurance of governance over the company's IT function. Still other small companies have chosen to use SOX as a catalyst for systemic change throughout the company's IT function. While the latter may seem the logical progression of a company's IT governance effort, that is not always the case. Understanding the reasons behind why some companies extend compliance efforts to invoke positive systemic change while others only do enough to comply with regulatory requirements is important in understanding the impact and limitations of government regulation on IT governance efforts in small and medium publicly companies. Brown and Grant (2005) echo this sentiment when they state that to understand the new paradigm of IT governance research advocated by Weill and Ross (2004) empirical analyses are needed to examine the implementation of the ideas discussed in their text (p.708). The intent of this study is to build upon the existing

body of IT governance research by examining how the aforementioned IT governance concepts discussed by Weill and Ross are manifest in small and medium publicly companies. Additionally, the reason(s) why or why not those concepts may be present is examined using the theoretical lens of institutional theory.

### 1.3 Research Questions

IT governance is defined as: "…the framework for decision rights and accountabilities to encourage desirable behaviors in the use of IT," (Weill and Ross, 2004). Within this definition lie three primary concepts that drive the focus of this study. The first concept, decision rights, focuses on who or what group(s) is responsible for the decision making process in an IT governance structure. The second concept, accountability framework, refers to the conceptual and literal mechanism used to assess who is responsible for specific areas within the IT function. The third and final concept, desirable behavior, refers to compliance actions that result from a combined impact from the accountability framework and the decision rights within the organization. Desirable behavior may be as simple as appropriate password nomenclature or as complex as identifying, implementing, and ensuring IT as a driver of every strategic initiative in an organization.

With the mandate of SOX compliance, publicly traded companies have had to demonstrate reasonable IT governance to a number of stakeholders including the Securities Exchange Commission, institutional investors, and their respective board of directors. Since IT governance may manifest differently in small and medium companies with more limited financial resources than larger more established companies, it is important to understand the influence of the factors that may affect IT governance efforts and IT governance maturity. Thus, the first research question is:

Research Question 1: How has IT governance in small and medium companies evolved since the enactment of Sarbanes Oxley?

The reasons associated with an organization's IT evolution or lack thereof can be linked to several antecedents. Brown and Magill (1994) identified ten interacting antecedents to IT governance including corporate vision, corporate strategy, overall firm structure, culture, strategic IT role, senior management of IT, satisfaction with management of IT, satisfaction with the use of technology, strategic grid of current/future applications, and locus of control for systems approval. While these antecedents influence a company's choice of IT governance structure they do not necessarily fully explain how or why an organization's IT governance structure changes or evolves from one form to another. Therefore, to acknowledge this reality this study applies institutional theory to examine how and why companies evolve their IT governance structures. This leads to the second research question:

Research Question 2: What institutional factors influence the evolution or change in IT governance in small and medium companies?

## 1.4 Overview of Research Framework

The research framework shown in Figure 1.1 provides a logical overview of the study. Theoretical support for the framework is provided in Chapter 3. The variable of interest in this study is the enactment and evolution of IT governance structure/archetypes. Based on IT governance literature it is argued that the IT governance structure of small and medium companies has evolved since the enactment of Sarbanes Oxley and that the current literature does not appropriately account for the impact of institutional forces in IT governance choices.

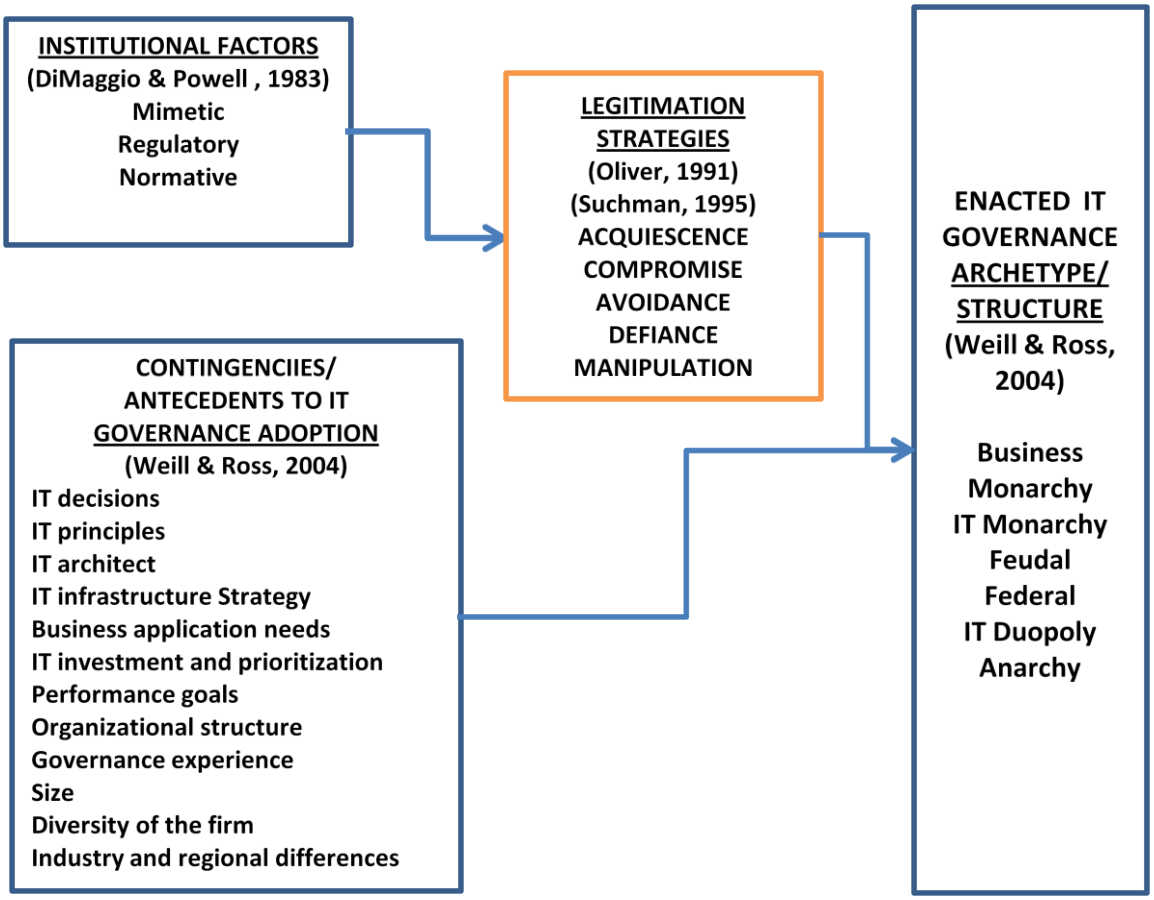



**Figure 1.1 Research Framework**

## 1.5 Overview of Research Methodology

The research model provides a summary of the different factors affecting IT governance archetype/structure evolution. A multiple site case research methodology was used to collect data. The use of the case study methodology has been well established in IS research (Walsham 2008; Klein and Myers1999; Orlikowski and Baroudi 1991; Benbasat et al. 1987). The interpretive paradigm is considered a suitable philosophical approach of case research for the present study. Case studies conducted within the interpretive paradigm have no defined dependent and independent variables but instead focus on the complexity of human sense-making as situations occur (Kaplan & Maxwell, 1994). The choice of sites and unit of analysis are discussed in detail in Chapter 3.

## 1.6 Organization of the Dissertation

This dissertation consists of five chapters. Chapter one presents and overview of the study including key components. Chapter two provides a survey of relevant literature on governance regulation, IT governance, and Institutional theory. Chapter three presents the research methodology including the case research methods chosen, an overview of qualitative research techniques used, and the rationale for the overall research method. Chapter four presents an analysis of data collected during the study, and Chapter five presents concluding remarks including implications and limits of the study and recommendations for future research.

# CHAPTER 2
# LITERATURE REVIEW

This chapter provides a description of terms and literature on the history of corporate governance, information technology governance, and institutional theory. Major legislation addressing corporate governance from the twentieth century is discussed. Information about the Sarbanes-Oxley act of 2002 is discussed in the context of new laws affecting IT governance. A discussion about institutional theory is provided with an extensive discussion of institutional theory in information systems research.

## 2.1 Corporate Regulations

### 2.1.1 The Securities Act of 1933 and the Securities and Exchange Act of 1934

The Securities Act of 1933 was implemented after President Franklin D. Roosevelt was inaugurated in an effort to address wide spread fraudulent activities in the banking and securities industry. At that time, it was the most sweeping legislation addressing the banking industry in an effort to protect investors from fraudulent activities. Essentially, this act mandated the divide between commercial banking and the securities industry. The Act also established the Securities and Exchange Commission (SEC) to oversee the implementation of the reforms. The Securities and Exchange Commission Act of 1934 was established to empower the SEC to regulate the securities industry including stock exchanges such as the National Association of Securities Dealers Automated Quotations (NASDAQ), the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), as well as other entities associated with the securities industry. The Act of 1934 also monitored and prohibited certain activities which provided the Commission with power to discipline and require publicly traded companies to meet certain reporting requirements to protect investors from trading and other fraudulent activities.

### 2.1.2 Foreign Corrupt Practices Act of 1977

In an effort to address transparency requirements in the Securities and Exchange Commission Act of 1934 and bribery of foreign officials by publicly traded companies, the Foreign Corrupt Practices Act of 1977 (FCPA) was enacted (Seitzinger, 1999). During the corporate investigations of the 1970s, U.S companies admitted making what ostensibly were bribes to government officials in foreign countries. The ultimate goal of this act, much like the SEC Act of 1934, was to again shore up the confidence of investors in the American business system. The Act specifically required companies whose securities are listed in the United States to make and keep accounting records that accurately convey the operations of the company. Additionally, the Act required that each company have an adequate system of internal controls (Seitzinger, 1999). In 1988, after repeated criticism of the Act from corporations, the FCPA was amended to provide no criminal liability for violations of the accounting standards set forth and to shield entities with minority ownership from responsibility of ensuring accounting practices (Seitzinger, 1999).

### 2.1.3 The Commission of Sponsoring Organizations of the Treadway Commission

A direct consequence of the FCPA's requirement of internal controls was the establishment of the Committee of Sponsoring Organizations of the Treadway Commission (COSO or Treadway Commission). This organization, founded in 1985, was a private initiative charged with the responsibility of establishing industry standards of mitigating operational risks in organizations (Committee of Sponsoring Organizations, 2008). In addition to establishing industry guidelines, the Treadway Commission is noted for being the first organization to establish an integrated framework which provided a common definition of internal control and specific techniques against which other companies could compare their internal control function.

The original COSO framework for internal control compliance is comprised of five major components: the control environment, risk assessment, control activities, information and communication and monitoring. Since its inception in 1992, the framework has been modified several times. The original framework served as a reference point for management to assess whether or not the organization's internal control system provided reasonable assurance to achieve the corporation's goals while complying with stated laws and regulations (SOX-Online Website, 2008). In 2004, after the onset of Sarbanes Oxley regulations, the Treadway Commission revised the framework and developed the Enterprise Risk Management (ERM) COSO Framework. This iteration of the COSO internal control framework consisted of the original five components with the addition of three new components: objective setting, monitoring, and information/communication (SOX-Online, 2008).

### 2.1.4 Sarbanes-Oxley Act of 2002

In response to the corporate scandals of 2000 and 2001, Congress reacted by establishing legislation to help mitigate further erosion of public trust in corporations. The Sarbanes-Oxley Act of 2002 (SOX), drafted by Senator Paul Sarbanes and U.S. Representative Michael Oxley implemented legislation that amended sections of the Securities Act of 1933 and the Securities and Exchange Act of 1934. SOX was signed into legislation on July 30, 2002, in an attempt to ensure investors that the integrity of information on financial statements of publicly traded companies. Additionally, SOX was to demonstrate internal control over business processes including the governance of each company's information technology function. The initial date in which companies had to be in compliance was phased in based on the size of the organization and additional criteria with all companies coming into compliance between November 15, 2004, and July 12, 2005.

Major provisions of SOX include: the establishment of the Public Company Accounting Oversight Board (PCAOB) to provide oversight of external auditors; independence of external auditors; independence of audit committee members; attestation of internal controls and documentation by the CFO and CEO; restrictions to prevent conflict of interests with investment brokerage analysts; authorization of the Securities Exchange Commission's appropriations; and criminal penalties for falsifying documents (Sarbanes-Oxley, 2002). The overarching themes associated with the provisions include: increased accountability, increased oversight, and increased internal control over financial reporting.

Section 404 of the Sarbanes Oxley Act of 2002 addresses management's assessment of internal controls within the organization. This section has an important impact on the IT governance of an organization. Section 404 mandates an annual evaluation of internal control and procedures for financial reporting. Many internal controls that companies implement to protect the integrity of financial reporting for SOX compliance also function as information technology controls.

## 2.2 Institutionalized IT Governance

Scott (2001) defines an institution as being "composed of cultural-cognitive, normative, and regulatory elements that, together with associated activities and resources, provide stability and meaning to life," (p.48). The three elements of institutionalization are ostensibly three conceptualizations of the process by which organizational structures and practices become a routine part of the organization, or *institutionalized*. The regulatory, normative, and cultural-cognitive perspectives provide insight on how a regulation may impact an organization's IT governance process.

In the regulative view of institutions, the source of organizational change is coercion to comply with external pressures, such as government regulation, that stem from an organization's

need to be perceived as legitimate (DiMaggio & Powell, 1983). Institutionalization is defined by Tolbert and Zucker (1983) as the process through which components of formal structure become widely accepted, as both appropriate and necessary to legitimate organizations. A basic tenet of institutional theory is that organizations seek legitimacy in order to gain critical resources; that is, the more skilled an organization is at attaining legitimacy, the more resources it will be able to secure from external stakeholders. Legitimacy is a generalized perception or assumption that actions of an entity are desirable, proper, or appropriate within some socially construed systems or norms, values, beliefs, and definitions (Suchman, 1995). Institutionalizing legitimate structures and practices enables an organization to display responsibility and avoid claims of negligence (Meyer & Rowan, 1977) by constituents internal and external to the organization that provide critical resources. The concept of structures refers to the actual design of the organization and it includes actual lines of communication and authority between administrative offices as well as the flows between them. Thus, organizations will institutionalize socially acceptable formal structures and practices in order to be perceived as legitimate by their constituents.

An assessment of organizations through the regulative perspective reveals that organizations governed by SOX have been coerced into implementing externally acceptable risk management structures, roles, policies and practices that establish accountability and protect financial reporting. Organizations in compliance with SOX gain legitimacy from external auditors and regulatory agencies such as the Securities Exchange Commission.

## 2.3 Institutional Theory

Institutional theory has evolved into a body of literature that encompasses multiple levels of analysis: nation, industry, organization, group, and individual. Research conducted using institutional theory spans the continuum of the aforementioned units of analysis. In these studies,

institutions are defined as the cognitive, normative and regulative structures and activities that provide stability and meaning in social behavior. The cognitive structures are the mental frameworks, beliefs, and assumptions shared by people about their shared purpose, work completed together, and mutual interactions. The normative element includes the standards and values that identify what is desirable and define what is expected of people as well as routine ways of completing tasks. The regulatory aspects of institutions include the formal rules that often develop, such as communication protocols and standard business practices.

While several organizational theories have evolved during the past thirty years (e.g., contingency theory, transaction cost theory, resource dependency theory, network theory, etc.), institutional theory arguably is the best suited theory to explain change within organizations because it represents one of the best theoretical perspectives within organizational theory (Perrow, 1979). Institutional theory is not usually regarded as a theory of organizational change, but rather as an explanation of the similarity (isomorphism) and stability of organizational arrangements in a given population of field or organizations (Greenwood & Hinings, 1996). Some organizational scholars have contended that institutional theory offers little guidance regarding change (Ledford, Morhman, & Lawler, 1989). Instead, these scholars contend that institutional theory supports the notion of institutional pressures that serve as a powerful force against transformational change (Buckho, 2004). Conversely, some scholars contend that institutional theory provides an excellent base to study change by first providing a convincing definition of radical change as opposed to convergent change. Second, they contend that institutional theory provides an indication of the contextual dynamics that precipitate the need for organizational adaptation (Oliver, 1991).

Organizations are comprised of social and cultural systems that are susceptible to external pressures (Scott, 2001). These external pressures often create expectations to which organizations

adopt and adhere. According to Greening and Gray (1994), institutional theory explains managerial action generated by external force. The external environmental demands can serve as the impetus for organizations to adopt roles in society and create appearances (Hatch, 1997), which may not be the original intention of the organization. As a result, organizational choices and actions are constrained and influenced by norms, habits, and customs of the environment (Oliver, 1997). This theoretical postulation is known as institutional theory as articulated by W. R. Scott (1981).

The primary view of institutional theory is that organizations operate in a social network and organizational practices are caused by and influenced through rules of thumb (Ingram and Simons, 1995). Selznick (1957) an originator of the institutional paradigm, suggests in his seminal writings that organizations are influenced by social behavior, norms, and values in their external environment. Moreover, institutional theory purports that social reality is created and defined by the environment in which the organization operates. This reality is created by the values and norms accepted in a particular environment. As a result, the social reality becomes the guideline for social behavior (Scott, 2005). In short, institutional theory helps to explain corporate behavior by identifying how organizations are influenced and molded by other organizations and environmental factors through conforming to standards set by the environment to survive and excel (Hoffman, 1997; Scott, 2001). The following is a description of the components of institutional theory.

### 2.3.1 Organizational Field

In institutional theory, an organizational field is defined as " organizations that constitute a recognized area of institutional life such as key suppliers, consumers, regulatory agencies, and other organizations that provide similar services or products," ( DiMaggio & Powell, 1983, p.148). Organizations are members of fields that contain similar organizations who compete against one another but who also share suppliers and customers. The organization field also contains

governmental agencies, professional and trade organizations, and the general public. Members of the organizational field have the capability to assert influence in the form of coercive measures, normative techniques, and cognitive elements.

### 2.3.2 Institutionalization

Selznick (1957) suggests that the process of something becoming institutionalized is the process by which a structure or organizational form becomes instilled with value. Specifically, Hoffman (1999) defines an institution as rules, norms, and beliefs that describe reality for the organization, explaining what is and what is not, what can be acted upon and what cannot. Therefore, something that is institutionalized is widely and unconditionally accepted by the external environment. Moreover, the external environment will create pressure for other organizations to accept the institutionalized norms, values, and practices. Something becomes institutionalized when it is well approved and commonly accepted by other organizations in the environment without question (Selznick, 1957; Zucker, 1977).

Institutionalization creates processes and structures that are appropriate and necessary (Tolbert & Zucker, 1983). Institutionalized rules in the modern society are responsible for the elaborate formal organizations that exist today. For example, Kirby and Kirby (1996) find evidence for institutionalization of social values among individual nations as the result of global pressures. However, organizations can also fail to adopt institutionalized activities. If this is the case, organizations are vulnerable to scrutiny of being negligent, irrational, or unnecessary . Institutionalized norms, values, and behaviors will need to be adopted in order for an organization to be recognized as part of the organizational field. The adoption of these activities is ostensibly the search for legitimacy.

### 2.3.3 Legitimacy

The heart of institutional theory is that organizations have the desire and need to adopt rules and processes created by the external environment that are beyond the control of the firm (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Legitimacy is defined as a perception that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995). Firms adopt institutionalized behaviors to become legitimate in their environment; however, conforming may have both positive and negative effects (Zucker 1977; DiMaggio & Powell, 1983).

Legitimacy is important for organizations in that it creates the perception of credibility, persistence, and meaningfulness within the environment. Efforts to create legitimacy often result in anticipated benefits in the form of increased resources and unanticipated benefits in the form of survival capabilities (Myer & Rowan, 1977; DiMaggio & Powell, 1983). Thus, an organization's pursuit of legitimacy can be perceived as an act to seek support and survival within its environment. However, striving for external legitimacy can often lead to unintended negative consequences. For example, organizations may seek social legitimacy over efficiency and profits (Suchman, 1995). Additionally, an organization's need to be perceived as legitimate may cause the adoption of practices and values that do not lend to efficiency and effectiveness in organizational processes.

### 2.3.4 Institutional Pressure and Isomorphism

The process by which an organization adopts similar practices, policies, and procedures of other organizations is known as isomorphism (DiMaggio & Powell, 1983). Isomorphic actions are developed by the set of environmental standards that force organizations to imitate one another; which ultimately leads to legitimization and acceptance by society (DiMaggio & Powell, 1983). Scott (2001) contends that by incorporating institutional rules with their own structure,

organizations become more homogeneous and more similar in structure over time. As organizations continue to develop and mature, they begin to apply pressure to other organizations resulting in isomorphic responses that are consistent with activities of similar organizations. As a result, all organizations operating in an environment, which are deemed legitimate, adhere to similar norms, values, and rules. According to DiMaggio & Powell (1983), isomorphism is the result of three types of external pressure: coercive, mimetic, and normative pressures.

Coercive pressures result from force, persuasion, and invitations to participate with other external environment members. Coercive institutional pressures often take the form of governmental regulations or laws. Hoffman (1997) discusses coercive pressure by describing how environmental strategies are primarily adopted through fear of legal sanctions. Other scholars have suggested that adopting voluntary environmental strategies, such as ISO 14001 certification improves the working relationship between organizations and governmental agencies and can result in higher levels of trust. Coercive pressure can also manifest in the form of customer driven pressure. For example, in adopting environmentally friendly practices and strategies, consumers can play a very important role in terms of what is expected of an organization. Consequently, customers create policies and procedures that are imposed upon organizations for adoption.

Ultimately, coercive pressure comes from those who have the ability to impose formal and informal pressure. Coercive pressure has been linked to governments, internal and external customers, and market forces (Teo et al., 2003; Darnell, 2006).

Normative pressure emanates from cultural values and societal norms. Cultural values are defined as conceptions of the preferred and desirable blended together with the construction of standards, whereby existing behavior can be compared (Scott, 1995). Societal norms specify how things should be done with the legitimate means to pursue the valued end (Scott, 1995).

Organizations often conform to established values and norms because of moral and ethical obligation; however, avoidance of regulatory oversight is often an additional motive. These pressures usually result in rules of thumb, education curriculum, standard operating procedures, and occupational standards (Hoffman, 1999).

DiMaggio and Powell (1983) identify the primary cultural expectation from normative pressure as being professionalization which is defined as the, "struggle of members of an occupation to define the conditions and methods of their work to control the production of the producers and to establish a cognitive base and legitimization for their occupational autonomy," (p.152). March and March (1977) found that professionalization impacted socially acceptable behaviors. The process of professionalization often begins in educational settings where individuals are exposed to a common body of knowledge, social networks, and/or trade associations. Social networks and trade associations formally and informally convey the standards for suitable behavior for professionals and in the process legitimize those who adhere to the identified standards.

Mimetic pressure is the third institutional pressure. This type of pressure results from an organization's desire to appear like other organizations by mimicking other organization's structures, practices, or outputs (Oliver, 1997). Mimetic pressure is often the result of environmental uncertainty, ambiguity in the achievement of organizational goals, and/or technological complexity. When new or problematic situations arise in the environment, organizations model themselves after other organizations that they believe are adequately managing their business to survive environmental conditions. Additionally, organizations that adopt practices that are deemed acceptable by the organizational field may insulate the organization from competitors.

## 2.4 Institutional Theory in Information Systems

Although institutional theory has its origins in the discipline of organizational studies (Scott, 2001), the theory has been used increasingly in studying information systems. The following is a description of information systems studies that have used institutional theory in some capacity. This section begins with a description of how the theory has been used to develop additional theoretical foundations in information systems and then proceeds to give descriptions of research focused on systems development, electronic commerce, information technology in a global context, technology adoption, and organizational change. The following sections provide a description of research on information systems literature that incorporate institutional theory

### 2.4.1 Theory and Research

Kling (1980) conducted empirical studies that examined the use of computers in organizations and public life. Specifically, this study examined the use of computers in the decision making process, how computers altered power relationships, and the impact on computers on personal privacy. Kling focuses his findings on contrasting two broad perspectives about the social world in which computing is embedded: systems rationalism and segmented-institutionalism. Systems rationalism includes the disciplines of managerial science, managerial rationalism, and systems theory. These approaches, Kling points out, are found to be the most helpful in stable settings when there is a consensus among stakeholders over the social values governing the environment. Conversely, Kling points out that segmented institutionalism as a theoretical lens is more appropriate for settings where there is social conflict rather than consensus. He further postulates that as the social world of computing becomes more ubiquitous, segmented institutionalism will be more appropriate as a theoretical lens for understanding the dynamics between groups and individuals who use computing technology.

DiMaggio and Powell's (1983) seminal article is one of the most cited papers in the use of institutional theory with over 6,500[1] citations in various social science disciplines, including information systems. The extent to which DiMaggio and Powell address technology in isomorphic change is limited to a cursory reference about how an organization's technology can impact the structural and behavioral characteristics (p. 283). Nevertheless, this paper is highly useful in understanding how institutionalism can be used as a lens for assessing the changes in organizations and specifically the technology functions within organizations. Their study on organizational homogeneity examines how attempts to rationalize organizations with different characteristics ultimately result in their homogenization. They point out that this is paradoxical and give three specific isomorphic reasons as to why different organizations eventually become homogeneous: process-coercion, mimetic, and normative measures. Through these three forces of isomorphism, DiMaggio and Powell develop several hypotheses about the impact of resource centralization, goal ambiguity, technical uncertainty, professionalization, and structuration. The authors also provide suggestions for social policy and organizational theories; specifically, the employment of institutional isomorphism in explaining the increasing homogeneity of organizations.

Robey and Boudreau (1999) discuss the differences in logic between contemporary social theories used in information systems research. They point out that the logic of the majority of IS social theories views information technology as a determinant or enabler of social change where technology is the force or driver of social change (p.168). Citing the works of authors such as Hirschheim (1985), Kling (1980), DeSanctis and Poole (1994), Orlikowski and Robey (1991) and Walsham (1993), this study provides an alternative to the deterministic model of causal logic: *a logic of opposition.* A logic of opposition is defined as logic which, "explains organizational change

[1] According to GoogleScholar, retrieved September 21, 2008: http://scholar.google.com/scholar?q=dimaggio+and+powell+%281983%29&hl=en&lr=&btnG=Search

by focusing on opposing forces that respectively promote and oppose social change," (p.168). This type of logic contrasts sharply to a logic of determination which explains changes in the environment as result of variation in a set of predictor variables. Moreover, logic of opposition is equipped to account for contradictory outcomes of information technology.

Robey and Boudreau detail the use of four specific theories: organizational politics, organizational culture, institutional theory, and organizational learning, in describing how a logic of opposition may be employed. Each of the theories is discussed in tandem with corresponding methodological implications including: empirical identification of opposing forces, using statements of opposing hypotheses, conducting process research to identify opposing forces, and employing multiple interpretations to reduce the tendency of one dominant interpretation (p.179-180).

Orlikowski and Barley (2001) advocate for the increased interaction between the disciplines of organizational studies and information systems. Specifically, they cite institutional theory as a mechanism to improve the theoretical foundations and analyses in information systems research. The paper gives details of environmental changes occurring in the work place that promote the need to use institutional theory in order to understand the technological and institutional changes that are reshaping economic and organizational activity. Several examples are given of how institutional theory may benefit IS research and impeded the likelihood of constricting researcher's analyses of the environment under study. The authors conclude that the interplay between organizational studies and information systems should not be viewed as just an exercise to inform one discipline about the other but instead as a mechanism to understand some of the hidden dynamics associated with post-industrial organizational environments.

Aguila et al. (2002) discuss the integration of the management/international business literature and the global information technology literature. They identify a dearth of synthesis

between the two research areas and suggest that there should be an integration of the theoretical frameworks of both streams of research. Institutional theory is identified as one of the primary theoretical frameworks to facilitate merging and advancing the two disciplines. The authors offer new areas of research as a result of their analysis including: information systems structure and institutional legitimization(p.26). The authors conclude by discussing limitations associated with their work and offer next steps for furthering this endeavor.

Wareham (2002) presents a critique that examines how neo-institutional theory does not appropriately explain the loss of information that occurs when organizations change from face-to-face modes of communication to electronic channels of communication. Instead, Wareham use an Anthropological approach, to explain the dislocation resulting from the change in communication methods. Using twenty-nine interviews from a single case study, Wareham develops a five-level framework of information remediation that extends the traditional neo-institutional focus on internal resource allocation toward external environmental demand and fulfillment of institutional needs. Although the study attempts to extend neo-institutional theory, it is limited in that the metaphorical framework developed is applicable only to multichannel communication.

Lamb and Kling (2003) assess the use of the individual end-user as the unit of analysis in conducting studies related to information and communication technologies (ICT) adoption. Much of their criticism is aimed at the overuse of cognitive-based theories that view the end user as a rational deterministic being with little to no emphasis placed on the macro-level environmental influences on the individual. Lamb and Kling examine the theoretical constructs that shape the end-user concept and contrast these with alternative views that help to re-conceptualize the user as a social actor. The paper points of that most people who use ICT applications do so in an environment that is dynamic. Social actors often utilize multiple applications, in various roles, and as part of their

efforts to produce goods and services while interacting with a variety of other people, and often in multiple social contexts (p.199). Additionally, the authors purport that the socially thin user construct limits an understanding of information selection, manipulation, communication, and exchange within complex social contexts.

The study's analysis is conducted using a recent study of online information service use. The end result is an institutionalist concept of a social actor whose everyday interactions are infused with ICT use. Finally, the authors encourage a shift from the user concept to a concept of the social actor in IS research to sharpen perceptions of how organizational contexts shape ICT-related phenomena and simultaneously provide a holistic view of how individuals utilize ICTs in various contexts.

### 2.4.2 Institutional Theory and Technology Adoption

Premkumar et al. (1997) examine the impact of various environmental, organizational, and technological factors on the adoption of innovation in the context of electronic data interchange (EDI). Based on research in information technology (IT) adoption, organizational studies and marketing they develop a comprehensive model that identified eleven variables, within three broad categories (environmental, organizational, and innovation characteristics), that could potentially influence the adoption of EDI. The results of the study indicated that four factors were important to discriminate adopters from non-adopters of EDI in the transportation industry: size of the firm, competitive pressure, customer support, and top management support.

Tingling and Parent (2002) explore the extent to which societal norms or peer references influence choices in technology. This study applies institutional theory and the concept of mimetic isomorphism as peer influences to the technology evaluation process to determine the degree to which managers conform when selecting between competing information technologies. Using an

experimental design, the study analyzes data retrieved through web surveys from 348 senior IT and business decision makers across the United States. The study tested if peer influence was sufficient to overcome a product evaluation where the choice is believed to be inferior. The authors found that significant effects existed where inferior technologies were selected if respondents were informed that competitors have selected them. The study concludes by suggesting that further research should be conducted to investigate the presence and extent of effects found in the study.

Teo et al. (2003) used institutional theory as a lens to understand the factors that enable the adoption of inter-organizational systems. In this study they posit that mimetic, coercive, and normative pressures existing in an institutionalized environment could influence an organization's predisposition toward adopting an information technology-based financial system. Survey-based research was carried out to test this theory with data collected from the CEO, the CFO, and the CIO to measure the institutional pressures they faced and their intentions to adopt a financial electronic data interchange (FEDI). The research model was developed using structural equation modeling based on responses from the CEO's, the CFO's, and the CIO's initial responses. Results showed that all three institutional pressures— mimetic pressures, coercive pressures, and normative pressures—had a significant influence on organizational intention to adopt FEDI. The authors of the study contend that their results provide strong support for institutional-based variables as predictors of adoption intention for inter-organizational linkages and that organizations are embedded in institutional networks.

Lai et al. (2001) examine the institutional forces that affect the adoption of information technology (IT) along a supply chain. Citing the use of information technology as an increasingly necessity for enhancing supply chain performance this study focuses on why organizations in a supply chain often adopt IT due to the institutional pressure exerted by their supply chain partners.

The study looks at the impact and implications of the different types of institutional isomorphism from both the perspectives of firms that have taken their own initiatives to adopt IT and those that have followed their supply chain partners to adopt IT. The authors suggest that their study may provide insight on the possible impact of the different types of institutional isomorphism and in the process assist managers in better understanding the institutional pressure they exert on and receive from their supply chain partners.

### 2.4.3 IT and Institutional Theory in International Contexts

Damsgaard and Scheepers (1999) at the turn of the 21st century, examined how intranets were implemented to facilitate communication across departments within organizations. Using institutional theory, they developed a taxonomy and distinguish six broad diffusion drivers that might be considered to sustain the intranet implementation process. Using their taxonomy, they conducted an exploratory field study of four intranet implementations and analyzed which drivers were used to facilitate implementation. The results of the study led them to several conclusions including: all six drivers were deployed in the analyzed cases; the choice of drivers varied with the level of the intranet (corporate or unit), the implementation stage, and existing organizational practices and contingencies; and last they found that the critical drivers for facilitating implementation are knowledge building, subsidy and mobilization in the early stages of implementation. Drivers in the later stages were knowledge deployment, subsidy and innovation directives were most commonly used.

Robey and Holmstrom (2001) present a social analysis of the development and use of IT to support governance in the city of Umea, Sweden. The intended use of the technology was to monitor resource allocation for social programs administered at the municipal level of government through increased transparency for external and internal stakeholders. The study analyzes the

implementation of the system at the organizational and institutional levels of social analyses by employing a dialectic approach. The researchers found that although the information system reinforced a new economic discourse and helped to make organizational members more accountable for their actions, the citizens protested the effects of the new economic discourse.

Silva and Figueroa (2002) proposed a framework for the analysis and the execution of policies aimed at the adoption of information and communication technologies (ICTs) in developing countries. Their framework is derived from institutional theory components, which offers a better explanation for those interested in understanding the forces that influence the adoption of ICTs in developing countries. The authors' framework is used as a lens to tease out meanings of the case studied and identify possible courses of action that a country in a similar situation may take to expand and boost the expansion of ICTs. Using the framework as a point of reference, the authors theorize about why some policies achieve their objectives while some others may not. The authors conclude the study by offering policy suggestions about how ICTs should be implemented and administered.

Bada et al. (2004) apply concepts and ideas from institutional theory to study improvisations in IT and organizational change. Within the information systems (IS) discipline, IT and organizational change models have evolved from early teleological models to more dynamic models which consider the role of IT in organizational change as emergent based on improvisations. Improvisations are regarded as unexpected actions aimed at solving crises and/or exploiting opportunities. Applying institutional ideas, the authors suggest that the sources of these crises/opportunities are the normative, mimetic and coercive prescriptions found within the institutional context of the organization.

### 2.4.4 Institutional Theory and E-commerce

Chatterjee et al (2002) use institutional theory to examine the assimilation of Web technologies within organizations. This study used institutional theory and the conceptual lens of structuring and meta-structuring actions to explain how three factors--top management championship, strategic investment rationale, and extent of coordination--facilitate higher levels of Web assimilation within an organization.

Gibbs and Kraemer (2004) used past EDI and IT diffusion studies to assess determinants of scope of use among e-commerce adopters in countries outside the United States. The authors developed and tested an integrated model to assess the scope of e-commerce use. The study's sample was substantial with empirical survey data from 2,139 companies in three industries across ten countries analyzed to formulate conclusions about the model. The study's research model is derived from institutional theory and the technology-organization-environment (TOE) framework. The research model integrated factors of national environment and policy with organizational and technological factors. The most significant predictors of scope of use were found to be technology resources, perceived strategic benefits, financial resources, legislation barriers, external pressure, and government promotion. The policy environment was also found to have a significant effect on the scope of e-commerce use.

Wang and Cheung (2004) explored why some firms actively implement e-business functions with their business processes while others were more reluctant to do so. Using several theoretical foundations (innovation adoption research, institutional theory, strategic orientation theory, and upper-echelon theory), this study proposed a multi-level model to explain e-business adoption by service firms. Using survey data, this research found that external competitive pressure, innovation

orientation, financial slack, and IT resources were found to be associated with two measures of e-business adoption. CEO risk-taking propensity and firm size also had an interaction effect on e-business adoption.

### 2.4.5 Institutional Theory, IT, and Organizational Change

Barley (1986) explored the changes in organizational relationships between medical professionals resulting from the use of information technologies in medical environments. Focusing on the role changes of workers in two radiological departments, the author's findings challenged the thought that contemporary sociological theory about technology was adequate in explaining how the link between institutions and actions explain the potential number of structural variations implicit in role-based change. This paper expanded sociological thought on the link between institution and action by offering a theory of how technology might facilitate different organizational structures by altering institutionalized roles and patterns of interaction. Barley's new theory uses technology as a social rather than a physical object, and organizational structure is defined as a process (dynamic) rather than an entity (static). The author concludes the study by suggesting that to understand how technologies alter organizational structures, researchers may need to integrate the study of social action and the study of social form. He offers the example of conflicting results of an empirical correlation analysis compared to qualitative field research results (p. 106).

Orlikowski and Robey (1991) construct a theoretical framework in which the institutionalization of information technology in organizations and its impact are examined. This study extends Giddens' theory of structuration and allows for deeper analysis by avoiding the traditional dichotomies associated with conducting organizational research (e.g., subjective ontology versus objective ontology). The authors suggest that their framework can be used to guide

studies in systems analysis and design and/or studies on the impact of information technology on organizations. Boudreau and Robey (1996) extend this point in their assessment of Business Process reengineering by suggesting that present studies would benefit from using organizational political theory, organizational learning theory, and or institutional theory.

Avgerou (2000) suggests that the present IT literature fails to fully explain the relationship between IT innovation and organizational change. In this case study, Avgerou contends the interaction between IT innovation and organizational change is best understood as a dual process of institutionalization of IT and the de-institutionalization of established organizational structures (p.235). Drawing upon the tenets of the new institutionalist theory[2], the study moves past the traditional rational-actor perspective and places emphasis on cultural and political systems embedded within organizations. The study's setting is a Mexican petroleum company that has an extensive history of using technology for innovation. Through interviews with IT professionals in the organization and management, the history of the organization's organizational changes and IT developments is used to demonstrate Avgerou's theoretical assertion that a holistic approach should be employed when studying organizational change and IT development/innovation.

Tillquist et al. (2002) offer a new representation methodology for developing organizational technologies. Extending the prevailing presumption that organizations are instrumentally rational, the authors developed the dependency network diagrams (DNDs) methodology for organizational technology development. Their contention was that DNDs improve the likelihood that essential elements governing organizational relations captured, that otherwise are omitted using traditional methods such as dataflow diagrams, process diagrams and state transition diagrams (p.114). The rules and construction algorithm for DNDs are presented and applied to a case study of a Canadian

[2] This stream of research evolved after the 1960s and was championed by sociologist such as Talcott Parsons and Peter Selznick.

automobile insurance company. Analysis of the case reveals how DNDs model the dependencies within highly institutionalized organizations and in the process describing institutionalized relations.

Lamb et al. (2003) examined online information usage of data gathering practices and incentives in organizations. Using an adaptation of Scott's (1987) two-by-two matrix, this study provides an assessment tool to identify which industries have different degrees of institutional and technical environmental elements. Lamb et al. are critical of the limitations of Scott's typology and suggest that institutional theory should be used to provide a richer assessment of environmental forces that impact the use of online technologies. The study utilizes integrated qualitative methods including theoretical sampling, in-depth semi-structured interviews, and concurrent analysis of coded transcripts to extract and analyze data from a sample of twenty-six firms. Ultimately, the study concludes that an informational dimension should be included in describing organizational environments. Lamb and Davidson (2005) utilize the new framework developed in 2003 to examine the adoption and use of organizational intranets as an extension of the end-user computing movement. This paper reviews important milestones in the end-user computing movement of the 1980s through the early 2000s and assesses similarities and differences between historical and contemporary end-user computing adoption. This study uses an overlapping research methodology of qualitative and quantitative techniques that identify the institutional and technical influences that shape intranet usage and development.

### 2.4.6 Systems Development

Laudon's (1985) paper is one of the most heavily cited papers on systems development. In his study he examined the differences in institutional and environmental methods of information systems development. These models form the basis for most explanations of why systems are developed and utilized. The adoption of criminal history systems is the basis for the study and like

Lamb et al. (2003) Laudon concludes the study by suggesting that a hybrid framework that incorporates both institutional and environmental factors in explaining adoption of information systems.

Nicolaou (1999) examines sources of control over information system development decisions. Although past research has examined sources of internal organizational control that were solely determined by technical/rational goals, this article analyzes the symbolic role of social institutions in exerting control over system development decisions. Three regulatory mechanisms, developed by institutional theorists, are used to explain how specific social institutions exert their control. The mechanisms of coercive isomorphism, mimetic isomorphism and normative isomorphism help illustrate the types of social forces that enhance similarity of systems across organizations. Three conditions also are identified which moderate these effects: dependence on external institutions having control over an organization's resources; unclear performance standards for system development; and interaction patterns during development. These conditions imply that social control would differ greatly according to whether the major influences on the process of system development arise from within the organization or are imposed from external institutions. The examination of symbolic/institutional forces in system development is useful in both the evaluation of system effectiveness and the assessment of the "appropriateness" of managerial interventions in the process. Future research should empirically examine these manifestations of social control and their influence on system development decisions.

Alvarez (2001) examines how information systems development is influenced by power relationships and the deinstitutionalization of legacy systems by using the coercive tenet of institutional theory. This research shows how individuals valorize the past by using face-work to assert how previous legacy systems are superior to present systems. Face-work was accomplished

through individuals constructing the legacy system as a great system of the past and proclaiming their technological competence. Both strategies were an intricate part of identity negotiations that served to secure an individuals' place in the organization. Alvarez points out that face-work is profoundly influenced by the discursive field in which it takes place and provides suggestions for research in that area.

Butler (2003) uses a constructivist, case-based research strategy to examine the differences in the development and implementation of intranet- and internet-based information systems versus the development of traditional information systems. The author provides a theoretical framework to examine the factors that influence the successful development and implementation of traditional information systems. Drawing heavily on Selznick's (1957) theory of commitment, institutional theory is used examined to illustrate how the commitments of social actors within the organization influence and shape organizational objectives. The paper concludes by highlighting the similarities between the problems in developing and implementing web-based information systems and those of traditional information systems.

Hedman and Borell (2004) use narratives to improve ERP systems. Using institutional theory and qualitative research methods, the authors collect narratives and demonstrate how they may assist in management's efforts to improve ERP systems noting that the potential of narratives is that they can convey meanings, interpretations, and knowledge of the system, which may lead to action. The study concludes that narratives can advance evaluation practice by providing a richer evaluation picture which conveys meanings not included in traditional evaluations which often omit data found in narratives.

Adler (2005) contributes to an ongoing debate on the effects of bureaucratic rationalization on innovative knowledge-based work. He explores how the software development process is

impacted by the implementation of the Software Engineering's Institute Capability Maturity Model (CMM). Using interviews in four units of a large software consulting firm, he collects evidence that supports several assertions about the incongruence of bureaucratization and innovation in knowledge based work. The study points out that the CMM addresses a number of conformity elements associated with meeting standards set for adequate systems development. Additionally, the CMM facilitates efficiencies by clarifying task responsibility and interdependence. However, as the study points out, the CMM is not adequate in identifying some of the deep structure elements of the development process in particular the symbolic dimensions of the finished product. Organizations in this study were found to have contradictory outcomes relative to the objectives of the CMM. Instead, it was found that the CMM deepened rather than resolved the contradiction of competing forces to have an inexpensive finished product with great source code.

This chapter has presented an overview of literature associated with the research framework including an extensive review of the use of institutional theory in IS research. The next chapter provides a description of the research methodology employed in the study including a description of the research sites, the unit of analysis, the philosophical orientation of the study and corresponding research questions.

# CHAPTER 3
# METHODOLOGY

## 3.1 Introduction

The purpose of this dissertation is to explore the impact of the Sarbanes Oxley legislation on IT governance in publicly traded small and medium enterprises. The following steps were used complete this task. First a literature review was conducted to identify a theoretical lens to employ when examining relationships between organizational entities and corresponding actions to comply with SOX. Next, a pilot study was conducted to test initial interview questions. Three subsequent sites were used to collect data after the refinement of the interview script. Finally, an analysis of the data retrieved from the cases was conducted including comparative analyses. This chapter provides detailed information on the steps taken during the development of the research methodology.

To date, limited research has been conducted on the impact of Sarbanes Oxley on IT departments within small and medium publicly traded companies; thus, this research is exploratory in nature and seeks not to confirm hypotheses but explore and identify the changes inIT departments within small and medium publicly traded companies. Philosophically, this study is situated within the interpretive paradigm. As such, the epistemological perspective of the study is subjective and the ontological perspective of the study is that reality is socially constructed and contingent upon the interpretation of the observer. Orlikowski and Baroudi (1991) observed that, "Social process is not captured in hypothetical deductions, covariances and degrees of freedom. Instead, understanding social process involves getting inside the world of those generating it," (p. 14). As such, this study has attempted to answer research questions by direct observation of individuals employed with the organizations within the study; semi-structured interviews, and review/analysis of related secondary data.

## 3.2 Development of the Conceptual Framework

The purpose of this study is to explore the changes information technology departments of small and medium companies publicly traded companies have experienced since the implementation of Sarbanes-Oxley legislation enacted in 2002. To facilitate the study, a conceptual framework was developed using literature relevant to institutional theory and IT governance. Using the conceptual framework, interview questions were developed and administered to subjects participating in the study at the four research sites including the pilot study site. This section of this chapter focuses on: explaining how the conceptual framework was developed; identifying and defining key terms used in the framework; discussing assumptions underlying the framework; and linking the components of the framework by identifying their theoretical support.

Miles and Huberman (1994) suggest that researchers conducting qualitative studies should start with a conceptual framework built from existing empirical knowledge and logic. A conceptual framework helps to explain in pictorial images or narrative expressions. According to Miles et al. (1994) a conceptual framework includes: " …the main things to be studied—key factors, constructs, or variables—and the presumed relationships among them," (p.18). Ultimately, the conceptual framework helps the researcher to select concepts and relationships between constructs that the researcher deems important during the initial stages of a study. In this dissertation, the conceptual framework adopted at the beginning may be modified as a result of findings during the data analysis process.

Miles and Huberman (1994) assert that researchers should begin with a conceptual framework built from existing literature. They add that a conceptual framework provides an explanation of the research components by identifying and detailing the key elements and primary constructs along with their presumed relationships (p. 18). The conceptual framework also aids the

researcher in providing a starting list of initial important constructs that may be included in the early stages of the research and refined during the research process. As is often the case, the framework used at the beginning of a study is modified as a result of additional factors or relationships identified during the data analysis phase. The initial conceptual framework is offered in this section and any modifications will be discussed in chapter four.

### 3.3 Research Questions

Institutional theory helps to explain corporate behavior by identifying how organizations are influenced and molded by other organizations and environmental factors through conforming to standards set by the environment to survive and excel (Hoffman, 1997; Scott, 2001). Using institutional theory and the IT Governance framework the following question was raised: To what extent has Sarbanes Oxley legislation impacted the IT governance structure of publicly traded small and medium companies? Such a broad question requires additional specificity to allow for any chance of achieving results. Thus, the overarching research question was broken down to address specific areas of inquiry. The following specific areas were addressed in this study:

- What is the extent to which internal and external factors related to Sarbanes Oxley legislation have facilitated congruence between enterprise-wide strategy and IT departmental strategy?
- What IT governance mechanisms are most useful to influence effective IT governance arrangements in small and medium companies?
- How have small and medium companies used IT metrics and accountabilities to facilitate attainment of business performance goals?

- How do IT departments in small and medium companies adopt similar practices, policies, and procedures of other organizations to gain legitimacy in the eyes of stakeholders (i.e., corporate boards, executive management, institutional investors, audit committee, etc.)?

## 3.4 Research Design

### 3.4.1 The Case Study Method

As stated earlier, case studies may be categorized as positivist, critical, or interpretive. It should be noted that while the case study methodology is often associated with qualitative research, it can be used as a method of inquiry by employing a positivist ontology and epistemology. Yin (2003) warns against automatic association of case studies with qualitative research techniques, such as ethnographies. Unlike ethnographies, case studies do not necessarily require the extended time-period to conduct and require very detailed observational evidence. Instead, case studies are conducted in a defined time frame and do not necessarily imply the use of ethnographic techniques. By contrast, researchers conducting case studies may not even visit the organization under study but instead use secondary data sources and conduct interviews remotely using information and communication technologies.

Yin (2003) suggests that case studies are empirical inquiries that investigate a contemporary phenomenon within its real-life context. This technique is most helpful when the boundaries between phenomena and context are not clearly defined. Yin (2003, p.12) states, " the case study allows an investigation to retain the holistic and meaningful characteristics of real-life events such as individual life-cycles, organizational and managerial processes, neighborhood changes, international relations and the maturation of industries." Information systems scholars have contended that because information systems is essentially a social science, understanding the phenomenon is its proper social context is essential to full comprehension. Franz and Robey (1984)

stated that information systems research should be conducted using idiographic techniques that seek to understand a phenomenon in its own context. Benbasat (1987) and Bonoma (1983) both contend that case study research is particularly appropriate for certain types of research problems including those where, " …research and theory are at their early formative stages, and 'sticky, practice-based problems where the experiences of the actors are important and the context of action is critical," (p.370). Benbasat adds that a case research strategy is well-suited for capturing the knowledge of practitioners and developing theories from it. Benbasat further states that to judge the appropriateness of the case research strategy, one may ask the following questions:

1. Can the phenomenon of interest be studied outside its natural setting?
2. Must the study focus on contemporary events?
3. Is control or manipulation of subjects or events necessary?
4. Does the phenomenon of interest enjoy an established theoretical base?

According to Benbasat, the case study method is useful when a natural setting or a focus on contemporary events is needed; when research phenomena are not supported by a strong theoretical base; and/or when a rich natural setting may be fertile ground for generating theories. Conversely, when subjects or events must be controlled or manipulated in the course of a research project, the case approach is not suitable.

Case studies may be placed in a number of categories. Stake (1999) and Yin (2003) both offer frameworks for categorizing case studies. Stake (1999) identifies three types of case studies: instrumental, intrinsic, and collective. An instrumental case study is selected to provide insights or to further develop an existing theory. The intrinsic case study is conducted when the circumstances surround a case are unique and not representative of others. This technique's purpose is not theory building but to examine the unique phenomena associated with the case. The collective case study extends to more than one instance. Yin (2003) offers exploratory, causal and descriptive case

studies as labels for characterizing case studies. The exploratory case study is conducted without a priori criteria. This type of case study involves data collection prior to research questions being formulated and is used to determine which research issues should be further explored. This type of case study is often followed up with additional in-depth focused case research. Causal case studies examine case and effect relationships and while identifying explanatory theories of the phenomenon. This type of case study is often employed in positivist case study methodology advocated by Lee (1989). Unlike exploratory case studies, descriptive case studies use a priori theory to guide the collection of data and eventually serve as the design for the case study.

### 3.4.2 The Case Study Methodology in IS

Research is usually classified within three specific philosophical paradigms: interpretive, positivist, and critical. Specific research techniques may be used and classified within more than one paradigm. The case method is one such research technique. Case study methods may be employed using a positivist philosophical approach (Lee, 1989), a critical philosophical approach (Avison et al., 1999), or an interpretive philosophical approach (Walsham, 1995). This study was conducted using an exploratory interpretive case study methodology. According to Walsham (2008), "interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors," (p.36). Klein and Myers (1999) contend that interpretive research assumes that our knowledge of reality is gained examining social constructions such as language, consciousness, shared meanings, documents, tools, and other artifacts.

A case study may be considered positivist if there is a pronouncement of formal propositions, specific variables to be measured, a stated hypothesis(es), and an extrapolation of the findings from the sample to the general population (Orlikowski and Baroudi, 1991). The positivist

paradigm assumes that the relationship between social reality and the human being is independent and objective. This philosophical approach has received criticism from some information systems researchers for its inability to fully explain the complexities of the social environment in which most information systems exist (Galliers, 1991).

A case study may be considered as critical if the primary objective is to provide social critique for the eventual reformation of the social environment (Klein and Myers, 1999). The objective of critical research is to unmask and critique the forms of domination and distorted communication by showing how they are produced and reproduced (Ngwenyama and Lee 1997). Critical research may also be viewed as a mechanism for emancipation from alienation and domination within organizations (Hirschheim and Klein, 1994) and in the process illuminating the possibility of human potential. In the critical paradigm, social reality is historically constituted and produced by individuals.

Case studies conducted within the interpretive paradigm have no defined dependent and independent variables but instead focus on the complexity of human sense-making as situations occur (Kaplan & Maxwell, 1994). Researchers steeped in the interpretive tradition claim that social phenomena must be studied and understood in the social contexts in which they are constructed; that is, actions must be understood by also including the meanings assigned by the social actors who produce the social actions (Burrell & Morgan, 1979). Within the information systems discipline, interpretive research methods are aimed at understanding the context in which information systems exist and the process whereby the information system influences and is influenced by the context (Walsham, 1993). Myers (1997) contends that interpretive research can be divided into four categories: phenomenology, philosophy of language, ethno-methodology, and hermeneutics. Mingers (2001) details seminal studies in information systems that utilize the phenomenological

approach to interpretive research including studies conducted by Zuboff (1988), Winograd and Flores (1987), and Verela (1991). An example of research using an ethnomethodology approach to interpretive research can be found in the work of Suchman (1987) where she introduces the concept of situated action as a way to reformulate the concept of purposeful action. She further identifies that the purpose of ethnomethodology is to not produce formal models of knowledge and action but to explore the relation of knowledge and action in the social context in which they occur. Boland (1991) and Hirschheim and Klein (1994) offer example of the use of hermeneutics in the interpretive paradigm of information systems research.

Using the interpretive approach to explore the impact of Sarbanes Oxley on IT governance in publicly traded companies will enable us to improve our understanding of the social, critical and organizational issues incurred by individuals who work at small and medium companies publicly traded companies. The interpretive research paradigm holds that reality can only be explained by assessing social constructions such as symbols, language, and shared meanings. Walsham (1993) contends that the interpretive approach to information systems research should yield a better understanding of the context of information systems and the process by which information systems influences and is influenced by the context and in the process provide a greater scope to study the elements that impact and are impacted by information systems (Orlikowski and Baroudi, 1991).

The philosophical deviation of interpretive research from positive research has resulted in strong criticism of the interpretive paradigm. Once such criticism has been the rigor with which interpretive research is conducted. To address such criticism Klein and Myers (1999) proposed a set of principles used to improve and critique interpretive research. These criteria have their origins in the hermeneutic orientation of interpretive research and are as follows: 1) the hermeneutic circle, 2) contextualization, 3) interaction between the researcher and the subject, 4) abstraction and

generalization, 5) dialogical reasoning, 6) multiple interpretations, and 7) suspicion (p.72). The hermeneutic circle principle asserts that comprehension of human behavior is achieved by oscillating between the interdependent meaning of parts and the whole they form. They add that, "this principle of human understanding is fundamental to all other principles," (p. 72). The principle of contextualization maintains that the researcher must conduct critical reflection of the social and historical background of the research setting to provide a point of reference on how the present research setting emerged. The principle of interaction between the researcher and the subjects requires that the researcher undergo critical self-analysis related to socially constructed meaning of data retrieved and acknowledge that the initial perspective of the research data may evolve as the researcher continues to interact with research participants. The principle of abstraction and generalization requires that the researcher link the themes identified during data interpretation to theoretical and general concepts that describe the nature of human understanding and social action. The principle of dialogical reasoning requires that researchers remain sensitive to possible contradictions between their own intellectual history informs the research designs and the actual findings of the study with subsequent cycles of revisions. The principle of multiple interpretations suggests that the researcher examine the influences of the social context and retrieve multiple narratives of the same sequence of events under study. Finally, the principle of suspicion contends that researchers should be intellectually curious and as such should question the biases and systematic distortions in the narratives collected from participants in the study.

Klein and Myers (1999) suggest the aforementioned principles to facilitate plausibility and cogency for an interpretive study's target audience. They add that researchers must work out for themselves how and which principle may be applied in any given research situation. They further caution against using these principles mechanically, as the importance and relevance of each

principle is partly derived from the manner in which the others are applied to the collection and interpretation of the data collected.

### 3.4.3 Single Case vs. Multiple-Case Studies

Yin (2004) suggests that single-case studies are appropriate if the phenomenon under study is: a situation previously inaccessible to scientific investigations; represents a critical case for testing a well-formulated theory; and  is an extreme or unique case. This study does not fit these criteria and consequently a multi-case methodology is used.  Multiple-case research designs are preferred when the intent of the research is to provide description, build theory, or conduct theory testing (Benbasat, 1987). These three criteria correspond to Bonoma's (1985) design, prediction, and disconfirmation stages. Multiple-case designs allow for cross-case analysis and the extension for theory. This multi-case study attempts to provide a cross-case analysis of IT governance and an extension of the Weil and Ross (2004) framework for IT governance.

### 3.4.4 Site Selection

Yin provides two criteria for selecting potential sites in a multiple-case design. First, the researcher may choose sites where similar results are predicted. Second, the researcher may choose sites based on theoretical replication where contradictory results are predicted and consequently help to build theory through the revision of initial propositions. Ideally, site selection should be thought out rather than opportunistic. Consideration should be given to the nature of the topic, characteristics of firms (industry, company-size, organizational structure, public/private/non-profit, geographic coverage, degree of vertical/horizontal integration, etc.) Sites used in this study were chosen for both access and the organization's demographics (i.e., small publicly traded companies).

Gaining access to a small and medium publicly traded companies may be easier than larger companies. Publicly traded companies are often reluctant to grant access to their company for fear

of breach to proprietary information when studying organizational processes. The target organization for this study needed to meet two specific criteria. First, the organization needed to be publicly traded before and after the enactment of Sarbanes Oxley legislation. Second, the organization needed to meet a financial threshold to be considered a small or medium company. The research sites' demographics met the criteria of studying publicly traded small and medium companies. The organizations in this study all have market capitalizations under the industry threshold of a largely capitalized enterprise (over $5 billion U.S.) and would be classified as either a medium capitalized entity ($1 billion U.S. to $5 billion U.S.) or a small capitalized company ($250 million U.S. to $1 billion U.S.). All sites were publicly traded prior to the passage of the SOX and were still being traded at time interviews were conducted.

To identify small and medium companies to be used in the study, a form letter was drafted and sent to thirty companies in a four state area covering an approximate radius of about five hundred miles. Companies were identified using several sources including solicitations at Information Security Audit and Control Association meetings, Standard and Poor's databases, and corporate board members who were directly connected to a regional university with which the researcher is affiliated. Of the thirty companies initially solicited, four responded in the affirmative by returning a consent form indicating the contact person for future correspondence. A follow up letter was sent to the contact person at each research site that provided an overview of the study; a list of organizational personnel requesting to be interviewed; and a range of dates to conduct initial interviews. Additional correspondence occurred via e-mail, in-person discussions, and/or telephone conversations.

One of the four organizations used in the study agreed to participate only after the company's legal counsel held a two-hour meeting to review interview protocol, interview topics,

and the potential interview list. During that discussion it was decided that the organization wanted to revise the original Informed Consent form to address additional concerns the organization had regarding the use of information obtained during the interview process. The other three sites allowed access without additional legal standards and felt the parameters stated in the original Informed Consent form met their threshold for acceptance.

## 3.5 Pilot Study

Researchers are advised to conduct a pilot study to determine the appropriate unit of analysis; to refine the data collection instrument(s); and to get familiar with the phenomenon under study (Yin 2003). After corresponding with representatives from the research sites and receiving notification of potential interviewees, the decision was made to use the site with the least number of interviewees as the pilot site. Interviews at the pilot site were conducted in February 2009. The goal of the pilot study was to test the appropriateness of interview questions and to seek preliminary evidence that institutional theory would be an appropriate theoretical lens to explain the impact of Sarbanes Oxley legislation on IT governance. Gaps between the preliminary interview questions and the overarching research question were identified and addressed. Duplicate questions were omitted and internal factors influencing IT governance were added to the interview question list. Interviews at the three additional sites were conducted between February 2009 and May 2009.

## 3.6 Unit of Analysis

The unit of analysis in this study is at the organizational level. Because IT governance is an organization-wide phenomenon, the ability to retrieve significantly rich data requires assessing data from across the organization. Emphasis is placed on each company's IT department with some emphasis on tangential departments (e.g., operations, internal audit). Through examination of these units, the researcher expects to identify any significant findings and provide a context for

understanding the impact of Sarbanes Oxley on IT governance. Prior to beginning the study a pilot study was conducted to substantiate whether the unit of analysis should be the IT department solely or include additional units within the organization. While the pilot study did substantiate the focus of the study being placed on the IT department, additional departments were identified as possible points of interest including: the internal auditing function, executive-level management and field operations. Thus, the decision was made to examine the phenomena at the organizational level.

### 3.7 Data Collection Methods

Case study research affords the opportunity to study phenomena using multiple and diverse sources (Benbasat et al. 1987). Evidence from two or more sources are used to substantiate a research finding. According to Yin (2004), the following are acceptable examples of evidence that work well in case research: documentation, archival records (i.e., organization charts, service, personnel, or financial records), interviews, direct observations, and physical artifacts. Triangulation of data is used to obtain a rich set of data surrounding a specific research issue as well as to capture the contextual complexity of a phenomenon.

Data collection for this study was conducted using primary and secondary data sources. Primary data came in the form of open-ended and semi-structured interview questions, in-depth interviews, and direct observations. Secondary data sources used in the study included organizational charts of the IT department prior to and after Sarbanes Oxley implementation, financial data retrieved from public filings, annual reports, internal process documents, and technical documents. The use of secondary data was helpful in identifying main organizational players and roles; understanding responses to questions posed during the interviews; substantiating technical details; comprehending shifts in organizational power; and understanding historical decisions.

### 3.7.1 Interviews

The primary goal of interviewing is to retrieve information from respondents about the phenomena under study from his/her perspective. Interviews may come in three primary formats: structured interviews, semi-structured interviews, and unstructured interviews. Structured interviews are characterized by standardized structured formats for asking questions. Respondents of structured interviews typically are given the same set of response options during the interview process. Conversely, unstructured questions used during interviews do not employ a standard schedule of questions and instead develop the line of questioning based on the respondent's statements during the progress of the interview. Semi-structured interviews are characterized by the use of predetermined questions, with questions being asked in a systematic and consistent manner. Semi-structured questions, however, do allow for flexibility in asking additional related questions that may not have been scheduled for the interview.

The interviewees for this study were chosen for their relevance to the research questions. Generally, a mid-level employee was identified as the point of contact and first level interviewee. During first-level interviews, additional interviewees were identified who may add insight to understanding the perceived organizational changes. The researcher attempted to limit the total number of interviewees when theoretical saturation had been achieved and no new information was being obtained. Unfortunately, due to the limited access to interviewees, theoretical saturation occurred in only one of the research sites in this study. Moreover, the IT departments and tangential departments in the other two organizations were relatively small (less than 10) and did not lend themselves to iterative interview sessions.

The majority of the interviews were recorded digitally and transcribed by the researcher and a contracted third-party vendor. During first-level recorded interviews, the researcher followed a list

of prepared open-ended questions. First-level interviews lasted from forty-five to ninety minutes. Second-level interviews were conducted using semi-structured questions specific to the interviewee's role or specific to a topic of interest. These interviews lasted between twenty and forty-five minutes. During all recorded interviews, the researcher took written notes on responses from the interviewee on topics for future discussion. At the request of three interviewees, interviews were not recorded and instead hand written by the researcher. Transcriptions from the interviews as well as the researcher's written notes were reviewed and analyzed using an iterative coding process. Using an iterative process provided the ability to understand the viewpoint of each interviewee, link connections between perspectives of interviewees as well as show contradictions between employees. Additionally, the iterative process helped to yield contextual factors related to the organization's IT governance initiatives after implementing Sarbanes Oxley compliance initiatives. A total of eighteen interviews were conducted (1-pilot case; 5-case one; 4-case two; 8-case three) with staff-level employees, executive management, and senior/mid-level management.

### 3.7.2 Definitions and Concepts

This study employs the following concepts in the conceptual framework using components of Weil and Ross's (2004) governance design framework including: enterprise strategy and organization; IT organization and desirable behavior; IT governance arrangements; IT governance mechanisms; business performance goals; IT metrics and accountabilities. The components of this conceptual framework and their interrelationships are examined using components from institutional theory including: The conceptual framework for this study is grounded in the tenets of institutional theory discussed in chapter two and the IT Governance Design Framework established by the MIT Sloan Center for Information Systems Research (CISR). Components of the conceptual framework and the theoretical lens are discussed below to clarify the scope of this study.

- **Enterprise Strategy and Organization** refers to a set of clear concise statements that clarify the enterprises' strategic intent. This implies an agreed upon statement that can be readily communicated. Typically, strategy statements include one of the following: competitive thrust of the enterprise; relationships among business units; and/or intentions for the role and management of information and information technology (Weill and Ross, 2004).
- **IT Governance Arrangements** identify the models and parameters used for each IT decision. These arrangements reinforce the organization's divisional and business unit structures. These arrangements may transcend the formal organizational structure (Weill and Ross, 2004).
- **Business Performance Goals** establish clear objectives for the governing entities and provide a benchmark for assessing the success of governance efforts. These goals may come in the form of innovation, efficiency, or effectiveness metrics as antecedents to goals such as increases in share price and profitability (Weill and Ross, 2004).
- **IT Structure and Desirable Behaviors** is informed by and provides direction to the organizational enterprise strategy. The definition of governance used in this study—specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT—does not include the concept of strategy. Instead, the focus is placed on the desirable behaviors of the organization's employees. Weill and Ross (2004) contend that behaviors not strategy create value and are influenced by many factors including incentives, culture, internal politics, and organizational

history. However, to achieve the organization's goals the desirable behaviors of employees must have congruence with strategic direction.

- **IT Metrics and Accountabilities** articulate the methods used and the parties responsible for measuring IT governance within an organization. Measurement and accountabilities are necessary for good IT governance design and the IT desirable behaviors associated with IT governance. Specifying what party is responsible for what activities and how they will be evaluated provides clarity, ownership, and tools to assess governance performance (Weil and Ross 2004).
- **IT Governance Mechanisms** reinforce and encourage desirable IT behaviors. Additionally, IT governance mechanisms lead to outcomes specified in the IT metrics and accountabilities entity of the IT Governance Design framework (Weil and Ross 2004). Moreover, well designed mechanisms convert IT desirable behaviors into the outcomes listed in the IT governance framework used in organizations. While the exposure to the actual IT governance framework employed at an organization may vary depending on the level of management in which an individual is placed, most IT employees (especially managers) interact with one or more of the mechanisms daily. Examples of governance mechanisms may be a technology council that oversees the organization-wide architecture and infrastructure decisions.
- **Institutions** are defined as the cognitive, normative and regulative structures and activities that provide stability and meaning in social behavior. The cognitive structures are the mental frameworks, beliefs, and assumptions shared by people about their shared purpose, work completed together, and mutual interactions.

- The **cognitive structures** are the mental frameworks, beliefs, and assumptions shared by people about their shared purpose, work completed together, and mutual interactions.
- The **normative elements** include the standards and values that identify what is desirable and define what is expected of people as well as routine ways of completing tasks.
- The **regulatory** aspects of institutions include the formal rules that often develop, such as communication protocols, standard business practices and legal constraints.

The primary purpose of the study is to explore the impact that regulation such as Sarbanes Oxley has had on IT departments of small and medium companies. Additionally, the study explores how small and medium companies begin to engage in isomorphism or the process by which an organization adopts similar practices, policies, and procedures of other organizations (DiMaggio & Powell, 1983). Isomorphic actions are developed by the set of environmental standards that force organizations to imitate one another; which ultimately leads to legitimization and acceptance by society (DiMaggio & Powell, 1983).

## 3.8 Validity and Reliability

Yin (2003) provides guidelines for addressing issues of validity and reliability related to case studies. This section details how the author addressed achieving reliability and validity issues.

### 3.8.1 Construct Validity

Construct validity is defined as the establishment of correct operational measures for the concepts being studied (Kidder & Judd 1986). Yin (2003) states that the following tactics can be used to increase construct validity in case studies: use of multiple sources of evidence; establishment of a chain of evidence; and review of draft case study reports by key informants.

In this study, multiple persons were interviewed at all each company which provided triangulation of data. Additionally, information from documents and direct observations bolstered triangulation efforts. Yin (2003) contends that a chain of evidence of a case study should be established to afford an external reader to follow the sequence of events in the case study, and, to trace the conclusions from the research questions or trace the research questions from the conclusions. In this study, establishing a chain of evidence was achieved through the use of a detailed narrative of each case to provide an external reader with a clear structure of the sequence of events. Additionally, appropriate interview protocol and procedures were followed with no deviation. Finally, the researcher validated the coding scheme by using an external coder. The details of the coding validation techniques are discussed later in this chapter.

### 3.8.2 Internal Validity

Internal validity is a major component of empirical research techniques such as experimental and quasi-experimental techniques (Pedhazur and Schmelkin, 1991). The causality or the absence of relationship between two variables depends significantly upon the internal validity of the research design. Yin (2003) provides guidelines for increasing internal validity by using pattern matching logic. Using pattern matching logic involves comparing empirically based patterns against the predicted pattern from theoretical perspectives. This study employs the use of pattern logic matching to increase internal validity.

Internal validity was also increased by the use of explanation building through the use of multiple iterations of coding. This technique involved taking theoretical positions at each iteration and examining their consistency with the data collected and revising the theoretical position if appropriate. In this study, the data collected included coded interviews. This process was conducted for each individual case in this study.

### 3.8.3 External Validity

External validity addresses the ability of research findings to be generalizable to the general population. In case study research, Yin (2003) suggests the use of replication logic to increase the external validity of findings in multi-site case studies. As such, replication logic is employed in this study.

### 3.8.4 Reliability

Efforts to achieve reliability in research are done so to minimize the errors and biases in a particular study (Yin 2003). Achieving reliability is contingent upon the research process being consistent and allowing subsequent research efforts that follow the same procedures to achieve the same results. Yin suggests that case study protocol and the development of a case study database should be employed to ensure reliability in case study research. Case study protocol guides the researcher in conducting research and includes the following components: an overview of the case study project which detail the project's objectives and site; field procedures which include the type of data sources and access to data required for the completion of the study; case study questions which detail specific questions or issues to keep in mind while collecting data; and a guide for the case study report which should contain the research questions, literature review, derivation of theoretical propositions, description of methodology to the adopted, and a list of relevant readings (Yin, 2003).

This study satisfies a majority of the criteria suggested in the case study protocol. An overview of the study is provided in chapter one as well as chapter three. General characteristics of sites have been identified and delineated. Data sources and access to data have been discussed earlier in this chapter. Case study questions are provided in the appendices at the end of this manuscript. Finally, the case study report components (i.e., research questions, literature review,

conceptual framework, and description of methodology) are provided throughout this study and relevant findings are discussed in chapter four.

The development of a case study database to organize and document data collected from each site involved collecting and archiving case study notes, case study documents, tabular material, and case study narratives. Case study notes include notes made during the collection or analysis of data. Case study notes were transcribed using Microsoft One Note software. Case study documents include interview questionnaires, transcripts of interviews, and documents related to background information of each site. Case study notes were transcribed primarily in Word document format or PDF format depending on their origin. Tabular material include survey results as part of the study or any empirical data. Tabular material in this study was kept in an Excel spreadsheet and was limited to demographic counts retrieved from interview questionnaires. Case study narratives a synthesized form of information from various sources from the site and provides the main sequence of events in a site. Case study narratives were conducted for each site using MS OneNote software. These documents, with the exception of OneNote documents, were all analyzed and eventually housed in an Atlas.ti software database.

### 3.9 Analytical Procedures

Miles and Huberman (1994) define data analysis, "as consisting of three concurrent flows of activity: (1) Data reduction, (2) Data display, and (3) Conclusion drawing/verification" (p. 10). Data analysis in case research include examining, categorizing, tabulating, and recombining the evidence to address the initial relationships as indentified in the theoretical framework and to further identify new concepts and relationships (Yin 2003). In qualitative data analysis, the researcher must first decide on a general strategy in deciding what exactly should be analyzed and

why it should be analyzed. After those decisions have been made and executed, the researcher must then code the data followed by an analysis of the findings.

Yin (2003) describes three techniques for analyzing data in case research. The first strategy argues for reliance on theoretical propositions to organize the case study data. The assumption associated with this strategy is that theoretically grounded propositions guides the data collection techniques and help decide which data have to be chosen and should be ignored (Yin 2003). The second strategy involves the development of a descriptive framework to organize the case data. This analytical strategy is well suited for studies that have no formal propositions. This approach is often useful when the other two choice are not working; however, it is less preferable that theoretical prepositions or rival explanations (Yin 2003). The third strategy involves the process of defining and testing rival explanations. This strategy is used when a researcher's original theoretical prepositions may have included rival hypotheses. Additionally, Yin (2003) points out that this strategy may relevant even in the absence of such theoretical propositions (p. 112). The analysis of this study employs the descriptive framework to organize the data work each of the cases discussed.

### 3.9.1 Coding Data

Coding is the core physical activity in developing analysis in qualitative research. Codes are defined as tags or symbols that are attached to words, sentences, or paragraphs to assign meaning to the data that is collected during qualitative research. This study used two stages of coding in the analysis suggested by Lofland and Lofland (1995): initial coding and focused or pattern coding as suggested by Miles and Huberman (1994). Each code is associated with a unique meaning that reflects the logic applied by the researcher during the analysis phase. Specific codes used in the study were generated using guidelines from Miles and Huberman (1994 pp. 55-72) and were based on the conceptual research framework discussed in chapter 1.

The analysis of interviews from the pilot study aided in the refinement of the initial list of codes used in the study. During the pilot study analysis, inter-rate reliability analysis of codes associated with the conceptual framework was conducted to provide assurance that the codes being used were appropriate for capturing the meaning(s) of the data. Milne and Adler (1999) contend that:

> "Reliability in content analysis involves two separate but related issues. First, content analysts can seek to attest that the coded data or data set that they have produced from their analysis is in fact reliable. The most usual ways in which this is achieved is by demonstrating the use of multiple coders and either reporting that the discrepancies between the coders are few, or that the discrepancies have been re-analysed and the differences resolved. Alternatively, researchers can demonstrate that a single coder has undergone a sufficient period of training. The reliability of the coding decisions on a pilot sample could be shown to have reached an acceptable level before the coder is permitted to code the main data set," (p.238).

For this study, an external reader, a sociology professor with a qualitative research record, was selected from a university in the researcher's metropolitan area to assist in establishing inter-rater reliability of the coding scheme. The external reader was briefed by the researcher about the study and was instructed to familiarize herself with the coding scheme and instructions (SEE: Appendix III). The external reader was then provided small segments of test narrative for each of the codes from the transcripts in the pilot study. The test narrative for each initial code was randomly selected and the external reader was then asked to assign codes to the individual segments of narrative. After reading the narratives and assigning codes to each individual narrative, the external reader's codes were compared to the codes initially assigned by the researcher. Where there was agreement or disagreement between the external reader and the researcher for test narrative codes a notation was made. Holsti's (1969) coefficient of inter-coder reliability was used to compute the inter-rater reliability based on the number of agreements per total of coding decisions. The following ratio and components comprise Holsti's coefficient of inter-coder reliability:

Coefficient of Inter-coder Reliability = 2M/(N1+N2)

M = Number of coding decisions agreed upon by both coders

N1 = Number of coding decisions made by the first coder (researcher)

N2 = Number of coding decisions made by the second coder (external reader).

The Holsti's coefficient of inter-coder reliability ranges from 1 (perfect reliability) to 0 (absence of reliability).

Where there was disagreement over a specific code, the both the researcher and the external coder reviewed the specific test narrative and discussed why each had chosen a particular code for the narrative. After both parties provided input on their code choice a decision was agreed upon to use one code over the other. Inter-coder reliability for the initial codes used in the pilot study narratives was 0.73. Thus, the original coding scheme with limited modification was used to code subsequent transcripts.

As stated earlier, focused or pattern coding helps the researcher to identify emergent themes or patterns (Lofland & Lofland 1995). According to Mile et al. (1994), pattern coding serves two main purposes for case research: 1) reduction of large amounts of data into a smaller manageable units and 2) aids in the development of a cognitive map of events and processes happening in the site. To expedite the initial and pattern coding processes, Atlas.ti software was employed by the researcher.

This study seeks to provide insight to the answers to these questions by using the aforementioned theoretical lens and providing empirical evidence. A summary of the concepts discussed in this chapter are provided in Table 3.3. This chapter has provided an overview of the research methodology including: a history of case study methods in information systems research; a justification of the choice of the case method for this study; details of the data collection techniques

employed; how reliability and validity issues were addressed and a description of data analysis techniques.

| **Table 3.1 Summary of the Research Design** | |
|---|---|
| Epistemological & Ontological Assumptions | Interpretive |
| Research Strategy | Multiple case studies |
| Research Techniques | Direct observation, semi-structured interviews, structure interviews, document analysis |
| Organizations | Small/Medium publicly traded companies in the United States |
| Sub-units of Analysis | IT departments |
| Timeline | Pilot study-Feb. 2009; Case 1-March 2009; Case 2-April/May 2009; Case 3-May 2009 |
| Subject | IT Governance and Sarbanes Oxley |
| Theoretical Framework | institutional Theory and IT Governance Framework |

# CHAPTER 4
# ANALYSIS AND RESULTS

## 4.1 Introduction

The research objective of this study is to identify how IT governance in small and medium publicly traded companies has evolved since the enactment of the Sarbanes-Oxley act of 2002 (SOX). Moreover, the study seeks to identify if changes in IT governance in small and medium companies are merely a direct result of compliance efforts or additional mediating factors. The firms included in this study were diverse in their business operations and included operations in healthcare, financial services, and media advertising. The study involved collecting data from primary sources through semi-structured interviews conducted with employees of these three companies and data collection from secondary sources including internal documents, annual reports, and public domain documents from news sources and each company's website. Employees of each company were interviewed to elicit responses about IT governance at the company, including when available, information about the company's IT governance efforts before SOX. Responses from interviews at all three sites were reviewed and coded using appropriate guidelines to identify data that confirmed or refuted a significant evolution of the company's IT governance since SOX.

The first part of this chapter provides an overview of each firm in this study including history of the firm, IT structure of the firm, and IT governance structure of the firm. The second part provides analysis of the interviews related to IT governance each specific firm in this study. Finally, the third part of this chapter discusses the impetus for change in IT governance at each firm using components of institutional theory as a theoretical lens.

## 4.2 Overview of Company X

Company X is a financial services company with operations in the Gulf South region of the

United States. Company X is a corporation that is registered as a bank holding company under the Bank Holding Company Act of 1956. The Company began operations in 1962 as the parent company of its primary subsidiary that is a bank. The bank is a national banking association headquartered in New Orleans, Louisiana, that has been in continuous operation in the greater New Orleans area since 1883. Company X has at times operated as a multi-bank holding company when it established or acquired new entities in connection with business acquisitions. To achieve the synergies and efficiencies of operating as a single-bank holding company, the Company merged all banking operations and intends to continue merging the operations of any future acquisitions.

Company X engages in community banking activities and serves a market area that covers the five-state Gulf Coast region stretching from Houston, Texas, across southern Louisiana and the coastal region of Mississippi, to central and south Alabama, the western panhandle of Florida, and to the Tampa Bay metropolitan area of Florida. Company X also maintains a foreign banking branch on Grand Cayman in the British West Indies. Company X provides a broad range of community banking services to commercial, small business and retail customers, offering a variety of transaction and savings deposit products, treasury management services, secured and unsecured loan products, including revolving credit facilities, and letters of credit and similar financial guarantees. Company X also provides trust and investment management services to retirement plans, and offers investment brokerage services and annuity products. The company currently offers personal and business lines of insurance to customers mainly in northwest Florida and the New Orleans metropolitan area. The Company also owns a community development corporation to provide financial support to corporations or projects that promote community welfare in areas with mainly low or moderate incomes.

The IT functions of the organization are decentralized with data centers in Dallas and New Orleans, programmers in eastern U.S. cities, and architectural governance operations in New Orleans. The IT department has traditionally been located exclusively in the South Louisiana region but with the impact of Hurricane Katrina, the decision was made to decentralize the IT department's operations. In addition to Hurricane Katrina, the dearth of technology talent in the New Orleans region also precipitated the move to expand the company's IT operations. The company's Chief Information Officer stated:

> "…there are challenges to recruiting folks to come down to New Orleans and work out of here. One of the things that I started which was pretty radical for the (name omitted) is I have a data center in Dallas…why do I need operations people here only?"

Prior to Sarbanes-Oxley the IT department had arguably too many applications running throughout the organization with minimal explanation of why the applications were in use. According to the Senior Vice-President for IT architecture:

> "Really when I came here there was no architecture group so that's the first thing that we needed to look at. We did projects on a very much ad hoc manner…a project would come in and they made sure they followed all the proper regulatory agent checkpoints… so what happened at the Company is that over a period of many, many years the company has over 500 applications supporting this bank…When you look at GMAC I might have had 260 applications supporting me worldwide so you see the disparity there. I'm going from a multi-billion dollar, multi-national organization to a multi-billion dollar bank in the South. Okay, what's the issue here? So we really didn't have a good understanding of our environment. Don't get me wrong they understood it very well. People understood **their** side of it."

This statement made by the Sr. V.P. further indicates that the company lacked a level of efficiency and shared processes for the company's IT governance efforts. Figure 4.1 shows the management structure of the IT department of Company X in 2009.

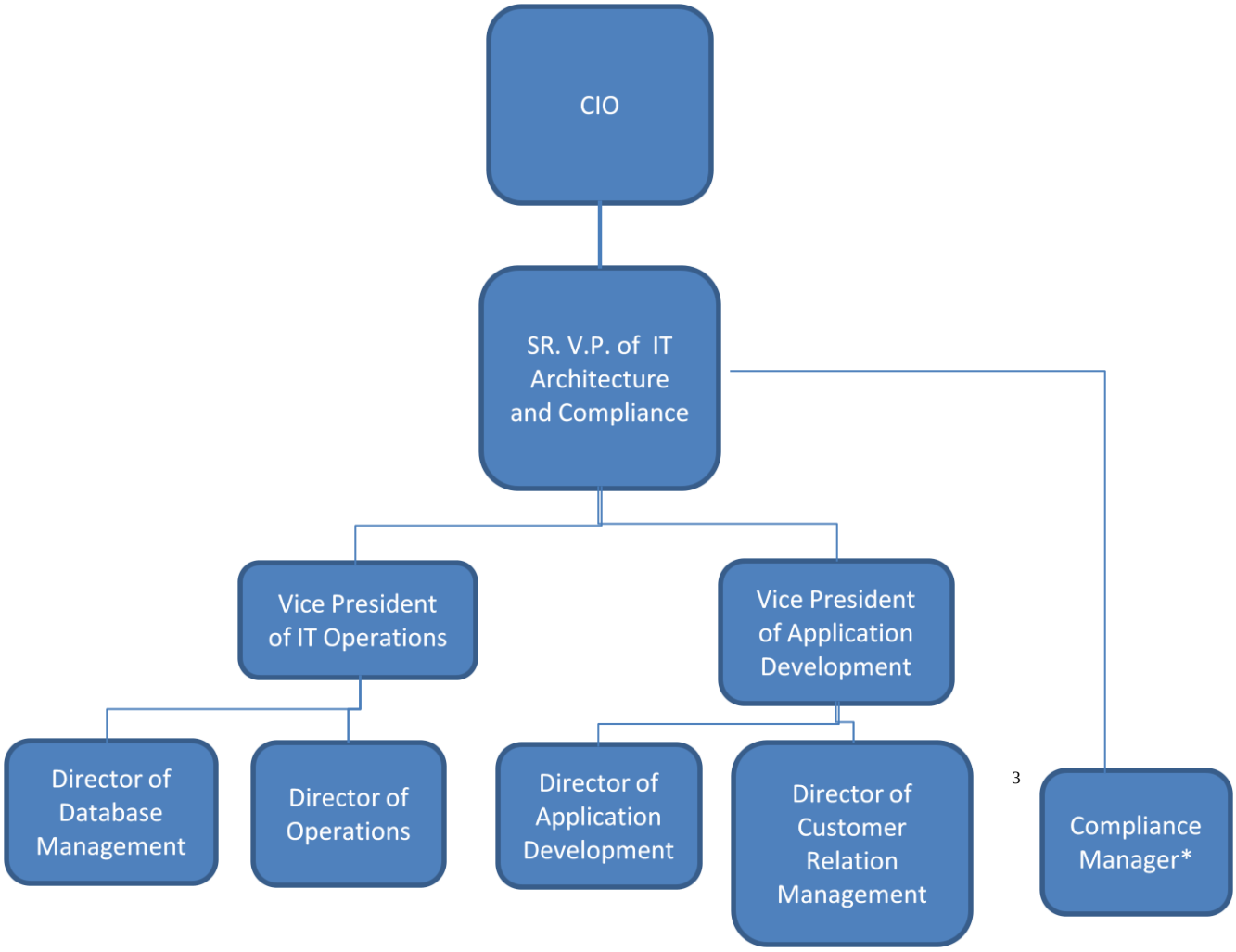



**FIGURE 4.1 Management Structure of IT Dept at Company X**

## 4.3 Overview of Company Y

Company Y is one of the largest outdoor advertising companies in the United States based on number of displays and has operated since 1902. The firm has been publicly traded on NASDAQ

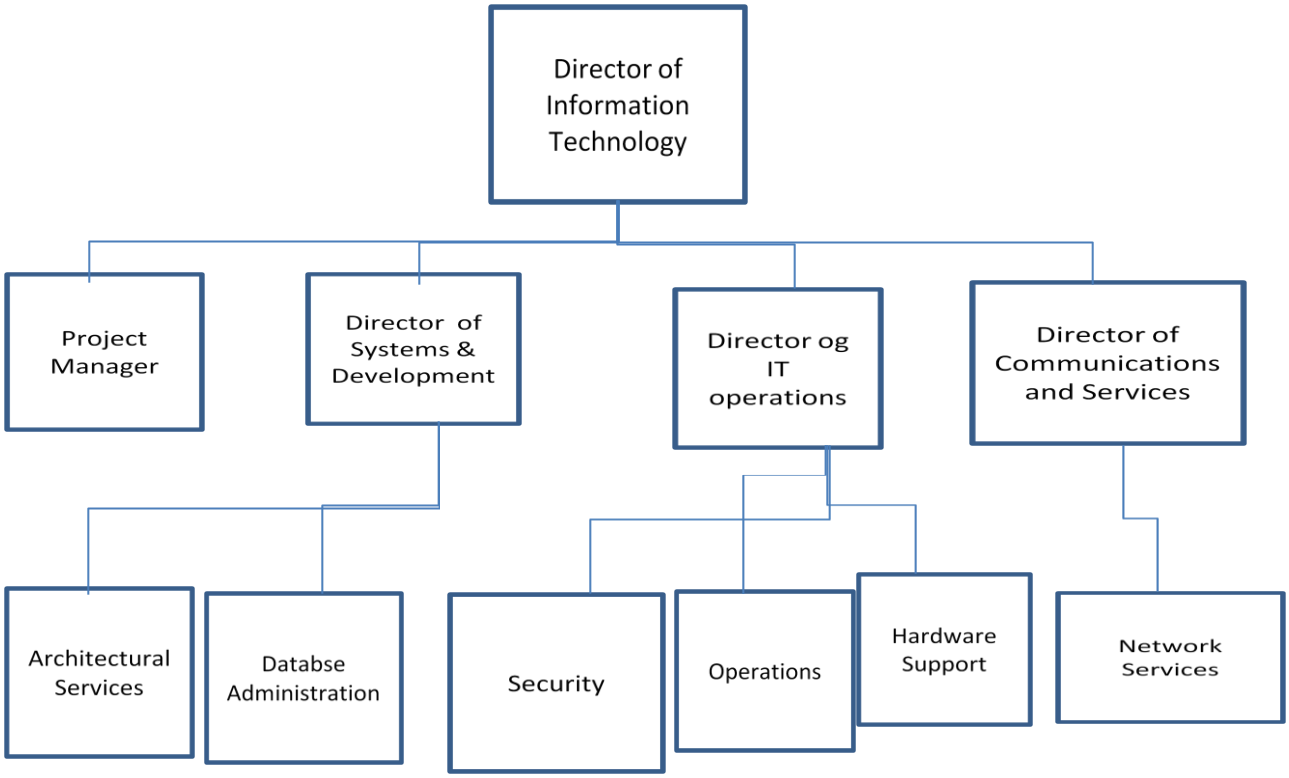
[3] Compliance manager has a dotted reporting line to the Director of Internal Audit

since 1996. As of December 31, 2008, the firm owned and operated approximately 159,000 billboard advertising displays in 44 states, Canada and Puerto Rico, over 100,000 logo advertising displays in 19 states and the province of Ontario, Canada. Additionally, the firm operated over 29,000 transit advertising displays in 17 states, Canada and Puerto Rico. The firm offers their customers a fully integrated service, satisfying all aspects of their billboard display requirements from ad copy production to placement and maintenance (Annual Report 2008).

Company Y operates three types of outdoor advertising displays: billboards, logo signs and transit advertising displays. The company sells most of their advertising space on two types of billboards: bulletins and posters. In addition to these traditional billboards, they also sell digital billboards, which are generally located on major traffic arteries and city streets. As of December 31, 2008, the firm owned and operated approximately 1,100 digital billboard advertising displays in 38 states, Canada and Puerto Rico. Company Y also sells advertising space on logo signs located near highway exits and is the largest provider of logo signs in the United States, operating 19 of the 25 privatized state logo sign contracts. As of December 31, 2008, the firm operated over 100,000 logo sign advertising displays in 19 states and Canada (Annual Report 2008). The firm's third revenue stream, transit advertising displays, includes selling advertising space on the exterior and interior of public transportation vehicles, transit shelters and benches in 66 markets. As of December 31, 2008, the firm operated over 29,000 transit advertising displays in 17 states, Canada and Puerto Rico (Annual Report 2008).

The IT department operation of Company Y is centralized at the company's corporate headquarters and can best be described as limited yet growing. Figure 4.2 provides an overview of Company Y's IT management structure. The IT department does not have an executive level manager within the organization (i.e., Chief Information Officer). Instead, the highest level of

management within the IT department is at the director level. The Director of Information Technology reports to the Chief Operating Officer and oversees the four primary IT functions within the organization: Project Management, Systems Development, IT operations and Communications services.




**FICURE 4.2: IT Management and Structure at Company Y**

## 4.4 Overview of Company Z

Company Z defines itself as a leading provider of high-quality, low-cost home health services to the chronic, co-morbid, and aging American population. The firm was originally incorporated in Louisiana in 1982 and eventually transferred operations to a Delaware corporation, which was incorporated in 1994. The firm became a publicly traded company in August of 1994 and is traded on the NASDAQ Global Select Market.

The firm's services include both home health and hospice services that are primarily paid by Medicare, which represented approximately 87%, 89%, and 93% of the net service revenue in 2008, 2007 and 2006, respectively (Annual Reports 2006; Annual Report 2007; Annual Report 2008). As of December 31, 2008, the firm owned and operated 480 Medicare-certified home health agencies; 48 Medicare-certified hospice agencies; managed the operations of two Medicare-certified hospice agencies in 37 states within the United States, the District of Columbia and Puerto Rico (Annual Report 2008).

The company's typical home health patient is Medicare eligible, approximately 72 years old, takes approximately 12 different medications on a daily basis and has multiple co-morbidities. For home health patients, the firm typically receives a 60-day episodic-based payment from Medicare. This payment can vary and depends on the type of care provided, how sick or debilitated a patient is, the patient's condition and the amount of services required.

During the past three years, the firm more than doubled their net service revenue from $541.1 million in 2006 to $1.18 billion in 2008 (Annual Report 2008). The firm's stock was robust during FY 2008 with diluted earnings per share increasing by 87.2% from $1.72 per share in 2006 to $3.22 per share in 2008. The firm continues to implement an aggressive growth strategy based on acquisition and mergers in 2008 by completing the acquisition and conversion of 131 home health and 14 hospice agencies to their operating systems and Point of Care ("POC") network.

The IT function at Company Z is not a single department but is instead a division comprised of several IT related departments within the overall corporate structure. Company Z's IT division is comprised of six departments including the Enterprise IT Security Department, IT Compliance Department, IT Enterprise Metrics/Project Management Office, Applications Development, Networking, and IT Strategic Initiatives. Each department has specific responsibilities regarding the

company's overall IT strategy. Across each department within the IT division are tacit and explicit synergies discussed later in this chapter.

The IT division has received awards for its approach to technology innovation in operational excellence. In September 2008, Information Week Magazine recognized Company Z as one of the top fifty most innovative companies in the country. Out of five-hundred business technology innovators, Company Z ranked forty-fourth for the companywide implementation of their point of care system, a laptop computer technology used by nurses and therapists to document and monitor each patient's health condition and plan of care. The system has enhanced the company's clinical compliance controls and delivered a positive net impact to earnings through improved administrative efficiencies (Retrieved from BusinessWire.com, 2008).

The following is a synopsis of responsibilities for each department within Company Z's IT division. The Enterprise IT Security department is responsible for ensuring system security administration; enterprise security risk awareness; and enterprise security initiatives. The IT Compliance department focuses on the IT internal control environment for the firm as it relates to state, federal, and accreditation compliance such as with the Joint Commission on Accreditation of Health Care Organizations (JCAHO). This department is also responsible for oversight of SOX compliance initiatives and serves as a liaison between the company's internal audit department, third-party reviewers, and the company's external auditors. The company's IT Enterprise Metrics/Project Management Office provides guidance on IT strategic initiatives and serves as a liaison between business units. This department also develops and monitors metrics across the firm to assess return on assets (ROA) acquired during IT strategic initiatives. Finally, this department is tasked with the responsibility of turning the data retrieved from the established IT metrics into business intelligence in the form of internal best practices and white papers. Ultimately, this

information must be disseminated across the enterprise. The applications development department is responsible for software development including quality assurance. Database administration, maintenance, IT integration, and data conversion during acquisitions also fall under the jurisdiction of this department. The networking department's responsibilities center on the firm's IT hardware concerns including the firm's network infrastructure, telecommunications, IT operations, IT support, and acquisition conversion activities. Finally, the IT Strategic Initiatives department is responsible for identifying and implementing IT efficiency initiatives that drive the company's business forward each year (Company Z, 2008).

The IT Division as a whole has seen significant growth since 2005. At that time the number of employees was fifty-five. In 2008, the number of IT employees has almost doubled with 105 full-time active employees. The company reports a low turnover rate (10-16%) over the period from 2005 through 2008 (Company Z, 2008). The company's low turnover rate helps to ensure institutional knowledge is developed and maintained in furthering the goals of the company.

## 4.5 Analysis of IT Governance

This section provides an analysis of the IT governance structure of each site in the study. The IT governance structure of each company is classified using Weill and Ross's (2004) Governance Archetypes classifications relative to how governance decisions are made. The five different archetypes include:

- **business monarchy** where IT decisions are made by company executives exclusively;
- **IT monarchy** where IT decisions are made by corporate IT professionals;
- **feudal** structures where autonomous business units make IT decisions;
- **federal** structures where a hybrid decision making process takes place between IT professionals/executives and business unit professionals/executives;

- **IT duopoly** structures where IT executives and one business group makes the IT decisions; and an
- **anarchy** structures where each small group makes individual IT decisions.

The IT decisions used to identify each archetype include: IT principles, IT architecture, IT infrastructure, business application needs, and IT investment. With each decision, the internal organizational source of input on the decision and the organizational entity that actually makes the final decision are identified. Each analysis includes a matrix which displays the IT decision juxtaposed to the appropriate governance archetype. While the sites did not cluster into one specific archetype, there were definite patterns that have implications for the effectiveness of IT governance in small and medium companies.

### 4.5.1 Company X

IT governance at Company X (Figure 4.4) can best be described as a combination of the IT monarchy and federal archetypes. Decision making for IT architecture, IT strategy, and IT investment rests exclusively with the executive and senior-level IT management, while the input for those three decisions originates from the business units as well as IT management. The governance structure around these three key IT decisions is not necessarily dissimilar from the governance structure of large companies in previous studies (Weill & Ross 2004). This fact may be related to the history of the new CIO of the organization who previously was a financial executive for a big-three auto company based in the U.S. Midwest. He states:

> "When I came here it was obvious that the organization could benefit from some of the things we were doing at (company name omitted). Some of that included changing personnel but a lot of it included just how we made decisions regarding the strategic nature of the IT department."

The remaining two decisions, IT principles and business application needs involve a federated approach to verbal input that includes the business units and IT management. However, the decision on which IT principles are adopted is made with Senior IT management and business operations exclusively. Weill and Ross (2004) characterize this type of arrangement as a duopoly. While the IT governance at Company X is clearly a top-down approach, there appears to be an attempt to include input from the IT and business unit staff in the organization. A database administrator interviewed stated that:

> "Since (name omitted) came on as our head architect guy (Sr. V.P. Architecture), we really have been kept in the loop on what changes are going to be made as far as infrastructure goes…we've been able to give input on decisions on the IT strategy. That wasn't the case before and I've been here ten years."

The primary antecedents that have impacted the IT governance structure of Company X include, the previous governance experience of the senior management, the company's size, the company's organizational structure and the company's IT investment. Additionally, the impact of a natural disaster, Hurricane Katrina, on the company's systems also appeared to be a significant factor in the evolution of the company's IT governance. The Director of Operations stated that:

> "We were caught with our pants down during Katrina…our down time was significant enough to make us rethink the vulnerability of our operations particularly since we were already going through Sarbanes Oxley…what we ended up doing was looking outside of OUR box and getting some guidance on how best to improve our governance structure. I think a result of that was hiring (name omitted (Sr. V.P. Architecture))."

Despite being on the Gulf Coast, the company made a strategic move to expand its IT operations to the Dallas, Texas, metropolitan area to hedge against not just natural disasters but what they believe is a dearth of IT/IS talent in the Gulf South region.

"We have…there are challenges to recruiting folks to come down to New Orleans and work out of here. One of the things that I started which was pretty radical for (the company) is I have a data center in Dallas. Especially with the talent that's available in Dallas and all those places. So we've hired some folks there. We're getting more into that… away from the everything has to be in New Orleans…We also have some remote programmers in Boston."

The company's Senior V.P. for Architecture conveyed that the strategic IT investments for the company lay not in IT hardware or software but in the acquisition of IT professionals who possess a body of knowledge that conveys competence in both IT and general business processes. He states:

> " Our business partners are also getting more technically savvy. What you have is a business and IT starting at opposite ends of the table and over the years what you've seen is the business getting more technically savvy and what you see is the IT folks that are surviving and not just surviving but thriving and growing. Their careers are getting much more business savvy. Those are the folks I'm after. When you look at someone in my position you'll probably see someone who has not only been a geek…and I'm proud to be a geek…but I also run a business unit… I used to be a technologist banker or a technologist with a business element. I consider myself a business technologist. I'm referred to as a business person who has technology knowledge."

The future of IT governance at Company X is a source of continual discussion between senior management in the Business Operations and IT departments. With the continued permeation

of social networking and mini-blog technologies such as twitter and facebook, companies are exploring how they will leverage those technologies and future technologies to gain market share. This sentiment was echoed by the CIO of Company X when speaking about social networking technology and understanding their impact on future business trends:

"…It is because you get to understand customer impact. You get to understand how weird marketing is. You get to understand all those fun things. I think that's important at the end of the. That's where our business is headed and that's some of the stuff we will consider in setting up control mechanisms."

**DECISION**

| GOVERNANCE ARCHETYPE | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| **Business Monarchy** | | | | | | | | | | |
| **IT Monarchy** | | | CIO, S.V.P, IT Arch, IT Dir. | CIO, S.V.P, IT Arch | | CIO, S.V.P, IT Arch | | | | CIO, S.V.P. IT Arch, IT Dir. |
| **Feudal** | | | | | | | | | | |
| **Federal** | S.V.P, IT Arch, IT Dir., Bus | | | | CIO, S.V.P, IT Arch, IT Dir., BUs | | IT Dir., BUs | IT Dir.; BUs | CFO, COO, CIO, S.V.P, IT Arch, IT Dir., Bus | |
| **Duopoly** | | CIO, S.V.P., IT Arch., Bus. Ops. | | | | | | | | |

**FIGURE 4.4: IT Governance Arrangement at Company X**

### 4.5.2 Company Y

IT governance decisions at Company Y rest almost solely with the executive and senior management of the organization and can best be characterized as a combination of the Business Monarchy and IT Monarchy archetypes. With the exception of business application needs, all primary governance decisions are made by a combination of the Director of IT, the Chief Financial Officer, and/or the Chief Operating Officer. No executive-level officer worked in the IT department. However, a majority of the IT governance decisions are guided by input from both IT entities and the business units. According to the Project Manager tasked with the responsibility of guiding the organization through Sarbanes Oxley compliance, the processes employed in the company's governance efforts have not changed since the enactment of SOX:

> "I would say the governance of them (IT processes) has increased dramatically, but the actual processes themselves have not changed a lot. There are a couple of reasons for that."

When pressed to elaborate about the company's governance structure and its impact of the company, the Project Manager's response described actual controls and not governance structure:

> "It was our opinion that in the IT world there are certain things you have to be doing in order to be doing your job. You have to backup data. You have to monitor people's access to data. You have to make sure your systems are protected from being hacked from the outside for our protection.
> All these things that we monitor that we're continuing to monitor now just has to be done. For the most part were already being done here at (name omitted). I don't know the people who say that it changed…Sarbanes Oxley changed their environment. Obviously, maybe they weren't following those practices in certain areas."

Company Y's Director of IT also was unable to convey how the company's IT governance has changed or impacted the company's business. He stated:

> "I really don't know what I could point to that would indicate change other than we are documenting a whole lot more than we used to…but to say that the business has changed I don't know about that."

These two positions are at the top two tiers of the company's IT department yet neither employee could articulate a conceptual view of the company's IT governance and its impact on the company's business other than the effects of noncompliance with Sarbanes Oxley. This implies that the IT governance structure at the company is either immature or non-existent. This point is corroborated by the company's database administrator:

> "Unfortunately very little governance exists within our company. Prior to SOX requirements there was very little regulation or supervision over software development and deployment. Since the implementation of SOX audits the view and methods regarding IT governance has changed. Governance is enforced through the Project Managers on staff. Deliverance of new software projects are regulated by processes that have been suggested and implemented by the same Project Managers."

This statement substantiates statements made by the Director of IT and the Project Manager about limited changes in processes pre/post SOX. However, what is telling is that it appears that the reason for limited change is that the processes and principles surrounding IT governance efforts are established and filtered through the Project Manager who is a contract employee. Further statements made by the systems administrator imply that the company's view of governance is limited and that the company's IT governance structure is immature. When asked about the company's IT procurement policies and IT performance metrics for assessing IT governance she replied:

> "Each process is different. Actual policies do not exist… Unfortunately I am not sure that a process exists to establish performance goals and bench marks…they just do not exist."

The presence of knowledge of and about IT governance was absent during the interviews with employees at Company Y implying a lack of shared language across the organization. Despite an average tenure of 7 years with the company, none of the interviewees could articulate the

company's IT governance structure; further implying an immature governance structure. While there was some evidence of documentation related to risk management of IT, the impetus appeared to be based on satisfying regulatory requirements.

**DECISION**

| GOVERNANCE ARCHETYPE | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| **Business Monarchy** | | COO | | | COO, Dir. IT, | | | | | Dir. IT, COO, CFO |
| **IT Monarchy** | | | Arch Serv. | Dir. Arch | | Dir. IT, Dir. IT Ops, Dir. Arch, | | | | |
| **Feudal** | | | | | | | | | | |
| **Federal** | Proj. Mgr. BU mgrs | | | | | | Bus Mgt., IT directors | Dir. Of Sys&Dev. | Bus, IT Dir. | |
| **Duopoly** | | | | | | | | | | |

**FIGURE 4.5 IT Governance at Company Y**

### 4.5.3 Company Z

IT governance at Company Z is formally described in three layers of IT controls: the Internal Audit layer, the Enterprise Risk Management Layer, and the IT Compliance Department layer (Internal Document, 2008). Within these three layers of IT governance are entity level controls, business process controls and general IT controls. At the executive level of management, IT business objectives are set, policies are established and decisions are made on how to deploy and management the resources of the IT division. Entity-level controls set the tone and culture of the organization and serve as an overall key component of the company's control environment. All positions identified in Figure 4.2 constitute the executive management of Company Z's IT division.

Weill and Ross (2004) advocate that alignment between organizational goals and IT goals is important to establish and sustain a mature effective IT governance structure. The executive management of Company Z's IT Division has prepared strategic plans for IT that align the firm's business objectives with IT strategies. According to the company's *IT Division Profile* document available on the company's website,

> "Executive management regularly confers to review alignment between the company's strategy, goals, and objectives of the IT division. Independent reviews are conducted by external entities to provide feedback on benchmarking strategies, best practices and opportunities for improvement,"(p.8).

Additionally, the document states that:

> "The Systems Development Life Cycle is used to address complex and significant initiatives. (Company Name Omitted) employs this process to ensure that projects **support strategic business objectives** and that resources are effectively implemented throughout the entire life of the project: Initiation Phase, Analysis Phase, System Design and Development Phase, Testing Phase and Implementation (Roll-out) Phase," (p.9).

Clearly with Company Z there has been some forethought into implementing processes that will maintain alignment between organizational and IT divisional goals.

The IT division has also established appropriate metrics to measure risks across the firm associated with daily activities of the IT division. Each department within the IT division is responsible for identifying key metrics to measure and monitor established benchmarks. These metrics assist the IT division management as a tool to monitor the overall risk profile of the division. One technique used by the IT division management to mitigate risk and implement its IT governance efforts is the IT change management board used at Company Z. This board aggregates all information associated with pending changes to a particular system in the IT division and allows

management to review and approve any change that might affect IT systems and enterprise resources.

Company Z's IT governance over applications is imbedded within each proprietary business process application. As the company has grown so has the amount of automation associated with the company's business processes, particularly the company's revenue stream data flow. The three primary applications used by the company are homegrown and proprietary and include a point of care application, a medical billing application, and a revenue report application. Effective governance around these applications is most important to the company's overall business strategy according to the Executive Vice President for IT because:

> "…they are the life of our company and allow us to have a competitive edge over our rivals."

The point of care application audit tool identifies the existence of data transfer errors between a clinician's laptop and the company's billing system exist. The company's billing system has an automated trigger to alert the system administrator that changes to the billing system have been made. Finally, to ensure that any IT changes have not affected the revenue cycle, the company has a third-party vendor recalculate the revenue stream on a periodic basis.

Additionally, Company Z has developed an extensive Disaster Recovery Plan to support the overall business continuity plan. The Disaster Recovery Plan was developed using best practices from top performing companies. The company employs a remote, out of region data center which hosts replicated data and allows for quick recovery times in the event the corporate data center should become compromised. Testing of the Disaster Recovery/Business Continuity Plan is performed annually or more often at the recommendation of the Enterprise Risk Management Steering and Sub-Committees. In September 2008, Company Z's corporate office was faced with a true disaster as a result of Hurricane Gustav. However, the planning and execution from the IT

Division ensured that the corporate office and data center remained fully functional during the entire incident.

The CIO and the senior management of the IT division at Company Z believe that an independent third party is needed periodically to provide an assessment of the company's IT governance activities. As such, the company has employed the services of several third-party vendors within the last two years. In 2007, Microsoft Consulting Services performed an enterprise review and gap analysis on IT best practices for the IT division and made additional recommendations for establishing an Enterprise Project Management office and a Senior Vice President to focus on IT governance. In 2008, Third Sky Consulting Services conducted an IT services management maturity assessment for the IT division and conducted training on the Information Technology Infrastructure Library (ITIL) best practices. As a result of the ITIL training twenty-eight managers across the company took and passed the ITIL foundation exam. According to the company's CIO:

"It is the company's intention to continue to implement ITIL practices in the IT division." In 2008, CMA Technology Solutions was contracted to perform an enterprise security assessment which included identifying vulnerabilities in the company's networks and applications.

An analysis of Company Z's IT governance structure (Figure 4.6) using Weill and Ross's (2004) framework reveals that the company has a hybrid structure between an IT monarchy and a federated structure. While most of the company's IT decisions are made by senior and executive management in the IT division, input for governance decisions comes from not only the IT division's upper management but also the company's business units. The centralization of decision making for the IT division has allowed the company to exercise control over key strategic decisions that affect the division while also promoting democracy through input from the business units. This

may provide some explanation of why the company's IT governance structure resembles that of a mature IT governance structure in larger companies.

| | | DECISION | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
| | | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| GOVERNANCE ARCHETYPE | Business Monarchy | | | | | | | | | | |
| | IT Monarchy | | IT Metr; IT Comply; Enterp. IT Sec. | IT Div., CIO, | IT Div. Execs, CIO, | | IT Strateg.Init.; CIO | | | | CIO; IT Div. Execs |
| | Feudal | | | | | | | | | | |
| | Federal | Intern. Audit; IT Strateg. Init.s; IT Metrics; IT Comply; Enterp. IT Security | | | | Internal Audit; IT Strateg Init.s; IT Metrics; IT Comply; Enterp IT Security | | BU's; IT Div. | BU's; IT Div. | Int. Audit; IT Strat. Init.; IT Met.; IT Comply; BU's | |
| | Duopoly | | | | | | | | | | |

**FIGURE 4.6 IT Governance Structure at Company Z**

### 4.5.4 Discussion of IT Governance Archetypes

Figure 4.7 provides an aggregated view of the clustered IT governance archetypes associated with the IT decisions made by the companies in this study. Each cluster is juxtaposed to the most common decision patterns chosen by large companies in Weill and Ross's study. In choosing IT principles of their respective organizations, the companies in this study mirrored the input process of large companies. However, the final decisions about IT principles deviated from that of large companies with the exception of Company X. This deviation is attributable to Company X's new

CIO coming from a Fortune 500 large multinational corporation where the decision making would be characterized as a duopoly. Decisions about IT architecture saw all three companies mirror large companies regarding the final decision; however, all three companies deviated from large company patterns of input on IT architecture with none clustering in the federal or duopoly archetype and instead clustering in the IT monarchy archetype. Decisions about IT infrastructure typically involve input from a federated approach and the final decision being made from an IT monarchy in large companies. Such was the case with the companies in this study. All clustered in patterns similar to those of large companies. This point can probably be explained by the technical expertise of the IT management in all companies and the lack thereof by management in other departments. Similarly, the companies in this study mirrored the decision patterns of large companies in business application needs decisions with all three clustering in the federal archetype in the category. Finally, the decision process on IT investment revealed a slight deviation by the companies in this study. Decision patterns on input of large companies on IT investment tend to cluster around the federal archetype. The companies in this study stayed true to that pattern. However, large companies tend to choose a federated, duopoly, or business monarchy approach in making the final decision. With the exception of Company Y there the companies in this study chose an IT monarchy approach to making the final decision. This point possibly be attributed to the fact that the CIO of both companies have a background in the operations side of their respective companies. The CIO at Company X is a former CFO at a similar company and the CIO at Company Z has an advanced degree in nursing from Johns Hopkins and is a past regional director of operations for the same company. Thus, both individuals understand the operations side of the business first hand and the technical side of the business and are better prepared to make strategic investments in IT.

**DECISION**

GOVERNANCE ARCHETYPE

| | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| **Business Monarchy** | | **Y** | | | | | | | | **Y** |
| **IT Monarchy** | | **Z** | **Y, X,Z** | **Y, X,Z** | | **Y,X,Z** | | | | **X,Z** |
| **Feudal** | | | | | | | | | | |
| **Federal** | **Y,X,Z** | | | | **Y, X,Z** | | **Y,X,Z** | **Y,X,Z** | **Y,X,Z** | |
| **Duopoly** | | **X** | | | | | | | | |

**FIGURE 4.7: Aggregated IT Governance Archetypes**

**SHADED AREAS INDICATE MOST COMMON PATTERNS FOR LARGE COMPANIES (WEILL & ROSS, 2004)**

## 4.6 Institutional Effects on IT Governance

As discussed in Chapter three, institutional pressures on organizations can be characterized as coercive, normative, and mimetic. Coercive pressures evolve from the organization's legal environment through the mandate of standards which can be imposed by entities upon which the organization is dependent (DiMaggio and Powell, 1983). Normative pressures result from the "professionalization" process including membership in professional organizations such as the Institute for Internal Auditors; inter-organizational networks; and adherence to established formal professional standards (DiMaggio and Powell, 1983). Mimetic pressures refers to the process of organizations modeling themselves after other organizations in their fields that are perceived to be more legitimate or successful and often appear in times of uncertainty in the organizational environment (DiMaggio and Powell, 1983).

Institutional pressures affect organizations by forcing them to implement strategies that facilitate, maintain, or repair their legitimacy (Suchman, 1995). According to Oliver (1991) a continuum of strategies exists that result from institutional pressures to conform including: acquiescence, compromise, avoidance, defiance, and manipulation. Acquiescence is defined as the organization's conscious intent to conform for self-serving reasons and is expressed through tactics such as habits, imitation, and compliance (Oliver, 1991). Compromise strategies are used to promote an organization's own interests through such tactics as balancing, pacifying, and bargaining (Olive, 1991). Avoidance is an attempt to prevent the need to conform to an external pressure and may include tactics such as concealing, buffering, or escaping (Oliver, 1991). Defiance is the rejection of institutional norms and include tactics such as dismissing, challenging, and attacking. Finally, the last strategy is manipulation. This strategy can be defined as the purposeful and opportunistic application of the tactics of co-opting, influencing, or controlling an institutional pressure (Oliver, 1991). These five legitimization strategies proposed by Oliver may assist in understanding how and why the companies in this study, under institutional pressures, adopted and implemented their IT governance structure.

Acquiescence resulting from coercion is often the most logical perception of institutional forces on organizational change. Likewise, it is logical to believe that the primary reason for the companies in this study to evolve their IT governance structure would be to meet the legal requirements for SOX. While that certainly was the case in the initial years of SOX requirements, evidence from Company X and Company Z indicate that their IT governance structure has evolved past mere acquiescence to a legal mandate. These companies have chosen to leverage efficiencies and strategic initiatives realized through the compliance process. This statement by the Senior V.P. of Internal Audit at Company Z bolsters this point:

> "…We're trying to get ahead of that (compliance) and we've got three years of investment in our ERM process and we aren't where we need to be on that but when you were here we didn't have that. We were just like, oh, god let's just get through Sarbanes Oxley and move on, have a month off and then move on after that… We're way beyond that. If you interview somebody like (Our CEO)… He would tell you that as painful as Sarbanes-Oxley was it was the best thing happened to this organization. The reason he says that is because we did not have that process infrastructure in place prior to SOX. People really didn't understand the process to be able to document it or articulate it and now they can. Now they have to think about how I can make that more efficient, how can I enhance the controls and every quarter you got to be thinking ahead."

Likewise, the Senior V.P. for Architecture at Company X conveys that his strategy in leveraging his company's IT governance transcends mere compliance with the legal requirements of SOX:

> "You need to look at how you're doing your work and how you control what's happening in your environment. Regulatory requirements is just really one constituency of that entire puzzle. I started off and I tackle these things really starting from a system's point of view, from an architecture point of view."

In addition to external regulatory factors, coercive pressures may emanate from internal factors within an organization. IT research has long advocated that a key success factor IT in implementation is a top management champion. Chatterjee et al. (2002) and Purvis et al. (2001) contend that a top management champion provides managers from departments with institutional norms and values that reassure them about the legitimacy of their conformity. Both Company X and Company Z had top management champions associated with their IT governance structure. Company X had a senior vice president as their champion and Company Z had their CIO as their champion. Consequently, both companies demonstrated evidence that their IT governance structures were important in the company's overall business strategy and maturing. Conversely, Company Y's IT governance champion was a 3rd-party project manager who had worked with the company previously was a consultant. Also of note is the fact that Company Y's highest ranking IT

official was at the director level and no IT manager was at the executive level. According to the project manager:

> "The executives here haven't been involved in the running of IT. There's been a closer relationship with our engineers and that's been on purpose. It's being developed to have that close relationship. It's been run basically I don't want to say on its own, but it's very independent function within the company."

Instead of promoting the IT governance structure, the autonomous approach by Company Y's executive management may be limiting the development of the company's IT governance structure.

Normative and mimetic pressures have also influenced the IT governance structures of the companies in this study. All three sites indicated that they used some type of industry benchmark or framework to assess their IT governance structure with the Information Systems Audit and Control Association's (ISACA) CoBIT framework reported most. Company Z also indicated that influence and information about IT governance initiatives was exerted during knowledge building projects such as needs assessments for new technologies. Through these projects, participants were exposed and required to adhere to established IT governance standards, thus expanding and reinforcing awareness of the company's IT governance processes.

Normative and mimetic pressure may also emanate from trading partners or potential investors, as was the case with Company Z. According to the 2008 Annual report for Company Z the company has been and continues to be a fast paced fast growth company. As such, the company has solicited the finances of institutional investors to raise capital for mergers and acquisitions. Immediately after the company's initial SOX compliance efforts, they lost a round of funding due to a perception of vulnerability to their proprietary revenue system. Despite the company's belief that the system provided competitive advantage, the external perception of the system's possible vulnerabilities temporarily hindered the company's progress. As a result, the company proactively

and transparently improved its IT governance structure and in the process began to innovate by producing new operational products to make the company more attractive to institutional investors. The company understood that correcting the external perception about their IT governance was their responsibility as conveyed by the company's CIO:

> "Once we found out why we lost that round of funding it became clear that we had to approach SOX from a totally new perspective…we brought in the right people and made it a priority to never let that happen again."

This quote further implies that while it appears that Company Z's initial intent was to acquiesce to the legal mandate of SOX, the company ended up co-opting the mandate's initial intent and instead leveraged it for competitive and strategic advantage. Oliver (1991) classifies this legitimization strategy as manipulation where the organization applies co-optation, influence, or control over an institutional pressure. Company Z's legitimization efforts as a result of institutional forces may also be characterized as compromising according to Oliver (1991). Their efforts to refute the external perception about the company's IT governance by publishing white papers about the company's IT governance efforts can be seen as an attempt to promote the company's own interests by pacifying the concerns of institutional investors.

This chapter has provided results and analyses of the data collected during in this study. IT governance archetypes have been identified for each site in this study and evidence has been presented to demonstrate institutional forces that affect IT governance structures in small and medium companies. The next chapter provides concluding remarks and a discussion of the major findings.

# CHAPTER 5:
# CONCLUSION

## 5.1 Introduction

This study examines the IT governance structure of small and medium companies since the enactment of Sarbanes Oxley legislation. A primary goal of this study was to use institutional theory to identify factors that may impact the adoption and evolution of IT governance structures in small and medium companies. A research framework was developed based on theory from information systems and organizational studies. Primary data was collected via interviews using open-ended and semi-structured questions. Secondary data was collected in the form of internal organizational charts, public domain documents from research databases, company websites, and annual reports for each company from 2005 to 2008. In this chapter the major findings will be discussed along with the contributions of the study. Finally, limitations of the study are discussed along with future possibilities for research.

The first objective of this study was to explore the manner in which small and medium publicly traded companies are adopting IT governance practices in response to the regulations associated with the Sarbanes Oxley Act of 2002. While the research herein was exploratory and thus did not present formal propositions, it was expected that small and medium companies would generally adopt similar practices as those of large publicly traded companies as described in Weill and Ross (2004). The results of this study provide some support of this expectation, however; there were some notable deviations in how small companies adopt and implement IT principles to guide their IT governance efforts; how small and medium companies identify which organizational entities provide input for IT architecture for the organization; and how small and medium companied decide which organizational entities make final decisions about IT investments. The possible reasons for these deviations are detailed in the discussion section of this chapter.

The second objective of this study was to explore the reasons small and medium companies choose specific IT governance archetypes. This objective was conducted by using the theoretical lens of institutional theory advanced by DiMaggio and Powell (1983) and legitimization strategies discussed in Oliver (1991) and Suchman (1995). The findings of this study provide evidence that institutional theory, mediated by legitimization strategies, is an appropriate theoretical lens to provide some explanation of why small and medium publicly traded companies adopt one IT governance model over another. Specifically, evidence was found to substantiate that small and medium companies adopt IT governance models or archetypes in an effort to not only comply with the legal requirements of Sarbanes Oxley but to also project a sense of stability, security, and legitimacy to the external community, especially the investor community.

## 5.2 Discussion of Major Findings and Contributions of the Study

This study makes several contributions to the IS literature on IT governance. First, this study responds to Brown and Grant's (2005) suggestion to build upon the work of Weill and Ross (2004) by providing empirical analysis to test the implementation of their ideas in real world settings. Specifically, this study examines the use of legitimization strategies in IT governance design choice. Most notably, this study uses data from the post-Sarbanes Oxley enactment, which is a clear distinction from studies which examine IT governance in the pre-Sarbanes Oxley period. Because IT governance implementation within small and medium companies predicts to improve in structure and formality, examining post-Sarbanes Oxley models for IT governance provides a rich context to examine the effectiveness of corporate governance mechanisms and allow for identification of governance characteristics that may be leveraged for improvement in overall corporate governance.

The next contribution this study makes to that it provides a theoretical framework through which a researcher may begin to understand the reasons why a small or medium company may

adopt a particular IT governance archetype or model. While Weill and Ross (2004) identify best practices in IT governance, they fail to acknowledge the institutional forces that may influence the adoption of IT governance practices, particularly as it pertains to small and medium companies. This study addresses that limitation and provides evidence of specific institutional forces that may influence IT governance choice. This study is the first to utilize institutional theory to explain IT governance in small and medium companies exclusively.

This study is one of the few studies to demonstrate that small and medium companies do not uniformly mimic large companies. Resources, both financial and human, are often limited in small and medium companies. Moreover, corporate management is not always rational in setting and achieving objectives. Therefore, to comply with the mandates associated with the requirements of Sarbanes Oxley, small and medium companies have satisficed rather than leveraged Sarbanes Oxley as a strategic driver. That is, small and medium companies often fail to realize the opportunities afforded them through an regulatory exercise like Sarbanes Oxley. This fact was clearly evident in the analysis of IT governance at Company Y.

IT governance as a research stream continues to evolve and is influenced by an increasing global awareness about the importance of sound governance over a company's IT function. Globalization, automation of supply chains, and other market forces continue to drive the need for companies to not only comply with industry standards regarding IT governance but to leverage compliance efforts for strategic advantage. While Weill and Ross's IT Governance Framework represents a synthesis of previous research in IT governance and a useful tool in IT governance efforts, it is not a panacea and will need to adjust as new social phenomena continue to impact the IT function of organizations. To date, limited case research has been conducted on the IT governance structure in small and medium companies. Moreover, international case research on IT

governance in small and medium countries is almost nonexistent despite several international studies being conducted on overall corporate governance (Parum, 2006; Aksoy and Bozkus, 2008; Jandik and Rennie, 2008; Račić et al., 2008). Some of the findings in this study either support or extend Weill and Ross's (2004) contemporary IT governance research framework while other findings provide new perspectives for contemporary IT governance research frameworks.

The proximity to decision making of an IT governance champion in a small or medium companies directly influences the rate of maturity of the company's IT governance structure and its ultimate success. Weill and Ross (2004) make this point in asserting that more direct involvement of senior leaders in IT governance in their delineation of characteristics of top governance performers. Our study also found that to be the case. Company X and Company Z both have IT governance champions at the senior management level as well as intimate involvement of the CIO in IT governance development. Company Z even demonstrated an awareness of IT governance by the company's CEO through his articulation of the importance of the company's governance structure on internal documents. In contrast, Company Y's IT governance champion is not a full-time employee of the company and is instead a project manager with part-time governance responsibilities limited to compliance issues associated with SOX. Clearly, Company Y would benefit from a full-time position at the senior management level that would be solely responsible for the company's IT governance efforts.

## 5.3 Limitations of the Study

This study used multiple sites to increase external validity and provide cross-case analysis. While data was retrieved from all three sites, the richness and utility of the data retrieved from the sites varied. The access to interviewees at Company Z was unlimited, while access to interviewees at Company Y and Company X was limited. Additionally, access to interviewees was limited

primarily to mid-level IT managers which may bias the findings of the study. Consequently, full theoretical saturation was achieved only at Company Z; limited theoretical saturation was achieved at Company X and Company Y.

The diverse business operations of the research sites presented some difficulties during data collection and analysis. While the IT operations of Company Y and Company were centrally located at their respective corporate headquarters, IT operations at Company X were geographically dispersed and limited the opportunity to triangulate findings. The level of IT governance maturity at each site differed and thus limited the amount of relevant topics discussed during interviews. For example, Company Y was clearly in the adolescent stage of their IT governance efforts. Consequently, the ability of the researcher to discuss the topic of IT governance as a strategic driver with interviewees at Company Y was limited and instead the interview responses focused on discussions around compliance efforts. The varying stages of maturity did however offer the opportunity to see what drivers were associated with small companies who could be characterized as highly developed versus those who may be characterized as less developed in their IT governance efforts.

Finally, the study could benefit from additional cases to improve generalizability of the study's findings. This research was not sponsored by an external or internal funding entity and the budget for research activities was limited to the income of the researcher. Field research is expensive and time consuming. As both resources were scarce while the study was being conducted, data collection and analysis in this study could benefit from additional resources to gather data from additional case sites from similar small and medium companies in other geographic areas.

## 5.4 Directions for Future Research and Conclusion

As is the case in most studies, the analysis of the data in this study generated more questions than it answered. The following are suggestions of research that may be conducted to answer questions raised during the course of this study and to further research on IT governance in small and medium companies since the enactment of Sarbanes Oxley

As stated earlier, this study provides a framework for assessing the reasons publicly traded companies adopt IT governance archetypes from an institutional perspective. The results of the study provide an opportunity to further explore the predicted behavior of small and medium companies relative to their larger counterparts. Ideally, future research on such a comparison would be conducted using qualitative field research techniques. However, an empirical quantitative study could be conducted using the tenets of institutional theory and the antecedents to IT adoption as exogenous constructs and legitimating strategies and enacted IT adoption archetype as the endogenous constructs for a structured equation model (SEM) using data acquired using surveys. While retrieving the requisite number of surveys required to substantiate an SEM study may be problematic, a study using data retrieved from surveys coupled with data retrieved from field research would provide invaluable insight on the reasons small and medium companies adopt specific IT governance archetypes.

An additional study that may be pursued as a result of this research may include using the Weill and Ross (2004) framework for IT governance adoption as a categorization tools to predict where small and medium companies are most likely to cluster given the original and updated Sarbanes Oxley requirements for small and medium publicly traded companies. Evidence presented in this study indicates that there are definite deviations when it comes to assessing how small and medium companies structure their IT governance efforts to comply with Sarbanes Oxley. Using

characteristics such as size, resource constraints, and IT departmental history formal hypotheses for such a study could be present and tested using the positivist case study methodology advocated by Lee (1989) or empirical survey research.

This study provided an analysis of IT governance at small and medium publicly traded companies. The results indicated that small and medium companies emulate the IT governance patterns of large companies in some areas of IT governance while deviating from the patterns of large companies in others. This study provided an additional dimension to the assessment of the contemporary IT governance framework of Weill and Ross (2004) by examining the precipitating factors associated with adopting a particular IT governance archetype over another through the theoretical lens of institutional theory and legitimization strategies asserted by Suchman (2003) and Oliver (1999). The limitations of the study and future research in IT governance were also provided in an effort to build upon the synthesized contemporary stream of IT governance research begun by Weill and Ross (2004).

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## APPENDIX I:

## IT GOVERNANCE STUDY INTERVIEW SCRIPT

State: The following questions are being asked in relation to my dissertation study on IT governance in small and medium publicly traded enterprises. Any and all information you give regarding your participation in the study, including your participation is strictly confidential. If at any time you do not wish to participate in the study you may refrain from doing so. If you have any questions in the future about this study you may contact me at 225.802.0924 or loshead1285@yahoo.com.

Demographic Questions

The following questions are used to gather demographic data on respondents in the study:

- Title:
- Department:
- Years with company:
- Age
- Gender
- Race
- Education (including certifications)

1. What is your definition of IT governance?
    - How does your company demonstrate it?
    - How has it changed since SOX?

2. Harmonization b/w enterprise strategy & desirable IT behaviors
    - What's the history of the IT department? Company?
    - How would you describe the culture w/I the organization? IT department?
    - What is the level of autonomy/centralization b/w business units?
    - Why are the business units centralized/autonomous? History?
    - What is the company's competitive thrust?
    - How are synergies realized within the company?
    - What incentives are available to employees to implement the stated strategy?

- How are internal politics resolved in the org? IT department?

3. Harmonization b/w IT Governance arrangements and IT Governance mechanisms
    - How are IT governance arrangements developed in your company?
    - What process is used to define IT principles? Make investments?
    - Which parts of IT are decentralized? Why?
    - Which parts of IT are centralized? Why?
    - How does the organization share internal innovations of IT across the company if at all?
    - How does the IT governance arrangement reinforce the divisional or business unit structures w/I the organization?
    - What IT governance mechanisms are employed in your organization?
    - Is there a technology council? If so, composition?
    - Are there efforts to reduce technologies across the organization?
    - What are the company's IT procurement policies?
    - Does your company use performance metrics such as six-sigma? Charge back policies?

4. Harmonization b/w IT metrics and accountabilities and business performance goals.
    - How does your company/dept. establish performance goals and benchmarks for assessing governance efforts?
    - Is there evidence of a shared language? (may may/not ask)
    - What metrics are used companywide to assess the impact of IT? Unit level? (ROA? share price?)
    - Any unique strategies/metrics used to implement accountability?
    - How is standardization implemented in the IT department?

5. Business Units Synergy versus Business Units Autonomy (may not be asked directly look for additional evidence)
    - Is there evidence of shared technology and infrastructure→economies of scale
    - Is there evidence of shared data→ process integration
    - Is there evidence of shared processes→ process excellence & org. learning
    - Emphasis on BU decision making→more = greater autonomy
    - Emphasis on BU innovation→ more = greater autonomy
    - Few mandated processes→ less is greater autonomy

## APPENDIX II: INTER-CODER RELIABILITY

## VALIDATION OF THE INITIAL CODING SCHEME FOR IT GOVERNANCE

Instructions: The following list of codes relate to a study on IT governance in small and medium companies. The steps below should be followed in sequential order with no deviation. After you have completed all steps, please contact the researcher to review, compare, and discuss the findings.

**STEP 1: Get familiar with the case study.** The researcher will discuss directly with you the research objectives associated with the study as well as key topics associated with IT governance and institutional theory.

**STEP 2: Familiarize yourself with the research questions associated with this study:** How has IT governance in small and medium companies evolved since the enactment of Sarbanes Oxley? What institutional factors influence the evolution or change in IT governance in small and medium companies?

**STEP 3: Read the definitions of each code.** The following pages provide the description for the proposed codes for the study and each should be read and evaluated by you. If you have any questions regarding the logic of the coding scheme please contact me.

### CODES AND DESCRIPTIONS

| CODES | DESCRIPTION |
|---|---|
| **IT_Gov_Assess_Governance_Arrangements** | Includes key IT decisions and archetypes of an organization and includes IT councils, 3rd-party service level agreements, the overall IT organization, and IT architecture committees |
| **IT_Gov_Assess_Governance_Awareness** | The percent of managers (or overall employees) who can actually describe IT governance. This may come in the form if meetings, internal documents, and/or intranet portals |
| **IT_Gov_Assess_Setting** | Assessment of IT governance based on the company's strategy, size, synergy and IT intensity |
| **IT_Gov_Clarify_CustDataOwnership/Consistency** | Assessment of IT governance based on clear ownership of customer data in the firm |
| **IT_Gov_ClarifyBxCustNeeds** | Assessment of IT governance based a clear understanding of information |

| | |
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| | needs of the customer |
| **IT_Gov_InfoNeedsFocus** | Assessment of IT governance based on clear comprehension of information needs of employees in the company |
| **IT_Gov_InnovUnitsAutonomous** | Assessment of IT governance based on how much autonomy units within the IT department have with innovation; limited innovation implies a lack of autonomy |
| **IT_Gov_OperExcel_Strategy** | Assessment of IT governance based operational excellence as a strategic driver for the company. |
| **IT_Gov_Priciples_Descretion/Standardization** | Assessment of IT governance based on discretion given to units within the company's IT function to implement IT governance principles versus a standardized approach from a central body within the organization. |
| **IT_Gov_SharedInfrastructureEfficiency** | Assessment of IT governance based on evidence of shared infrastructure and realized efficiencies |
| **Resistance to IT Governance** | Demonstrated resistance to IT governance implementation by company employees. |
| **Value_Cust_intimacy_AnalyticalTools** | Characterization of the company as one that has IT governance around its analytical tools to facilitate their strategic driver of Customer Intimacy |
| **Value_Cust_Intimacy_Relationships** | Characterization of the company as one that has IT governance around tools used to define customer relationships to facilitate their strategic driver of Customer Intimacy |
| **Value_OperExcel_Efficiency** | Characterization of the company as one that demonstrates operational excellent and has IT governance tools that facilitate efficiencies |
| **Value_OperExcel_Innovation** | Characterization of the company as one that demonstrates operational excellent and has IT governance tools that facilitate innovation |
| **Value_OperExcel_MinOverhead** | Characterization of the company as one that demonstrates operational excellent and has IT governance tools that facilitate minimization of overhead |
| **Value_OperExcel_ROA** | Characterization of the company as one that demonstrates operational excellent and has IT governance tools |

| | |
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| | that facilitate a return on assets |
| **Value_OperExcel_StreamlineSC** | Characterization of the company as one that demonstrates operational excellent and has IT governance tools that help to streamline the company's supply chain |
| **Value_ProductLead_Embrace_Ideas** | Characterization of the company as one that demonstrates product leadership by embracing new ideas |
| **Value_ProductLead_Innovation** | Characterization of the company as one that demonstrates product leadership by promoting innovation in IT |

**STEP 4: PLEASE ASSIGN CODES TO THE FOLLOWING SEGMENTS**

| NO. | EXAMPLE | CODE OF YOUR CHOICE |
|---|---|---|
| 1 | Q:Can you describe for me the IT governance arrangements of your company?<br><br>A: We did a pretty good job, but we just found that they're very siloed. We know that. We found that here. What we recently have done and when I say recently probably within the last year we started talking about it, but we just actually formally kicked off a project we're calling our governance, risk, and compliance project. | |
| 2 | Q: How would you describe the level of IT governance awareness among IT employees?<br><br>A:I know that in terms of its importance in the organization. It's extremely high priority. Lots of conversations, meetings regarding simply Sarbanes-Oxley. Insuring that we're doing all the things that we need to do. In my role here because I'm pure IT and this is the way we're structure I don't have as much of a role in the Sarbanes-Oxley side because of the fact that I'm strictly a VIP. | |
| 4 | Q: Who is responsible for customer data in your company?<br><br>A: Our DBA is responsible not only for customer data but also employee data and our GL. | |
| 5 | Q: How does your company determine the information needs of your customers and who is responsible for that data.<br><br>A: We don't have a department that actually determines | |

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| | information a specific customer needs however, we do have an information portal on our website. | |
| 6 | Q:What governance mechanisms does your company use to clearly communicate information needs of the employees?<br><br>A: Whatever audit we do we kind of have an upfront meeting about data responsibilities with the SOX Team to make sure there's no duplication. | |
| 7 | Q: How much autonomy does your IT department have with being able to innovate?<br><br>A: Continuing a centralized control and decentralized management structure. The Company's management believes that, for its particular business, centralized control and a decentralized organization provide for greater economies of scale and are more responsive to local market demands. | |
| 8 | Q: How does your company demonstrate operational excellence?<br><br>A: Our IT Division has taken a top-down, risk-based approach to SOX designed to help ensure that sufficient and appropriate attention is given to areas of highest risk. As a division, we remain extremely committed to enhancing the control environment. | |
| 9 | Q: Can you give any examples of how the company has standardized or not standardized IT governance?<br><br>A: One of the main things we have to do is as a company how are we going to define risk because right now you'll see the compliance division, our internal audit division, our ER division and then our SOX division. Even myself separately I'll define risk differently. We all have different lists, spreadsheets… our SOX team would do that with an automated tool that we use for SOX compliance. | |
| 10 | Q: Can you provide any information on how your company has found efficiencies through shared infrastructure?<br><br>A: So therein lay your governance so you start looking at what you have today that's part of IT today, what's the roadmap for the future and then how do you start things like standardization, architectural standardization and process standardization. | |
| 11 | Q: What analytical tools has your company implemented?<br><br>A: I'm not so interested in a bunch of black belts (Six Sigma) I just want them to understand what the process is all about. And I want to instill in them the whole sense of our continuous improvements. You can never be satisfied with where you're at. Where you're at is just a point and time. You have to | |

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| | continuously look at how you can improve your services to your customers. | |
| 12 | Q: Is the concept of relationship building with customers important to your company's strategy?<br><br>A:That's right. One of the things that I've noticed in this particular company that regardless of how big we get they take that personal "know your customer" concept seriously. I've been to many, many meetings and…where it was mandatory. You had to show up. You had to talk about what was important and serving your customer is top of the list. | |
| 13 | Q: How does your company realize efficiency in its operations?<br><br>A: One of the benefits of organizational scale is the ability to deliver high quality care more efficiently and cost effectively than smaller providers. A way in which to gain insight into this dimension of organizational performance is to evaluate the publicly available Medicare cost reports and compare the relationship of overhead expenditures to net patient revenue. | |
| 14 | Q: How has your company demonstrated innovation in its operations?<br><br>A: We have been recognized nationally for our innovation in our use of technology in healthcare delivery. | |
| 15 | Q: What operational strategies have been employed at your company to minimize overhead?<br><br>A: We can sit right here and not incur all the travel cost and stuff that we used to. They've built out of point-of-care tablets for our home health line of business and the plan is to do a similar product in-house for our hospice line of business. | |
| 16 | Q: How does the company get a return on its IT assets?<br><br>A: We're trying to get an integrated GRC platform like we have Sarbanes-Oxley software that we use for the documentation stuff and our ERM process if you will uses a Cognos product. Its two different products, don't talk to each other. We've never gotten automated work papers and our compliance group uses Office just kind of like we do. | |
| 17 | Q: Has your company's supply chain been streamlined by your IT governance structure?<br><br>A: If you look at kind of priorities on what's getting programmed and what's getting enhanced it falls around that patient care at the bed side tool. From that perspective most of the key initiatives | |

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| | we have as a company involve IT to some degree. Whether we're buying a company you have a conversation process or integration of the data, the patient information or whatever it might be you have to make sure they get hooked up to our wide area network. There's a huge role of IT in that. | |
| 18 | Q: Would you characterize your company as one that embraces new ideas using IT?<br><br>A: Plus, now we have…I don't know but we've spent probably $12 million on point-of-care tablets, so a huge asset investment of technology to have that at the bed side while they're seeing the patient in the home. I would say the visibility is high because look we're even looking at a technology automation right now for audit and compliance and ERM. | |
| 19 | Q: What types of innovative technologies has your company developed to meet customer needs?<br><br>A: They're developing. We've had these kinds of individual modules for different areas of the business. We're trying to develop what's called a 360 view where everything is connected; the customer experience is seamless in the different parts of our company. | |

## STEP 5: COMPARISON AND VALIDATION OF CODES

| NO | CODES | CODE SET BY RESEARCHER | COMMENTS |
|---|---|---|---|
| **1** | | **IT_Gov_Assess_Governance_Arrangements** | |
| **2** | | **IT_Gov_Assess_Governance_Awareness** | |
| **3** | | **IT_Gov_Assess_Setting** | |
| **4** | | **IT_Gov_Clarify_CustDataOwnership/Consistency** | |
| **5** | | **IT_Gov_ClarifyBxCustNeeds** | |
| **6** | | **IT_Gov_InfoNeedsFocus** | |
| **7** | | **IT_Gov_InnovUnitsAutonomous** | |
| **8** | | **IT_Gov_OperExcel_Strategy** | |
| **9** | | **IT_Gov_Priciples_Descretion/Standardization** | |
| **10** | | **IT_Gov_SharedInfrastructureEfficiency** | |
| **11** | **N/A** | **Resistance to IT Governance** | **DO NOT SCORE** |
| **12** | | **Value_Cust_intimacy_AnalyticalTools** | |
| **13** | | **Value_Cust_Intimacy_Relationships** | |
| **14** | | **Value_OperExcel_Efficiency** | |
| **15** | | **Value_OperExcel_Innovation** | |
| **16** | | **Value_OperExcel_MinOverhead** | |
| **17** | | **Value_OperExcel_ROA** | |
| **18** | | **Value_OperExcel_StreamlineSC** | |
| **19** | | **Value_ProductLead_Embrace_Ideas** | |
| **20** | | **Value_ProductLead_Innovation** | |

## APPENDIX III:

## PATTERN CODES ASSOCIATED WITH EMERGING THEMES FROM INITIAL CODING

| PATTERN CODES | DESCRIPTION |
|---|---|
| Harmonization_BusinessGoals-->IT_Metrics/Accountabilities | Harmonization between business goals and IT metrics and accountabilities within the company's IT governance structure |
| Harmonization_EnterpriseStrat-->IT_Strat | Harmonization between the company's overall strategy and the strategy within the company's IT governance structure |
| Harmonization_ITGov_Arrangements-->ITGov_Mechanisms | Harmonization between the company's IT governance arrangements and the mechanisms employed to facilitate IT governance |
| Isomorphic-->Mimetic | Institutional pressures that cause the company to conform by emulating similar organizations |
| Isomorphic-->Normative | Institutional pressures that cause the company to conform by adopting standards and procedures that are generally accepted in industry |
| Isomorphic-->Regulatory | Institutional pressure that causes a company to conform to a specific standard as a result of coercive legal requirements |
| Resistance to IT Governance | Evidence that an entity within the organization is resistant to IT governance implementation |

## APPENDIX IV:

## INVITATION LETTER

Date

Dear Sir/Madam:

My name is Carlos Thomas and I am a doctoral student at Louisiana State University in the department of Information Systems & Decision Sciences. I am completing my dissertation on the effects of Sarbanes-Oxley on information technology departments of small/medium sized publicly traded companies and would like to interview members of your organization to get their opinions

The study is COMPLETELY confidential and at no time will any of your employees or identifiable information about your organization be revealed in the study. The interview process usually lasts between fifteen (15) to forty-five (45) minutes and consists of questions which allow the respondent to elaborate on his/her perception of specific impact of Sarbanes-Oxley legislation on your organization's IT department/function. Interviews are conducted around your schedules and will minimally invasive to your organization.

If you are willing to participate in this study please contact complete the enclosed acceptance letter and mail it to me in the enclosed self-stamped envelope. Alternately, you may e-mail me at the following e-mail address: loshead@lsu.edu. After receipt of your acceptance to participate I shall contact you to schedule a request to meet with you and/or members of your IT staff at your office.
I trust you will choose to participate in this study and look forward to a favorable response.
Best regards,

Carlos A. Thomas, Doctoral Student
Department of Information Systems and Decision Sciences
E.J. Ourso College of Business
Louisiana State University

## APPENDIX V:

## INFORMED CONSENT FORM

# Informed Consent Form

Title of Research: Post Hoc Review of Sarbanes Oxley

Investigator: Carlos A. Thomas, Doctoral Candidate

Before agreeing to participate in this research study, it is important that you read the following explanation of this study. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the program. Also described are the alternative procedures available to you, as well as your right to withdraw from the study at any time. No guarantees or assurances can be made as to the results of the study.

Explanation of Procedures
This research study is designed to examine the transition(s) of IT departments of small and medium public traded companies after the implementation of Sarbanes Oxley legislation. Participation in the study involves completion of an interview, which will last for approximately one hour. The interviews will be audio taped by the researcher and later transcribed for the purpose of data analysis. The interviews will be conducted at a setting that is mutually agreeable to the participant and the researcher.

Risks and Discomforts
There are no risks or discomforts that are anticipated from your participation in the study.

Benefits
The anticipated benefit of participation is the opportunity to discuss changes in the organization after the implementation of SOX compliance efforts.

Alternative Treatments
Because this study does not involve specific treatments or procedures, there are no known alternative treatments to participating in this study.

Confidentiality
The information gathered during this study will remain confidential in a locked drawer during this project. Only the researcher and Louisiana State University IRB will have access to the study data and information. There will be no identification of names on the tapes, and participant's names will not be available to any-one. The tapes will be destroyed at the completion of the study. The results of the research will be published in the form of a doctoral dissertation and may be published in a professional journal or presented at professional meetings. The information will assist IT and internal audit professionals in their efforts to comply with SOX legislation.

Withdrawal without Prejudice
Participation in this study is voluntary; refusal to participate will involve no penalty. Each participant is free to withdraw consent and discontinue participation in this project at any time without prejudice from this institution.

Participant's initials: _____

New Findings
Any significant new findings that develop during the course of the study, which may affect a participant's willingness to continue in the research, will be provided to each participant by Carlos A. Thomas

Cost and/or Payment to Subject for Participation in Research
There will be no cost for participation in the research. Also, participants will not be paid to participate in this research project.

Questions
Any questions concerning the research project and/or in the case of injury due to the project, participants can call Dr. Helmut Schneider, Department Chair of Information Systems and Decision Sciences at 225.578.3202.

Agreement
This agreement states that you have received a copy of this informed consent. Your signature below indicates that you agree to participate in this study.

Signature of Subject_____ Date_____

Subject name (printed) _____

Signature of Researcher_____ Date_____

# VITA

Carlos Anthony Thomas is a native of West Tennessee and has lived in Louisiana since 1999. He has worked in academia as an academic counselor, adjunct professor, graduate assistant, and most recently as an assistant professor of management. He holds degrees from the following universities: Vanderbilt University (B.S. in Human and Organizational Development), The University of Memphis (M.A. in Sociology), Tennessee State University (Ph.D. in Public Administration), and Louisiana State University (M.S. in Information Systems and Decision Sciences and Ph.D. in Business Administration (ISDS)).

Dr. Thomas has held positions in the public, non-profit, and private profit sectors. After graduating from his undergraduate studies, he began his professional career in the non-profit sector as the program coordinator for the Student Anti-Violence Education program in Philadelphia, Pennsylvania. After a year of service, he returned to Memphis, Tennessee, to attend graduate school while simultaneously teaching and coaching at his high school alma mater. After completing his master's at the University of Memphis, Dr. Thomas matriculated in the doctoral program in public administration at Tennessee State University in Nashville, Tennessee. Simultaneous to attending graduate school at night, he worked as a family counselor tasked with the responsibility of unifying families whose children had been adjudicated through the Tennessee juvenile justice system. After completing his doctoral coursework, Dr. Thomas returned to Memphis in hope of finding gainful employment. Unsuccessful in his efforts, he accepted a position at Louisiana State University as an academic counselor for the men's varsity football team. While at LSU, Dr. Thomas became interested in the impact of technology on society and after a year of service to the university, he enrolled in the master's program in information systems and decision sciences at LSU. Simultaneous to serving as an academic counselor and attending graduate school, Dr. Thomas also

taught courses in the African and African American studies department at LSU. After completing his master's in ISDS, Dr. Thomas accepted a position in industry as an IT auditor. During his tenure in that capacity, he worked in African, Latin America, Europe, and throughout North America.

Dr. Thomas returned to Louisiana State University to complete his doctorate in business administration in August of 2003. During his doctoral studies he worked as an adjunct professor at the University of Phoenix; a research assistant with the Public Affairs Research Council of Louisiana; and a research director for the Louisiana Family Recovery Corps in the aftermath of hurricane Katrina. During his third year of coursework at LSU, Dr. Thomas completed his dissertation for his doctorate in public administration at Tennessee State University which had been started nine years prior. Three years later, he successfully defended his dissertation for his doctorate at LSU in business administration.

Dr. Thomas is the proud father of three children and the luckiest man in the world to be married to the former Kerii Landry. His family is the center of his world and the impetus for his drive to succeed.