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FRAMING THE FRAMEWORKS: A REVIEW OF IT GOVERNANCE RESEARCH

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ABSTRACT

With the passage of the Sarbanes-Oxley Act in the United States in 2002, and an ever-increasing corporate focus on ensuring prudent returns on technology investments, the notion of IT governance became a major issue for both business practitioners and academics. Although the term "IT governance" is a relatively new addition to the syntax of academic research, significant previous work is reported on IT decisions rights and IT loci of control, notions that are synonymous with the current understanding of IT governance.

This paper presents a literature review for existing research in IT governance. A framework, named the Conceptual Framework For IT Governance Research is proposed to provide a logical structure for existing research results. Using this framework, we classify the previous literature on governance into two separate streams that follow parallel paths of advancement. A popular contemporary notion of IT governance is then presented, together with the argument that this new notion, by implicitly extending both streams of research, represents an initial amalgamation of the two paths of literature. We conclude that even with the consideration of contemporary structures, academicians and practitioners alike continue to explore the concept of IT governance in an attempt to find appropriate mechanisms to govern corporate IT decisions.

Keywords: IT governance, IT decision making, IT investment, IT organizational alignment, Sarbanes-Oxley Act

INTRODUCTION

With the passage of the Sarbanes-Oxley Act in the United States in 2002, corporations were forced to reexamine their overall corporate governance structures to ensure proper fiscal accountability to organizational shareholders and stakeholders. As a result, corporate management teams are now obligated, through legislation, to adopt a more stringent and transparent framework by which to govern their organizations. Not surprisingly, this heightened focus on overall governance frameworks naturally led to a reassessment of the underlying individual governance frameworks of functions within an organization [Vlahakis et al., 2004]. IT governance, the subject of this paper and often the weakest link in a corporation's overall

governance structure [Trites, 2004; Huber, 2004], represents one of the fundamental functional governance models receiving a significant increase in attention by business management.

In the current trade press, many articles discuss, debate and theorize about the virtues of a prudent, practical, and well aligned IT governance. Topics such as the use IT governance committees [Hoffman, 2004a; Hoffman, 2004b], management of technology expenditures and investments [Fogarty, 2004; LePree, 2002], IT governance and organizational alignment [Leung, 2004; Lewis, 2004; Johnson, 2004], governance relationships between IT management and corporate management [Orlikoff and Totten, 2000; Monnoyer, 2003; Saran, 2004], and IT security governance [Van Arnum, 2004; Fisher, 2003; Garigue and Stefaniu, 2003] abound in the popular press, almost imploring enterprises to board the "IT Governance Bandwagon" [Computer Weekly 2004].

So what is this notion of IT governance and how does the academic literature relate to these popular press articles? The purpose of this paper is to examine the previous and current research in IT governance to provide a basis for further research. To understand better where we are heading and where we currently stand, a review of where we were is needed. In the academic literature, a number of authors compiled "mini" reviews to support their own conceptual or empirical papers [Tavakolian, 1989; Brown and Magill, 1994; Brown, 1997; Sambamurthy and Zmud, 1999; Sambamurthy and Zmud, 2000]. None of these reviews, however, attempted to provide a comprehensive review of the topic as a whole, in a synthesized, conceptual manner.

In this paper we propose a conceptual framework of IT governance that divides previous research into two parallel streams that, when examined together provided the foundation for the popular, contemporary views of IT governance. Using Weill and Ross [2004] as representative of these contemporary views, we show that current IT governance research represents a strong, albeit not completely inclusive, amalgamation of the two streams of literature.

The paper begins with a brief overview of IT governance and a consolidation of the disparate terms and definitions employed in this area of research (Section II). Following a brief description of the methodology used in this study (Section II), the basis of this paper, called A Conceptual Framework for IT Governance Research, is proposed with each of the two streams described in detail and substantiated by existing literature (Section III). The underlying streams are then used as a frame of reference for an investigation into the contemporary research of this field. The paper concludes (Section IV) with a discussion on the implications of governance for both academics and practitioners, and presents a commentary on future research directions.

II. WHAT IS IT GOVERNANCE?

With many slightly disparate descriptions, attempting to secure a definitive definition of IT governance from existing literature quickly becomes a futile exercise in semantics. For the purpose of this paper, we adopted Weill's [2004] definition of IT governance that states,

> *"IT governance represents the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT"* [p. 3].

Weill extends this definition by providing a contrast to IT Management:

> *IT governance is not about what specific decisions are made. That is management. Rather, governance is about systematically determining who makes each type of decision (a decision right), who has input to a decision (an input right) and how these people (or groups) are held accountable for their role. Good IT governance draws on corporate governance principles to manage and use IT to achieve corporate performance goals. [p. 3]*

Weill's definition remains consistent with an earlier explanation by Boynton et al., [1992] who suggest that IT governance is not concerned with the "location and distribution of the IT resources

themselves, but rather with the location, distribution and pattern of managerial responsibilities and control that ultimately affect how IT resources are applied and then implemented." [p. 1]

A MATTER OF NOMENCLATURE

The term "IT governance" was used by Loh and Venkatraman [1992] and Henderson and Venkatraman [1993] to describe the set of mechanisms for ensuring the attainment of necessary IT capabilities [De Haes and Grembergen, 2005], but did not feature prominently in the academic literature until the late 1990's when Brown [1997] and Sambamurthy and Zmud [1999] began to refer to a notion of "IS governance frameworks" and then later to "IT governance frameworks" in their papers. If we adopt Weill's definition of IT governance, the concept of defining IT decision-rights and accountabilities is, in fact, well researched long before the 1990's. This work represents substantial progress in studying governance.

Computer systems management controls [Garrity, 1963], control of information services [Olson and Chervany, 1980], IS organizational structure [Von Simson, 1990], IT standards [Kayworth and Sambamurthy, 2000], IT decision making responsibilities [Boynton et al., 1992], IT management architecture and locus of IT decision making [Boynton et al., 1992], IS organizational role, and location of IS responsibility [Brown and Magill, 1994] all represent terms or concepts that contributed to the fundamental research of IT governance.

Even as early as the 1960's, researchers were examining and addressing the fundamental concepts that are included in the contemporary definition of IT governance. In 1963, in a survey of 27 companies with at least four years of corporate computer use, Garrity [1963] indirectly tackled the issue of IT governance, when he attempted to isolate the various organizational factors that lead to an increased return on technology investments. Although the primary focus of Garrity's paper was the development of antecedents for successful technology investment, the survey consisted of numerous questions that resemble the current notion of IT governance. Sample questions included:

- Are applications selected on the basis of a careful feasibility study?
- Are project plans developed and progress reports prepared?
- Are plans and controls as effective as those applied to similar functions?
- Are completed projects appraised?
- Does top management devote time to the computer systems effort in proportion to its cost and potential?
- Does top management review plans and follow up on computer systems results?
- How many levels below the chief executive is the computer executive?

Upon closer examination, Garrity was attempting to capture the answers to three primary questions:

- Who is responsible for IT investment activities?
- Who provides input into IT investment activities? and
- What controls are in place to ensure IT investment activities are carried out positively?

In Weill's definition of IT governance, these questions directly mirror the current-day notion of decision-making rights, input rights, and accountability measures.

METHODOLOGY

The majority of research on governance uses a conceptual examination of various IT governance framework propositions. Few researchers attempted to perform empirical studies on this topic. As a result, the majority of works cited in this paper are conceptual. We tried, however, to include a large number of empirical works to provide a more substantive justification to the existing frameworks.

Principal sources for this review include academic journal articles, the popular press writings, and books. Business Source Premier[1], an online periodical database, was used as the primary directory of journal articles, and Web of Science[2] was used as the sole citation index. Business Source Premier houses over 3300 journals and business periodicals in all functional areas of business, dating from 1965 to the present. Prominent IS academic and practitioner journals captured in this index include MIS Quarterly, Information Systems Research, Journal of Management Information Systems, Harvard Business Review, and Sloan Management Review.

Using Business Source Premier to define the research scope, various search terms were used to develop the initial review pool of over 200 articles. Search subjects included: IS organizational structures, centralization/decentralization, IS loci of decision-making, IT governance frameworks, general business governance frameworks, IS organization performance, and general IS/IT research commentaries. From this initial review, articles were selected for the final review pool based on their relevance to the topic, acceptance by subsequent researchers based on number of times cited, and overall impact on the specific area of study.

The approach used in this paper follows the concept-centric methodology of IS literature reviews as outlined in Webster and Watson [2002]. Using this method, literature in the review pool was grouped based on the two historical streams rather than by individual author.

III. A CONCEPTUAL FRAMEWORK FOR IT GOVERNANCE RESEARCH

Figure 1 represents the fundamental framework presented in this paper for classifying research about corporate IT governance. Building on the precedents outlined in previous research articles (Tavakolian, 1989; Brown and Magill, 1994; Brown, 1997; Sambamurthy and Zmud, 1999; Sambamurthy and Zmud, 2000; Schwarz and Hirschheim, 2003), the proposed framework contends that previous research in IT governance can be divided into two distinct streams that, although related in terms of a common overall research objective, represent separate, albeit parallel, research paths. These two progressions, one dealing with IT governance forms and the other dealing with IT governance contingency influences, both contribute to provide the foundation of prevailing IT governance research. The two streams are outlined in detail in the following sections. Expanding on the framework, Table 1 identifies the primary papers found in each of the two streams and provides a brief overview of the type of research performed by the respective authors.

STREAM ONE: IT GOVERNANCE FORMS

The first stream of IT governance research deals with the decision-making structures adopted by IT organizations. Early research in this area dealt with the basic, bi-polar notion of centralized and decentralized loci of IT decision making, with subsequent research concentrating on providing an expanded, more sophisticated understanding of these baseline frameworks. Research from this stream provides a direct association between IT governance and the underlying decision-making structures adopted by individual IT organizations, an association fundamental to later research.

Basic Locus of IT Decision Making

In the late 1960s, the advent of large-scale computers led directly to organizations being able to perform a centralized version of the data analysis that was previously performed locally. By centralizing hardware and the ability for analysis, information technology managers could centralize their organizational structures [Olson and Chervany, 1980]. As a result, in most corporations, a majority of traditional IT management responsibilities were delegated to a

[1] http://www.epnet.com/academic/bussourceprem.asp
[2] http://www.isinet.com/products/citation/wos/

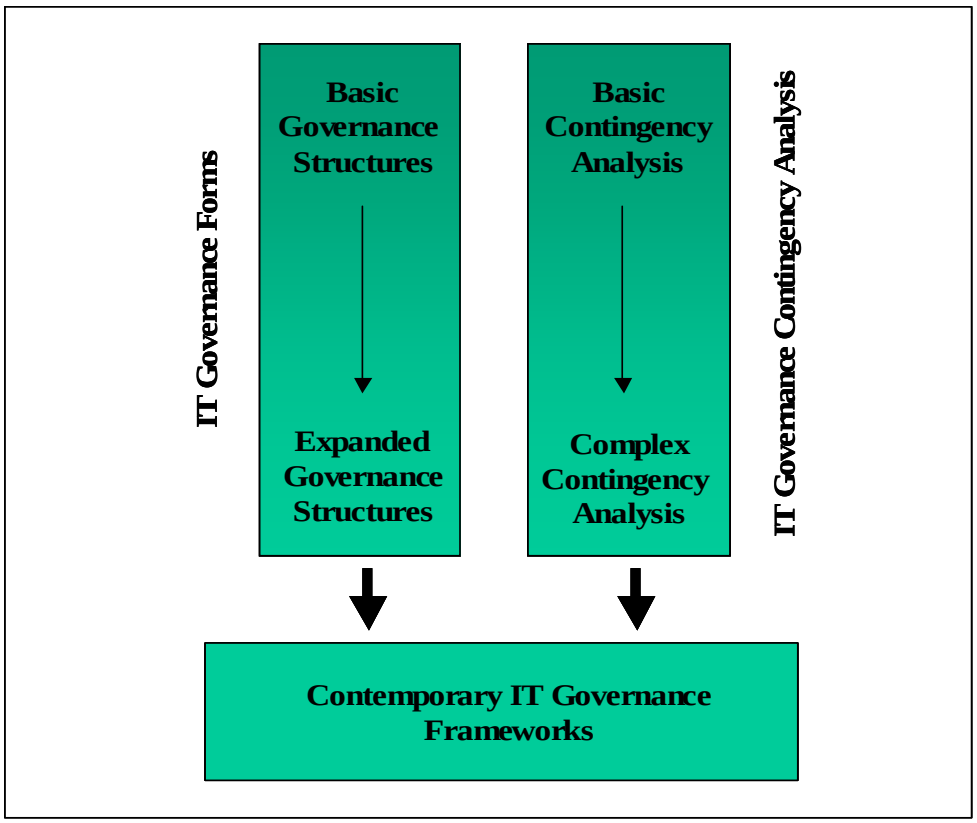

Figure 1. Conceptual Framework for IT Governance Research

centralized IS organization tasked with supplying sufficient centralized IT resources to meet overall workloads [Boynton and Zmud, 1987].

In studying IT governance forms, research focused on the organizational placement of the decision-making authority and the organizational structuring of IT activities. Early research addressed the notion of who is involved in IT decisions and what structure should be in place to maximize return on investment [Garrity, 1963]. Within this context, two basic governance designs were discussed:

- centralized IT governance and
- decentralized IT governance [Brown and Magill, 1994; Schwarz and Hirschheim, 2003].

A strict centralized governance design places all decision-making authority in a central IS organizational body, while a strict decentralized governance design places all decision-making authority within the confines of the individual business units or processes [Brown, 1997].

The primary research dealing with basic loci of decision making, addressed the various proposed advantages and disadvantages of each of the bi-polar, centralized and decentralized governance designs [Cross et al., 1997; Kayworth and Sambamurthy 2000; Lewis 2004]. From this research, most authors agreed that a centralized form allows for a greater control over IT standards and provides a greater opportunity for realizing general economies of scale, while a decentralized form allows an increase in customization of solutions for each business unit and drastically improves the overall responsiveness to business unit needs [Burlingame, 1961; Galub, 1975; Keen, 1981; Jenkins and Santos, 1982; Wetherbe, 1988; Von Simson, 1990].

Table 1. Primary Sources and Key Ideas by Stream

Stream One – IT Governance Forms		
Basic Locus of IT-Decision Making	Thompson, 1957, Jelinek, 1977, Burlingame, 1961, Golub, 1975, Olson and Chervany, 1980, Keen, 1981, Jenkins and Santos, 1982, Wetherbe, 1988, Von Simson, 1990	Research on traditional IT organizational structures
Expanded IT Decision Making Structures	Ein-Dor and Segev, 1978, Rockart et al., 1978, King, 1983, Zmud et al., 1986, Boynton and Zmud, 1987	Research on vertical and horizontal expansion of the traditional IT organizational structures
Stream Two – IT Governance Contingency Analysis		
Individual and Multiple Contingencies for Uniform Governance Frameworks	Olson and Chervany, 1980, Ein-Dor and Sege,v 1982, Tavakolian, 1987, Dixon and John,, 1989 Ahituv et al., 1989, Allen and Boynton, 1991, Boynton et al., 1992, Henderson and Venkatraman, 1992, Clar,k 1992, Venkatraman, 1997	Research on the individual and multiple contingencies affecting traditional IT organizational structure decisions
Complex Analysis For Non-Uniform Governance Frameworks	Brown, 1997, Brown and Magill, 1998, Brown, 1999, Sambamurthy and Zmud, 1999	Research on the individual and multiple contingencies affecting expanded (vertically and horizontally) IT organizational structure decisions

Expanded IT Decision Making Structures

With a general understanding of the virtues of each of the centralized and decentralized governance forms, research in this stream began to examine a new dilemma facing IT management: How to deal with the paradox of bi-polar governance systems within the same organization? Companies wanted the best of both worlds; to provide centralized direction and coordination while simultaneously providing for discretionary input into IT decisions by managers throughout the organization [Boynton and Zmud, 1987]. It is at this stage that research of IT governance forms began to branch in several directions.

Vertical Expansion

In one camp, researchers began to question the strict dichotomous classification of IS organizational structures. Treating the bi-polar paradox between centralized and decentralized information technology governance structures as an absolute was deemed restrictive and unrealistic, and scholars began to add to the bipolar framework theory. Three primary methods of expansion emerged:

- continuous classification,
- discrete nominal classification and
- redefinition of extremes.

To deal with the unrealistic bi-polar classification of centralized and decentralized governance designs, the rigid dichotomous classification was treated as scalar, allowing for multiple degrees of centralized and decentralized structures. With this continuous classification, some researchers introduced the notion of soft midrange points between the centralized and decentralized extremes [Ein-Dor and Segev, 1978; King, 1983], while others began treating organizational structure along a continuum between the two endpoints [Olson and Chervany, 1980; Tavakilian, 1987].

Contrasting the continuous classification argument, others proposed adding discrete classifications to the mix. Zmud et al. [1986] took the soft midrange argument a step further to

create a tri-partite taxonomy of forms to account for organizations that balance the benefits of the centralized and decentralized models. This new governance model was termed a "Federal governance framework" with parallels drawn to the way typical federal governments operate in a free-economy state by providing centralized directional influence in the form of policies and guidelines, while still allowing subdivisions, such as Provinces or States to operate with a certain amount of autonomy. In a corporate context, the information technology federal governance design represents the notion of leveraging the advantages of both centralized and decentralized organizations by establishing a centralized IS group to provide core IT services while still allowing business units to control a portion of the overall IS function [Boynton and Zmud, 1987; Rockart et al., 1996]. (For a summary of federal IT governance, see Hodgkinson [1996])

Although generally adopted, the term Federal governance is used interchangeably with distributed governance [Rockart et al., 1978], hybrid governance [Rockart, 1988; Dixon and John, 1989; Brown, 1997], equilibrium model of governance [La Belle and Nyce, 1987], and "centrally-decentralized" governance [Von Simson, 1990]. A recentralized governance model [Von Simson, 1990; Brown and Magill, 1994] is a similar concept, dealing with organizations that previously decentralized but then moved some strategic and core functions back to a centralized IS group.

The third vertical expansion of the basic centralize /decentralized framework involved redefinition of the extreme points. Rather than addressing the scalar notion of organizational designs, some researchers in this stream studied the choices for decision-making authorities within a decentralized governance form. Most of this research involved the idea of line managers taking responsibility for the use of technology while leaving the responsibility of the core services, such as corporate infrastructures, planning, and operations to a centralized IS department [Rockart, 1988; Dixon and John, 1989; Boynton and Zmud, 1992].

Essentially, when considering the classic centralized/decentralized dichotomous relationship, the introduction of line management responsibilities within IT governance research, singled out a specific group of managers responsible for the decision-making responsibility in the decentralized governance design. Up until this point, the notion of the decentralized system was well understood, however explicit decision-making authorities within this form were never addressed substantively [Boynton and Zmud, 1987; Rockart, 1988; Dixon and John, 1989; Boynton et al., 1992; Rockart et al., 1996].

From a practitioner standpoint, it was not surprising that line managers much preferred a decentralized approach to IT governance. These managers were extremely hesitant to have their careers and decisions managed by an external, centralized locus of control when they knew they understood their business lines better than a centralized IS team [Gerrity and Rockart, 1986; Rockart, 1988; Boynton et al., 1992].

Horizontal Expansion

Simultaneous to expanding the idea of centralized and decentralized IT organizational designs, researchers began to find synergies between IT governance forms and the various types of IT decisions. This new, melded body of research focused on examining the impact of centralization or decentralization across specific types of IT decisions rather than the IS organization as a whole [Sambamurthy and Zmud, 1999].

Most prominent was the idea of decentralizing decision making about the use of technology where it was argued that the use of technology could be centralized or decentralized irrespective of the overall IS organizational governance structure [Zmud et al., 1986; Dixon and John, 1989; Allen and Boynton, 1991; Brown and Magill, 1994].

Olson and Chervany [1980] studied centralized/decentralized structures across Norton's [1973] three, widely adopted IT service functions: system operation, system development, and system management. They concluded that each of these functions related to a slightly different IT governance structure. Following this work, Zmud [1987] and Byrd et al. [1995] published separate

studies that focused solely on IT governance structures as they applied to the IT planning function.

IT Governance Forms Summary

Overall, this entire stream of IT governance research attempts to define the various structural forms that governance models can adopt. Starting from a basic dichotomous centralized and decentralized design, researchers attempted to provide less-rigid alternatives for governance structures that more closely modeled the way organizations actually operated. These vertical and horizontal expansions on the baseline forms provide the fundamental structures used by contemporary literature.

STREAM TWO: IT GOVERNANCE CONTINGENCY ANALYSIS

The second stream runs parallel to Stream one on IT governance forms. In this stream, research focuses on the "why and how" of IT governance fit. Rather than investigate basic structural options, researchers attempt to understand which option is best for which organization, through an analysis of factors that affect individual IT governance framework success.

Researchers are unanimous that a universal best IT governance structure does not exist. Rather the best IT governance solution for a given firm is contingent on a variety of factors [Brown and Magill, 1994; Brown, 1997]. Analyses range from investigations into single and multiple contingencies for a uniform governance framework (which indicates adoption of a single governance design across all business units), to complex situations involving multiple contingencies in a non-uniform governance framework where a single governance design gives way to numerous business unit-specific governance forms.

Individual and Multiple Contingencies for Uniform Governance Frameworks

The earliest research of this stream tried to determine which of the individual factors influenced the adoption of an overall IT governance design for an organization. The research focused on determining the individual bi-variate contingencies for uniform governance decisions [Brown, 1997]. Although later proved to be somewhat limited in scope [Allen and Boynton, 1991; Clark, 1992; Brown and Magill, 1994; Brown and Magill, 1998; Sambamurthy and Zmud, 1999], these studies provided a substantial foundation for more complex analyses.

While some authors limited their investigation to a single contingency, most authors chose to deal with a number of individual contingencies at the same time, but without considering possible interactions. For example, Ein-Dor and Segev [1978] proposed a conceptual model using ten organizational context variables that were expected to influence IT governance adoption within organizations. The variables included organizational maturity, organizational size, organizational structure, organizational time frames, psychological climate, extra-organization situations, organizational resources, rank, and location of responsible executive and steering committees. In a subsequent paper, Ein-Dor and Segev [1982] tested this conceptual model using four of these variables (size, structure, time frame, psychological climate), and two new variables (propensity to pioneer and implementer/user relationships) in an empirical study of 53 large firms. They concluded that centralized IS governance design was directly associated with the size of an organization (negatively associated to revenue, no association with employee count), psychological climate, and quality of user/implementer relationships.

From the studies of non-interacting, single contingencies came a number of substantive conclusions relating contingent factors to IT governance framework adoption. Contingencies for which conclusions were proposed include organizational structure, business strategy, industry, and firm size.

Organizational Structures and Decision-Making Structures

Most researchers generally agreed that a centralized organization led to a centralized IT governance design and a decentralized organization led to the adoption of a decentralized IT governance design [Ahituv et al., 1980; Ein-Dor and Segev, 1982; Tavakilian, 1989; Brown and Magill, 1994]. This conclusion was not fully accepted though, as Olson and Chervany [1982] found evidence that an association did not in fact exist between organization structure and IT governance structure.

Competitive and Business Strategy

Tavokolian [1989] published an empirical study of 52 large organizations, linking information technology structure (governance framework) and organizational competitive strategy. In this study, Tavokolian found that organizations with a "defender" competitive strategy (conservative competitive strategy) were more likely to adopt a centralized IT governance structure than similar organizations with a more aggressive competitive strategy. Henderson and Venkatraman [1993] later developed a strategic alignment model that was used to determine effective IT governance structures across four fundamental domains of strategic choice that supported Tavokolian's earlier conclusions.

Industry

In their highly cited study of 303 organizations in Israel, Ahituv et al. [1989] were unable to find any significant association between a corporation's industry type and the level of decentralization of IT within the organization. Clark's later work [1992] echoed this conclusion.

Firm Size

In a number of studies, the size of a corporation could not be proven as a significant antecedent for the adoption of a particular IT governance design [Olson and Chervany, 1980; Ahituv et al., 1989; Tavalkolian, 1989; Clark, 1992]. Ein-Dor and Segev in their [1982] study, were only able to prove an association when firm size was measured in terms of total revenue, but not when firm size was measured in terms of employee headcounts.

Table 2 identifies a number of papers that investigated single, non-interacting contingencies for IT governance adoption. Noticeably absent from the list of variables is a discussion on technology and technology adoption, where surprisingly, little to no research was found.

Table 2. Non-Interactive Single Contingency Analysis Research

Contingency	Authors
Organizational Structure/Decision Making Structure/Organization Environment	Ein-Dor and Segev, 1978; Olson and Chervany, 1980; Wheelock, 1982; King, 1983; Tavakolian, 1987; Dixon and John, 1989; Allen and Boynton, 1991; Boynton et al., 1992; Henderson and Venkatraman, 1992
Competitive/ Business Strategy	King, 1983; Tavakolian, 1989; Boynton et al., 1992; Henderson and Venkatraman, 1993; Venkatraman, 1997
Industry	Ahituv et al., 1989; Clark, 1992
Firm Size	Olson and Chervany, 1980; Ein-Dor and Segev, 1982; Ahituv et al., 1989; Tavalkolian, 1989; Clark, 1992

The research on individual contingencies of IT governance forms produced a number of fundamental conceptual and empirical studies that began to identify how and why organizations

should choose a specific IT governance form. Realizing the value of these studies, yet recognizing the unrealistic assumptions of non-interacting contingencies, many researchers studied multiple, interacting and conflicting contingencies [Brown and Magill, 1994; Sambamurthy and Zmud, 1999]. Building on precedence, single contingency studies were often used as the foundation for these multiple contingency articles [Allen and Boynton, 1991; Clark, 1992; Brown and Magill, 1994; Brown and Magill, 1998; Sambamurthy and Zmud, 1999]. As with the fundamental research, this contingency analysis was still only concerned with the overall, uniform IT governance structure of an organization and did not address differing designs for differing IT functions.

Brown and Magill were the main drivers for a shift away from single contingency analysis and towards multiple contingency analysis. Their empirical study of 6 companies [1994] attempted to relate patterns of ten primary antecedents to four IT governance forms - highly centralized, highly decentralized, hybrid, and re-centralized governance structures. The ten interacting antecedents included:

1. Corporate Vision
2. Corporate Strategy
3. Overall Firm Structure
4. Culture – Business Unit Autonomy
5. Strategic IT Role
6. Senior Management of IT
7. Satisfaction with Management of Technology
8. Satisfaction with Use of Technology
9. Strategic Grid of Current/Future Applications
10. Locus of Control for System approval/priority.

As a result of their research, Brown and Magill proposed individualized contingency patterns for each of the four IT governance designs. These four configurations profiled each form against the ten primary antecedents in an attempt to provide a predictor model for IT governance structures.

Complex Analysis for Non-Uniform Governance Frameworks

Building further on single and multiple contingencies, researchers began to expand their analysis by examining contingencies across the horizontal and vertical expansions of the bi-polar systems being proposed by researchers in the IT governance forms stream. Becoming increasingly complex, papers of this type attempted to deal with multiple contingencies relating to IT governance frameworks for individual IT Service categories or for individual business units (Non-uniform governance frameworks) in an organization.

Three fundamental papers drive the research in complex analysis of non-uniform frameworks:

1. Brown [1997] - Using a case research strategy, Brown examined contingencies driving IT governance fit for individual business units. An organization housing multiple IT governance designs across different business units was labeled a hybrid IS governance framework to differentiate it from the hybrid governance design which is defined as a single centralized and decentralized framework adopted enterprise-wide. Of the six proposed context variables, four proved to be significant predictors of business unit IT governance adoption. Decision-making structure, business unit autonomy, competitive strategy, and industry stability all proved to be good predictors while workgroup interdependence and information intensity of products/services were not significant predictors in this study.

2. Brown and Magill [1998] - Expanding on previous research, Brown and Magill took contingency analysis one-step further. In this study, they attempted to look at hybrid IT governance solutions across multiple business units for a specific IT service (systems development). This study essentially pulled all previous research avenues into a single

paper: expanded definitions of IT governance designs, multiple contingency analysis, business line unit of analysis (hybrid governance frameworks), and differing IT service solutions are all addressed. Using an iterative approach, the authors presented a framework that predicted the locus of decision-making within the systems development function for business units given six enterprise and business-wide contingencies.

3. Sambamurthy and Zmud [1999] - In their empirical study, Sambamurthy and Zmud break out types of multiple contingency interactions (reinforcing, conflicting, and dominating) and examine them against three IT services (IT infrastructure, IT use, and IT project management) and nine patterns of centralized, decentralized, and federal governance models. Their conclusions involved a complex framework, integrating the Theory of Multiple Contingencies (Gresov, 1989), and providing an explanation of the determinants affecting IT governance adoption.

IT Governance Contingency Analysis Summary

Rather than investigating new or expanded structures, researchers in this stream concentrated on understanding the single and multiple contingencies that influenced the adoption of particular individual governance forms. This understanding provides current frameworks with a solid foundation of factors affecting IT governance adoption.

IV.CONTEMPORARY FRAMEWORKS – ENTER WEILL AND ROSS

Two definitive research realizations provide the demarcation between previous IT governance research and the body of works that can be considered as contemporary frameworks:

1. Agreement that consensus was reached regarding contingency factors for an IT governance mode [Brown and Magill, 1994; Sambamurthy and Zmud, 1999]. These authors claim that contingency analysis for existing governance forms is almost saturated.

2. Sambamurthy and Zmud [2000] challenge the research community to reevaluate the basic assumption that IT governance is a function of organizational design. They propose to move away from the traditional “organization logic” argument for selection of dominant governance architectures.

With these two assertions, researchers were asked to reconsider both streams when conducting further research on IT governance.

After a temporary lull in publishing on IT governance research, Weill and Ross resuscitated interest in the topic with the proposal of a contemporary framework in their book [Weill and Ross, 2004] and associated journal articles [Weill, 2004; Weill and Ross, 2005]. In a study of 250 organizations in 23 countries, Weill and Ross map six mutually exclusive organization structures, or “archetypes” against five key IT decision areas. They also address numerous organization contingencies. By treating the archetypes and decision types as row and column headers, common governance arrangements are presented and discussed as unique patterns spanning the governance arrangement matrix. This matrix approach, together with the IT governance design framework, provides practitioners with a succinct set of tools for determining the best IT governance arrangement for their organization. Other topics addressed, but outside the scope of this paper include a discussion of horizontal mechanisms[3], as well as a classification of implementation strategies.

With this contemporary framework, the obvious question arises: under which stream of IT governance research should this framework be classified? As shown in Section III, we contend

[3] For a discussion on horizontal mechanisms see Brown [1999]

that Weill and Ross's work represents not only a furthering of research in both streams, but in actuallity represents the beginning of a convergence and aggregation of two previously divided research paths.

ELEMENTS OF IT GOVERNANCE FORMS

As a baseline assumption to their new framework, Weill and Ross [2004] expand on the notion of the tripartite governance structure. Rather than considering the traditional centralized, decentralized and middle ground designs, Weill and Ross propose that there are in fact six goverance classifications available to IT organizations based on the ideal of political archetypes. These archetypes include:

- Business Monarchy – IT decisions are made by CxOs
- IT Monarchy – Corporate IT professionals make the IT decision
- Feudal – Decision by autonomous business units
- Federal – Hybrid decision making
- IT Duopoly – IT executives and one business group
- Anarchy – Each small group makes decisions

A closer examination of these governance structures shows that some of these classifications very closely mirror concepts proposed in earlier governance research. The Business Monarchy and IT Monarchy archetypes represent a strict centralized decision making structure with different interpretations of the centralized unit, while the parallels between the Feudal archetype and a decentralized structure are sufficiently evident in their congruent use of business unit owners as the primary decision makers within their realm of control. Furthering this progression, the most prominent similarity can be seen with the Federal archetype, which even maintains the same terminology, representing the middle ground, centralized-decentralized concept by Zmud et al. [1986].

Although closely linked to earlier research, the archetype classification does include two structures not as heavily addressed by other authors. The IT Duopoly archetype represents a two-party arrangement between a business partner and a technical partner, and although similar to the Federal model, the IT Duopoly is more restrictive and specialized than research suggests for the Federal Model [pp61-63]. Equally absent is previous research on the notion of an Anarchical IT governance structure.

Expanding the discussion on types of organization forms, Weill and Ross consider the governance archetype across five major IT decisions in the form of a Governance Arrangement Matrix. These key decisions include: IT decisions, IT principles, IT architecture, IT infrastructure strategies, business application needs, and IT investment and prioritization. This notion of fitting different organizational structures to different IT decisions formed the basis of the horizontal analysis performed within the governance forms stream by Sambamurthy and Zmud [1999], Zmud et al. [1986], and Brown and Magill [1994].

ELEMENTS OF CONTINGENCY ANALYSIS

The work by Weill and Ross also contains an extension on the contingency analysis stream of IT governance literature, tying in both paths of research. At an introductory level, five primary factors for determining governance patterns are presented: Strategic and Performance Goals, Organizational Structure, Governance Experience, Size and Diversity, and Industry and Regional Differences [Weill and Ross, 2004, pp.71-72].

Building on the notion of creating patterns of governance arrangements, Weill and Ross argue that the best combinations of governance structures are a reflection on these five underlying factors. An entire chapter study [chapter 6, pp. 147-185] is devoted to the alignment of governance structures with the underlying goals, strategies, and cultural norms culminating in an analysis of contingencies based on business unit arrangements and value principles. A

governance design framework is presented as a method for ensuring governance success based on alignment with underlying factors.

V. DISCUSSION

Although not explicitly stated, Weill and Ross's work on IT governance [2004] represents an extension of the two streams of previous IT governance research. The linking of governance structures to decision-making forms of an organization, the proposition of multiple governance forms for multiple IT decisions, and the use of contingency analysis for determining appropriate governance structures all build on existing literature. As such, the contemporary framework represents a subtle amalgamation of these two streams of IT governance research. Weill and Ross [2004] challenge and expanded the underlying fundamental IT governance framework available to organizations while maintaining the link between these structures and organizational IT decisions.

Despite this increasingly prominent contemporary view, some disparity of viewpoints still remains in IT governance research. Sambamurthy and Zmud's [2000] view that IS decision-making and organizational structures and IT governance designs should be disjoint still remains relatively unexamined based on citation analysis. In addition, others [Peterson, 2004; Rau, 2004; Robbins, 2004] opted to address this topic from a more practical view of IT governance by examining the implementation of IT governance systems irrespective of the more theoretical frameworks.

With "key issues" studies over a 15 year period finding that IT organizational fit is of paramount importance to IT executives [Brancheau and Wetherbe, 1987; Brancheau and Wetherbe, 1996; Luftman and McLean, 2004], IT governance remains an important field of IS/IT study for both practitioners and academics.

IMPLICATIONS FOR RESEARCHERS

For researchers, the contemporary model represents a beginning of the culmination of foundational research on IT governance frameworks. The building blocks of current research are being used, while new core concepts are also being proposed. Prior to Weill and Ross [2004], the two streams of research resulted in a complex web of theoretical models, many of which are too difficult to substantiate empirically. Researchers are now faced with the opportunity to build on the framework articulated in this paper, to examine the appropriateness of continuing research in one of the streams, or to heed the call for research put forth by Sambamurthy and Zmud [2000] and attempt to separate IT governance structures from IT organizational structures.

IMPLICATIONS FOR PRACTITIONERS

Given the increasing internal pressures of IT-Business alignment and IT return-on-investment, as well as external pressures of the Sarbanes-Oxley Act and the continued pursuit of increased shareholder value, corporate management are increasingly searching for the ideal IT governance framework for their organizations. Based on the volume of popular press articles devoted to the subject, corporate management is beginning to realize the importance of IT governance but is less sure of what design to employ. To aid this effort, managers should apply a contemporary governance framework that combines ideas from both IT governance forms and IT governance contingency research.

FUTURE RESEARCH

Academics are faced with a decision of continuing with the aggregated-stream approach begun by Weill and Ross [2004], expanding on the research of either individual stream, or creating a new stream as proposed by Sambamurthy and Zmud [2000].

To continue with the aggregated approach implicit in the work of Weill and Ross [2004] empirical analyses are needed to test the implementation of these ideas in real world settings. Specifically,

researchers may wish to assess the impact of organizational culture and politics on IT governance design choice. To heed Sambamurthy and Zmud's [2000] call, researchers may have to reframe the assumptions underlying IT governance research in order to develop alternative conceptualizations suited to the realities facing contemporary organizations.

VI. CONCLUSION

This paper provides an in-depth review of the existing literature about IT governance frameworks. By classifying research using our Conceptual Framework For IT Governance Research (section III), we found that historical work in this area can be divided into two separate streams: IT governance forms, and IT governance contingency analysis.

From this framework, we concluded that the Weill and Ross' contemporary framework signals the beginning of an amalgamation of the two streams of previous IT governance research. Researchers are now faced with deciding whether to continue with Weill and Ross' aggregated research approach or expanding on individual streams, in an effort to improve the understanding of IT governance.

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REFERENCES

Ahituv, N., S. Neumann, and M. Zviran (1989) "Factors Affecting the Policy for Distributing Computing Resources", *MIS Quartely*, (13)4, pp. 388-402.

Allen, B.R. and A.C. Boynton (1991) "Information Architecture: In Search of Efficient Flexibility", *MIS Quarterly* (15)4, pp. 435-446.

Boynton, A.C. and R.W. Zmud (1987) "Information Technology Planning in the 1990's: Directions for Practice and Research", *MIS Quarterly* (11)1, pp. 58-72.

Boynton, A.C., G.C. Jacobs, and R.W. Zmud (1992) "Whose Responsibility is IT Management? ", *Sloan Management Review* (33)4, pp. 32-39.

Brancheau, J.C. and J.C. Wetherbe (1987) "Key Issues in Information Systems Management", *MIS Quarterly* (11)1, pp. 22-46.

Brancheau, J.C. and J.C. Wetherbe (1996) "Key Issues in Information Systems Management: 1994-95 SIM Delphi results", *MIS Quarterly* (25)2, pp. 225-243.

Brown, C.V., (1997) "Examining the Emergence of Hybrid IS governance Solutions: Evidence from a Single Case Site", *Information Systems Research* (8)1), pp. 69-95.

Brown, C.V. (1999) Horizontal Mechanisms under Differing IS Organizational Contexts, *MIS Quarterly* (23)3, pp.421-454.

Brown, C.V. and S.L. Magill (1994) "Alignment of the IS Functions with the Enterprise: Toward a Model of Antecedents", *MIS Quarterly* (18)4, pp. 371-404.

Brown, C.V. and S.L. Magill (1998) "Reconceptualizing the Context-Design Issue for the Information Systems Function", *Organization Science: A journal of the Institute of Management Sciences* (9)2, pp. 176-195.

Burlingame, J.F. (1961) "Information Technology & Decentralization", *Harvard Business Review* (39)6, pp. 121-127.

Byrd, T.A., V. Sambamurthy, and R.W. Zmud (1995) "An Examination of IT Planning in a Large, Diversified Public Organization", *Decision Science*s (26)1, pp. 49-74.

Clark, C.E. et al. (1997) "Building Change-Readiness Capabilities in the IS Organization: Insights from the Bell Atlantic Experience", *MIS Quarterly* (21)4, pp.425-456.

Clark, T.D. Jr. (1992) "Corporate Systems Management: An Overview and Research Perspective", *Communications of the ACM* (35)2, pp.61-86.

Colley, J. (2004) "governance is IT's Game", *Computer Weekly*, May 4, p. 21.

Computer Weekly (2004) "Get in front of the bandwagon", *Computer Weekly*, April 27, p. 20.

Cross, J., M.J. Earl, and J.L. Sampler (1997) "Transformation of the IT Function at British Petroleum", *MIS Quarterly* (21)4, pp. 401-424.

De Haes, S. and W.V. Grembergen (2005) "IT Governance Structures, Processes and Relational Mechanisms: Achieving IT/Business Alignment in a Major Belgian Financial Group", *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*, Track 8, pp.237.

Dixon, P.J. and D.A. John (1989) "Technology Issues Facing Corporate Management in the 1990s", *MIS Quarterly* (13)3, pp. 246-255.

Ein-Dor, P. and E. Segev (1978) "Organizational Context and the success of Management Information Systems", *Management Science* (24)10, pp. 1064-1078.

Ein-Dor, P. and E. Segev (1982) "Organizational Context and MIS Structure: Some Empirical Evidence", *MIS Quarterly* (6)3, pp. 55-69.

Fisher, D. (2003) "Execs set up task force", *eWeek* (20)46, p. 34.

Fogarty, K. (2004) "The Governing Concepts of governance", *Baseline*, April, p. 79.

Garigue, R. and M. Stefaniu (2003) "Information Security governance Reporting", *Information Systems Security* (12)4), pp. 36-41.

Garrity, J. (1963) "Top Management and Computer Profits", *Harvard Business Review* (41)4, pp. 6-13.

Gerrity, T.P. and J.F. Rockart (1986) "End-User Computing: Are You a Leader or a Laggard", *Sloan Management Review* (27)4, pp. 25-35.

Golub, H. (1975) "Organizing information system resources: Centralization vs. decentralization" in McFarlan F.W. and R.L. Nolan (eds.) *The Information Systems Handbook*, Homewood, IL: Dow- Jones Irwin, pp. 65-91.

Gresov, C. (1989) "Exploring Fit and Misfit with Multiple Contingencies", *Administrative Sciences Quarterly* (34)3, pp. 431-453.

Henderson, J.C and N. Venkatraman (1993) "Strategic alignment: Leveraging information technology for transforming organizations", *IBM Systems Journal* (32)1, pp. 472-485.

Hodgkinson, S.L (1996) "The Role of the Corporate IT Function in the Federal IT Organization" in Earl, M.J. (ed.) *Information Management: The Organization Dimensio*n, Oxford, NY: Oxford University Press, pp. 247-269.

Hoffman, T. (2004a) "IT Oversight Gets Attention at Board Level", *Computerworld* (38)20, pp.1-3.

Hoffman, T. (2004b) "IT governance is on the Hot Seat", *Computerworld* (38)28, pp. 6-8.

Huber, N. (2004) "IT looks the weak link in compliance", *Computer Weekly*, July 27, p. 4.

Jelinek, M. (1977) "Technology, Orgganizations, and Contingency", *Academy of Management Review* (2)1, pp.17-27.

Jenkins, J.M and R.F Santos (1982) "Centralization vs. Decentralization of Data Processing Functions" in Goldberg R. and H. Lorin (eds.) *The Economics of Information Processing*, New York, NY: Whiley-Interscience, pp. 62-67.

Johnson, M. (2004) "No More IT Projects", *Computerworld* (28)13, p.20.

Kayworth, T. and V. Sambamurthy (2000) "Managing the Information Technology Infrastructure", *Baylor Business Review* (18)1, pp. 13-15.

Keen, P.G.W. (1981) "Communications in the 21st Century: Telecommunications and Business Policy", *Organizational Dynamics* (10)2, pp. 54-68.

King, J.L (1983) "Centralized versus decentralized computing: organizational considerations and management options", ACM Computing Surveys (CSUR) (15)4, pp. 319-349.

La Belle, A. and H.E. Nyce (1987) "Whither the IT Organization?", *Sloan Management Review (28)4*, pp. 75-86.

LePree, J. (2002) "Think Big, Think governance", *MSI* (20)4, pp. 32-35.

Leung, L. (2004) "Instilling It governance", *Network World (21)16*, pp. 43-44.

Lewis, D. (2004) "Stop the Pendulum", *Computerworld* (38)2, pp. 37-39.

Loh, L. and N. Venkatraman (1992) "Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect, *Information Systems Research* 3(4), pp. 334-359.

Luftman, J. and E.R. McLean (2004) "Key Issues for IT Executives", *MIS Quarterly Executive* (3)2, pp. 89-104.

Miller, D. and P. Friesen (1980) "Archetypes of Organizational Transition", *Administrative Science Quarterly* (25)2, pp. 268-300.

Monnoyer, E. (2003) "What CEOs really think about IT", *McKinsey Quarterly* (3), pp. 80-82.
Norton, D.P. (1973) "Information Systems Centralization: The Issues" in McFarlan F.W., Nolan R. and Norton D. (eds.) *Information Systems Administratio*n, New York, NY: Holt Rinehart and Winston.
Olson, M.H., and N.L. Chervany (1980) "The Relationship Between Organizational Characteristics and the Structure of the Information Services Function", *MIS Quarterly* (4)2, pp. 57-69.
Orlikoff, J.E. and M.K. Totten (2000) "E-Heath and the Board: The Brave New World of governance, Part 1", *Trustee* (53)7, pp. 14-18.
Peterson, R. (2004) "Crafting Information Technology Governance", *Information Systems Management* (21)4, pp. 7-23.
Rau, K.G. (2004) "Effective Governance of IT: Design objectives, roles and relationships", *Information Systems Management* (21)4, pp. 35-43.
Robbins, S. (2004) "IS Governance", *Information Systems Management* (21)4, pp. 81-83.
Rockart J.F., C.V. Bullen and J.N. Kogan (1979) "The management of distributed processing", *CISR Report 39*, Center for Information Systems Research, MIT Sloan School, Cambridge, Mass.
Rockart, J.F. (1988) "The Line Takes the Leadership – IS Management in a Wired Society", *Sloan Management Review* (29)4, pp. 57-65.
Rockart, J.F., M.J. Earl, and J.W. Ross (1996) "Eight Imperatives for the New IT Organization", Sloan Management Review (38)1, pp. 43-56.
Ross, J.W., P. Weill (2002) "Six IT Decisions Your IT People Shouldn't Make", *Harvard Business Review* (80)11, pp. 84-92.
Ross, J.W. and C. Brown (2003) "Designing a Process-Based IT Organization", *Information Strategy: The Executives Journal* (19)4, pp. 35-42.
Saran, C. (2004) "IT directors are not involved in vital compliance planning process", *Computer Weekly*, April 27, p. 5.
Sambamurthy V. and R.W. Zmud (1999) "Arrangements for Information Technology governance: A Theory of Multiple Contingencies", *MIS Quarterly* (23)2, pp. 261-291.
Sambamurthy V. and R.W. Zmud (2000) "Research Commentary: The Organizing Logic for an Enterprise's IT Activities in the Digital Era – A Prognosis of Practice and a Call for Research", Information Systems Research (11)2, pp. 105-115.
Schwarz A. and R. Hirschheim (2003) "An Extended Platform Logic Perspective of IT Governance: Managing Perceptions and Activities of IT", Journal of Strategic Information Systems (12)2, pp.129-166.
Tavakolian, H. (1989) "Linking the Information Technology Structure With Organizational Competitive Strategy: A Survey", *MIS Quarterly* (13)3, pp. 308-318.
Thompson, J.D. (1957) "Technology, Organization, and Administration", Administrative Science Quarterly (2)3, pp.325-343.
Trites, G. (2004) "Director Responsibility for IT Governance", *International Journal of Accounting Information Systems* (5)2, pp. 89-100.
Van Arnum, P. (2004) "Information Technology Insights: Cyber Security Ushers IT into Corporate governance Practices", *Chemical Market Reporter*, pp. 17-19.
Venkatraman, N. (1997) "Beyond Outsourcing: Managing IT Resources as a Value Center", *Sloan Management Review* (38)3, pp. 51-65.
Vlahakis, P.A., J.M. Wintner, and J.R. Cammaker (2002) "Understanding the Sarbanes-Oxley Act of 2002", *Corporate Governance Advisor* (10)5, pp. 13-17.
Von Simson, E.M. (1995) "The recentralization of IT", *Compterworld* (29)51, pp. 1-5.
Webster, J. and R.T. Watson (2002) "Analyzing the Past to Prepare for the Future: Writing a Literature Review", *MIS Quarterly* (26)2, pp. xiii-xxiii.
Weill, P. (2004) "Don't Just Lead Govern: How Top-Performing Firms Govern IT", *MIS Quarterly Executive* (3)1, pp. 1-17.
Weill, P. and J.W. Ross (2004) *IT governance: How Top Performers Manage IT Decision Rights for Superior Results*, Watertown, MA: *Harvard Business School Press*.
Weill, P. and J.W. Ross (2005) "A Matrixed Approach to Designing IT Governance", *Sloan Management Review* (46)2, pp. 26-34.

Wetherbe, J.C. (1988) "The MIS Conundrum—Centralization or Decentralization", *Chief Financial Officer USA*.

Wheelock, A.R. (1982) "Service Center or Profit Center? " *Datamation (28)5*, pp. 167-176.

Zmud, R.W., A.C. Boynton, and G.C. Jacobs (1986) "The Information Economy: A New Perspective for Effective Information Systems Management," *DataBase* (18)1, pp. 17-23.

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