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# The Impact of IT Governance on Organizational Performance

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## ABSTRACT

IT governance, as a subset of corporate governance, consists of organizational structures and processes that ensure the organization's IT can sustain and extend the organization's strategies and objectives. In previous research, different types of IT governance have been proposed. However, it is not clear how different governance types affect firm performance and what are the theories underlying the causal relationships. Drawing from strategic alignment and coordination theories, a research model is proposed for investigating how intra-organizational coordination could help build goal congruence through strategic alignment and hence achieve higher organizational performance. The purpose of this research is to examine the relationship between IT governance, strategic alignment, and organizational performance. Data collected from 167 Taiwanese firms were used to empirically evaluate the theoretical relationships proposed in the research model, and the results show that strategic alignment is a major factor that mediates the effect of IT governance on firm performance.

## Keywords

IT governance, strategic alignment, organizational performance.

## INTRODUCTION

The value of information technology (IT) in allowing enterprises to survive in today's competitive global marketplace has become more and more evident. The effective use of IT, however, relies on good governance. IT governance is important in its significant impact on the performance of IT investment. However, CEOs without IT background often ignore IT's essential role and hence the return on IT investment turns out to be below their expectations. A recent study conducted by ITGI (2009) reported some interesting findings: (1) Half of the respondents recognized the importance of IT to the enterprise, and three-quarters try to work on the alignment between IT and business strategies; (2) The potential of IT as a value-enhancing strategic asset is not fully exploited; (3) Governance practices need to be further improved judging from the fact that three-quarters of businesses consider IT governance to be an integral part of enterprise governance (albeit the overall maturity is still relatively low).

In previous research, different types of IT governance have been proposed (e.g., Brown 1997; Sambamurthy and Zmud, 1999; Weill, 2004); however, it is still not clear and how different governance types affect firm performance and whether there is a fit between IT governance type and firm strategy. In this research, we attempt to address these two research issues. The purpose of this research is to examine the relationship between IT governance, strategic alignment, and organizational performance. Data collected from 167 Taiwanese companies were used to empirically validate the theoretical relationships proposed in the research model. The findings provide a better understanding of effective IT governance mechanisms.

## THE RESEARCH MODEL

In this section, we review literature related to IT governance and business-IT alignment and develop our research model to assess relationships between IT governance (decision making on IT and implementation maturity), strategic alignment (as the fit between IT strategies and Business strategies), and organizational performance.

## IT Governance

IT governance is commonly referred to as a subset of corporate governance (Korac-Kakabadse and Kadabadse, 2001; Weill and Ross, 2004). Despite its critical impact on IT investment returns, major academic research on IT governance did not

appear until late 1990s (Weill and Ross, 2004; De Haes and Van Grembergen, 2005). Existing literature offers varying views on IT governance. Among them, two main streams have been recognized: IT governance structure and contingency analysis (Brown and Grant, 2005).

The governance structure perspective focuses on investigating how the decision rights and responsibility are distributed among enterprise stakeholders (i.e., IT governance structures), while the latter concentrates on investigating various contingencies that influence the adoption of different governance structures (e.g., Brown and Magill, 1994; Brown, 1997; Sambamurthy and Zmud, 1999). Weill and Ross (2004) expanded the classifications of IT governance forms and proposed six archetypes based on five major IT decisions: Business Monarchy (IT decisions are made by CxOs), IT Monarchy (corporate IT professionals make the IT decision), Feudal (decisions are made by autonomous business units), Federal (hybrid decision mode), IT Duopoly (decisions made by IT executives and one business group) and Anarchy (each small group makes its own IT decisions).

In this research, IT strategic alignment (the strategic fit between IT and business strategy) is treated as a driving mechanism to mediate the effective of IT governance structure and implementation maturity on organizational performance. We adopt Weill's (2004) definition of IT governance: "IT governance specifies the decision rights and accountability framework to encourage desirable behavior in the use of IT" (p.3). The reason is consistent with Brown and Grant (2005), in which the authors argue that Weill's definition is concerned with the location, distribution and pattern of managerial responsibilities and control that ultimately affect how IT resources are applied and implemented.

As an extension of Weill and Ross' (2004) archetypes, we attempt to further explore the influences of two key elements on the effectiveness of IT governance: decision level and professionalization. High-level decision refers to the degree to which the decision rights are held by higher level decision makers (e.g., Business Monarchy is rated as the highest in decision level). The concept is similar to the centralized governance structure proposed by Brown (1997) and Sambamurthy and Zmud (1999). Professionalization shows the degree to which decision rights are held by IT professionals (e.g., IT Monarchy is rated as the highest in professionalization). According to the principal-agent theory, agents (i.e., managers) are rational individuals who will always maximize their own self-interests (Eisenhardt, 1989), rather than pursuing the interests of the principal. When the theory is applied to IT decisions, high-level corporate executives/managers or IT professionals will tend to make decisions that are in favor of themselves or avoid to make any decisions that may risk themselves, even if these decisions are good for the whole organization. This kind of agency problem can be more significant if a single authority (either Business or IT Monarchy) holds the whole decision right and may be alleviated if multiple parties are involved in the decision process or the decision making process involves different levels of managers. The underlying assumption is that multiple parties may have conflict interests and hence are more likely to have a better internal control mechanism. Therefore, we hypothesize the following:

H1: Decision type hypothesis: Centralized decision types (either by CxO or CIO) lead to lower organizational performance.

*H1a: IT governance by high-level decision makers alone is negatively associated with organizational performance.*

*H1b: IT governance by IT professionals alone (professionalization) is negatively associated with organizational performance.*

A second issue of interest is which governance type will lead to better strategic alignment. Agarwal, and Sambamurthy (2002) proposed a centralized mechanism for IT strategic planning so that strategic IT thrusts can be developed to support strategic business thrusts. In other words, a centralized mechanism is more likely to align IT strategies and business strategies. Luftman and Kempaiah (2007) found that the organizations with the structure of the senior IT executive reporting to the CEO, president, or chairman had significantly higher alignment maturity. Therefore, it seems that centralized decision type has a higher possibility to produce a better alignment between IT and business strategies. This may be explained by the coordination complexity. Since coordination is the process of managing dependencies between different IT activities, we believe that decisions made by higher-level managers should lead to better IT/business alignment. However, due to their lack of expertise, non-IT background business executives often rely on IT managers for technical and project management opinions. As a result, they may feel particularly vulnerable to IT professionals' opportunistic behaviors. From a coordination perspective, business and IT executives/managers should build a partner relationship to accomplish the strategic goals of both sides. According to Luftman and Kempaiah (2008), "close partnership between the IT and business" is among one of the top three enablers of alignment. Hence, we argue that through the process of high-level decision makers working together with IT experts on aligning business strategies with IT, the goal congruence can be met and hence lead to better firm performance.

Therefore, we conclude that IT decision level and IT professionalization can both have positive impact on the alignment of business and IT strategies. We hypothesize the following:

H2: Strategic alignment hypothesis:

*H2a: Decision level in IT governance is positively associated with strategic alignment.*

*H2b: Professionalization (IT orientation) in IT governance is positively associated with strategic alignment.*

Another factor that may affect organizational performance is the maturity of IT governance. To explore how organizations are implementing IT governance to achieve a better fusion between the business and IT, De Haes and Van Grembergen (2006, 2009) propose the idea of “Best Practices” based on the framework of IT governance structures, processes and relational mechanisms. They argue that each of these practices serve specific or multiple goals in the complex IT governance process. Through a Delphi research that interviewed 22 senior IT and business professionals, De Haes and Van Grembergen (2009) proposed top 10 most important IT governance practices as minimum baseline of an optimal IT governance mix and define IT governance maturity as the degree to which an organization implements the top 10 IT governance practices. As a well balanced mix of structures, processes and relational mechanisms will enable better IT governance outcomes (De Haes and Van Grembergen, 2006), and thus help an organization to enable strategic alignment and achieve higher performance. Therefore, higher IT governance maturity can lead to better organizational performance. Luftman and Brier (1999) also indicated that an appropriate combination of IT governance practices can lead to sustained alignment.

*H3: Maturity of IT governance is positively associated with organizational performance.*

*H4: Maturity of IT governance is positively associated with strategic alignment.*

### **Strategic Alignment and Organizational Performance**

The ultimate goal of IT governance is achieving strategic alignment between the business and IT to make sure that money spent in IT is delivering value for the business (De Haes and Van Grembergen, 2005). “Strategic alignment”, or “business-IT alignment”, intends to support the integration of IT into business strategy and processes (Luftman et al, 2005). Business-IT alignment is a complex construct and remains a key concern of business executives. A Society for Information Management (SIM) survey showed that “IT and business alignment” is one of the top managerial concern and has consistently been in the top 10 major IT management concerns since 1994 (Luftman and Kempaiah, 2008). Although the classic “Strategic Alignment Model” distinguishes between the business domain (business strategy and business processes) and the technology domain (information strategy and IT processes, including systems development and maintenance) in an organization (Henderson and Venkatraman, 1993), Luftman and Kempaiah (2007) point out that “many alignment definitions in literature are frequently focused only on how IT is aligned with the business. Alignment must also address how the business is aligned with IT” (p.166). Based on Luftman and Kempaiah’s argument, we adopt a definition which focuses on both directions of aligning business and IT. In other words, strategic alignment is defined as the fit between business strategy and IT strategy (Cragg et al., 2002).

Based on the strategic fit theory, an aligned organization will have better performance. In addition, many studies have shown the importance of strategic alignment in improving business performance (Tallon et al., 2000; Tallon and Kraemer, 2003; Chan, Sabherwal and Thatcher, 2006; Khaiata and Zulkeman, 2009). For example, Chan et al (1997) found that companies with high IS strategic alignment are better performing companies. Moreover, companies that have achieved alignment can build a strategic competitive advantage that will provide them with increased efficiency and profitability (Luftman and Brier, 1999). Therefore, we propose that the alignment between business and IT strategies will lead to a better performance.

*H5: Strategic alignment is positively associated with organizational performance.*

### **THE EMPIRICAL STUDY**

In order to evaluate our research model, a survey was conducted to test our hypotheses.

#### **Instrument Development**

The research instrument was developed by adapting existing validated questions wherever possible. Past literature was reviewed to specify a set of items that ensured content and face validity and to achieve minimal overlap between constructs (Kerlinger 1986). Items associated with these constructs were assessed using a five-point Likert type scale where respondents

were asked to state their agreement with a given statement on a scale that ranged from “strongly agree”(5) to “strongly disagree” (1). Interviews with one CIO and one CEO were conducted to evaluate the appropriateness of the use of words and contents of the measurement items. Some of the contents were modified and then elaborated by two well-established IS scholars. All items were further refined using a small-scale pre-test of the questionnaire conducted with 58 MBA graduate students with business and IT background to assess its logical consistency, ease of understanding, sequence of items, and contextual relevance. Hence the measurement error was reduced and the internal validity of the survey was improved. Constructs in the study include IT governance maturity (De Haes and Van Grembergen, 2009), IT governance structure (Weill, 2004), strategic alignment (Cragg, King and Hussin, 2002) and organizational performance (Kaplan and Norton, 1992, 1996, 2004). The measurement of decision levels and IT-orientation is developed in this research based on Weill’s (2004) original definitions. By examining Weill’s (2004) IT governance archetypes matrix, we can tell that different types have decision rights held at different levels (such as enterprise-wide, by business unit, and by region or group of business units). We assign the weights to each governance type based on the indicated decision levels. Similarly, those with decision rights held by IT professionals should be more IT professional-oriented. For example, in the IT monarchy, IT professionals make the IT decisions alone, and hence is the most IT-oriented type. Table 1 shows our assessment of the decision level and IT professional orientation of different governance types..

IT Governance Structure Type					
Decision Level	Feudal	IT Duopoly	Federal	IT Monarchy	Business Monarchy
IT-Orientation	Feudal	Business Monarchy	Federal	IT Duopoly	IT Monarchy

Weights Low (1) High (5)

**Table 1. Measurement of IT Governance Structure**

**Data Collection**

The final instrument was handed out to high level/senior business and IT executives/managers from mid- to large-sized firms in Taiwan. Since IT governance is most practiced in bigger companies and the strategic level decisions should involve higher level managers/executives, we determined the most suitable target respondents should be senior managers or high level executives from both business and IT departments. Thus, we contacted EMBA programs from different universities and related associations for volunteer participants. Questionnaires were then sent and collected from May 2010 to July 2010. We received 382 returned questionnaires. To avoid the common method bias, we dropped those observations with only one respondent in a firm and those that contain incomplete or invalid data. A total of 334 useful observations from 167 organizations were available for further analysis.

Non-response bias was tested using the analysis of variance. Since the last group of respondents is most likely to be similar to non-respondents, a comparison of the first and last quartile of respondents provides a valid test of response bias in the sample (Armstrong and Overton 1977). The first and last 25 percent of respondents in our sample were compared on key study variables and the results did not indicate any response bias across these variables. Similar comparisons were made across participants who responded by regular mail and those who completed the survey online. The analysis indicated that the two groups were statistically similar on all demographic and study variables.

**Measurement Validation**

PLS (partial least squares, SmartPLS version 2.0) was used for data analysis because it provides the analysis of both a measurement model and a structural model, and is generally recommended for predictive research models where the emphasis is on theory development (Jöreskog and Wold 1982). In addition, the ability of PLS to model formative as well as reflective constructs makes it suitable for our research purposes.

The adequacy of the measurement model was evaluated on the criteria of internal consistency, convergent validity and discriminant validity. Internal consistency of each sub-construct was assessed using Cronbach’s alpha and Fornell and Larcker’s (1981) measure of composite reliability. Based on Nunnally’s (1978) guidelines, a score of 0.70 or above is an acceptable value of internal consistency for exploratory research. All values in our research are above 0.7, which indicates adequate data reliability. The convergent validity of the scales was assessed using two criteria suggested by Fornell and

Larcker (1981): (1) all indicator loadings should be significant and exceed 0.7 and (2) average variance extracted (AVE) by each construct should exceed the variance due to measurement error for that construct (i.e., AVE should exceed 0.50). In our data, all items exhibited loading higher than 0.7 on their respective construct, providing evidence of acceptable item convergence on the intended constructs, and the AVE of all scales exceeded Chin's (1998) guideline of 0.5, meaning that at least 50% of the variance in the indicators was accounted for by its respective construct.

An examination of cross-factor loadings indicates a good discriminant validity, because the loading of each measurement item on its assigned latent variable is greater than its loading on any other constructs (Chin, 1998). The correlations among all constructs are all well below the 0.85 threshold (Kline, 1998), suggesting that all constructs are distinct from each other. The square root of the AVE from the construct is much larger than the correlation shared between the construct and other constructs in the model. A construct is considered to be distinct from other constructs if the square root of the AVE is greater than its correlations with other latent constructs (Barclay et al. 1995). In our study, all items exhibited loading higher than 0.7 on their respective construct, providing evidence of acceptable item convergence on the intended constructs. AVE ranged from 0.6 to 0.87; hence, both conditions for convergent validity were met.

Table 2 provides a summary of the results of measurement model analyses. The collective evidence suggests that the constructs demonstrate good measurement properties; however, while the constructs meet tests of internal consistency and convergent validity in our empirical context, it should be emphasized that these are *not necessary* requirements for formative constructs (Jarvis et al. 2003).

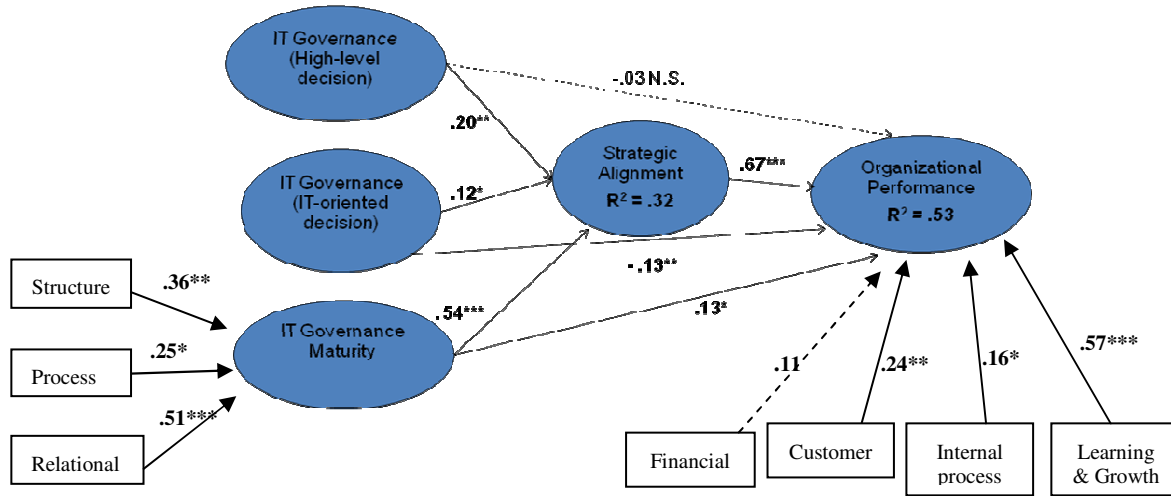
Constructs	Mean (SD)	SM	PM	RM	FP	CP	IP	LG
Structure Maturity (SM)	3.48 (.75)	.78						
Process Maturity (PM)	3.65 (.76)	.76	.82					
Relational Mechanism (RM)	3.53 (.88)	.64	.65	1				
Financial Perspective (FP)	3.53 (.84)	.30	.27	.19	.93			
Customer Perspective (CP)	3.71 (.81)	.36	.33	.33	.76	.89		
Internal Process (IP)	3.70 (.79)	.35	.40	.28	.71	.78	.89	
Learning & Growth (LG)	3.64 (.86)	.43	.44	.47	.64	.74	.74	.90

\*The shaded diagonal values are the square root of the average variance extracted for each construct.

**Table 2. Assessment of Discriminant Validity Results**

The PLS method does not directly provide significance tests and confidence interval estimates of path coefficients in the research model. In order to estimate the significance of path coefficients, a bootstrapping technique was used. Hypotheses were tested by examining the size and significance of the paths in the model with 500 re-samples. The vector of parameter estimates was used to compute parameter means, standard errors, significance of path coefficients, indicator loadings, and indicator weights (Löhmoeller 1984). One indicator of the predictive power of path models is to examine the explained variance or  $R^2$  values (Barclay et al. 1995; Chin and Gopal 1995).  $R^2$  values are interpreted in the same manner as those obtained from multiple regression analysis. They indicate the amount of variance in the construct that is explained by the path model (Barclay et al. 1995). The resulting PLS structural model, along with the path coefficients and the percentage of variance explained are reported in Figure 3. No minimum threshold values for indicator weights have been established. The statistical significance of weights can be used to determine the relative importance of indicators in forming a latent construct.

The results presented in Figure 1 below indicate that the model explained 53% of the variance in organizational performance, and 32% of the variance in strategic alignment was explained by IT governance maturity, IT decision levels (high-level decision) and IT professionalization (IT-orientation in decision). The path coefficient from IT governance maturity to strategic alignment and to performance was .54 and .13, respectively. The path coefficient from IT governance (high-level decision) to strategic alignment was .20 and from IT governance (high-level decision) to performance was -.03 N.S. The path coefficient from IT governance (IT-oriented decision) to strategic alignment was .12 and from IT governance (IT-oriented decision) to performance was -.13; respectively. The effect of strategic alignment on organizational performance was .67. The magnitude and significance of these path coefficients shows that the majority of our research hypotheses are supported.



Significance level: \*p < .10; \*\*P < .05; \*\*\*P < .01

Figure 1. Results of Path Analysis

**DISCUSSION AND CONCLUSION**

While previous research has focused on the impact of specific contingent factors (e.g., Brown and Magil, 1994; Sambamurthy and Zmud, 1999) and the relationship between strategic alignment and business performance (e.g., Bergeron et al., 2004), the relationships between IT governance, strategic alignment and business performance remain under-investigated in academic literature. This research was designed to fill this gap. Additionally, the IT governance implementation challenge becomes crucial in the sustainability and growth of organizations today; once a specific governance model is chosen and implemented, it should enable that IT is aligned to the business needs. Therefore, choosing a proper IT governance type is the first step to become well-performed firms. In this research, we attempted to answer how different governance types may affect strategic alignment and business performance from power distribution (level of decision makers) and professionalism (IT-orientation in decisions) perspectives based on the agency and coordination theories.

As a general conclusion of this study, the results suggest that the maturity, decision level and IT professional-orientation in IT governance enable strategic alignment, which in turn yields better organizational performance, particularly in the learning and growth aspect of the Balance Scorecard. These findings have significant implications for organizations in developing their IT governance structure.

Some detailed observations regarding IT governance maturity and organizational performance can be elaborated. First, the relative weights associated with the three formative indicators of IT governance maturity (i.e., governance structure, process and relational mechanism) suggest that relational mechanism (IT leadership) is the most critical element of IT governance maturity in this context. In other words, leadership of IT managers plays a major role in a more mature implementation of IT governance practices, which can generate positive impacts on strategic alignment and firm performance.. This is understandable because any changes in strategy may create employee resistance, which relies on a good leadership to alleviate. Second, the major portion of performance improvement is in learning and growth, which has a weight of .57. On the other hand, the strategic alignment has no significant effect on the financial return of the surveyed organizations. The

strong effect of strategic alignment on organizational performance, as indicated by the path coefficient, suggests that strategic alignment improves organizational performance in that it enhances human and organization capital such as employees' skills and knowledge sharing. This may be because there are other factors that have a higher impact on financial performance. For example, the financial tsunami in 2008 would dominate any IT governance factors in determining the financial performance of an organization.

Thus, the main contribution of this research is two folds. First, we have found that strategic alignment plays a major role in mediating the impact of IT governance structure on organizational performance. Second, we have examined the roles of three major structural dimensions: the maturity, decision level, and IT professionalization. The IT-business strategic alignment is enabled by more mature implementation of IT governance and the involvement of both high-level managers and IT professionals in the IT-related decision-making process. IT governance maturity has the highest effect on business/IT alignment, followed by high-level decision involvement and IT professionalization. The direct path coefficients from the above three features of governance structures are either low or insignificant, which indicates that the impact of IT governance structures on organizational performance can be realized only through strategic alignment. This is consistent with previous literature that strategic alignment is a key variable for explaining the effect of IT on firm performance.

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## REFERENCES

1. Agarwal, R. and Sambamurthy, V. (2002) Principles and models for organizing the IT function, *MIS Quarterly Executive*, 1, 1, 1-16.
2. Armstrong, J. and Overton, T. (1977) Estimating non-response bias in mail surveys, *Journal of Marketing Research*, 14, 3, 396-402.
3. Banker, R.D., Janakiraman, S. and Konstans, C. (2001) Balanced scorecard: Linking strategy to performance, Financial Executives Research Foundation, Morristown, NJ.
4. Barclay, D., Higgins, C. and Thomson, R. (1995) The partial least squares approach to causal modeling, personal computer adoption and use as an illustration, *Technology Studies*, 2, 2, 285-309.
5. Bergeron, F., Raymond, L. and Rivard, S. (2004) Ideal patterns of strategic alignment and business performance, *Information and Management*, 41, 8, 1003-1020.
6. Brown, A. E. and Grant, G. G. (2005) Framing the frameworks: A review of IT governance research, *Communications of AIS*, 15, 696-712.
7. Brown, C. V. (1997) Examining the emergence of hybrid governance solutions: Evidence from a single case site, *Information Systems Research*, 8, 1, 69-94.
8. Brown, C. V. and Magill, S. L. (1994) Alignment of the IS functions with the enterprise: Toward a model of antecedents, *MIS Quarterly*, 18, 4, 371-404.
9. Chan, Y. E., Huff, S. L., Barclay, D.W., and Copeland, D. G. (1997) Business strategic orientation, information systems strategic orientation and strategic alignment, *Information Systems Research*, 8, 2, 125-150.
10. Chan, Y. E., Sabherwal, R. and Thatcher, J. B. (2006) Antecedents and outcomes of strategic IS alignment: An empirical investigation, *IEEE Transactions on Engineering Management*, 53, 1, 27-47.
11. Chin, W. W. (1998) The partial least squares approach to structural equation modeling, in G. A. Marcoulides (Ed.), *Modern Methods for Business Research*, Mahwah, NJ, Lawrence Erlbaum Associates, 295-336.
12. Chin, W. W. and Gopal, A. (1995) Adoption intention in GSS: Relative importance of beliefs, *The Data Base for Advances in Information Systems*, 26, 2&3, 42-63.
13. Cragg, P., King, M. and Hussin, H. (2002) IT alignment and firm performance in small manufacturing firms, *Journal of Strategic Information Systems*, 11, 2, 109-132.
14. De Haes, S. and Van Grembergen, W. (2005) 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 Science*, Hawaii.



15. De Haes, S. and Van Grembergen, W. (2006) Information technology governance best practices in Belgian Organisations, *Proceedings of the 39th Hawaii International Conference on System Science*, Hawaii.
16. De Haes, S., and Van Grembergen, W. (2009) An exploratory study into IT governance implementations and its impact on business/IT alignment, *Information Systems Management*, 26, 2, 123-137.
17. Eisenhardt, K. (1989) Agency theory: An assessment and review, *Academy Management Review*, 14, 1, 57-74.
18. Fornell, C. and Larcker, D. (1981) Evaluating structural equation models with unobservable variables and measurement error, *Journal of Marketing Research*, 18, 1, 39-50.
19. Henderson, J. C. and Venkatraman, N. (1993) Strategic alignment: A model for organizational transformation through information technology, *IBM Systems Journal*, 32, 1, 4-16.
20. Hofacker, C. F. (1992) Alternative methods for measuring organization fit: Technology, structure, and performance, *MIS Quarterly*, 18, 1, 45-57.
21. Information Technology Governance Institute (ITGI). (2009) An executive view of IT governance, retrieved May 5 2010 from [www.itgi.org](http://www.itgi.org).
22. Jarvis, C. B., Mackenzie, S. B. and Podsakoff, P. M. (2003) A critical review of construct indicators and measurement model misspecification in marketing and consumer research, *Journal of Consumer Research*, 30, 2, 199-218.
23. Jöreskog, K. G. and Wold, H. (1982) The ML and PLS techniques for modeling with latent variables: Historical and comparative aspects, in K. G. Jöreskog and H. Wold (Eds.), *Systems Under Indirect Observation: Causality Structure and Prediction*, Amsterdam, North Holland, 263-270.
24. Kaplan, R.S. and Norton, D.P. (1992) The balanced scorecard - Measures that drive performance, *Harvard Business Review*, 70, 1, 71-79.
25. Kaplan, R.S. and Norton, D.P. (1996) Using the balanced scorecard as a strategic management system, *Harvard Business Review*, 74, 1, 75-85.
26. Kaplan, R.S. and Norton, D.P. (2000) Having trouble with your strategy? Then map it, *Harvard Business Review*, 78, 5, 167-176.
27. Kaplan, R.S. and Norton, D.P. (2004) Measuring the strategic readiness of intangible assets, *Harvard Business Review*, 82, 2, 52-63.
28. Kerlinger, F. N. (1986) Foundations of behavioral research, Rinehart & Winston, New York.
29. Khaiata, M. and Zulkeman, I. A. (2009) A simple instrument to measure IT-business alignment maturity, *Information Systems Management*, 26, 2, 138-152.
30. Kline, R. B. (1998) Principles and practice of structural equation modeling. Guilford Press, New York.
31. Korac-Kakabadse, N., and Kakabadse, A. (2001) IS/IT governance: Need for an integrated model, *Corporate Governance*, 1, 4, 9-11.
32. Löhmoeller, J. B. (1984) LVPS 1.6 program manual: Latent variable path analysis with partial least squares estimation, Universitaet zu Koehn, Zentralarchiv fuer Empirische Sozialforschung.
33. Luftman, J. (2000) Assessing business-IT alignment maturity, *Communications of AIS*, 4, 14, 1-49.
34. Luftman, J. N. and Brier, T. (1999) Achieving and sustaining business-IT alignment, *California Management Review*, 42, 1, 109-122.
35. Luftman, J. and Kempaiah, R. (2007) An update on business/IT alignment: A line has been drawn, *MIS Quarterly Executive*, 6, 3, 165-177.
36. Luftman, J. and Kempaiah, R. (2008) Key issues for IT executives 2007, *MIS Quarterly Executive*, 7, 2, 99-112.
37. Luftman, J., Kampaiah, R. and Nash, E. (2005) Key issues for IT executives 2005, *MIS Quarterly Executive*, 5, 2, 81-101.
38. Nunnally, J. C. (1978) Psychometric theory, McGraw-Hill, New York.
39. Peterson, R. (2004) Crafting information technology governance, *Information Systems Management*, 21, 4, 7-23.
40. Sambamurthy, V. and Zmud, R. W. (1999) Arrangements for information technology governance: A theory of multiple contingencies, *MIS Quarterly*, 23, 2, 261-291.

41. Tallon, P. P. and Kraemer, K. L. (2003) Investigating the relationship between strategic alignment and IT business value: The discovery of a paradox, *Relationship Between Strategic Alignment and IT Business Value*, Idea Group Publishing, 1-22.
42. Tallon, P. P., Kraemer, K.L. and Gurbaxani, V. (2000) Executives' perceptions of the business value of information technology: A process-oriented approach, *Journal of Management Information Systems*, 16, 4, 145-173.
43. Van Grembergen, W., De Haes, S. and Guldentops, E. (2004) Structure, process and relational mechanism for IT governance," In W. Van Grembergen (Ed.) *Strategies for Information Technology Governance*, Idea Group Publishing, Hershey, PA.
44. Venkatraman, N., Henderson, J. C. and Oldach, S. (1993) Continuous strategic alignment: Exploiting information technology capabilities for competitive success, *European Management Journal*, 11, 2, 139-149.
45. Weill, P. (2004) Don't just lead, govern: How top-performing firms govern IT, *MIS Quarterly Executive*, 3, 1, 1-17.
46. Weill, P. and Ross, J. (2004) IT governance: How top managers manage IT decision rights for superior results, Harvard Business School Press, Boston.
47. Weill, P. and Woodham, R. (2002) Don't just lead, govern: Implementing effective IT governance, Center for Information Systems Research, Massachusetts Institute of Technology, CISR WP No. 326.