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ITJ

ISSN 1812-5638

INFORMATION TECHNOLOGY JOURNAL

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Information Technology Journal 12 (18): 4601-4609, 2013
ISSN 1812-5638 / DOI: 10.3923/itj.2013.4601.4609

An Empirical Investigation of Itg Performance in Taiwanese Enterprises

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Abstract: This study designed nine ITG categories to investigate ITG in Taiwanese enterprises. A questionnaire was administered to a random sample of enterprises and 150 valid questionnaires were obtained. This study also collected and analyzed important ITG information from many Taiwanese enterprises to derive various findings such as the degree of current ITG maturity in Taiwan and the ITG archetype distribution results. Furthermore, six ITG categories, namely, CIO authority, ability and evaluation of IT department, decision-making of top management, review and evaluation IT tasks, user support and risk management, are able to predict governance performance. Finally, a cross-border comparative analysis was performed to assess the results of this study relative to corresponding results from the United States and Japan. The findings from this investigation are expected to provide Taiwanese enterprises with guidelines for enterprises to select suitable and effective methods of ITG implementation.

Key words: IT governance, IT governance archetypes, IT governance performance

INTRODUCTION

Effective Information Technology Governance (ITG) is the most important indicator used to forecast an organization's Information Technology (IT) performance (Weilland Ross, 2004). Weilland Ross (2004) created an ITG framework used to quantitatively analyze firms' ITG performance (called "governance performance" or "GP"). Itakura (2007) supplemented this ITG framework with dimensions that represent "organizational capabilities and decision-making authority," considered highly important in Japan to examine the current ITG situation among Japanese enterprises. However, the causes of the current state of ITG for Taiwanese enterprises remain unknown and appropriate methods of implementing ITG is still unclear (Shaw *et al*., 2010). It is still unclear what are the most appropriately methods of implementing ITG among enterprises. For instance, what factors will affect ITG performance? Compare with the ITG performance of enterprises in other countries, how are the ITG performance of Taiwanese enterprises?

Current research on ITG include: ITG mechanisms frameworks (Van Grembergen and de Haes, 2009; Weilland Ross, 2004); ITG processes maturity (Debreceny and Gray, 2013; ITGI, 2001); ITG performance measurement (De Haes and Van Grembergen, 2009; Spremic, 2012; Weilland Ross, 2004); ITG and business/IT alignment (Chan and Reich, 2007; De Haes and Van Grembergen, 2009). Among these studies, there were few empirical studies comparing existing circumstances of international enterprises on ITG performance and ITG arrangements. In this study, we try to understand the current average GP among Taiwanese enterprises and address the current ITG status in Taiwan along with the comparison between American and Japanese enterprises done by Weilland Ross (2004) and Itakura (2007)which is the first research objective of this study. We also incorporated the work of Weilland Ross (2004), Itakura (2007) and the worldwide ITG practice issues (ITGI, 2008) to build the research model to investigate the effects of ITG categories on GP of Taiwanese enterprises. Itakura (2007) proposed nine ITG implement categories to investigate their impacts on enterprise's GP. The ITGI (2008) also identified 11 issues of current worldwide ITG practices. We integrate the above two studies and introduced nine ITG categories to explore the relationships among the nine categories and GPwhich is the second objective of this study The findings from this investigation are expected to provide Taiwanese enterprises with a reference to select a suitable and effective method of ITG implementation.

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LITERATURE DISCUSSION

Information technology governance (ITG): In order to ensure that information technology is selected, created, modified and used in a desirable manner, Information Technology Governance specifies who has the rights to make certain decisions and how the accountability matrix is structured (Weilland Ross, 2004). According to De Haes and Van Grembergen (2004), ITG concerns the organizational capacities exercised by the organization's information management team, executive management and Board of Directors to generate and implement IT strategies and ensure IT is properly integrated within the enterprise.

ITG arrangements: Weilland Ross (2004) noted that a company can increase its ITG effectiveness via "ITG arrangements" which allow the enterprise to determine various IT decision-making processes and grant the appropriate roles the right to make such decisions. ITG arrangements are often depicted in matrices. The five key ITG decisions lie on the horizontal axis and the six ITG archetypes are arranged on the vertical axis. See below for more detail on how a clear understanding of ITG archetypes can help facilitate the five key ITG decisions and their implementation.

Key ITG decisions: In 2004, an ITG analysis framework was created by Weilland Ross (2004), designed specifically to coherently interrelate the organizational structure, operational objectives, ITG arrangement and corporate strategy of the enterprise. According to the Weilland Ross (2004) framework, the implementation of ITG presents the organization with five key information technology decisions: principles, architecture, infrastructure, investment and prioritization and business applications needs.

ITG archetypes: ITG can be classified into six different political system archetypes (Weilland Ross, 2004). These archetypes indicate which organizational members can do influence and decision-making power over IT-related choices. Each archetype determines certain individuals who are likely to provide information to ITG decision makers or to make one or more of the aforementioned five key ITG decisions.

Organizational capabilities and decision-making authority affect ITG: Itakura (2007) mentioned that there are three perspectives which are important for ITG. The three perspectives are organizational capabilities, decision-making authority and security. He designed nine categories about the three perspectives to investigate the relationship between enterprise's GP. The ITGI (2008) pointed out that there are 11 issues of current worldwide ITG practices in 2008. Many categories are similar in these two studies.

Hypothesis development: This study introduces new nine ITG categories of interest with respect to the implementation of ITG. There are the CIO authority, budgetary session process, outsourcing, IT project development management, ability and evaluation of IT department, decision-making of top management, review and evaluation IT tasks, user support and risk management. Seven of the nine ITG categories can be categorized and listed on "current ITG practices" (except for CIO authority and outsourcing) by ITGI (2008). In addition, some report show out that CIO authority and outsourcing are very important for enterprise ITGI (2008). Based on the above, we believe they may affect the enterprise's GP.

Traditionally, top management commitment enhances IT successes (Powell and Dent-Micallef, 1997). Chun and Mooney (2009) noted that the CIO has become a key influencer in today's corporate enterprise, assisting the CEO in the creation of new business strategies and helping business units manage their implementation. Though necessary, the effective involvement of the CIO in ITG is insufficient to ensure effective governance (Weilland Ross, 2004). In the study of De Haes and Van Grembergen (2009) indicates that CIO involvement and authorization received will affect governance maturity in the 10 important ITG baseline practices. In this regard, we propose:

- **H1:** The extent of CIO authority will significantly affect GP value prediction

Among the mechanisms required by ITG are appropriate committees, processes for budgeting and project approval and the IT department's participation in the development of corporate strategy (Weilland Ross, 2004). Companies lack even the most basic rules, fail to periodically adjust and align the IT budget with business needs which will certainly affect organizational performance (Verhoef, 2007). Lengthy budgeting period or un-proper budgeting process could affect ITG performance (Meta Group, 2002). In addition, IT budgeting formal process is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). In this regard, we propose:

- **H2:** The extent of budgetary session process will significantly affect GP value prediction

Many firms outsource IT in order to either reduce their total IT costs or take advantage of IT capabilities unavailable in-house (Bhalla *et al*., 2008). Outsourcing is becoming an increasingly common component of firms'

strategic IT decisions, yet for many sophisticated forms of outsourcing to be successful, significant management attention is required (Goo and Huang, 2008). In this fashion, IT outsourcing can also help resource-strapped firms leverage managerial talent by reducing the time spent by managers overseeing non-core IT activities, allowing them to focus on higher value-added core activities (Kobelsky and Robinson, 2010). So we believe IT outsourcing may affect the enterprise's GP. Thus, we propose:

- **H3:** The extent of outsourced will significantly affect GP value prediction

Sambamurthy and Zmud (1999) emphasizes ITG scopes should include IT project management. The Board of Directors should have oversight of the value delivered by IT and it should monitor the return on investment from significant IT projects. In the study of IDSA (2009) suggests a direct link between IT projects and IT governance, further suggesting a link between ITG and the management of IT-related projects and programs. In addition, IT project development management is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). In this regard, we propose:

- **H4:** The extent of IT project development and management will significantly affect GP value prediction

An organization's IT-related capabilities determine how much value can be potentially created by the acquired IT for that firm in comparison to other firms (Melville *et al*., 2004; Ray *et al*., 2005). Schwarz and Hirschheim (2003) noted that while IT capabilities were unrelated to firm size, the differences in those capabilities among various firms reflect the different means by which IT adds value to each enterprise. Research has often shown that a company's IT-related capabilities impact various measures of IT-related business value (Ray *et al*., 2005). Furthermore, ability and evaluation of IT department is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). Through the ITG maturity, GP will be enhanced. In this regard, we propose:

- **H5:** The extent of ability and evaluation of IT departments will significantly affect GP value prediction

With the effective governance of IT, executives can integrate business and IT decisions, implement appropriate technological solutions and monitor the effectiveness of new and existing systems (Weilland Ross, 2004). As Tonn and Stiefel (2012) have indicated: High quality decision-making is necessary for good governance. This represents top managers' decision quality and clarity which can directly affect ITG executions to achieve enterprise targets and create enterprise values. Furthermore, decision-making of top management is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). Thus, we propose:

- **H6:** The level of certainty of the decision-making by top management will significantly affect GP value prediction

According to ITG principles, the Board of Directors should monitor and evaluate any IT investment or expenditure of significance (IDSA., 2009). This monitoring and evaluation are critical if IT is to be governed effectively. Each IT process must be assessed regularly, over time, to ensure that it is of acceptable quality and complies with control requirements (ITGI, 2007). Effective assessment of IT task is an important evaluation and adjustment mechanism toward combination enterprise goal of the company and missions of each department. In addition, review and evaluation IT tasks is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). We believe that these improvements can enhance GP. In this regard, we propose:

- **H7:** The extent of review and evaluation IT tasks will significantly affect GP value prediction

Best practices must established, integrated and institutionalized via ITG to ensure that IT properly support the company's business objectives (ITGI, 2007). The CIO must receive the solutions and turn them into usable functions for the end users (ITGI, 2007). Constructive relationships and open communication a amongst all parties are required for an ITG initiative to be successful (Bowen *et al*., 2007). Business unit leaders are critical players in the setting of high-level architecture and can be strong advocates for effective ITG (Weilland Ross, 2004). Furthermore, user support is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). In this regard, we propose:

- **H8:** The level of support for user will significantly affect GP value prediction

ITGI (2001) points out that ITG directs IT to exhaust all efforts and ensure IT performance can consist with company targets, realize set benefit, maximum benefits, guarantee reasonable utilization of IT resources and

properly manage IT related risks. From above, risk management is a considerable important role in successful IT management. Practically speaking, since ITG supports the business by adding value by maximizing the use of IT systems and minimizing IT risks, one of ITG's key domains is in the area of risk management (De Haes and Van Grembergen, 2004; ITGI, 2007). In addition, risk management is an important practice in ITG that can affect ITG maturity (De Haes and Van Grembergen, 2009; ITGI, 2008). In this regard, we propose:

- **H9:** The extent of risk management efforts will significantly affect GP value prediction

RESEARCH METHODOLOGY

Questionnaire design and measurement: This study adopted the works done by Itakura (2007), Weill and Woodham (2002) and the ITGI (2008) to design the questionnaires of the new nine ITG categories. The questionnaire was pre-tested by several experts and then modified for the Taiwanese context to make the wordings be easily understood. The survey focused primarily on the two topics of the current state of the examined enterprises with respect to the nine aforementioned ITG categories and how the ITG arrangements of these enterprises were related to performance.

A firm's GP score is calculated using the following formula, based on the firm's performance with respect to the four objectives specified by Weilland Ross (2004). For each enterprise, the maximum GP score is 100 and the lowest GP score is 20.

GP = {(Σ n = 1-4 (importance of the result) x (effect of the result)) x 100 }/{Σ n = 1-4 (5 x importance of the result)}

Data collection: The questionnaires were administered using a random sampling approach. Respondents were obtained from the following sampling frame: (1) The companies listed in the Taiwanese roster of industrial and commercial registrations, (2) The 2006 Manager Directory in Taiwan (China Credit Information Service, 2006) and (3) the 2012 annual conference and seminar of Taiwan Information Management Association. A total of 500 questionnaires were sent and 170 responses were returned. After excluding invalid responses, 150 valid questionnaires were obtained; thus, the valid response rate was 30%.

Measurement validation: The study had good reliability for the examined dimensions of ITG and GP as indicated by the fact that each dimension had a Cronbach's α value that was greater than 0.7 (Nunnally, 1978) (Table 1).

Table 1: Reliability analysis and factors loading

Constuct	Load-ing	α	Constuct	Load-ing	α
CIO authority		0.857	review		0.892
Ci1	0.750		Re1	0.725	
Ci2	0.707		Re2	0.706	
Ci3	0.838		Re3	0.784	
Ci4	0.796		Re4	0.822	
Ci5	0.759		Re5	0.759	
Ci6	0.750		Re6	0.791	
Budgetary		0.860	Re7	0.707	
Bu1	0.804		Re8	0.705	
Bu2	0.804		User support		0.882
Bu3	0.784		Us1	0.702	
Bu4	0.744		Us2	0.765	
Bu5	0.868		Us3	0.758	
Outsourcing		0.823	Us4	0.781	
Ou1	0.851		Us5	0.742	
Ou2	0.804		Us6	0.847	
Ou3	0.849		Us7	0.774	
Ou4	0.761		Risk		0.714
IT Project		0.842	Ri1	0.882	
Pr1	0.777		Ri2	0.882	
Pr2	0.845		Importance. of perform		0.895
Pr 3	0.859		Im1	0.887	
Pr4	0.715		Im2	0.910	
Pr5	0.725		Im3	0.853	
Ability and evaluation		0.885	Im4	0.839	
Ab1	0.750		Influence of performance		0.906
Ab2	0.721		In1	0.853	
Ab3	0.702		In2	0.920	
Ab4	0.846		In3	0.903	
Ab5	0.778		In4	0.857	
Ab6	0.829				
Ab7	0.797				
Decision-making		0.869			
De1	0.710				
De2	0.810				
De3	0.881				
De4	0.836				
De5	0.743				
De6	0.709				

Factor analysis claims that the threshold of each item factor loading has to be over .7. Base on the criteria, none of the items were eliminated. All the items met the criteria and were used to obtain an overall score of corresponding concepts (see Table 1). The sampling adequacy of the questionnaire information was verified by examining the Kaiser-Meyer-Olkin (KMO) value and the Bartlett's test of sphericity. The KMO result of 0.897 and thus demonstrated that the questionnaire has good construct validity.

DATA ANALYSIS AND RESULTS

Profile of the respondents: Among the 150 respondents, 13% were CxO-level personnel, 48% were IT managers and 12% were IT staff. Thus, in total, approximately 73% of respondents were information technology personnel. Other descriptive statistics are in Table 2.

Taiwanese enterprises GP values and characteristic: Table 3 showed the comparison between the results from this study and the results from GP assessments by Weilland Ross (2004) and by Itakura (2007). The mean value of GP is similar among the three studieswhich implies that the sample representative of our study.

Comparison of ITG archetypes among taiwan, japan and united states: Table 4 presents the distribution of ITG archetypes that Taiwanese enterprises exhibit with respect to the five key ITG decisions. For decisions involving IT principles, top managers were the decision makers in 48% of Taiwanese enterprises (i.e., business monarchy). The required informational inputs for making these decisions were usually provided by a federal archetype (28%) in Taiwanese enterprises. An IT monarchy was the most common archetype in all of the examined countries for decisions involving IT architecture. The informational inputs for these decisions were most commonly provided through the federal archetype in Taiwan and the United States. With respect to decisions involving IT infrastructure most Taiwanese firms adopted an archetype of either an IT monarchy or a business monarchy. In Taiwan, the necessary informational input for these decisions was, essentially, equally likely to be obtained through an IT monarchy, federal, or IT/business duopoly archetype. In other words, these results indicated that Taiwanese IT executives have influence but lack decision-making power. In Taiwanese enterprises, decisions regarding business application software were made by high-level managers and/or IT executives. For IT investment and prioritization decisions, a business monarchy archetype was most frequently employed in Taiwan. To obtain the required information for these decisions, Taiwanese firms employed the federal, IT monarchy, or duopoly archetypes. The rate of anarchy was very low in the Taiwanese firms examined by this study, regardless of the governance archetype context, indicating that decision-making power was rather explicitly allocated in these firms. However, relative to enterprises in the United States and Japan, a higher proportion of Taiwanese firms

Table 2: Number of employees in the respondents' companies

Staff of company	< 50	50~100	101~500	501~1000	> 1000	Tot
Company of number	18	15	31	16	70	150
Ratio (%)	12.0	10.0	20.7	10.7	46.7	100.0

Table 3: A comparison of taiwanese GP values with the GP values from other countries

	This study (2011~2012)	Itakura (2007)	Weilland ross (2004)
N	150	137	256
Mean	74	72	69
Upper tertile	80	76	74
Maximum	100	100	100
Minimum	20	40	20

Table 4: Distribution of ITG archetypes among taiwanese enterprises

	IT Principles		IT Architecture		IT Infrastructure		Business application		IT Investment	
	Input	Decision	Input	Decision	Input	Decision	Input	Decision	Input	Decision
Business	19	48	19	23	16	30	14	29	10	56
Monarchy	(2)	(0)	(4)	(6)	(3)	(0)	(3)	(8)	(5)	(15)
	(0)	(27)	(0)	(6)	(0)	(7)	(1)	(12)	(1)	(30)
IT Monarchy	17	14	17	38	19	33	14	23	21	7
	(10)	(33)	(9)	(54)	(16)	(62)	(10)	(29)	(16)	(8)
	(1)	(18)	(20)	(73)	(10)	(59)	(0)	(8)	(0)	(9)
Feudal	9	3	9	1	7	3	13	4	10	3
	(30)	(25)	(28)	(10)	(27)	(8)	(31)	(23)	(27)	(3)
	(0)	(3)	(0)	(0)	(1)	(2)	(1)	(18)	(0)	(3)
Federal	28	5	21	6	19	4	25	6	28	7
	(16)	(14)	(17)	(5)	(18)	(2)	(13)	(10)	(11)	(20)
	(83)	(14)	(46)	(4)	(50)	(6)	(81)	(30)	(93)	(27)
IT Duopoly	11	21	12	19	16	20	19	25	16	16
	(18)	(12)	(8)	(12)	(9)	(6)	(18)	(17)	(25)	(19)
	(15)	(36)	(34)	(15)	(30)	(23)	(17)	(27)	(6)	(30)
Anarchy	3	1	3	4	3	0	5	5	4	1
	(16)	(14)	(27)	(8)	(20)	(18)	(17)	(9)	(9)	(1)
	(0)	(0)	(0)	(1)	(0)	(1)	(0)	(3)	(0)	(1)
No Answer	13	8	19	9	20	10	10	8	11	10
	(8)	4	(8)	(4)	(8)	(4)	(8)	(4)	(8)	(4)
	(1)	(2)	(0)	(1)	(0)	(2)	(0)	(2)	(0)	(0)
	100	100	100	100	100	100	100	100	100	100

Note: percentages; The second row ( ) is obtained from Itakura (2007) and the third row ( ) is obtained from Weilland Ross (2004), Shaded and Boldtypeentries: The common answer for governance types

Table 5: Summary of regression analysis

Model	R	R square	Adjusted rsquare	Std. error of estimate	Durbin-waston
1	0.655[a]	0.429	0.425	11.01112	
2	0.686[b]	0.471	0.464	10.62994	
3	0.697[c]	0.486	0.475	10.51770	
4	0.717[d]	0.514	0.501	10.25992	
5	0.726[e]	0.527	0.511	10.15332	
6	0.735[f]	0.541	0.522	10.04187	2.307

a: Predictors: (Constant), user support b: Predictors: (Constant), user support, decision-making,c: Predictors: (Constant), user support, decision-making, review and evaluation,d: Predictors: (Constant), user support, decision-making, review and evaluation, ability and evaluation, e: Predictors: (Constant), user support, decision-making, review and evaluation, ability and evaluation, risk management, f: Predictors: (Constant), User Support, Decision-making, review and evaluation, ability and evaluation, risk management, CIO authority

Table 6: Regression model

Mo-del		Unstand.β	Coef.std. Error	Stand.coef.β	T	Sig
1	(Constant)	20.227	5.168		3.914	0.000
	User support	14.664	1.391	0.655	10.539	0.000
2	(Constant)	15.157	5.203		2.913	0.004
	User support	9.626	1.989	0.430	4.840	0.000
	Decision-making	6.379	1.857	0.305	3.436	0.001
3	(Constant)	18.191	5.359		3.395	0.001
	User support	11.688	2.213	0.522	5.283	0.000
	Decision-making	7.993	2.001	0.382	3.996	0.000
	Review and eva.	-4.594	2.254	-.199	-2.038	0.043
4	(Constant)	13.294	5.493		2.420	0.017
	User support	9.671	2.267	0.432	4.265	0.000
	Decision-making	7.875	1.952	0.377	4.034	0.000
	Review and eva.	-7.409	2.403	-.321	-3.083	0.002
	Ability and eva.	6.353	2.188	0.264	2.903	0.004
5	(Constant)	12.397	5.454		2.273	0.024
	User support	8.282	2.347	0.370	3.528	0.001
	Decision-making	7.479	1.942	0.358	3.852	0.000
	Review and eva.	-8.448	2.433	-.366	-3.472	0.001
	Ability and eva.	6.514	2.167	0.270	3.006	0.003
	Risk management	2.926	1.452	0.160	2.015	0.046
6	(Constant)	8.184	5.771		1.418	0.158
	User support	7.679	2.340	0.343	3.282	0.001
	Decision-making	6.752	1.953	0.323	3.457	0.001
	Review and eva.	-9.367	2.448	-.405	-3.826	0.000
	Ability and eva.	6.127	2.151	0.254	2.848	0.005
	Risk management	3.166	1.441	0.173	2.198	0.030
	CIO authority	3.439	1.675	0.151	2.053	0.042

a: Dependent variable: GP

could not respond with certainty to questions about the required informational inputs for decision-making processes.

Relationships between nine ITG categories and GP: Stepwise multiple regression analysis was utilized to study the relationships between the nine examined ITG categories and GP. The results of this regression analysis indicated that six categories, "user support", "decision-making of top management", "review and evaluation IT tasks", "ability and evaluation of IT department", "risk management" and "CIO authority" significantly affected GP, as shown in Table 5 and Table 6.Thus, H1, H5, H6, H7, H8 and H9 were supported. The six ITG categories can predict GP values. We analyzed the collinearity between the six independent variables that demonstrated significant positive correlations with GP. The Variance Inflation Factor (VIF) value of the six variables were all smaller than 10, indicating the absence of meaningful collinearity between these six variables.

DISCUSSION AND CONCLUSION

ITG arrangements of taiwanese enterprises: In general, most Taiwanese enterprises adopt the ITG archetype more evenly distributed in business monarchy, IT monarchy, federal and IT duopoly, whereas most Japanese enterprises have higher degree of clustering in the feudal or IT monarchy archetype and most American enterprises exhibit either a federal or an IT monarchy with higher degree of clustering. Commonalities among the enterprises of these three countries include the fact that the business monarchy archetype is the most popular approach to IT investment. In addition, an IT monarchy is the most common archetype for decisions involving IT

architecture and infrastructurewhich is typically regarded as technical issues. The study obtained the current ITG arrangement matrix of Taiwanese enterprises, summarized various aspects of this matrix, compared this matrix with the ITG arrangements of enterprises in the United States and Japan.

In Taiwanese enterprises, most top-level executives expect to play a dominant role in making decisions regarding IT principles to ensure that these principles are consistent with business strategies. However, if these executives do not understand the feasibility of implementing their desired IT principles, the risk of implementation failure will increase. These approaches are more common among American firms than among Taiwanese or Japanese firms. For decisions involving IT architecture, most enterprises use the IT monarchy archetype because they regard these issues as technical problems rather than issues of corporate strategy. If managers or business units provide sufficient information to IT units, these units will often take the responsibility for addressing IT architecture issues.

For most Taiwanese firms, similar to the way decisions regarding IT architecture are managed, decisions regarding IT infrastructure are largely controlled by IT managers. The remaining 30% of Taiwanese enterprises adopt a business monarchy model for these decisions, an approach very rarely observed in U.S. and Japanese firms. The business monarchy is the most popular archetype among Taiwanese enterprises for decisions involving business application software. This approach allows the entire strategy of a firm to be considered as part of these decisions. IT/business duopoly is also a popular approach to these decisions because this archetype allows IT managers to retain decision-making power and enables other aspects of an enterprise to more readily implement an IT decision.

The business monarchy archetype is 56% of Taiwanese enterprises to make decisions regarding IT investment and prioritization, as these decisions typically involve first considering the priorities of the business as a whole and only subsequently collecting the required capital that must be allocated to IT to implement these decisions. The federal and IT duopoly archetypes are also suitable for such decisions because the consideration of both IT and business needs when deciding where to invest in IT can facilitate the efficient sharing of resources and avoid the duplication of investments, among other benefits.

Relationship between ITG and GP: The results of ITG and GP relationship revealed that the current ITG maturity of Taiwanese enterprises is very similar to the ITG maturity of enterprises in other countries. As shown in Table 3, the overall average GP score of Taiwanese enterprises in this study was 74 which is higher than the overall average GP scores for Japanese enterprises in 2005 and American enterprises in 2004. Furthermore, one third of the examined Taiwanese enterprises received scores of more than 80 points. On the other hand, the survey data from the 2011 Global Status Report on the Governance of Enterprise IT (GEIT) (ITGI, 2011) indicate that the global cumulative ratio of ITG maturity, as determined by the proportion of enterprises that are at least planning to implement ITG, was 54% in 2008 but had dropped to 38.4% by 2010. Our study shows a current ratio of 46.9% among the Taiwanese enterpriseswhich is alike the results of ITGI survey (ITGI, 2011). Based on this, we conclude that the time gap is not the main factor influencing ITG maturity. Therefore, we propose that level of ITG maturity among Taiwanese enterprises is similar to the level found in other countries. The overall GP scores of Taiwanese enterprises are relatively high when compared with the GP scores from other countries.

Among nine ITG categories, there are six categories can predict GP scores. Furthermore, we compare these six categories that can predict the GP with the results of ITG arrangements of Taiwanese enterprises in this study by cross-analysis. From Table 4, Taiwan enterprises in governance arrangement of the five key ITG decisions are evenly distributed over business monarchy, federal, IT duopoly. This means Taiwan enterprises have multiple organization forms and operation processes. This case is different from America and Japan. From the category aspect, there are four ITG decisions mostly focus on business monarchy among key ITG decision items. From archetype aspect, ITG Taiwan enterprises pay a lot of attentions to the supports for user units. From decision aspect, enterprises provide full authorization to CIO and top management makes clear decisions are important to ITG. Therefore, top management pays attentions to and support to ITG is very important in implementation of ITG. These further proved that "authorization to CIO", "clear decisions from top management" and "supports to user units" can predict GP value. In the input of ITG decision information in five key ITG decisions, all five input items mostly are federal. This implies IT department's IT tasks review and evaluation comes from demands of different functional departments and these federal departments will review and evaluate execution performances. Base on these, "ability and evaluation of IT department" and "review and evaluation IT tasks" are able to predict GP. According to ITGI (2008) research, there are 80% of international enterprises have classified IT risk

management as important level. Risk management is one component of ITG framework and the safeguarding of IT assets, disaster recovery and continuity of operations. Being conscious of the system of internal control to manage risks often has the capacity to generate cost-efficiency (ITGI, 2003). Therefore, risk management is able to predict GP results.

However, there are three ITG categories not significantly affect GP. They are budgeting process, outsourcing and IT project development management. We proposed the following possible reasons to explain the three non-significant hypotheses. About IT budgeting process, IT budgeting processes are influenced by some enterprise internal factors (Weiner, 1985), such as ability, skill, knowledge, competence and therefore, it might create uncertainty in performances of ITG implementation. As for outsourcing, Lacity and Hirschheim (1993) believes there are many risks in IT outsourcing, for examples, controlled by outsourcing suppliers, difficult transferred back to internal after unsuccessful outsourcing, lost flexibility in organization, occurred potential costs and no assurance in outsourcing quality. Because of these risks, the more extent of outsourced, the more factors could create negative effect on ITG performance. In the long term, it will cause enterprises washing out technological capability and losing competitiveness. Regarding IT project development and management research indicates that a mere 29% of all IT projects actually succeed (SGI, 2004). Marnewick and Labuschagne (2011) point out that IT projects are often not completed within the defined time and costing and do not add value to the organization. So even the extent of IT project demelopment and management is higher, the enterprise may create low GP because of some project failure or escalation.

Limitations and future research: This study is not without limitations. First, in order to improve the amount of samples, the study did not deliberately limit the categories of respondents because of unknown ITG status in Taiwan (Shaw *et al*., 2010). However, we believe that our sample has certain representative since the GP value and demographic characteristics similar to the studies of Weilland Ross (2004) and Itakura (2007). Sec, the data is cross-sectional. It is understandable that longitudinal data for ITG implementation and GP would be better. Especially, objective data for GP would be better, such as the actual performance of enterprises. Further study may be needed to verify our findings. Third, ITG arrangements in various countries may be affected by the diverse enterprise organizations and cultures of these nationswhich might produce different effects on GP scores. Thus, future studies may consider the issue of organizational cultures.

ACKNOWLEDGMENTS

We acknowledge Professor Hiroaki Itakura from Kagawa University, Japan, for providing us with both the questionnaire that he used in Japan and an analysis of his results.

This work was supported in part by the National Science Council of Taiwan, Republic of China, under the Grants NSC 101-2410-H-032 -012.

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