The Role of a Culture of Compliance in Information Technology Governance

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Abstract. Ethics has been perceived as one of the most important factors in establishing good corporate governance. Information Technology (IT) plays an increasing role in helping modern organizations to achieve their goals, and it has become critical in creating and implementing effective IT governance mechanisms. This study examines the extent to which an ethic or culture of compliance in IT within an organization influences the overall effectiveness of IT governance, and the factors that contribute to this effect. Responses from 122 internal auditors, members of ISACA (Information Systems and Audit Control Association) Australia, show that two factors contributed to the ethics or culture of compliance in IT: corporate communication systems and the involvement of senior management in IT. This study advances our understanding of the roles of IT governance mechanisms and their impact on the overall effectiveness of IT governance. Furthermore, the findings of this study provide empirical results on the IT governance mechanisms that have been previously studied mainly by normative and case study approaches.

Keywords: *compliance, ethics, information technology, IT governance, Australia.*

1 Introduction

The collapses of Enron, WorldCom, HIH, One.Tel and many others early this century have brought about renewed attention to corporate governance mechanisms and birth to a spate of legislation and regulations worldwide. Some countries, like the United States and its Sarbanes-Oxley Act (SOX), have chosen coercive mechanisms, focusing on enforcement and punishment for egregious behavior, while others, like Australia and the United Kingdom, have chosen more cooperative approaches that place the burden for disclosure and explanation on the companies themselves rather than auditors and regulatory enforcement officers. Whichever approach is used, it remains that governments worldwide have ushered in a new era for business, one in which the actions of directors and executives will be closely scrutinized in order to prevent gross breaches of investor confidence, and their associated destruction of wealth, as has happened in the past.

Shailer (2004, p.55) defines governance as *"…decision-making in the exercise of authority for direction and control."* This theme is echoed in Picou and Rubachs (2006) broader, agency-theoretic conceptualization of governance as *"...the construction of rules, practices and incentives to effectively align the interests of agents…with those of principals."* These definitions imply four interrelated principles: first, the company's directors and officers know the strategic direction the company is pursuing. Second, they act, or make decisions. Third, they have authority over the affairs of the organization. Finally, they have a fiduciary duty-of-care centered on oversight and control aimed at optimizing the interests of the organizations shareholders. Underlying them is an active commitment to engage in an ethic that transcends strict responses to precise regulations. Roberts (2001) expresses this enhanced form of governance as a shared responsibility felt towards others.

This trend towards an ethic of responsibility or culture of compliance, in organizations is part of what some have described as New Governance in which strict standards are replaced by boundaries that allow local experimentation to occur. Lobel (2004) describes this as a participatory, collaborative, decentralized, diverse, flexible, fallible and adaptable system whereby governance is embedded. A New

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Governance approach puts ethical behavior in the forefront, establishing it as one of its most important factors (Coffin, 2003; Farrar, 2002; Trevino et al., 1999; McCabe et al., 1996; and Verschoor, 2004). In a survey of Fortune 1000 firms, Weaver et al. (1990) found that 98 percent of responding firms address ethical or conduct issues in formal documents. Meanwhile, 78 percent have a separate code of ethics, and most of them distribute these policies widely within the organization.

Implicit in most governance legislation and regulation is the need for prudent governance of organizations IT functions. As McAfee (2006) recently showed, U.S. companies spend as much on information technology each year as they do on offices, warehouses and factories *combined*. As a result of these large investments, the consequences of any disasters are likely to be profound and lasting.

The importance of IT to business functions is well documented (cf. El Sawy and Pavlou, 2008). IT, for so long having been considered an enabler of an organizations strategy, is now viewed as an integral part of an organizations strategy in facilitating the exploitation of information-based competitive advantage to maximize benefits, capitalize on opportunities, and promote organizational growth. In this regard, IT has progressed from being a separate function marginalized from the rest of the organization to increasingly critical.

In this study, we argue that an ethic or culture of compliance in IT is critical for organizations in establishing and implementing effective IT governance. As IT becomes more important, a sound ethic leads to more effective IT governance. Thus, our research questions are: *To what extent does an ethic or culture of compliance in IT influence the overall effectiveness of IT Governance mechanisms in organizations?* This question leads to additional sub-questions: *What factors influence the development of such an ethic of compliance? Which factors are most salient?*

Existing research provides only anecdotal evidence. We explore in greater detail this role of ethical compliance in governing information technology through a survey of 122 internal auditors and members of the Information Systems Audit and Control Association (ISACA) in Australia. Furthermore, this study represents to the best of our knowledge the first work to demonstrate empirically a positive significant relationship between ethic or culture of compliance and effective IT governance.

2 Theoretical Foundations

In this section we develop the theoretical bases for our investigation. First, we examine the foundations and importance of sound IT governance. Next, we review the few studies that have been done in linking ethics to information systems decisions in organizations.

2.1 IT Governance and Agency Loss

Governance was first posited to be an agency problem, that is, one where power between the owners of a corporation (shareholders) was less than that of its managers who, though not owners, had near-perfect information about the company and its operations. Owners and managers also sometimes had conflicting goals: owners for wealth-maximization, managers for ongoing employment with high remuneration. "Agency loss", then, occurred when managers pursued objectives that were more in their interest than in the interests of the many, typically diffused shareholders (Jensen and Meckling, 1976). Principals were aware of these possible agency losses, and took steps to minimize them by imposing contracts and performance checks on management, mainly through elected representatives, some from outside the organization, that formed a Board of Directors, and hence, corporate governance. Directors, in turn, organized themselves to provide appropriate levels of scrutiny towards the organization, mainly through Audit and Compensation committees composed solely of external (independent) directors.

The Boards compensation committee sets executive compensation levels. The audit committee oversees and attests to the completeness and accuracy of corporate financial statements. In both cases, Directors (and by extension, the managers who report to these directors through the CEO) rely on the organizations information systems to provide the necessary data for decision-making. As such, senior management involvement in financial reporting systems are crucial for the organization to succeed, and to transparently demonstrate to shareholders and stakeholders that opportunistic behavior is nor occurring.

Information Technology (IT), then, has the potential to be one of the most significant drivers of economic wealth for enterprises. In many organizations IT is a critical asset, not simply for organizational success, but to provide opportunities to obtain competitive advantage (IT Governance Institute, 2003). Further, a

large portion of the market value of organizations has transitioned from the tangible, (e.g., facilities, inventory, etc.) to the intangible (e.g., information, knowledge, expertise, reputation, etc.). However, despite the large investments and potentially huge risks associated with IT, boards typically focus on business strategy and strategic risks, perhaps at the cost of less effective IT Governance (ITG) in the hope that nothing goes wrong (IT Governance Institute (ITGI), 2003a, 2003b). In this study, we propose a more active form of involvement on the part of directors and managers that is subsumed in the ITGIs (2003a) definition of IT Governance as "A structure of relationships and processes to control the enterprise in order to achieve the enterprises goals by adding value while balancing risk versus return over IT and its processes."

Early research in IT Governance sought to identify and quantify the elements of good IT governance. Weill and Ross (2004), surveyed CIOs of 256 firms from 23 countries, and identified fifteen of the most common IT governance mechanisms. They categorised these into three broad factors: decision-making structures, alignment processes, and communication approaches.

Sohal and Fitzpatrick (2002) observed the IT governance mechanisms used by Australian organizations, including the existence of an IT steering committee, centralisation of IT decision-making activities and the involvement of senior management in IT. However, the study did not provide empirical support of the relationship of the three mechanisms to the level of effectiveness of IT governance.

De Haes and Van Grembergen (2005) conducted a case study of a major Belgian financial firm, examining how the mechanisms, processes and structures of IT governance contributed to the implementation of IT governance. Their case study revealed that the firm used governance mechanisms effectively; for example, an executive committee composed of business and IT people, service-level agreements (SLAs), and charge-back systems were used to regulate IT resources.

Vaswani (2003), ran a study of Auditors to determine the effectiveness of IT governance mechanisms, revealing that the existence of three mechanisms — an IT steering committee, the involvement of senior management in IT, and corporate performance measurement systems — were positively correlated with the effectiveness of IT governance. Two additional mechanisms (centralisation of IT decision-making and the position of the IT function within the organization) were not supported.

More recent research (Parent & Reich, 2009) has noted that a plethora of possible ITG frameworks exist – over 14 at last count, with more evolving. These frameworks differ somewhat in their approach, for example, CoBIT, COSO, and ITIL provide comprehensive guidance from the micro level upwards. Given their focus, they also tend to be fairly prescriptive. In contrast, AS8015, the Australian Standard for ICT governance is targeted at the strategic level. Its focus is more macro level and discretionary, offering principles rather than prescription. While these frameworks differ relative to their focus, they still have a single common goal: the good governance of organizational IT through the establishment of structural mechanisms (e.g., IT Steering and Strategy committees) that inevitably facilitate director focus and attention to IT-related issues.

Filatotchev (2007) suggests that the dominant view of governance comes from agency theory, which emphasizes monitoring and control functions. Within this perspective, director's responsibilities take two forms: ensuring accountability to minimize downside risk and enabling managerial entrepreneurship to reap upside potential. These two perspectives are called the wealth protecting and wealth creating aspects of corporate governance. They see to it that wealth is not squandered or put at risk and ensure that measures are taken to increase this wealth over time.

Given the number of alternative ITG frameworks, it is fair to conclude that no single dominant approach to IT governance has emerged. Rather, recent research has conceived of IT Governance as having two distinct modes consistent with Filatotchevs approaches: defensive and strategic (Parent & Reich, 2009). Defensive ITG seeks to fire-proof the organization by preventing or mitigating the consequences of disasters. Strategic ITG, on the other hand, aims to create sustainable shareholder value by either reducing costs (such as the cost of capital, or of IT projects) or creating a sustainable competitive advantage. We contend that governance legislation and regulations help shape organizational responses to ITG, as do the particular organizations approach to their IT functions. That is, organizations ITG mechanisms evolve so they align with the legislation and regulation prevailing in their particular jurisdiction, resulting in an organizational ethic that reflects this fiduciary environment.

2.2 Ethic or Culture of Compliance and IT Governance

Much has been written about the importance of ethics in establishing good corporate governance (Coffin, 2003; Farrar, J. 2002; Trevino et al., 1999; McCabe et al., 1996; and Verschoor, C.C. 2004). Effective ethical compliance management has several advantages. First, as employees ethical and legal awareness increase, the employees tend to ask questions correctly and, in the end, do "the right thing" when facing dilemmas. Second, it influences employees to be willing to report violations to management, thus contributing to process transparency in the organization. Finally, it increases employees' commitment, because a culture of ethical compliance creates value congruence that generates a sense of community and organizational commitment among employees (Trevino et al., 1999; McCabe et al., 1996).

However, very little has been written with respect to ethics and IT Governance. One reason might be that the link between a culture of ethical compliance and effective governance is seen as axiomatic, and has been well handled in the literature. However, if this were the case, legislation like the Sarbanes-Oxley Act of 2002, which mandates even closer scrutiny to IT practices and financial reporting mechanisms, would not be necessary. Nor would increased attention to the ongoing failure of most IT projects be studied so extensively.

A recent study by Córdoba (2007) suggested that stakeholder-centric perspectives still dominate research into ethics and information systems, and that ethical behavior is largely a matter of reflective practice on the part of individual decision-makers. This perspective is similar to that advocated by Filatotchev (2007), which criticizes the disciplines focus on agency perspectives. We could find no study, however, that directly addressed the notion of an ethic of compliance driving IT governance mechanisms, largely, we feel, because the complexity information systems does not lend itself well to close scrutiny.

This study tries to uncover the invisible, and argue the need to promote a culture of ethical compliance in order for firms to achieve effective IT governance. Such an environment is useful in preventing and detecting conduct that may endanger the objectives of IT governance, and in particular, alignment of business and IT goals and strategies.
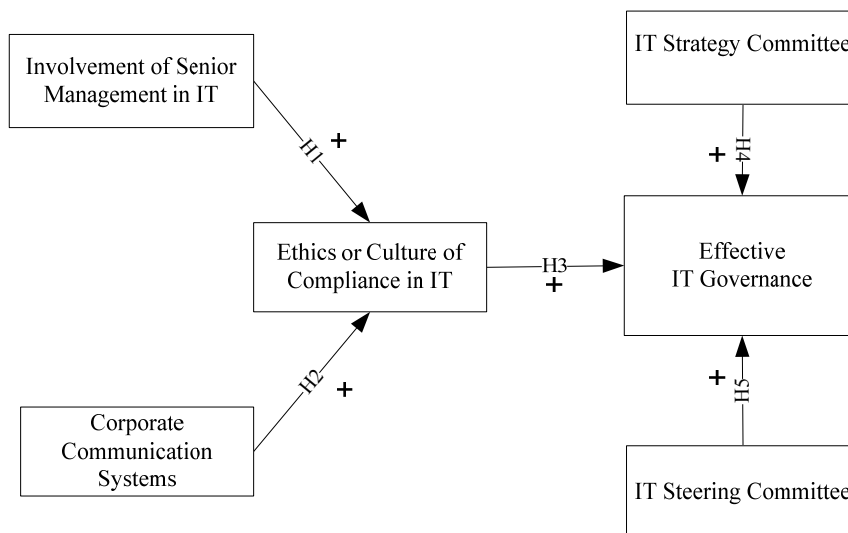
3 Research Model and Hypotheses Development

Figure 1. Research Model

Involvement of Senior Management in IT

Many researchers have examined the critical role of senior management practices in creating an ethic or culture of compliance for IT processes within an organization (Beyer and Nino, 1999; Dickson et al, 2001; Schein, 1992; Schneider, 1987; and Grojean et al., 2004). In this study senior management means the CEO and the level of management directly below that of the CEO whereas an ethic or culture of

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compliance refers to "all the beliefs, values, attitudes, rituals and behavior pattern that people in an organization share" (Meyer, 2004, p.29).

It is important for top management to lead in promoting awareness of ethical compliance within their organization, as it sends messages to employees that inevitably shape the culture of their organizations (Beyer and Nino, 1999). The involvement of senior management sends messages that "bond" or help to align employees actions to the goals of the organization, and thus it contributes to Filatotchevs (2007) wealth creating perspectives of governance. Dickson et al (2001) argue that the organizations leaders play critical roles in communicating and demonstrating the importance of ethical values to the organization stakeholders. Further, Grojean et al. (2004) proposed seven mechanisms by which senior management promote the importance of ethical values to members such as using values-based leadership, setting the example, establishing clear expectations of ethical conduct, and formal socialization activities. Using fifty-seven in-depth, semi-structured interviews, Schwartz (2004) found that provisions of examples and senior management support are perceived as mechanisms in creating code effectiveness in influencing behavior. In line with the above arguments, involvement of senior management in information technology (IT) operations and decisions is also argued to be critical in creating an ethic/culture of compliance. Thus,
H1: Involvement of senior management in IT will positively influence the ethic or culture of compliance in IT

Corporate Communication Systems

Communication has been considered as one of the factors that critically supports an organizations internal control. The Committee on Sponsoring Organizations (COSO) of the Treadway Commission (1992) listed communication as one of the critical components of a sound internal control environment. Effective communication enables an organizations stakeholder to capture and exchange the information needed to manage and control its operations (COSO, 1992). In this way, an effective communication system contributes to achieving the wealth creating perspectives of governance of IT. Some forms of communication systems such as reporting violations ("whistleblowing"), provision of anonymous phone lines to communicate violations, and formal socialization activities have been promoted as effective mechanisms in implementing corporate codes of ethics successfully (Schwartz, 2004; Grojean et al., 2004). However, these studies were based primarily on normative opinion and case studies that have a limitation in terms of external validity. By contrast, this study differs from the previous studies in that it provides empirical evidence of effective communication mechanisms based on an extensive questionnaire survey. Accordingly,
H2: The implementation of an effective corporate communication system will positively influence the ethic or culture of compliance in IT

Ethic or Culture of Compliance in IT

With respect to IT governance, this study argues the need to promote a culture of ethical compliance in order for firms to achieve their IT governance effectively. Such an environment is useful in preventing and detecting conduct that may endanger the objectives of IT governance, and in particular, alignment of business and IT aims. Accordingly, this factor is significant in achieving the wealth creating perspectives of effective IT governance for the organization.

To achieve an effective ethic or culture of compliance, a firm needs to establish a code of conduct, adopt and implement (at least in part) a comprehensive compliance framework such as COSO (Committee of Sponsoring Organizations of the Treadway Commission), COBIT (Control Objectives for Information and related Technology), ITIL (Information Technology Infrastructure Library), and/or ISO 17799, provide sufficient ethical training for employees, and provide a reporting hotline. Thus,
H3: The existence of an ethic/culture of compliance in IT will positively influence the level of effective IT governance.

IT Strategy Committee

IT is widely acknowledged as a critical enabler for an organization to achieve its objectives. Accordingly, sound, independent, knowledgeable advice on the governance of IT within the organization to the Board of Directors is expected to play a greater role for Boards. IT is a critical element of business strategies and core operating processes. Accordingly, there is a need for direct involvement of the board of directors in establishing effective governance of IT. A board can pursue these responsibilities by establishing a committee (similar in function to the Audit Committee) called the IT strategy committee (IT Governance Institute, 2003). In this study an IT strategy committee means a sub-committee of board members with responsibility to provide insight and advice to the board on topics such as the alignment of IT with the

business direction and the achievement of strategic IT objectives, and also, to provide direction to management relating to the IT strategy (IT Governance Institute, 2003). As with other board sub-committees such as the audit committee, this committee has both wealth creating and wealth protecting (or risk management) responsibilities.

The involvement of boards more directly in IT governance implies that the organization is committed to establishing effective IT governance. The commitment of the IT strategy committee to IT governance is very important. Commitment is indicated by providing direction to management related to IT strategy and its approval (IT Governance Institute, 2003). A recent study by Ali & Green (2007) in public-sector organizations in Australia revealed that an IT strategy committee has a positive correlation with the level of effectiveness of overall IT governance. Thus,

H4: The existence of an IT strategy committee will positively influence the level of effective IT governance.

IT Steering Committee

The IT steering committee, as a mechanism for supporting information systems planning and management, has been widely supported in the systems literature. In this study an IT steering committee means a high-level executive management team of representatives from multiple divisions or functions that are assigned the task of linking IT strategy with business strategy by setting strategic directions, matching corporate concerns with technology potential, and building commitment (IT Governance Institute, 2003). The committee serves as a high-level executive team, comprised of representatives from various divisions or functions within the organization (such as business executives and the CIO), with the main function of linking its IT strategy and business strategy (Nolan, 1982; IT governance Institute, 2003). Again, from an agency perspective, this committee of senior managers has responsibilities for both wealth creating and wealth protecting activities in relation to the IT within the organization. This study provides evidence as to how well, on average, these committees are perceived to contribute through the performance of these activities to a higher level of effective IT governance for the organization.

Previous studies have empirically supported the benefits of the existence of an IT steering committee in IS planning and management (Doll, 1985; Steiner, 1979; Ragunathan & Ragunathan, 1989). Several earlier IS studies provide empirical evidence of the importance of an IT steering committee. For example, a study by Karimi et al. (2000) found that an IT steering committee had a positive impact on the sophistication of IT management, and it was shown to have made improvements to IS project portfolios (McKeen & Guimaraes, 1985). A more recent study by Vaswani (2003) revealed that an IT steering committee has a positive correlation with the level of effectiveness of overall IT governance. Thus,

H5: The existence of an IT steering committee will positively influence the level of effective IT governance

4 Research Methodology

All variables except for IT Strategy committee were adapted from previously validated scales. They were all measured using seven-point Likert scales and are reproduced in Appendix A.

4.1 Dependent Variables

Perceived overall level of effective IT governance (EFFECT) was measured using two items that were validated by Ali and Green (2007). The two items were originally developed and validated by Goodhue & Thompson (1995).

4.2 Independent Variables

To measure IT Strategy Committee (STRACOM), three questions adapted from the IT Governance Institute (2003) were used.

IT Steering Committee (STERCOM) was measured using three items that were validated by Ali and Green (2007). All three items were originally developed and validated based on a study conducted by Karimi et al. (2000).

To measure involvement of top management in IT (INVOLVE), this study used three items that were validated by Vaswani (2003). The first two items were originally developed and validated based on a study conducted by Jarvenpaa and Ives (1991), while the last item was developed and validated by Vaswani (2003).

Corporate communication systems (COMSYS) was measured using three items adapted from Weill & Ross (2004).

Finally, an ethic or culture of compliance (ETHICULT) was measured using three items from Trevino et.al. (1999) that we adapted to the context of IT governance.

5 Results and Discussion

5.1 Sample Characteristics

Internal auditors were used as participants in this study. An objective of IT governance is to ensure that risks related with IT have been analyzed and managed appropriately by management. The internal auditor plays an important role as he/she has expertise in reviewing control structures and recommending controls to overcome any uncontrolled risks (Williams, 2002). Furthermore, the internal auditor can provide a relatively independent and objective assessment of IT governance in the organization as he/she does not have a vested interest in the development/expansion of the IT functional area. Thus, the internal auditor is one of the best sources in assessing IT governance practices within an organization.

An online questionnaire survey was performed in 2005. Email invitations to participate in the survey were sent out to 1116 members of ISACA throughout Australia. The total of completed and usable responses was 176. From these responses, 122 were from internal auditors. The remaining 54 responses were from external auditors.

Table 1.Demographic Characteristics

		Frequency	**Percentage**
A.	Audit background (n=122)		
B.	IS Auditor	85	70%
C.	Qualified CISA (certified information systems auditor)	54	44%
	Experience and Familiarity*	***Mean***	***Std. Dev.***
D.	Audit experience (years)	9.34	7.84
E.	IS Audit experience (years)	5.92	6.25
F.	Familiarity with IT Governance	5.67	1.27

* On a 7–point Likert scale: (1= Not at All; 7= a Great Extent)

Table 1 indicates that 70% (of which 54 of them are CISA qualified) of the current study's respondents identified themselves as IS auditors. The mean audit experience is 9.34 years, whereas the IS audit experience is 5.92 years. The familiarity with IT governance implementation (or concepts), reported in this study result is relatively high (5.67 on a 7-point scale).

5.2 Structural Equation Modeling

The structural equation modeling technique (SEM) was used to test hypotheses proposed in the model.

Overall Model Fit

Prior to evaluating a structural model, the overall fit of the model has to be assessed to ensure that it is a sufficient representation of the entire set of causal relationships (Hair et al., 1998). Hence this study examined the absolute fit measures, the incremental fit measures, and the parsimonious fit measures resulting from AMOS.

Absolute Fit Measures

The measures of absolute fit include the likelihood-ratio chi-square (χ^2). The Chi-square (χ^2) statistic is the traditional measure for evaluating model fit (Schumacker, 1996). It examines the differences between the covariance matrix implied by the model and the covariance matrix obtained from the data. Hair et al.

(1998) suggest that the minimum p-value for the Chi-square to be considered insignificant is 0.05. The chi-square value for this study model is 101.317 with 92 degrees of freedom, returning a probability value of 0.238 (See Table 2, Panel A). Since the probability value of the chi-square test is far greater than the .05 level, this study fails to reject the null hypothesis that the model fits the data, or in other words suggests that the model fits nicely to the data.

Incremental and Parsimonious Fit Measures
The measure of incremental fit compares the proposed model to some baseline model, most often referred to as the null model (Bentler & Bonnet, 1980, Hair et al., 1999). Prior studies suggest some criteria such as the Tucker-Lewis Index (TLI), Normed Fit Index (NFI), and the Comparative-Fit-Index (CFI) (Hair et al., 1998; Tabachnick and Fidell, 1996) as measurement indexes. All the three incremental fit measures exceeded the recommended level of 0.90 (See Table 2, Panel B), that is considered to be indicative of good model fit. (Hair et al., 1998; Bentler & Bonnet, 1980)

Table 2. Overall Model Fit

Panel A. Absolute Fit Measure	Model Values
Chi-square (χ^2)	$\chi^2 = 101.455$; df = 93; P = 0.258

Panel B. Incremental Fit Measures	Model Values
Tucker-Lewis Index (TLI)	0.993
Normed Fit Index (NFI)	0.948
Comparative Fit Index (CFI)	0.995

Panel C. Parsimonius Fit Measure	
Normed chi-square (χ^2 /df)	1.090

Parsimonius fit measures are intended to determine the fit of the model in relation to the number of estimated coefficients. As this paper only tested a single model, a normed chi-square measure was used (Hair, et al., 1998). The range of acceptable normed chi-square values is between 1 and 2. In our study, the normed chi-square value is 1.090, which is clearly in the acceptable range (See Table 2, Panel C).

Measurement Model Fit

Table 3 below present the reliability and variance-extracted estimated for exogenous constructs used in the SEM model. Reliability is "a measure of the internal consistency of the construct indicators, depicting the degree to which they "indicate" the common latent (unobserved) construct" (Hair et al., 1998, pp.612). A reliability score greater than 0.70 is deemed appropriate. Whereas variance-extracted measure "reflect the overall amount of variance in the indicators accounted for by the latent construct" (Hair et al., 1998, pp.612). General rules suggest that the variance-extracted score should greater than 0.50. Using formula taken from Hair et al (1998), table 3 below present the calculation results of the reliability and the variance-extracted value. It is concluded that constructs used in the SEM model were reliable and valid.

Table 3. Reliability and Variance-Extracted Estimates for Construct in Confirmatory Factor Analysis

Construct	Reliability	Variance Extracted
STRACOM	0.94	0.83
STEERCOM	0.91	0.77
INVOLVE	0.91	0.78
ETICHULT	0.75	0.60
COMSYS	0.96	0.89
EFFECT	0.92	0.85

Structural Model Fit

Following the assessments of the measurement model fit, the next step is to examine the estimated coefficients between variables in the path analysis model. Table 4 presents the regression weights of variables from AMOS that were used to evaluate the research hypotheses in the model.

Table 4. Regression Weights of Variables

Dependent variable		Independent Variable	Hypothesize sign	Estimate	Standard Error	C.R	P
ETHICULT	H1	INVOLVE	+	0.238	0.072	3.313	0.001*
	H2	COMSYS	+	0.634	0.071	8.973	0.000*
EFFECT	H3	ETICHULT	+	1.066	0.116	9.174	0.000*
	H4	STRACOM	+	0.154	0.062	2.473	0.013**
	H5	STERCOM	+	-0.149	0.099	-1.497	0.134

* Significant at the 0.001 level
** Significant at the 0.05 level

The involvement of senior management in IT had a significant and positive effect on the ethic/culture of compliance in IT. The result was consistent with studies conducted by Beyer and Nino (1999), Dickson et al. (2001) and Grojean et al. (2004). Senior management leadership in promoting awareness of ethical compliance within their organization was perceived critical, as it sends messages to employees that inevitably shape the culture of their organizations (Beyer and Nino, 1999). The result provide empirical support to Schwartzs (2004) study that found the provision of examples and senior management support are perceived as mechanisms in creating code effectiveness in influencing behavior. It also points to the growing importance of endogenous factors, not exogenous forces like legislation, in creating and nurturing a culture of compliance in the organization.

Similarly, corporate communication systems, another endogenous factor, were also found to be positive and significant in influencing the ethic/culture of compliance in IT. This mechanism resulted as the biggest factor contributing to the ethic/culture of compliance in IT (B=0.634). The result provides empirical support for the Schwartz (2004) and Grojean et al., (2004) studies that suggested communication systems such as reporting violations, the provision of anonymous phone lines to aid communication of violations, and formal socialization activities was one of the effective mechanisms in facilitating a corporate code of ethics implementation successfully.

Ethic/Culture of compliance in IT had a significant and positive influence on the overall effectiveness of IT governance ($\rho<0.01$). This result suggests support for Hypothesis 3 that the existence of an ethic/culture of compliance in IT leads to a perception of an overall effective level of IT governance. The unstandardised coefficient for the variable was 1.066, which was the largest score among other variables — contributing the most toward the overall effectiveness of IT governance. This finding provides the first empirical support of the benefits of an Ethic/Culture of compliance in the IT governance literature. This finding is similar to other findings in the ethics literature, which reveals the increase of ethical and legal awareness of employees leads them to do the right thing when facing dilemmas. It influences the employees to be willing to report violations to management, thus contributing to better decisions in the company. Finally, it increases employees' commitment as an ethic/culture of compliance creates value congruence that generates a sense of belongingness among employees (Trevino et al., 1999; McCabe et al., 1996). These kinds of environments are useful in preventing and detecting conduct that may endanger the objectives of IT governance.

The direct influence of IT strategy committee on the overall effectiveness of IT governance (H4) was positive and significant, with ρ value =0.013, that suggests some support for Hypothesis 4—the existence of IT strategy committees positively influences the effectiveness of IT governance. This empirical finding partially supports the normative literature proposed by the IT Governance Institute (2003a). As those at board level get involved in the governance of IT through an IT strategy committee, they can provide

influential advice to the board and management on recent and future IT-related issues and their alignment with business goals.

The IT steering committee was negative and not significant ($\rho=0.134$). Thus, Hypothesis 5 that proposes the existence of the IT steering committee is directly positively correlated with the overall effectiveness of IT governance could not be supported. This finding is inconsistent with previous studies (Vaswani et al, 2008; Karimi, 2000) that found the IT steering committee positively influenced the level of IT governance. A possible explanation is that, for these organizations, the IT strategy committee was perceived as more effective in influencing the overall level of effective IT governance. It may also be because senior management were considered to have good knowledge in IT and did not need any steering committee in supporting their roles in governing the organizations IT. A third possible explanation is that, on average, in the perception of the respondents, the IS steering committees were dysfunctional and thus they did not contribute positively to an overall level of effective IT governance within the organization.
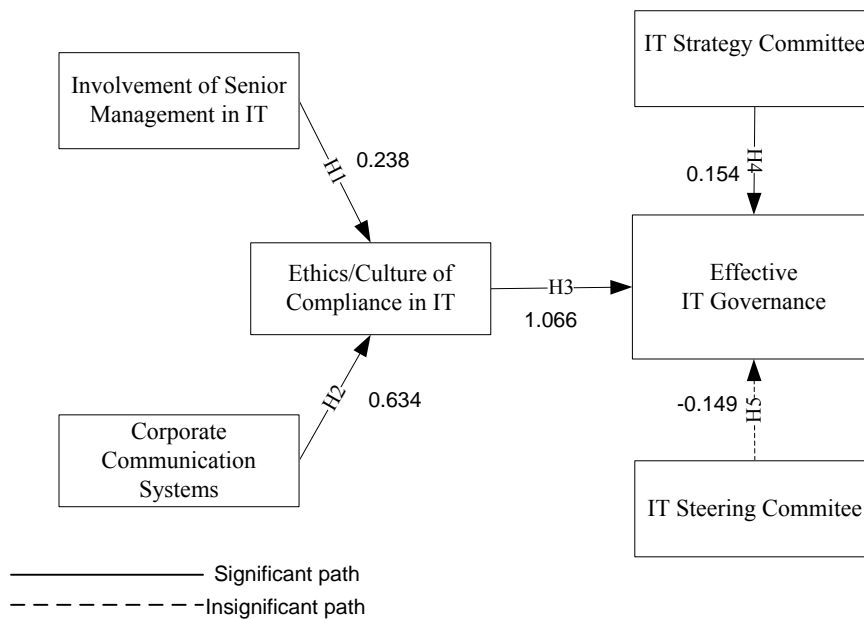

Figure 2. Path - Analysis

6 Summary, Contributions and Limitations

This study examined empirically whether an ethic or culture of compliance in IT influences the overall effectiveness of IT governance, and what factors affected this compliance. Other factors that influenced the level of effective IT governance were also examined. Using sample responses from 122 internal auditors, members of ISACA (Information Systems and Audit Control Association) Australia, this study revealed that an ethic/culture of compliance in IT significantly influenced the level of IT governance. Two factors were the main contributors: corporate communication systems and the involvement of senior management in IT. Another factor that emerged as salient was the IT strategy committee.

This should really come as no surprise, for it is well in-line with many other studies that have shown the importance of active senior management involvement in IT decision-making (cf. Philip, 2007). Philip (2007) notes that this involvement is manifested in two distinct fashions: by actively listening to IT personnel when they discuss the role technology should play in the organization; and by acting decisively to enact these roles. What our study found, in addition, is that doing so has the effect of creating and permeating a strong ethic around the governance of IT in the organization as well.

Interestingly, our study shows that the IT Steering Committee did not have a significant impact on effective IT governance in the organization. Many point towards the utility of an ethics steering

committee in catalyzing and sustaining an embodied culture of ethics in the organization (cf. Vitell and Singhapakdi, 2008). Our study does not support this contention, suggesting that this sort of committee might in fact impede a culture of ethics in the organization by turning employees into "rule followers" and the committee as enforcer. As a result, the emergence of cultural norms is impeded, not aided, by this structure. Additional research is needed in order to determine which of these viewpoints dominates, given the ubiquity of IT Steering Committees, and the axiomatic reliance on their good judgment as a latent indicator of ethical compliance.

This study advances our understanding of the roles of IT governance mechanisms and their impact on the overall effectiveness of IT governance. In particular, this study found robust empirical evidence that (1) the existence of ethics and a culture of compliance in IT is positively correlated with the overall effectiveness of IT governance, and (2) the existence of IT strategy committee greatly enhances the overall effectiveness of IT governance.

The findings also suggest that the presence of communication systems is a positive influence on the ethics and a culture of compliance in IT. As noted above, these communication systems are informal, as epitomized by senior management leadership, as well as the more formal mechanisms used to inform employees of technological innovations in organizations (newsletters, knowledge management system repositories, training sessions, project rollout communications, etc…). Again, our study shows that the mere fact of communicating has a positive effect on creating and sustaining a governance-centered culture. It gives credence to the adage that "what is measured (or observed) matters". The findings of this study provide empirical results on the IT governance mechanisms that have been previously studied mainly by normative and case study approaches (IT Government Institute, 2003; Weill and Ross, 2004).

Calling on the ethics and organizational literature (Trevino et al., 1999; McCabe et al., 1996), this study is the first empirical study to examine the influence of an ethic/culture of compliance in the context of IT governance. This finding contributes to the IT governance literature on the importance of an ethic/culture of compliance in establishing effective IT governance.

For managers, this study also points to a number of initiatives they might undertake to create an ethic and culture of compliance around their information technologies. First and foremost, we would echo our predecessors that state IT is too important to be left to the back-room. That is, IT should form a regular part of manager's agendas and be a regular topic of discussion – not just one engaged in when projects go wrong. Moreover, we would suggest that these discussions take place within the senior ranks of the organization, during and between strategic planning sessions. Secondly, we would advocate establishing formal communications mechanisms (employee newsletter, blog or other written communication) that would reinforce the culture of governance around IT throughout the organization. By doing so formally (as part of ongoing planning) and informally (communications to all employees), this ethic of compliance that we have witnessed in other areas (e.g., financial reporting and accounting) would likely emerge with respect to information technology. More research is needed on this point to establish which mechanisms, specifically, would be most effective in doing so.

There are some limitations that should be highlighted when interpreting the study's results. First, more reliable measures of the overall effectiveness of IT governance in an organization need to be developed, since subjective and indirect measures (based on internal auditor's perceptions) do not provide the same strength as objective measures might. Second, there are some issues of structural equation modeling design that may have limited the external validity of the results, such as the limited sample size, and the usage of a confirmatory model strategy instead of other strategies (e.g., a competing models strategy). Further analysis using a competing models strategy may provide a richer and better understanding of the structural relationships of the existing variables in the model. Our results are also limited by the fact that all respondents were internal auditors, the bulk of whom (70%) described themselves as IS auditors, from Australian companies. While we are confident that they are representative of all Australian companies, cultural differences may lead to different results in other cultures. The fact that all participants were also auditors limits the applicability of results to that population only. Further studies are needed in other countries as well as with other types of managers to see if our results hold. For example, it might be interesting to conduct a similar study with CIOs.

To our knowledge, this study is the first to explicitly consider the link between an ethical or culture of compliance and information technology governance. Previous studies have considered IT Governance to

be exogenous, that is, imposed on the organization by law (e.g., the Sarbanes-Oxley Act of 2002), by industry standard (e.g., CoBIT, COSO, ITIL) and/or by industry bodies (e.g., ISO). A number of researchers looking at broader governance issues (cf. Shailer, 2004) have contended that good governance should be, and is often the result of endogenous factors, those that emerge from within, not without. The most salient of these factors appears to be a strong ethic towards governance in the organization. In this study, we extend this argument to consider the special challenge associated with IT governance, and find that an ethic of compliance emerges naturally from senior management leadership aimed at this area, and from corporate communication systems that promote and reify this ethic throughout. In doing so, we not only extend the corporate governance literature, we also contribute to conversations about the governance of information assets in organizations. For researchers, it opens up a number of interesting avenues where the specific modalities of an IT governance ethic could be explored. For managers, this study points to a number of easily-implemented initiatives that might lead to greater oversight of this critical area in their organizations.

References:

Ali, S., Green, P.: Effective IT Governance Mechanisms in Public Sectors: An Australian Context. International Journal of Global Information Management. Vol. 15, Issue 4, 41-63 (2007)

Beyer, J. M., Nino, D.: Ethics and Cultures in International Business, Journal of Management Inquiry. 8(3), 287-297 (1999)

Coffin, Bill.: Ethics and Compliance at Honda of America. Risk Management. (Dec), 50, 12. (2003)

Committee of Sponsoring Organizations of the Treadway Committee (COSO).: Jersey City, NJ: AICPA. (1992)

Córdoba, J-R.: A Critical Systems View of Power-Ethics Interactions in Information Systems Evaluation, Information Resources Management Journal. 20(2), 74-89. (2007)

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

Doll, W. J.: Avenues for Top Management Involvement in Successful MIS Department. MIS Quarterly. 9(1), 17-35 (1985)

Dickson, M. W., D. B. Smith., M.W. Grojean., M. Ehrhart.: Ethical Climate: The Result of Interactions Between Leadership, Leadership Values, and Follower Values. Leadership Quarterly. 12, 1-21 (2001)

El Sawy, Omar A., Pavlou, Paul A.: IT-Enabled Business Capabilities for Turbulent Environments. MIS Quarterly Executive. Vol. 7 Issue 3, p139-150 (2008)

Farrar, J.: Corporate Governance in Australia and New Zealand. Oxford University Press (2002)

Filatotchev, I.: Corporate Governance and the Firms Dynamics: Contingencies and Complementarities. Journal of Management Studies. 44(6), 1041-1056 (2007)

Goodhue, D.L., Thompson, R.L.: Task-Technology Fit and Individual Performance. MIS Quarterly (19:2), pp. 213-236 (1995)

Hair, J.F., R.E. Anderson, R.L., Tatham., W.C. Black.: Multivariate Data Analysis 5th Ed. Upper Saddle River, NJ: Prentice Hall (1998)

Haes, S. D., Grembergen, W. V.: IT Governance and Its Mechanisms. Information Systems Control Journal, 1 (2004)

Hardy, G.: Coordinating IT Governance--A New Role for IT Strategy Committees. Information Systems Control Journal. 4 (2003)

Institute, IT Governance (ITGI).: Board Briefing on IT Governance. IT Governance Institute (2003a), Visited 31 January 2005. http://www.isaca.org/Content/ContentGroups/ITGI3/Resources1/Board_Briefing_on_IT_Govern ance/26904_Board_Briefing_final.pdf.

Institute, IT Governance (ITGI).: IT Governance Global Status Report 2003 (2003b,) Visited 1 February 2005. Http://www.itgi.org/Template_ITGI.cfm?Section=ITGIandCONTENTID=14539andTEMPLAT E=/ContentManagement/ContentDisplay.cfm.

ISACA.: The 2004 Annual Report (2004), Visited 1 April 2005. Http://www.isaca.org/Content/ContentGroups/Annual_Report/2004- Annual-Report.pdf.

Jarvenpaa, S.L., Ives, B.: Executive Involvement and Participation in the Management of Information Technology. MIS Quarterly. 15 (2), 205-227 (1991)

Jensen, M.C., W.H. Meckling.: Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. Journal of Financial Economics. Vol. 3, No. 4, 305-360 (1976)

Karimi, J., Bhattacherjee, A., Gupta, Y. P., Somers, T., M.: The Effect of MIS Steering Committees on Information Technology Management Sophistication, Journal of Management Information Systems. 17(fall, 2), 207-230 (2000)

Lobel, O.: The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought. Minnesota Law Review. 89(2), 342-471 (2004)

McAfee, A.: Mastering the Three Worlds of Information Technology. Harvard Business Review. November, 84(11), 141-149 (2006)

McCabe, D.L., Trevino, L.K., Butterfield, K.D.: The Influence of Collegiate and Corporate Codes of Conduct on Ethics-related behavior in the Workplace. Business Ethics Quarterly. 6, 461-476 (1996)

McKeen, J. D., Guimaraes, T.: Selecting MIS Projects by Steering Committee. Communications of the ACM, 28(12), 1344-1352 (1985)

Meyer, N. D.: Systemic IS Governance: An Introduction. Information Systems Management, 21(4), 23-34 (2004)

Nolan, R. L.: Managing Information Systems by Committee. Harvard Business Review. 72-79 (1982)

Parent, M., B.H. Reich.: Governing IT Risk. California Management Review. Forthcoming, spring, Mar-Apr (2009)

Philip, G.: IS Strategic Planning for Operational Efficiency. Information Systems Management. 24, 3(summer), 247-264 (2007)

Picou, A., M.J. Rubach.: Does Good Governance Matter to Institutional Investors? Evidence from the Enactment of Corporate Governance Guidelines. Journal of Business Ethics. 65, 55-67 (2006)

Ragunathan, B., Ragunathan, B.: MIS Steering Committees: Their Effect on Information Systems Planning. Journal of Information Systems. 104-116 (1989)

Roberts, J.: Corporate Governance and the Ethics of Narcissus. Business Ethics Quarterly. 11(1), 109-127 (2001)

Schein, E. H.: Organizational Culture and Leadership. 2nd Edition Jossey-Bass, San Fransisco (1992)

Schwartz, Mark S.: Effective Corporate Codes of Ethics: Perceptions of Code User. Journal of Business Ethics. 55, 323-343 (2004)

Shailer, G.E.P.: An Introduction to Corporate Governance in Australia. Frenchs Forest NSW: Pearson Education Australia (2004)

Steiner, G. A.: Strategic Planning: What Every Manager Must Know. New York: Free Press (1979)

Trevino, L. K., Weaver, G. R., Gibson, D. G., Toffler, B. L.: Managing Ethics and Legal Compliance: What Works and What Hurts. California Management Review. Winter 41(2), 131-151, (1999)

Verschoor, C.C.: Does Superior Governance Still Lead to Better Financial Performance? Strategic Finance, Oct-4 (2004)

Vaswani, Ravi.: Determinants of Effective Information Technology (IT) Governance. Unpublished Thesis. School of Business, University of Queensland, Australia (2003)

Vitell, S.J., Singhapakdi, A.: The Role of Ethics Institutionalization in Influencing Organizational Commitment, Job Satisfaction, and Esprit de Corps. Journal of Business Ethics. 81(2), 343-353 (2008)

Weaver, G.R; Trevino, L.K., Cochran, P.L.: Corporate Ethics Practices in the mid-1990s: An empirical Study of the Fortune 1000, Journal of Business Ethics. (1990)

Weill, P.: Don't Just Lead, Govern: How Top-Performing Firms Govern IT. CISR Working Paper: CISR MIT. (2004)

Weill, P., Ross, J. W.: IT Governance.: How Top Performers Manage IT Decision Rights for Superior Results, Boston, Massachusetts: Harvard Business School Press. (2004)

Williams, Paul.: IT Management: The Future of the IT Organization: How IT governance can help stop scandal (2002), visited 1 October 2007 at www.computerWeekly.com.

Appendix A. Variable, Questions and Source of Constructs in the Study

Variable	*Questions*	Source
Perceived overall effective IT governance	- To what extent do you agree with the following: The current individual IT governance mechanisms within my organizations IT environment has a large, positive impact on the overall level of effective IT governance within the organization. - To what extent do you agree with the following: The current individual IT governance mechanisms within my organization are an important and valuable aid to implementing overall effective IT governance within the organization	Goodhue & Thompson (1995); Ali and Green (2007).
Involvement of top management in IT	- To what extent does top management get involved in strategic matters related to the use of IT within the organization, outside of the IT steering committee? - To what extent is top management knowledgeable about IT opportunities and possibilities for the organization? - To what extent is top management knowledgeable about IT innovations that have been developed by major competitors?	Jarvenpaa and Ives, (1991); Vaswani, (2003).
Effective Corporate Communication Systems	- My organization (client organization) communications systems enable the organization to inform its employees effectively about the existence of IT governance mechanisms. - The communication systems enable the organization to inform its employees about IT governance decisions and processes throughout the organization. - The communication systems provide support in educating organizations members in IT governance processes in the organization.	Weill & Ross (2004)
Ethic/culture of compliance	- To what extent does your organization's ethic/culture of compliance enable you to achieve objectives in IT? - To what extent does your organization's ethic/culture of compliance enable you to circumvent any violation that could hinder organization to achieve its IT objectives? - To what extent does top management provides leadership in an ethic/culture of compliance related with IT objectives?	Trevino et al. (1999)
IT strategy committee	- To what extent does IT strategy committee provide strategic direction and the alignment of IT and the business issue? - To what extent does IT strategy committee provide direction for sourcing and use of IT resources, skills and infrastructure to meet the strategic objectives? - To what extent does IT strategy committee provides direction to management relative to IT strategy?	Hardy, (2003); IT Governance Institute, (2003)
IT steering committee	- To what extent does IT steering committee provide strategic direction to IT project that are in line with the strategic directions of the organization? - To what extent does the IT steering committee provide a mechanism for coordinating IT practices? - To what extent does the IT steering committee provide leadership in deriving benefits from IT?	Karimi, Bhattacherjee, Gupta, & Somers (2000); Ali and Green, (2007).