Association for Information Systems
AIS Electronic Library (AISeL)

July 2009

THE STRATEGIC CO-ALIGNMENT FOR IMPLEMENTING INFORMATION SYSTEMS IN E-GOVERNMENT

Fang-Ming Hsu
National Dong Hwa University, fmhsu@mail.ndhu.edu.tw

Paul Jen-Hwa hu
University of Utah, actph@business.utah.edu

Hsinchun Chen
MIS Dept.,University of Arizona, hchen@eller.arizona.edu

CHAO HUNG YU
National Dong Hwa University, d94322010@ems.ndhu.edu.tw

Follow this and additional works at: http://aisel.aisnet.org/pacis2009

THE STRATEGIC CO-ALIGNMENT FOR IMPLEMENTING INFORMATION SYSTEMS IN E-GOVERNMENT

Fang-Ming Hsu

   Associate Professor, Department of Information Management
   National Dong Hwa University
   1, Sec. 2, Dahsueh Rd., Shoufeng, Hualien, Taiwan, ROC
   fmhsu@mail.ndhu.edu.tw

Paul Jen-Hwa Hu

   Assistant Professor, David Eccles School of Business
   University of Utah, USA
   1645 E. Campus Center Drive, 108 KDGB, Salt Lake City, Utah 84112, USA
   actph@business.utah.edu

Hsinchun Chen

   Professor, Department of Management Information Systems
   University of Arizona, USA
   McClelland Hall 430Z, University of Arizona, Tucson, Arizona 85721, USA
   hchen@eller.arizona.edu

Chao-Hung Yu

   Ph.D. Candidate, Department of Information Management
   National Dong Hwa University
   1, Sec. 2, Dahsueh Rd., Shoufeng, Hualien, Taiwan, ROC
   d9432010@ems.ndhu.edu.tw

Abstract

A regulating agency in a government, i.e. regulator, must co-align its information systems (IS) planning strategy with executing agencies, i.e. executors, for better e-government performance. Using an established strategic co-alignment model, we analyze the mutual participating strategies between regulator and executors and examine the outcomes and performance associated with that co-alignment choice. After conducting a large-scale survey study of government agencies in Taiwan, the co-alignment relationship between e-government IS policy regulator and executor is examined. Based on the findings, we discuss their implications for e-government research and practice.

Keywords: E-government, strategic co-alignment, electronic record management systems.

1. INTRODUCTION

Public agencies have turned to strategic planning to enhance government performance and accountability (Kim, 2002). Information technology (IT) has been shown to be important for government administration, including collaboration and coordination among different agencies or functional areas (Chen et al., 2006). The IT expenditures by the United States government, for example, have grown significantly in recent years. However, the benefits accrued from these investments have been ambiguous and often questioned (Ault and Gleason, 2003). As Mullen (2003) notes, government agencies must focus on interagency collaborations and fully leveraging their IT capabilities.

The association between manager's support and strategic IS management is important to an understanding of top management's role in the use of what has been acknowledged as a strategic tool. Thus, the co-alignment between strategies of business and technology units is of fundamental importance to agencies in e-government contexts. Kearns and Lederer (2003) emphasizes the

alignment with internal resources and external environment forces in explaining firm profitability. Dynamic capabilities theory argues that a more effective implementation of IT strategies can result from adjusting certain organizational processes with dynamic environment (Kearns and Lederer, 2003). As Crittenden et al. (2004) conclude, government agencies will continue to struggle to generate appropriate actions and desired outcomes until they can align business/management decisions and technology opportunities. The alignment between business and technology departments in effect represents a critical challenge to managers/administrators in both public and private organizations (Pollalis, 2003). A review of extant literature suggests few empirical studies of the relationship between government agencies' co-alignment strategy and its performance. Therefore, analysis and examination of the mutual participation across decision-making units of e-government that affect its co-alignment strategy, outcomes and associated performance are critical. In December 1999, the Taiwanese government passed the Archives Act, which established the legal foundation and technology standards for managing government records and archives electronically. The National Archives Administration (NAA) was established in November 2001 as the supreme governing entity charged with educating, promoting, and advancing the use of electronic record management systems (ERMS) among government agencies at all levels.

This study investigated the co-alignment of IS strategy between policymaking agency, i.e. regulator, and executing agencies, i.e. executors, in implementing IS for e-government. In our context, the co-alignment model suggests an executor must align its IS strategy with the regulator, i.e. NAA, and the NAA must align its IS planning with the implementation capability of executors.

2. LITERATURE REVIEW

For e-government to succeed, government agencies require the effective integration of strategy, process, organization, and technology (Whitson and Davis, 2001) to link government IS to the necessary digital domains.

2.1 Co-Alignment Strategy in Government

Regulating agencies in e-government must coordinate their IS strategy with government agencies which are regulated by that IS policy. Pollalis (2003) shows the importance of aligning business and IS strategies and their integrations in the overall organization system. As described by Venkatraman et al. (1993), management practices act as "alignment mechanisms" that can meet the challenge of translating strategic choices into administrative practices and decision making. Growing researches suggest that investments in IS alone cannot warrant success in e-government; that is, agencies must invest in processes and human capital to ensure effective IS implementation and usage (Chircu and Kauffman, 2001). Soh and Markus (1995) suggest that performance enhancements enabled by IS assets must be accompanied by appropriate technology use, which often requires process changes. Such strategic alignment can be conceptualized with an internal or external focus (Henderson and Venkatraman, 1993). From an enterprise perspective, government agencies are similar to functional departments in an organization, and legislation and policymaking can facilitate cooperative efforts among them (Ault and Gleason, 2003). In turn, an appropriate alignment between the agency and the policymaking institution may induce desirable performance in e-government.

An organization needs an IS strategy to comply with regulations and external requirements (Bacon, 1991). Investment decision making of information systems in the public sector is influenced by political considerations and motives, which define resource allocations directly and indirectly in response to the needs of agencies and their stakeholders (Chircu and Kauffman, 2001). Documents must be integrated into a management process that provides desirable transparency to users and creates auditable trails for internal and external control purposes (Thurston, 1997). An agency's business strategy for implementing and operating an IS can be analyzed according to the perspective of internal versus external resources. In terms of internal resources, an agency can employ its financial and personnel resources to acquire a customized system through outsourcing or in-house development. Alternatively, agencies can rely on external resources to acquire free IS developed and made available by others.

2.2 Developments of Electronic Records Management Systems

A government agency often references pertinent records or documents and, in most cases, creates new records to reflect and document the service rendered. Several trends are emerging in the management of government records/archives, including a fundamental shift from paper-based storage to computer-based systems, from paper to electronic documents, from managing information to supporting its access and retrieval, and from a cost-reduction focus to continued process improvement (Sprague, 1995; Stephens, 1998). These trends all point to government agencies' need for ERMS. The Freedom of Information Act was fully implemented by the British government in January 2005, thereby legitimating the right of access to government information and demanding that public authorities publish and disseminate information in accordance with "publication schemes." (Blake, 2005). Similar developments have been observed in the United States, where the National Archives and Records Administration (NARA) is charged with addressing these problems and challenges, including divergent record/document formats, many of which are outdated (Weinstein, 2005).

The NAA in Taiwan initiated the National Archives Information System project for 2003-2006. According to the Archive Act, each government agency is responsible for managing its official records electronically, with the necessary accessibility and security. When issuing or receiving an official document, an agency must create the necessary electronic records and transform important records to archives. All agencies must provide a catalog of their records and archives with a pre-specified XML data format via e-mail or on website periodically to the NAA. NAA then aggregates these catalogs into the centralized database, conveniently accessible by the general public and agencies. To foster the use of official records and archives managed by individual agencies, the NAA has enacted a rule for digitalized record management that establishes a necessary regulatory baseline for the adoption of ERMS by agencies.

2.3 Strategic Co-Alignments of Electronic Records Management Systems in e-Government

Before the promulgation of the Archives Act, most record management practices were manual and could not provide effective access support. The NAA assumes multiple roles in fostering electronic record/archive management practices among agencies: policymaker, architect, and regulator. In terms of the NAA's IS strategy, an agency can choose from a range of strategic alignments: *self-development, outsourcing, and adoption*. If it selected *self-development* alignment type, an agency would develop an ERMS in-house using its own IT staff, funding, and existing system resources. In this case, the NAA assumes a supportive role and helps the agency use the online submission function with "Electronic Records Catalog Checking System" developed and maintained by the NAA to meet the mandated format requirements for delivering the catalog file. Government agencies that subscribe to alignment type I maintain their ERMS themselves. In *outsourcing* alignment type, an agency acquires an ERMS through outsourcing arrangements that may include system design, implementation, and testing by the chosen vendor. In this case, the NAA provides a mandatory baseline for functional specifications that must be noted in the agency's request for quotes or bid assessments. During the outsourcing process, the NAA assists agencies in identifying preferred vendors and assessing their capability and systems. With *adoption* alignment type, an agency adopts "Electronic Records Cataloging System", a simplified ERMS developed and made available by the NAA. Agencies can download and install this system, which already possesses the functionality required by the NAA, including cataloging. Agencies receive system administration and end-user training support from the NAA. For cost effectiveness and external controls, records managers often use existing software packages (Young, 2005). However, an agency also should select an appropriate business strategy with respect to its competence and operations scope. Such strategies straddle internal and external domains (Henderson and Venkatraman, 1993) and, in the case of acquiring ERMS, can be assessed according to internal versus external controls. An agency can gain increasing internal control by developing an ERMS specific to its needs and operations. In contrast, an agency can allow external control by adopting the ERMS developed and maintained by the NAA. Alternatively, agencies can balance the internal and external controls through resources arrangements.

3. RESEARCH FRAMEWORK AND HYPOTHESES

3.1 Research Framework

Strategic IS planning is a fundamental tool of strategic IS implementation and management (Kearns, 2006). Tallon and Kraemer (1999) suggest that an organization can derive favorable outcomes and performance by aligning business and technology strategies. In this model, management practices represent alignment mechanisms for translating strategic choices into administrative decision making and operational details (Venkatraman et al., 1993). Kearns and Lederer (2003) use a resource-based view to investigate the organizational alignment with external environmental forces in explaining firm's competitive advantage. The mutual participations between business planning of chief executive officer (CEO) and IS planning of chief information officer (CIO) and their co-alignment are discussed. The alignment in government could be analyzed from a "shortfall" perspective. A shortfall occurs when an agency's implementation strategy cannot be supported adequately by the NAA's IS capability or fails to take full advantage of the NAA's IS planning strategy. If an agency's business strategy fits well with the NAA's strategy for implementing ERMS, the alignment may affect the agency's performance in electronic record/archive management directly and significantly. That is, an adequate co-alignment can greatly facilitate or constrain an agency's favorable outcomes or improved performance in e-government services.

The model of this study is depicted in Figure 1. On the basis of Tallon and Kraemer (1999) and Kearns and Lederer's (2003) model, this study discusses information intensity of e-government policy, analyzes individual agencies' business strategies for computerizing records and archives, assesses their co-alignment with the IS strategy of the regulator, i.e. NAA, and examines the associated outcome and resulting agency performance. As part of their co-alignment strategy, some agencies develop ERMS in-house, whereas others acquire proprietary ERMS from outsourcing vendors or adoption of the free ERMS- whether in simple or complex form- provided by the NAA. Regardless of their strategic choices, agencies must comply with the related policies and regulations and the NAA's general guidelines. The strategic alignment anchor enables us to examine the outcomes associated with each co-alignment strategy, such as their satisfaction with the assistance and services provided by the NAA. In this study, we define strategic co-alignment specifically as the extent to which the NAA's IS strategy supports and is supported by an agency's business strategy to meet regulations and mandated requirements. An appropriate fit of alignment strategies will lead to desired outcomes and improved agency performance.
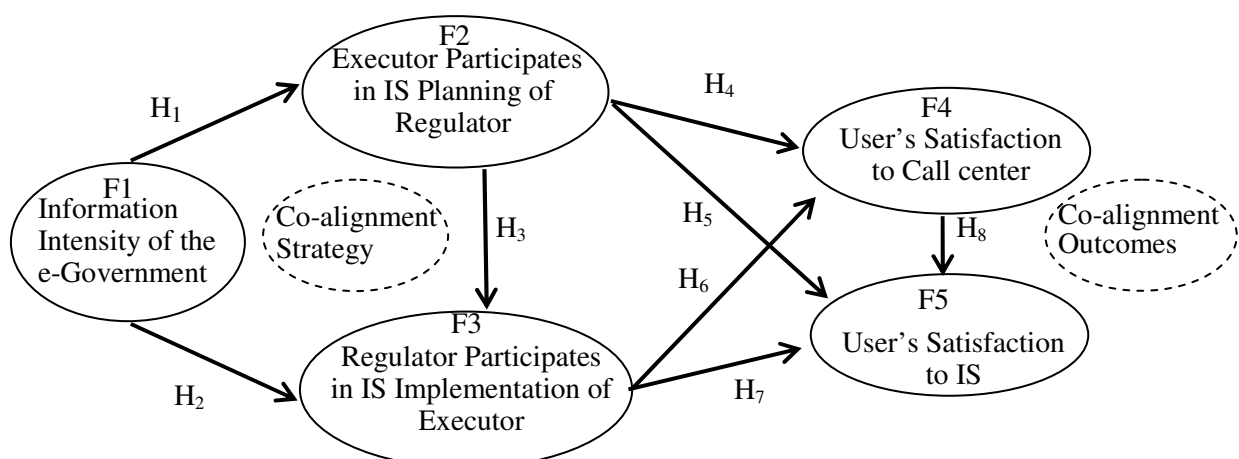

Figure 1. Model of strategic IS co-alignment between regulator and executor in e-government

The research model in Figure 2 consists of five latent factors and their hypothesized relationship. Factor F1 represents information intensity of e-Government; F2-F3 depicts alignment processes and renders its strategic co-alignment type; F4-F5 represents alignment outcome as measured by agencies'

satisfaction to IS and call center provided by the regulator. Thus, in the study model, three constructs represent the alignment mechanism.

3.2 Hypotheses

The first two hypotheses concern the effect of information intensity on alignment in implementing ERMS. In this study, information intensity is defined as the significance of the information component in government and is demonstrated by the level of regulation intensity, predefined IS design specification, and extent of the information employed in operation (Kearns & Lederer, 2003). Co-alignment is an organizational process as a host of routines and procedures that are systematic and predictable. The manager of NAA is as CIO and that of government agencies as CEO of ERMS affairs in e-Government. They are expected to have a higher motivation to participate in the strategic IS co-alignment process because their collaboration may yield superior IS strategies (Bharadwaj, 2000; Kearns and Lederer, 2003). Increasing investments in IS strategies and infrastructures have increased the consequences and potential importance of such collaboration (Brown and Sambamurphy, 1999; Kearns and Lederer, 2003). The NAA would thus spend time understanding business initiatives of government agencies, and the government agencies would spend time exploring IS opportunities. Hence, the following hypotheses are investigated:

H_1: Information intensity of the e-Government positively affects its IS policy executor's participation in the regulator's IS policy planning process.

H_2: Information intensity of the e-Government positively affects its IS policy regulator's participation in the executor's IS implementation process.

In the e-government context, IS policy regulator and executors have to coordinate with each other; indeed, the relationship between CEO and CIO is important for strategic information systems planning (Watson, 1990). Government agencies vary considerably in their resources, such as funding, specialized skills, and manpower. Something would be lost if the gap is not closed between MIS executives and the strategic objectives of the firm (Donovan, 1989). The gap between the understanding of the regulator in IS and the constraint of business process in executors is critical for IS success; as a result, they must choose adequate strategies to meet their regulatory and operational requirements. "Participation in strategy meetings" is an important factor affecting these CIOs' ability to successfully bridge the gap between the information technology unit and the strategic objectives of their firms (Stephens, Ledbetter, Mitra, and Ford, 1992). Accordingly, the participation of government agencies in the policy planning forum or conference is useful in bridging the gap between expectation and reality. Thus, we test the following hypothesis:

H_3: The participation of the executor in IS planning of the regulator positively affects the participation of the regulator in the IS implementation of executors.

Researchers and practitioners in both the public and private sectors agree that participative management improves employees' satisfaction. Managers' use of a participative management style and employees' perceptions of participative strategic planning processes are positively associated with high levels of satisfaction (Kim, 2002) including IS and support from the call center. An agency must attend to relevant policies and regulations when assessing and selecting its appropriate strategic alignments with respect to its operations and resource constraints. Such strategic assessments and choices likely relate to particular outcomes (Henderson and Venkatraman, 1993).

When government agencies assist in formulating IS policy, they are more likely to understand IS objectives of e-government and to link IS implementation strategy closely with e-government strategy resulting in the alignment between regulator and executors (Jones, Taylor and Spencer, 1995). Government agencies' attendance at IS policy planning meetings may lead to increased assimilation of technology and knowledge for themselves and other agencies, and may strengthen co-alignment (Andreau and Ciborra, 1996). Regular access to a regulator may increase the ability of executors to

provide knowledge about strategic use of IS and to share knowledge about emerging opportunities. A call center raised from a regulator can deliver the regulation policy, timely information, and related IS technical support. Mutual participation between regulator and executors provide for suitable operation of a call center and promote satisfaction with the call center. Information technology success generally reflects an effective relationship between managers and IS managers. The long-term success of records management requires government agencies to allocate resources and actually use the system- in addition to maintaining the records- and adequately supports their functions or services (Griffin, 2004). By working closely with other government agencies, a regulator is better positioned to influence and reflect the appropriate use of IS explicitly in the e-government plan (Kearns and Lederer, 2003). Thus, we test the following hypotheses:

H_4: The executor's participation in IS policy planning of the regulator positively affects user's satisfaction with a call center supported by the regulator.

H_5: The executor's participation in IS policy planning of the regulator positively affects user's satisfaction with IS functionality.

A regulator's participation in an executor's IS implementation strategy fosters an appreciation for what is meaningful and relevant, and promotes the combining of the e-government goal with IT knowledge. Direct participation leads to a high level of comprehensiveness and thus superior knowledge. When regulator has frequent contact with executors, IS strategy is more likely to be phrased in practical terms and reflect e-government reality, which might lead to increase alignment between regulator and executors. Participation of a CEO in strategic IS planning is positively and strongly associated with strategic IS management (Kearns, 2006). Good interaction between CEO and CIO enables the successful exploitation of IS (Feeny, Edwards and Simpson, 1992) and reflects on the satisfaction with IS functionality.

The regulator has the power to set "clear examples for government agencies regarding the need to give quality time to IS." When a regulator participates on IS implementation committees to obtain direct knowledge about related projects, IS policy is more likely to utilize the strategic capability of IT. Moreover, a regulator's understanding of IS opportunities within the executors may break the barriers to policy-implementation collaboration. Such increased understanding may be expected to lead to improvement in the satisfaction of the call center and IS functionality. Thus, we test the following hypotheses:

H_6: The regulator's participation in IS implementation of executors positively affects user's satisfaction with a call center supported by the regulator.

H_7: The regulator's participation in IS implementation of executors positively affects user's satisfaction with IS functionality.

The success of electronic record/archive management demands substantial efforts from an agency to ensure desired system usage and service enhancement (Griffin, 2004). Expertise and knowledge about electronic records management and IS functionality are updated in a short term manner; organizations can realize and capitalize on greater payoffs from their IS investments by aligning their business and IS strategies (Tallon et al., 2000). A call center is a hub of the knowledge sharing mechanism and the fulcrum of organizations; it further allows an organization to build, maintain, and manage relationships by delivering new information and solving problems quickly (Prahabkar, Sheehan and Coppett, 1997). Excellent performance of call center will lead to a better understanding and familiarity with IS. Thus, we test the following hypothesis:

H_8: User's satisfaction with a call center positively affects the satisfaction with IS functionality.

4. STUDY DESIGN AND DATA COLLECTION

On the basis of the proposed research framework, this study first identified the specific constructs to be examined and then operationalized them using relevant measures from prior research. Several domain experts reviewed a preliminary questionnaire and provided their evaluative feedback. The e-government policy in Taiwan requires all 8,029 agencies to implement ERMS. This study took a key informant approach by targeting records management staff, who understand the implementation and current practice of ERMS within the agency. The survey packet consisted of a cover letter describing our objectives and data management plan, a support letter from the NAA, and the questionnaire was sent to government agencies via postal mail. Through the official reporting channel, a total of 2,169 completed questionnaires and signatures from the chief officer of the participating agencies was received and accounted for an effective response rate of 26.9%. The sample includes 1,005 administration agencies, 107 business agencies, and 1,057 public schools.

According to our analysis, 396 participating agencies are at the central level, and the remaining 1,773 agencies pertain to local government. A total of 146 agencies developed their own ERMS, 256 agencies outsourced ERMS development, and 1,767 adopted the ERMS made available by the NAA. Besides, we also analyzed the agencies (43 central and 37 local) that received a Golden Archives Award between 2003 and 2005: 28 of the award winners responded to the questionnaire.

5. ANALYSIS RESULTS AND DISCUSSION

Factor analysis and Cronbach's alpha were used to evaluate the construct validity and reliability of each construct. As shown in Table 2, five factors—representing information Intensity of the e-Government, government agency participation in IS policy planning, NAA participation in IS implementation of government agencies, satisfaction with call center of NAA, and satisfaction with IS support from NAA—are extracted from the question items for measuring alignment outcomes. These factors correspond to key outcome dimensions and show satisfactory convergent and discriminant validity, in that the loadings of the items measuring the same construct are considerably higher than those for any different construct, with eigenvalue greater than 1.0, a common threshold. All investigated outcome dimensions exhibit an alpha value greater than the common threshold of 0.7, evidence of adequate reliability.

Table 2. Properties of factors in measurement model

Factor and Items	Loading	Cronbach's Alpha
Information intensity of the e-government		.74
• Obligation to follow Acts in implementation	.73	
• Specification defined by rule and regulation	.73	
• Information used in great extent in operation	.53	
Executor participates in IS planning of regulator		.97
• Comments proposed for planning IS rules	.96	
• Comments proposed for planning IS policy	.96	
Regulator participates in IS implementation of executor		.94
• System operation recommended from NAA	.96	
• System specifications recommended from NAA	.96	
User's satisfaction to call center		.93
• Satisfaction to expertise of call center	.94	
• Satisfaction to services by call center	.92	
• Overall Satisfaction to call center	.80	
User's satisfaction to IS		.91
• Satisfaction to online-submission functions	.85	
• Satisfaction to IS functionality	.78	
• Satisfaction to information services	.82	
• Satisfaction to training	.63	

Correlation analysis is also conducted to understand the relationship among factors. In Table 3, correlation coefficient among factors shows that information density is highly correlated with all other factors. Additionally, the factor 'NAA Participates in IS implementation of GA' is positively correlated with 'GA Participates in IS policy planning of NAA', 'Satisfaction with Call Center' and 'Satisfaction with IS Functionality.' The factor 'Satisfaction with Call Center' is positively correlated with 'Satisfaction with IS Functionality.'

Table 3. Correlation among factors

	Information intensity	Executor participates in IS planning of regulator	Regulator participates in IS implementation of executor	User's satisfaction to call center
Information intensity	1.00			
Executor participates in IS planning of regulator	.194 (<.0001)	1.00		
Regulator participates in IS implementation of executor	.306 (<.0001)	.565 (<.0001)	1.00	
User's satisfaction to call center	.183 (<.0001)	.033 (.127)	.068 (.002)	1.00
User's satisfaction to IS	.193 (<.0001)	.042 (.072)	.091 (.0002)	.667 (<.0001)

5.1 Strategic Co-alignments of Government Agencies in Implementing ERMS

Agencies can choose from a range of co-alignment types, i.e. self-development, outsourcing, and adoption, for IS implementation. ANOVA and Scheffe's posterior analysis are performed to evaluate the difference among the co-alignment outcomes associated with the various choices. Table 4 summarizes the mean and standard deviation of each factor, together with the p-value and Scheffe test. As shown in Table 4, government agencies with sensing high information intensity prefer self-development and outsourcing co-alignment strategy. Government agencies that adopt outsourcing co-alignment strategy seem to report more information intensity, like to take more participation between NAA's IS strategy planning, and feel more satisfied with IS and the call center. Government agencies with lower ones select adoption strategy.

Table 4. Analysis of factors in different co-alignment strategy

	Self-development	Outsourcing	Adoption	p-value
Information Intensity of the e-Government	5.72 (0.71)	5.87 (0.68)	5.42 (0.82)	.001*** II = I > III
Executor participates in IS planning of regulator	3.71 (1.54)	3.94 (1.44)	3.40 (1.50)	.001*** II > III
Regulator participates in IS implementation of executor	4.61 (1.69)	4.61 (1.24)	4.18 (1.54)	.001*** II = I > III
User's satisfaction to call center	5.10 (1.11)	5.33 (1.14)	4.99 (1.16)	.006** II > III
User's satisfaction to IS	4.86 (0.99)	5.02 (1.03)	4.76 (1.04)	.011* II = I > III

5.2 Strategic Co-alignments and Corresponding Performance

Of the 80 agencies that received Golden Archives Award, 28 of them participated in our study. For our measurement of an agency's performance according to whether it won a Golden Archives Award, winning the award is the target class and important alignment factors are predictor variables. Table 5 summarizes the mean and standard deviation of each co-alignment factor dimension of government agencies with or without winning Golden Archives Award, together with the p-value.

Table 5. Analysis of co-alignment outcomes and agency performance

	Agencies with Golden Archives Award	Agencies without Golden Archives Award	p-value
Information Intensity of the e-Government	6.23 (0.56)	5.50 (0.81)	.001***
Executor participates in IS planning of regulator	4.86 (1.24)	3.47 (1.51)	.001***
Regulator participates in IS implementation of executor	5.63 (0.88)	4.26 (1.70)	.001***
User's satisfaction to call center	5.65 (1.02)	5.09 (1.13)	.010**
User's satisfaction to IS	4.72 (1.17)	4.82 (1.00)	.610

Satisfaction offers a critical outcome measure for assessing strategic alignments (Arino, 2003). These co-alignment strategies may lead to different outcomes, which we measure in terms of its satisfaction with call center and IS functionality.

Agencies that received award sense higher information intensity, demonstrate higher mutual participation with NAA, and have high satisfaction with NAA's call center. Analysis of qualitative comments from 28 participating agencies suggests that the award-winning agencies, as a group, have greater concerns about and a better appreciation of future trends in record/archive management. Additionally, from a co-adaptation aspect, people adapt to a system which evolves to meet their needs (Ackerman, 2000). The call center allows NAA to maintain positive working relationships with agencies by providing relevant information or solving problems in a timely manner. In this vein, higher satisfaction with the call center leads to more positive working relationships between an agency and the NAA. The information intensity, mutual participation and satisfaction with call center factors can explain differential performance among agencies—namely, winning versus not winning Golden Archives Award.

5.3 Testing of the Measurement Model

In avoiding the over-fitting problem, this study used data without missing values and excluded local 3rd level agencies, e.g. elementary schools, as samples to investigate the relationship in the structural model. This sample includes 450 government agencies. The measurement model yields the following fit statistics: comparative fit index (CFI) is 0.96, normed fit index (NFI) is 0.95, non-normed fit index (NNFI) is 0.95, incremental fit index (IFI) is 0.96, relative fit index (RFI) is 0.94, and parsimony goodness of fit index (PGFI) is 0.65. In this study, goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) is 0.89 and 0.85 respectively. Although the goodness-of-fit is not perfect, at 0.90, it is still within the acceptable range (JOreslog and SOrbom, 1984). Root mean square error of approximation (RMSEA) is 0.085. Root mean square residual (RMR) is 0.076. Standardized RMR(SRMS) is 0.062. This suggests that the hypothesized measurement model fits the data reasonably well in Figure 2.
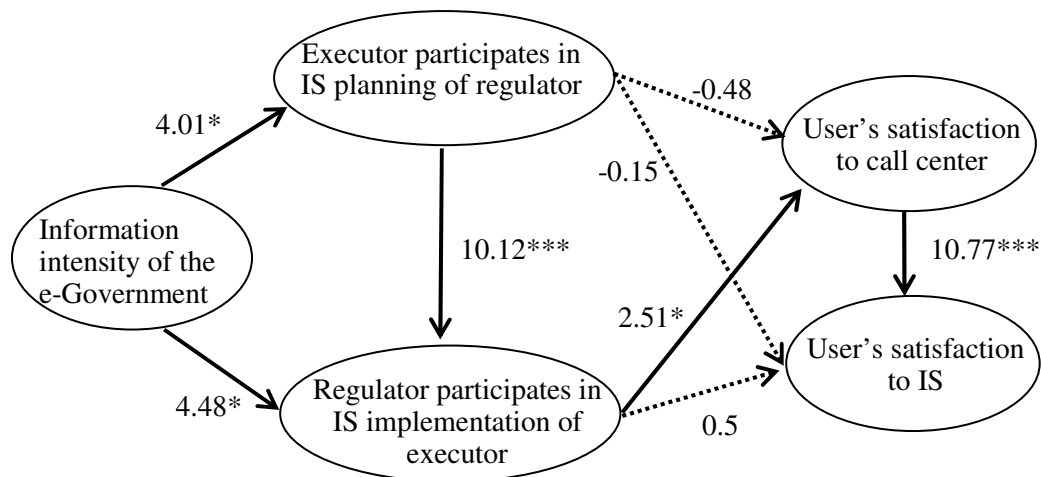
Figure 2. Final structural model with path coefficients

From the measurement model, information intensity of the e-government significantly affects the participation of executors in IS policy planning of regulator and the participation of regulator in IS implementation of executors. Furthermore, the degree of executors' participation in IS policy planning of regulator significantly affects the participation of regulator in IS implementation of executors. The satisfaction does not come from the participation of executors in IS policy planning of regulator but from the participation of regulator in IS implementation of executors. Therefore, Hypotheses H1, H2, H3, H6 and H8 are accepted while H4, H5, H7 are rejected.

6. SUMMARY

The co-alignment of IS strategies between regulator and executor is important and can affect outcomes and executors' performance. Such alignments represent a process of continuous adaptation and change (Henderson and Venkatraman 1993). In e-government contexts, agencies that differ in purposes or resources should analyze and select appropriate alignment strategies for favorable outcomes and performance. Good business and technology relationship contribute to success in at least three respects: strategic information systems planning, business/IS partnerships, and involvement in IT management (Feeny, Edwards and Simpson, 1992). The sensing of information intensity in government agency also affects its co-alignment strategy in implementing IS. Because agencies in charge of similar tasks or affairs need to exchange information routinely and frequently, their co-alignment strategy must support commonality and inter-organizational working relationships through the IS electronic channel and related systems (Blake, 2005).

Their use of outsourcing arrangements may improve organizational efficiency and knowledge sharing/transfer and possibly provide better alignment between the agency's mission and national policy with greater implementation flexibility (Castro et al., 2003). The use of outsourcing services to achieve desired system integration is therefore understandably common (Pollalis, 2003). From the analytical results, agencies that select the outsourcing alignment type have higher participation and are more satisfied with the call center than are other agencies that follow self-development or adoption strategies. The NAA grants Golden Archives Award to agencies that are outstanding in the operations, services, and use of ERMS. The award winners have sense of higher information intensity, mutual participation, and satisfaction with call center when compared with others.

Through the structural model, information intensity of the e-government significantly affects the participation of executors in IS policy planning of regulator and the participation of regulator in IS implementation of executors. Furthermore, the participation of executors in IS policy planning of regulator significantly affects the participation of regulator in IS implementation of executors. Effective supervisory communications in the context of the strategic planning process are positively associated with high levels of satisfaction (Kim, 2002). Participative management that incorporates effective supervisory communications can enhance employees' satisfaction. In this regard,

organizational leaders in the public sector should emphasize changing organizational culture from the traditional pattern of hierarchical structure to participative management and empowerment (Kim, 2002).

The satisfaction does not directly come from the participation of executor in IS policy planning of regulator but from the participation of regulator in IS implementation of executors. Finally, government agencies' satisfaction with IS functionality is significantly affected by satisfaction with the call center. Additional investigations are needed to further analyze the linkage among regulator, executors, and software vendors.

References

Ackerman,M.S.,"The Intellectual Challenge of CSCW:The Gap Between Social Requirements and Technical Feasibility," *Human-Computer Interaction* (15), 2000, pp.179-203.

Andreau, R., and Ciborra, C., "Organizational Learning and Core Capabilities Development: The Role of IT," *Journal of Strategic Information Systems* (5), 1996, pp.111-127.

Arino, A. "Measures of Strategic Alliance Performance: An Analysis of Construct Validity," *Journal of International Business Studies* (34:1), 2003, pp. 66-79.

Ault, J. T. and Gleason, J. M., "U.S. Government Decision Makers' Expectations and Patterns of Use of Emerging and Existing Information Technologies," *Government Information Quarterly* (20), 2003, pp. 63-76.

Bacon, N., "Information Systems Strategies in Government: Recent Survey Evidence," *Journal of Information Technology* (6), 1991, pp.94-107.

Bharadwaj, A. S., "A Resource-Based Perspective on Information Technology Capability and Firm Performance," *MIS Quarterly* (24:1), 2000, pp.169-196.

Bhattacherjee, A. "Understanding information systems continuance: An expectation- confirmation model," *MIS Quarterly* (25:3), 2001, pp. 351-370.

Blake, R., *Complying with the Records Management Code: Evaluation Workbook and Methodology - Consultation Draft*, The National Archives, UK, Mar. 2005.

Brown, C. V. and Sambamurthy, V., *Repositioning the IT Organization to Facilitate business Transformation*, 1999, Cincinnati, OH: Pinnaflex Press.

Castro, M., Foster, R. S., Gunn, K., and Roberts, E. B., "Managing R&D Alliances Within Government: The 'Virtual Agency' Concept," *IEEE Transactions on Engineering Management* (50:3), 2003, pp.297-306.

Chen, Y. N., Chen, H. M., Huang, W., and Ching, R. K. H., "E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study," *Journal of Global Information Management* (14:1), 2006, pp.23-46.

Chircu, A. M., and Kauffman, R. J. "Limits to Value in Electronic Commerce-Related Information Technology Investments," *Journal of Management Information Systems* (17:1), 2001, pp. 61-82.

Crittenden, W. F., Crittenden, V. L. Stone, M. M., and Robertson, C. J., "An Uneasy Alliance: Planning and Performance in Nonprofit Organizations," *International Journal of Organization Theory and Behavior* (7:1), 2004, pp.81-106.

Donovan, J, "Interview: From the Back Room to the Boardroom," *Computerworld*, April 17, 1989, pp. 83-84.

Feeny, D. F., Edwards, B. R., and Simpson, K. M., "Understanding the CEO/CIO relationship," *MIS Quarterly* (16: 4), Dec 1992, pp. 435-448.

Feinberg, R. A., Hokama, L., Kadam, R. and Kim, I., "Operational Determinants of Caller Satisfaction in Banking/Financial Service Call Center," *The International Journal of Bank Marketing* (20:4)*, 2002, pp.174-180.

Griffin, A, "Records Management Capacity Assessment System," *Archival Science* (4:1), 2004, pp.71-97.

Henderson, J. C. and Venkatraman, H. "Strategic Alignment: Leveraging Information Technology for Transforming Organizations," *IBM Systems Journal* (32:1), 1993, pp.4-16.

Jones, Mary C, Taylor, C S., and Spencer, B. A. "The CEO/CIO relationship revisited: An empirical assessment of satisfaction with IS," *Information & Management* (29:3), 1995, pp. 123-130.

Kaplan, R. S., "Strategic Performance Measurement in Nonprofit Organizations," *Nonprofit Management and Leadership* (11:3), 2001; pp.353-370.

Kearns, G. S., "The effect of top management support of SISP on strategic IS management: insights from the US electric power industry," *Omega* (34:3), Jun 2006, pp. 236

Kearns, G. S. and Lederer, A. L., "A Resourced-Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage," *Decision Science* (34:1), 2003, pp.1-29.

Kim, S., "Participative management and job satisfaction: Lessons for management leadership," *Public Administration Review* (62:2), Mar/Apr 2002, pp. 231-241.

Mullen, P. R., "The Need for Government-wide Information Capacity," *Social Science Computer Review* (21:4), 2003, pp.456.

Pollalis, Y. A., "Patterns of co-alignment in information-intensive organizations: business performance through integration strategies," *International Journal of Information Management* (23:6), 2003, pp. 469-492.

Prahabkar, P. R., Sheehan, M.J. and Coppett, JI, 'The power of technology in business selling: call centers', *Journal of Business and Industrial Marketing* (12), 1997, pp. 222-235.

Reich, B. H., and Benbasat, I., "Factors that Influence the Social Dimension of Alignment between Business and Information Technology Objectives," *MIS Quarterly* (24:1), 2000, pp. 181-113.

Soh, C., and Markus, M. L. "How IT Creates Business Value: A Process Theory Synthesis," *Proceedings of the Sixteenth International Conference on Information Systems,* 1995, pp. 29-41.

Sprague, R. H. Jr., "Electronic Document Management: Challenges and Opportunities," *MIS Quarterly*, (19:1), 1995, pp. 29-49.

Stephens, C. S., Ledbetter, W. N., Mitra, A., and Ford, F. N., "Executive or functional manager? The nature of the CIO's job," *MIS Quarterly* (16: 4), Dec 1992, pp. 449-467.

Stephens, D. O., "Megatrends in Records Management," *ARMA Records Management Quarterly* (32:1), Jan 1998, pp.3-9.

Tallon, P. and Kraemer, K. L., *A Process-oriented Assessment of the Alignment of Information Systems and Business Strategy: Implications for IT Business Value*, University of California, Irvine, Center for Research on Information Technology and Organizations, 1999.

Tallon, P., Kraemer, K. L., and Gurbaxani, V., "Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach," *Journal of Management Information Systems* (16:4), 2000, pp.145-173.

Teo, T. S. H. and King, W. R., "Integration between business planning and information systems planning: An evolutionary-contingency perspective," *Journal of Management Information Systems* (14:1), 1997, pp.185-214.

Thurston A. "Records Management as a Public Sector Accountability Function," *International Journal of Government Auditing* (24), 1997, pp. 7-9.

Venkatraman, N, Henderson, J. C., and Oldach, S. "Continuous Strategic Alignment: Exploiting Information Technology Capabilities for Competitive Success," *European Management Journal* (11:2), 1993, pp. 139-149.

Watson, R. T., "Influences on the IS Manager's Perceptions of Key Issues: Information Scanning and the relationship with the CEO," *MIS Quarterly* (14:2), June 1990, pp. 217-231.

Weinstein, A., "NARA Enters New 'ERA' of Electronic Records Management," *Information Management Journal* (39:5), 2005, pp.22-24.

West, D. M., *Improving Technology Utilization in ElectronicGovernment around the World, 2008,* Center for Public Policy, Brown University, 2008, http://www.insidepolitics.org.

Whitson, T. L. and Davis, L., "Best Practices in Electronic Government: Comprehensive Electronic Information Dissemination for Science and Technology," *Government Information Quarterly* (18), 2001, pp. 79-91.

Young, J., "Electronic Records Management on a Shoestring: Three Case Studies," *Information Management Journal* (39:1), 2005, pp.58-60.