A Study of the Causal Relationship between IT Governance Inhibitors and Its Success in Korea Enterprises

Chi-Hoon Lee, Jung-Hoon Lee, Jong-Sung Park, Kap-Young Jeong
Graduate School of Information, Yonsei University, Seoul, Korea
chihoon@yonsei.ac.kr, jhoonlee@yonsei.ac.kr, bizajou@yonsei.ac.kr, jeongky@yonsei.ac.kr

Abstract

In recent years, the emergence of the term IT Governance (ITG) has pointed to the increasing importance for business of effecting an alignment between its strategic direction and IT units. Many leading organizations have turned to ITG to pursue gains in efficiency, accountability, and regulatory and other forms of compliance, without, however, being able to implement coherent IT schemes on account of a number of challenging issues. Despite the growing interest of academics and practitioners in this area (as attested in recent publications), few studies have characterized the practical inhibitors frustrating the implementation of effective ITG. This paper, therefore, aims to examine empirically how inhibiting features associated with ITG affect the success of IT activities. Through a literature review, we identify 5 factors that work to restrain ITG implementation. Further, this work presents survey data gathered from 96 leading companies in Korea reporting the status of ITG practices according to a specific instrument of its own design.

1. Introduction

According to recent research carried out by Gartner, the emphasis in IT organization within companies has now shifted from technical to managerial issues [5; 6]. Significantly, many companies' IT structures have become increasingly complex, as structures have evolved to deliver and monitor virtually continuous product development and the provision of converged services. In particular, business organizations characterized by a high level of IT resource dependency, such as telecommunication service providers, take on an augmented level of IT and enterprise risks [7].

In this environment, many leading organizations have sought to devise principles for the better governance of their IT resources. Recent scholarship dealing with this issue has formulated three fundamental questions: 1.How should IT Governance (ITG) be defined? 2. What is the most appropriate theoretical framework for ITG? and 3. How can firms assure the success of ITG implementation?

A global ITG survey, conducted by ITGI (ITG Institute) in 2006 and drawing on 695 organizations [15], reports that 87% of participants considered IT crucial to the delivery of their business strategy, further perceiving that good ITG practices would improve the governance of IT resources. In this respect, Luftman proposes a set of performance metrics for determining companies' ITG maturity level, particularly focusing on the strategic alignment of IT with other functions of corporate activity. In research based on 25 in Fortune 500 companies, most companies' ITG maturity level was measured at just over 2+ in a 5-point Likert's scale [18]. This survey result indicates that most companies are currently ignorant of how ITG might be implemented using a formal framework such as COBIT, ITIL, EA etc. Although most managers grasp the importance of ITG practices, managers' and companies' accomplishment levels in bringing about satisfactory ITG practices remain low. This corresponds with our survey findings in the case of Korean companies [22].

Responding to this growing concern over how to implement ITG in order to strengthen strategic alignment, this research sets out to answer the following research questions.

I. *What are the key inhibitors for ITG implementation in Korea?*
II. *What is the cause and effect relationship between such inhibitors and companies' ITG success?*

To answer the first research question, we conducted literatures review presented as below, identifying those factors potentially restraining ITG implementation. We then propose a research model particularly to this study that provides independent and dependent variables for ITG implementation in different cases. Answering the second research question, we validate our survey results through rigorous statistical testing, analyzing how ITG success is affected by independent inhibitors in governance implementation. Finally, we highlight our findings, drawing out implications for management and suggesting future directions for research.

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2. Theoretical Foundation

2.1 ITG definitions

Despite several discussions on ITG through many years, diverse definitions of ITG have been advanced from multiple perspectives. Emerging in the early 1990s, the term 'ITG' did not gain broad currency in academic research domains until Brown [3] and Sambamurthy and Zmud [26] in late 1990s.

Lee et al. [19] have summarized these diverse definitions of ITG in a literature review study, classifying approaches to ITG according to three different perspectives: 1. Decision rights and accountabilities; 2. Strategic alignment between IT and business; 3. the organizational structure of relationships.

The first perspective focuses on the locus of decision making in firms, describing how specific stakeholders account for their role and responsibility in the context of IT-related decisions [14; 24; 28; 31]

The second perspective, as presented by Grembergen et al. [30] and Webb et al. [34], is concerned with the ultimate objective of achieving strategic alignment between business and IT units. Several conceptual models have been developed in this area enabling the effective control of IT resources, and coordinating performance and risk management.

The third perspective, ITGI (ITG Institute), defines ITG as "the responsibility of executives and the board of directors, consisting of the leadership, organizational structures and processes that ensures the enterprise's IT sustains and extends the organization's strategy and objectives" [14]

Although the above definitions differ in some aspects, they commonly focuses on the locus of decision making rights and responsibilities related to IT, and stress the aim of achieving a strategic alignment between ITG structures and governance mechanisms or associated processes.

2.2 Effect of ITG on firm performance

If this is so, why is ITG important and how have ITG issues manifested themselves recently in business practices? Further, how is ITG interrelated with firms' performance? First of all, we should take note of a number of issues related to Corporate Governance (CG). According to the OECD Principles of Corporate Governance (2004), relationships between stakeholders, such as the management, board of directors, and investors, are critical in CG in strengthening firms' economic efficiency and raising investor confidence. These relationships will determine the way a corporation sets its goals, goes about achieving them, and how eventual action plans will be monitored throughout the implementation process. A company adhering to good CG principles will also consider governance an important factor in investment decisions.

Furthermore, the practice and relevance of CG increases in relation to how internationalized firms' investment is. Xavier [35] asserts that corporations run by professional managers not directly responsible to investors must resolve problems of 'adverse selection' and 'moral hazard'-in other words, must put in place mechanisms aligning manager and investor interest, for instance preventing managers from taking short-term risks with limited downsides for themselves. Xavier defines CG as a tool to help overcome such misalignments of interest, allowing firms to sustain relationships of trust with external investors. Shleifer and Vishny [27] suggest that CG is a way for investors to assure themselves of a profit for the funds they invest, also adding that from an investor's point of view, effective governance represents the best company structure and system of supervision maximizing management performance.

Other scholars have sought to understand the relationships between CG and firm performance in terms of governance and firms' reporting levels of earnings, as reported in stock market submission [2; 9; 1]. Brown and Caylor [2] here companies with excellent CG boast good stock earnings rate and shareholder compensations. Gomper et al. [9] confirm that the CG of the U.S corporate world has shown a strong correlation with stock earnings rate in the late 90's. Further, Black et al. [1] analyze the effect of companies' improving their CG on companies' stock prices, examining the returns of 515 listed Korean businesses. After setting a corporate index value (1~100 point) benchmarking the stock prices of the 515 Korea companies, their study shows the index rising by increasing by 10 units whenever enterprises make their own moderate improvement in CG.

Collectively, these findings support the hypothesis of a strong correlation between firm performances practically and improved CG. Why, then, does ITG matter?

Nowadays, IT has a great effect on firms' strategic activity, playing an important role in the planning stages of strategy as CG determines and regulates the overall direction of ITG [30]. IT resources do not represent independent, separate assets for firms but rather form one element of corporate resources; in this respect, IT units are responsible for improving business processes, improving firms' return on investment (ROI) on both defined business tasks and information assets themselves. Since IT is such a critical function in supporting and enabling enterprise goals, effective ITG generates real business benefits such as enhanced reputation, trust, product leadership, time-to-market and reduced costs, all of which increase stakeholder value [13].

Furthermore, for these reasons, most organizations are vulnerable to IT risks. Large investment may mean large risks; and the degree of a business's dependence on IT in processing routine tasks determines the degree of its vulnerability. Thus ITG offers ways of mitigating this risk.

Last but not the least, well-structured ITG can have positive effects on corporate performance. As a survey of 256 corporations undertaken by Weill and Ross [30] for the MIT Sloan Management School suggests, Best performance enterprises show more than a 40% return on assets (ROA) compared to the values achieved by their competitors. Most of these enterprises succeed in developing effective forms of ITG supporting their business strategies. This is an important reason for organizations to put effective ITG arrangements in place [32]. These facts again support the presumption of strong correlations between ITG and firms' performance.

2.3 Review of ITG inhibitors

As noted, given these correlations between ITG and firm's performance, we should also be sensitive to the possible existence of underlying inhibitors interrupting companies' optimal ITG. To answer our first research question, we initially reviewed the current literature related to ITG and IT project implementation. Researchers have offered different classifications of various enablers and inhibitors in ITG implementation. In tracking these, we limited literature review in order to construct our own research model.

Table 1: Enablers/Inhibitors of Strategic Alignment

Enablers	Inhibitors
◆ Senior executive support for IT	◆ IT/Business lack close relationships
◆ IT involved in strategy development	◆ IT does not ◆ prioritize well
◆ IT understands the business	◆ IT fails to meet its commitments
◆ Business-IT partnership	◆ IT does not understand business
◆ Well-prioritized IT projects	◆ Senior executives do not support IT
◆ IT demonstrate leaderships	◆ IT management lacks leadership

Luftman et al. [17] classify enablers and inhibitors for business-IT alignment as shown in table 1. Most inhibitors pertain to possible social and managerial issues rather than technical factors. Through maximizing the effect of enablers and minimizing that of inhibitors, the authors claimed that a better alignment of IT with other processes may be both secured and sustained i.e. monitored by CIOs.

Analyzing 168 firms in different sectors, Teo and Ang [29] find that managerial commitment to the strategic use of IT (and to IT management literacy) was one of the top-ranked Critical Success Factors (CSFs) in business and IS alignment among 18 CSFs (as shown in table 2).

Table 2: CSFs in business and IS planning Alignment

No.	CSFs
1	Top management is committed to the strategic use of IT
2	IS management is knowledge about business
3	Top management has confidence in the IS department
4	The IS department provides efficient and reliable services to user departments
5	There is frequent communication between user and IS departments
6	The IS staff are able to keep up with advances in IT
7	Business and IS management work together in partnership in prioritizing application development
8	Business goals and objectives are made known to IS management
9	The IS department is responsive to user needs
10	Top management is knowledge about IT
11	The IS department often come up with creative ideas on how to use IT strategically
12	The corporate business plan is made available to the IS department
13	There is a set of organizational goals and objectives for the IS department
14	User departments view IS staff as competent
15	The IS management actively participants in IS planning
16	Top management actively participates in IS planning
17	The planning horizons for business and IS plans are similar
18	Users actively participate in IS planning

McLeod and Smith [21] identify two key enablers of an effective fit between ITG and strategy: ITG training and external support. ITG training here counts as the training needed to equip the employees assigned to carry the IT project. Within the same perspective, businesses often need to train relevant employees to implement ITG given the absence within firms of formal guidelines or dedicated management architectures. On the other hand, external support allows organizations to make use of external consultants and vendors, thereby buying in the expertise necessary to run in-house ITG.

Gottschalk [10] emphases that to ensure alignment between ITG and an organization, it is essential to understand the organizations themselves and their business processes before seeking to implement ITG. At the same time, he stresses the importance of the financial resources allocated to the project, which need to be adequate if projects are to succeed. Gottschalk also stresses the need for adequate human resources, adequate project time and a skilled and committed project champion.

There is reason to believe that these enablers can be transformed into inhibitors by their absence (i.e. rushed projects, lack of project sponsorship and

badly prepared staff can lead to ITG projects failing or having to overcome serious obstacles on the way to success).

Gerrard [8] argues that a support mechanism for ITG processes such as the project management office (PMO) is an important enabler in successful implementation (and similarly, the lack of such an office may act as an inhibitor of success).

Weill and Ross [33] nominate a number of critical factors in ITG success, namely the support of senior management, clear ITG principles and clear IT processes. Here, senior management support and sponsorship is accounted the key requirement for ITG to be implemented successfully. It is also critical to establish distinct ITG principles which originate from business strategies of the company. Further, Weill and Ross describe as important the existence of clear IT processes relating to systems development, IT architecture development, the outsourcing of IT services and their costing, as these processes meet variety of business needs.

Table 3: Obstacles of ITG implementation

Obstacles of ITG implementation	• 3Cs: Culture, Resistance to Change, lack of Appropriate Communication • Internal Politics • Resistance to acceptance of standard/policies • Resistance to accept accountability • Obtaining sufficient business involvement in governance initiatives

Though scholars and practitioners have vigorously debated concepts and frameworks in ITG, we found few studies concerned to identify potential obstacles in ITG implementation, However, PwC and ITGI [25] surveyed 50 CIOs around the globe, yielding a dozen of factors which either positively or negatively affect ITG (as shown in table 3).

The authors further defined the CSFs in surmounting these barriers: These were (1) defining a sound set of performance indicators, (2) involving management in IT initiatives, and establishing good communication between IT and business units, (3) driving change through strong personalities able to overcome resistance, (4) ensuring that senior management was visibly behind ITG initiatives and (5) putting in place a well-defined and strongly managed process for exceptional cases or processes [25]. Unless these features have been built into a longstanding corporate architecture for ITG, investigation suggests that they may also serve as inhibitors.

Letsoalo et al. [20] investigate the enablers and inhibitors of ITG implementation considered as an IT project. They identified 12 factors namely (1) Senior management support, (2) Organizational analysis, (3) Clear governance principles, (4) Clear IT processes, (5) Support for ITG processes, (6) ITG training, (7) Financial Resources, (8) Adequate Human Resources, (9) a Project Champion, (10) Adequate Project Time, (11) Stakeholder Involvement and (12) External Support. Running a case study of a large South African enterprise based on the COBIT ITG framework, the authors distinguished three key enablers: senior management support, a project champion, external support, and 3 key inhibitors: the lack of clear IT processes, inadequate human resources assigned, and inadequate stakeholder involvement across firms' organizational areas.

Table 4: 15 most important processes of COBIT

Ref	Processes of COBIT
PO1	Define a strategic IT plan
PO3	Determine technological direction
PO5	Manage the IT investment
PO9	Assess risks
PO10	Manage projects
AI1	Identify automated solutions
AI2	Acquire and maintain application S/W
AI5	Install and accredit systems
AI6	Manage changes
DS1	Define and manage service levels
DS4	Ensure continuous service
DS5	Ensure systems security
DS10	Manage problems and incidents
DS11	Manage data
ME1	Monitor the process

Guldentops et al. [11] provide a self-assessment tool to benchmark the IT control and governance maturity of 168 different organizations in both public and private sectors. The authors selected the 15 most relevant processes as the CSFs of effective implementation, further ranking most businesses' IT maturity level between 2.0 and 2.5 (see table 4) [11; 12].

Table 5: Driving and inhibiting forces of ITG maturity level

Driving forces	• Reputation and trust • Legal regulatory contract compliance • Performance improvement • Risk Reduction • Cost Reduction • Mission and goals • Corporate values • Competitive environment • External political/economical environment
Inhibiting Forces	• Budget limitation • Resource Priorities • Resource Conflicts • Availability of skilled staff • Management awareness • Management commitment • No easy solution • Existing architecture • Lack of ownership • External political/economical environment • Lack of tools

Based on the survey results, a number of driving forces and inhibitors in ITG were proposed with the aim of enabling management to monitor and drive strategic IT initiatives, thus growing their firms' IT maturity levels (as shown in table 5).

While a number of articles have focused on the alignment of IT with business strategy (as it is an important part of ITG), ITG research has yet to be explored theoretically from a holistic perspective. Therefore, a novel approach to analyzing and understanding ITG practices is required, which in our study rests on rigorous statistical techniques.

2.4 Summarized Framework for ITG inhibitors in research model

As all these limitations regarding inhibitors in the literature apply in our research model, we categorize them in terms of their characteristics, making an attempt to determine their common properties. Finally the model considers seven factors. We discounted useless inhibitor categories such as 'no easy solution' etc. and also excluded confusing items such as 'managerial leadership', 'external political or economical environment' etc. which have difficulties being measured by a quantitative tool. Our findings are summarized and categorized in table 6.

In considering the framing of these seven inhibitors as the dependent variables of our research model, we eliminated two factors, 'Inadequate organizational cultures' and 'Inadequate support for time resources.' According to surveys carried out by PwC & ITGI for CIOs of global companies, dishonest organizational cultures represent one of the most important inhibitors, given that businesses rely on such cultures to conduct operations. But although this term merited inclusion on this basis, it proved difficult to capture using quantitative tools.

Further, Gottschalk [10] insists that allowing sufficient time allocation to ITG projects is an important factor in successful ITG project implementation. However, we did not consider time because it is not our aim to measure ITG projects as a single time event amongst organizations' IT-related activities. We rather see ITG success as involving long term planning, requiring companies to perform the correct analytical procedures in cooperation with IT units conceived as strategic partners. Although we might not make completeness in set-up an inhibitor factor in this framework, we expended a certain amount of effort in defining redundancy and omission in these areas.

In the next section, we provide a research model derived from the above summarized framework of inhibitors. We use five categories of inhibitor, drawing on all our above sets except 2 (Inadequate organizational cultures and Inadequate support of time resource). Our revised inhibitors also serve as a measurement tool.

Table 6: Summarized Framework for ITG inhibitors

	Category	Inhibitor	Ref
1	Inadequate Stakeholder Involvement	◆ Difficulties in obtaining sufficient business involvement in ITG initiatives	[25]
		◆ Inadequate External or Internal Support	[21] [10]
		◆ Internal Politics	[25]
		◆ Resistance to Change	[25]
		◆ Resistance to Acceptance of Standard/Policies	[25]
		◆ Resistance in Accepting Accountabilities	[25]
		◆ Inadequate Human Resource Management	[10]
		◆ Inadequate Involvement in ITG	[21]
		◆ Lack of Ownership	[11]
2	Lack of Clear ITG Principles and Policies	◆ Failure of senior executives to support IT	[17]
		◆ Lack of IT management support	[17]
		◆ Senior management support	[33]
		◆ Clear ITG principles	[33]
		◆ Organizational Analysis	[10]
3	Inadequate Organizational Cultures	◆ IT does not prioritize well	[17]
		◆ Culture (societal/internal)	[25]
4	Lack of Communication	◆ IT/Business lacks close relationships	[17]
		◆ IT does not understand business	[17]
		◆ Lack of appropriate communication	[25]
5	Lack of Clear ITG Processes	◆ IT fails to meet its commitments in IT related processes	[17]
		◆ Support for IT Governance processes	[8]
		◆ Lack of Clear IT processes	[33]
6	Inadequate Support for Financial Resources	◆ Budget Limitations	[10] [11]
7	Inadequate Support for Time Resources	◆ Project Time	[10]

3. Research Methodology

Based on studies of the current literatures and summarized framework of inhibitors, we developed a research model putting in place operational definitions of a set of both dependent and

independent variables. The model was then used to test 5 research hypotheses.

3.1 Research Model and Hypotheses

The model set out to determine the causal relationship between five synthesized ITG inhibitors and firms' enterprise ITG success, as shown in figure 1.

In general, inhibiting factors have negative effects on organizational ITG performance. Our inhibitors synthesize many of the features described in the literature, being classified in terms of their characteristics. The research model developed to answer question 1 is used to answer hypotheses concerning the relationship between inhibitors and ITG success i.e. in answer to question 2.

As the five inhibitors, we selected 'lack of communication', 'inadequate stakeholders' involvement', 'lack of clear ITG principles/policy', 'lack of clear ITG processes, and 'inadequate support of financial resources' as independent variables. We also assumed that these inhibitors will affect both IT management performances and other firm performance variables, as defined in the literature (e.g. ROA, Process improvement, corporate governance). However, we limited our research scope to measure firms' ITG maturity levels, on account of the difficulty demonstrated in earlier research to relate other aspects of firm performance to IT performance in a measurable way. The dependent variable is general and comprehensive.

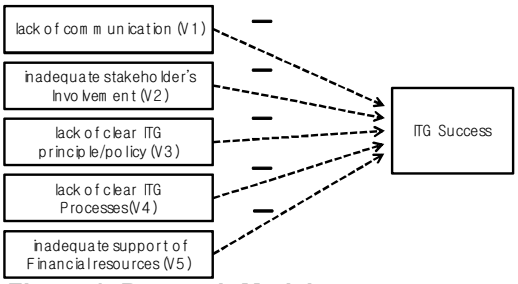

Figure 1: Research Model

The following five hypotheses set out purported empirical relationships between inhibitors and firm's ITG success:

H1. Lack of communication will have a negative effect on ITG success.

In academic fields, Luftman et al. [17] point that a lack of close relationships is the most important inhibitor for business-IT strategic alignment. Given the importance of strategic alignments in ITG, we may take 'lack of close relationship' as a measurement item for communication problems in this research. Furthermore, though many scholars have advanced conceptual frameworks for ITG, PwC & ITGI [25] have announced that one of the hardest-to-surmount practical obstacles to effective ITG implementation is a lack of communication through the entire body of organization. Further, Teo and Ang [29] consider communication between business and IT in securing alignment as their fifth important CSF. Hence, we can consider that lack of communication has considerable potential to inhibit ITG in Korea.

H2. Inadequate stakeholder involvement will have a negative effect on successful ITG implementation

PwC & ITGI [25] also report that ITG projects' failure sufficiently to interest senior management and other stakeholders counted as a significant inhibiting factor in the eyes of many CIOs. Many business employees feel that IT is crucial for business operations, but are unwilling to pay attention to IT issues other than where they come into contact with their own processes and tasks. These intra-business alignment concerns lead to staff involving themselves inadequately in IT planning, amounting to a significant risk factor in successful ITG implementation.

H3. Lack of clear ITG principles and policies will have a negative effect on successful ITG implementation

Weill and Ross [33] emphasize that the observation of ITG principle and policies derived from companies' strategic direction are very important for ITG success. For these authors, each company should rely on principles already in place for the support of their ITG development. Different company business strategy will determine the settings of company ITG policies. Few Korean companies, however, can put their hand on documentation of standardized IT principles worked through over the long term by management. Companies rather tend to view IT as a supporting function rather than a strategic partner [22]. The formulation of clear IT policies requires the support and involvement of senior management, who should be engaged at the stage of principle design. Thus the failure of some Korean companies to involve managers sufficiently can be counted another significant inhibiting factor in ITG success.

H4. Lack of clear ITG processes will have a negative effect on successful ITG implementation

While having IT processes in place supporting business, many companies wish to improve their processes, driving up productivity through some specific program or forms of re-engineering. In this way businesses have turned to the ITIL (IT infrastructure Library). In the area of ITG resource management, it is critical to set out clear processes for managing efficient forms of IT organization [8].The lack of such process may impair the effectiveness of ITG implementation in Korea.

Table 7: Operational Definition of Variable

Variable	Definition	Measurement Items	Source
lack of communication (V1)	Cross understanding and reliability among members of organization	◆ Level of IT/Business close relationship. ◆ Level of reliability across business/IT. ◆ Inter-organizational task comprehensive level. ◆ Opening level of Business and IT. ◆ Frequency level of meetings between IT and Business.	[17] [29] [25]
inadequate stakeholder's involvement (V2)	Degree of participation in ITG activities	◆ Stakeholder's involvement rate in ITG initiatives. ◆ Internal/external Stakeholders' support on ITG initiatives. ◆ IT fulfillment level for business request. ◆ Top managements' concerning level on ITG initiatives.	[21] [11] [10] [20] [25]
lack of clear ITG principle/policy (V3)	Established level of Senior managements' concern and support to set up IT principles and policies	◆ Established level of clear ITG principles. ◆ Established level of clear ITG policies.	[33] [11] [10]
lack of clear ITG processes (V4)	Established level of ITG processes	◆ Level of well-defined and strongly managed IT processes. ◆ Level of defined sound set of performance indicators.	[17] [33] [11] [25] [20]
inadequate support of financial resources (V5)	Level of sufficient financial support in governance initiatives	◆ Adequate Level of financial support in governance initiatives. ◆ Degree of investment on IT.	[11] [10] [15]
ITG Success	Enterprise wide maturity level of ITG performance.	◆ Degree of IT used in an integrated way to automate the IT workflow. ◆ Level of considering the criticality of IT processes in business changes. ◆ Level of regularity of self-performed assessment exercises confirming correct settings of IT controls i.e. Meeting business' required maturity level. ◆ Degree of standardization, documentation and formulation of ITG processes.	[16]

H5. Inadequate support of financial resources will have a negative effect to their success of ITG.

As Guldentops et al.'s [11] self-assessment survey tool suggests, many companies have difficulties associated with budget limitations, preventing them for implementing ITG successfully. Also, companies may not be able sufficiently to invest in ITG projects because their technology spend is structured across a broader investment portfolio. This may also have a negative effect on ITG in Korea.

As noted, few empirical works specifically examine inhibitors in ITG implementation. Hence, we set up conceptualized operational definitions of inhibitors to be used in this research as shown in table 7. Through the summarized framework above, we use categories in the framework as inhibitor factors, also examining inhibitors identified in the literature review as measurement items for the purposes of conducting empirical analysis. These measurement items derive from the special characteristics of features cited in the research literature. To measure lack of communication item, for example, the question 'we and our business unit do not have periodic meetings in initiatives of ITG" were used. In here, 1 point means strongly agree and 5 point means strongly disagree.

We also set up dependent variables in ITG success, using an ITG maturity level measured by the widely-used scale COBIT 4.1. As referenced by COBIT 4.1 maturity model, we devised operational definitions and measurement items as shown in table 7.

4. Hypotheses Test and Result Analysis

4.1 Survey Questionnaires and Data Collection

To perform this explanatory research, the leading 96 Korean companies (who expressed an interest in ITG reform) were selected. The reason for selecting Korea enterprises in this research is that there are very few studies of ITG in Korea as against in US or Europe [19]. Additionally, the fact that most Korean companies have yet to reach a maturity level indicates the importance of successful ITG [22].

The relative paucity of Korean companies at an IT maturity level, then, suggested Korea as a useful

setting in which to perform this research. We also had to consider whether the 96 companies genuinely had any intention of implementing ITG. Before selecting sample companies, we asked this question, selecting in consequence a number of finance companies to whom it is a business prerequisite. Many manufacturing companies, meanwhile, were unaware of ITG and had no plans to implement it. As a result our sample largely consists of Korean finance companies.

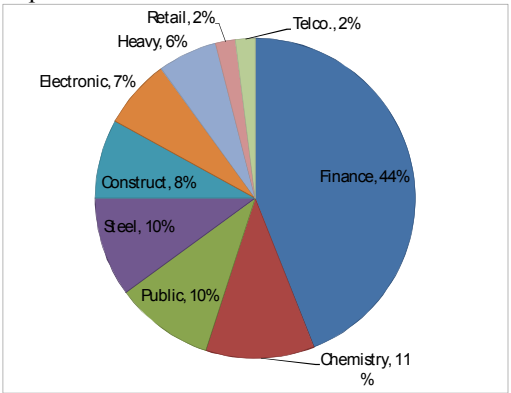

Figure2: Percentage of industries

In this study, the large number of responses showcases findings from a wide range of different industries. Respondents' profile, as shown in figure 2, was 44% from the financial industry, 8% from construction 11% from chemicals, 10% from the public sector and steel industries, 7% from electronics, 6% from heavy industry and 2% from telecommunication and retail.

The majority of the respondents are from financial industry since they have to comply with international financial regulation and standards such as Sarbanes-Oxley Act (SOX), which advocated auditor independence and enhanced systems of corporate governance and financial disclosure.

Research survey was conducted at firms' enterprise level between May and June 2007, taking as its respondents firms' project team planning managers and IT department heads. The survey dealt with many areas of ITG practice, relying on questionnaires putting 5-point Likert's scale questions for each item. The survey also circulated to respondents a brief description of the research purpose, together with working definitions of ITG. No data needed to be discarded on account of incompleteness.

4.2 Validity and Reliability Analysis

In this study, factor analysis was conducted for structural validity, in other words measuring the convergent validity and discriminant validity of survey items; these were evaluated by factor load and Eigen value according to VARIMAX rotation methods.

Factor loads show what variables are most related to which factors and loadings of 0.45 to 0.54 are considered fair, 0.55 to 0.62 are considered good, 0.63 to 0.70 are considered very good, and above 0.71 are considered excellent [4]. The items for factor analysis result measurements scored above 0.5 for factor loads and above 1.0 for Eigen values.

Hence, in this study, set variables met the criteria necessary for both convergent and discriminant validity. Variables were thus used for hypothesis verification; table 8 and 9 shows that all variables were valid.

A reliability analysis of our findings is presented also in Table 8 and 9 below. A value of Cronbach's Alpha is 0.6 or higher, it is generally considered reliable, meaning that research variables here are reliable [23].

Table 8: Factor Analysis Results of ITG Inhibitor Variables (KMO: .754)

V	E	1	2	3	4	5	α
V1	(1)	**.780**	.158	.000	.363	.007	**.835**
	(2)	**.767**	.209	.191	.026	.264	
	(3)	**.700**	.299	-.035	.325	.119	
	(4)	**.682**	.104	.435	-.312	-.054	
	(5)	**.632**	.335	.318	.037	-.075	
V2	(1)	.193	**.798**	.114	.187	.008	**.828**
	(2)	.499	**.720**	.084	-.044	.168	
	(3)	.202	**.706**	.342	.117	.027	
	(4)	.178	**.671**	.167	.192	.157	
V3	(1)	.058	.044	**.787**	.148	.228	**.795**
	(2)	.137	.200	**.705**	.211	.037	
	(3)	.133	.224	**.639**	.116	.116	
	(4)	.294	.452	**.583**	.318	-.052	
V4	(1)	.104	.138	.220	**.797**	.102	**.745**
	(2)	.142	.256	.364	**.720**	.094	
V5	(1)	.164	-.099	.197	.259	**.824**	**.663**
	(2)	-.002	.422	.185	-.072	**.787**	
Eigen values		6.70	1.79	1.23	1.18	1.14	

Table 9: Factor Analysis Results of ITG success variable

Variable	Element	1	α
ITG success	(1)	**.817**	**.782**
	(2)	**.810**	
	(3)	**.706**	
	(4)	**.683**	
	(5)	**.656**	
Eigen value		2.720	

4.3 Analysis of Research Results

After reliability and validation procedures to analyze causal relationship effects between inhibitors and firms' ITG success, we conducted analysis of descriptive statistics and multiple regression analysis as standard to separate out the effects of independent

variables. Our research results and verifications are shown below.

4.3.1 Analysis of Descriptive Statistics Analyzing the descriptive statistics in table 10, five inhibitors showed comparatively different standard deviations. 'Inadequate stakeholders' involvement (V2)' and 'lack of clear ITG processes (V4)' have the biggest values among five factors. The suggestion here is our 96 companies put forward different explanations as to the critical success or failure factors in ITG implementation in Korea. Further, 'inadequate support of financial resources (V5)' shows the lowest values among 5 factors, suggesting that 96 companies merely agree with their identification as inhibitors.

As we can see from the mean values of inhibitors in table 10, 'lack of clear ITG processes (V4)' shows the lowest value, while 'inadequate support of financial resources (V5)' the biggest mean value.

Table 10: Descriptive Statistics

Variables	Range	Mean		Standard Deviation
		Statistic	S.E	
V1	2.60	**2.56**	.056	**.552**
V2	2.75	**2.86**	.071	**.697**
V3	2.00	**2.57**	.054	**.532**
V4	3.00	**2.52**	.071	**.701**
V5	2.50	**3.06**	.050	**.498**

4.3.2 Verification of Research Hypotheses Results suggested all the independent variables correlated significantly to firms' ITG success i.e. these variables all had significance values lower than 0.001. So, it is supported that these 5 inhibitors are have negative affection to the ITG success in Korea.

The supposed causal relationships between ITG inhibitors and its success variables were verified for all five hypotheses. No variables were rejected by the study, and the regression explanation could be seen as reasonable (R^2 value = .683), strongly supporting the research model set out in figure 1.

Table 11: Results of the Research Hypotheses Test (R^2 = .683)

	Un-standardized Coeffici ents	Standardized Coeffic ients	t	Sig.	Test Results
	B	β			
Cons tant	9.53E-17		.000	1.000	
V1	-.372	-.372	-6.267	.000***	Supported
V2	-.329	-.329	-5.542	.000***	Supported
V3	-.449	-.449	-7.559	.000***	Supported
V4	-.439	-.439	-7.397	.000***	Supported
V5	-.203	-.203	-3.414	.001**	Supported

Dependent Variable: ITG success
** p<0.01, *** p<0.001

The supposed causal relationships between ITG inhibitors and its success were verified for all five hypotheses. No variables were rejected by the study, and the regression explanation could be seen as reasonable (R^2 value = .683), strongly supporting the research model set out in figure 1.

Data analysis results showed that all inhibitor variables had a negative effect on the dependent variables (all $\beta<0$). Of these, the lack of a clearly formulated IT policy had the biggest effect on ITG success (β = -.449, $p<0.001$) as shown in table 11. Lack of clear ITG processes (like COBIT, ITIL, EA…etc.), lack of communication, inadequate stakeholder involvement (either of other areas of the business or an external consultant) also affected ITG success. However, inadequate financial support had a less significant negative effect on ITG success among the independent variables (β= -.203, $p<0.001$). We can thus conclude that the five inhibiting factors strongly influence firms' failure to reach ITG success, serving to threaten the success of ITG implementation strategies.

These results promise to be very meaningful to academics and practitioners faced with the initial situation of needing to implement effective ITG. Through these results, we can recognize that many Korea companies tend to perceive IT organization as merely a department supporting enterprises' operational business functions. The lack of IT principles or policy in Korean companies can suggest two things. First, companies might have no need to set up a policy framework for governance, since they only use IT for operations. Second, companies may not have formulated IT policies because they believe they would prove useless or ineffective to their business. However, it is doubtful that many leading Korea companies do not want to optimize their use of IT. The inference is that Korea companies do not know how to achieve ITG success (especially setting correct IT principles/policy) through a transformative application of frameworks such as COBIT, ITIL, EA, etc.

On the other hand, it is surprising that inadequate financial resources are the least important reason for ITG failure. As many Korean companies have had low ROI on their IT assets for decades, it is possible that companies may lack confidence in articulate any overarching IT principles or policy, as highlighted by our research results.

Companies have devised formal governance mechanisms for both IT and business units. There is a further need for companies to continuously monitor the setting of IT principles and their cascading to other parts of organization (e.g. marketing, strategic planning). Using such ITG frameworks as COBIT, Enterprise Architecture, ITSM/ITIL, IT/IS BSC will help to enhance ITG implementation and also provide clear IT management processes identifying the necessary steps in governing integrated IT processes.

5. Conclusion

This research synthesized past research on inhibiting factors of ITG and conducted an empirical analysis of the causal relationships between critical inhibitors and firms' ITG success in Korea. The research results may be summarized as follows.

A literature review derived five synthetic factors in the failure of ITG implementation schemes: 'lack of IT principles and policies', 'lack of clear ITG processes', 'lack of communication', 'inadequate stakeholder involvement', and 'inadequate financial support'. We also considered further conceptual inhibitors (e.g. lack of senior managements' leadership), but limitations of quantification led us to confine ourselves to the most real relevant factors to ITG success in Korean companies. Although our variables might not sufficient for the study of all the types of inhibitors conceivably interrupting the optimization of firms' ITG success, they are nevertheless reliable and realistic enough to provide future studies a basis in their own investigations. Further, our identification of variables is robust enough to be applied in practical fields where managers seek to implement ITG successfully.

The most important finding of this research is that many Korean enterprises do not set up clear IT principles/policy optimizing their IT values. This probably owes to a decades-long history of Korean companies failure to realize the full value of their IT investments. Until now, many companies have persisted in a view of IT departments as simply supporting other business processes, refusing to see IT as a strategic business partner. In this situation, businesses are genuinely unaware of how they might achieve ITG success.

The study lays down a conceptual foundation for future work on inhibitors in ITG implementation; in this regard, its key contribution will be to help managers to implement IT plans on a good basis. The research should also be valuable to practitioners seeking to improve their control and coordination activities with regard to IT, or to improve the strategic alignment of IT with the rest of their business. Plans that take account of inhibitors (and of the CSFs associated with their avoidance) are more likely to succeed in implementing comprehensive ITG plans.

Furthermore, these five inhibitors can be cascaded to representative performance indicators to measure and improve the maturity level of ITG. This is especially true since the research accepts all five hypotheses. The study is also valuable in an empirical sense, in that it presents a realistic measurement of inhibitors in ITG, which had not so fully existed prior to this work. But we should also draw attention at this point to the study's limitations. It deals exclusively with Korean, rather than with a range of multinational, companies; and cannot hope to capture all the factors that conduce to ITG success and failure. Therefore further work needs to be carried out on ITG inhibitors in a global context.

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