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International Conference on Information Systems (ICIS)

December 2003

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THE ROLE OF KNOWLEDGE IN INFORMATION TECHNOLOGY PROJECT GOVERNANCE

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Abstract

IT governance, the distribution of decision-making concerning IT, has primarily been studied at the organizational or, more recently, the business unit level. However, many IT decisions take place in the context of IT projects, making it important to understand governance issues at the project level. This research develops a project-level conceptualization of IT governance that draws from both the governance and project management literatures. A model of how IT project governance arrangements are influenced by the distribution of business and IT knowledge and the impact on project performance is also proposed. This model will be tested using matched surveys from business and IT managers involved in IT projects.

Keywords: Project governance, knowledge, project performance, survey

Introduction

The governance of information technology (IT) has emerged as a management challenge facing organizations. This concept has primarily been studied at the organizational or, more recently, the business unit level. Research in this area has yielded valuable insight into how and why IT decision-making is split between business units and the corporate IT. While IS professionals and researchers tend to think about governance in terms of centralization or decentralization of the IT function (Alter 1994; Berkman 2001), many IT decisions take place within the context of specific IT projects. IT projects can be thought of as the point "where the rubber meets the road" for IT decision-making. Just as there are differences between units within an organization, making different governance arrangements necessary, there are differences between individual projects. This suggests that it would be valuable to understand governance in terms of the roles played by business and IT units at the project level.

This research explores how the characteristics of the IT and business processes involved in a project impact project governance and performance. Particular emphasis is placed on understanding the distribution and transferability of knowledge between business and IT units.

IT Project Governance

IT governance has traditionally been defined strictly in terms of authority relationships between business and IT units (Sambamurthy and Zmud 1999). However, at the project level, views of governance need to be expanded to address the roles that are played by business and IT units in decisions regarding a project and how those decisions are carried out. This is especially true considering the push for business unit participation and involvement (Barki and Hartwick 1989) and ownership of IT projects (Avital and Vandenbosch 2002; Brown and Sambamurthy 1999; Kirsch et al. 2002) that is apparent in the IT literature. This research therefore categorizes project governance in terms of *authority*, *responsibility*, and *participation*.

Authority reflects the location of decision rights to make final decisions or have the final "say so." This concept lies at the heart of traditional views of governance in that it represents formal reporting relationships. This is clearly necessary to understand IT project governance. However, the project control literature (Henderson and Lee 1992; Kirsch 1997) shows that *governance* can be exerted outside the bounds of authority or reporting relationships. Looking at only formal authority does not fully capture project governance.

Responsibility is defined as the duty or obligation to perform various tasks. This includes having accountability for the specific action being completed and the results. Within an IT project, who is assigned and held responsible for various tasks is an essential aspect of governance. Responsibilities without authority or authority without responsibility are telling features of the governance arrangement. Including responsibility affords a deeper view of the true governance of a project than looking only at authority.

Participation is the third aspect of project governance used in this research. This has been a topic that has been widely studied in the IT literature (Barki and Hartwick 1989). End user participation is widely discussed as an important element of successful IT and as a means for closely linking business and IT interests. The ability to influence, through participation, the decisions associated with a project represents a different mechanism for affecting project decisions and helps clarify the roles played by various constituencies.

Knowledge and Project Governance

Typically the attention in governance focuses only on who makes particular decisions. A central question relating to IT project governance must also be: *Who is most capable of making specific IT decisions?* This question highlights a specific point about IT decision-making: successful IT requires knowledge of both the business processes and technologies. This suggests that the distribution of knowledge should play a key role in determining the appropriateness or inappropriateness of a project governance arrangement. Recent organizational research supports this assertion by highlighting the importance of an organization's underlying knowledge in effective organizational designs (Birkinshaw et al. 2002). In the context of an IT project, the distribution of knowledge between the IT and business units involved in a project is especially important because of the specific nature of the decisions that must be made.

Jensen and Meckling (1992) argue that decision makers must have access to the necessary knowledge when making decisions. This suggests that the location of decision-making should, at least in part, be determined by the location of the necessary knowledge. At the IT project level, knowledge of the business processes being supported and knowledge of the technologies that will be used are both essential to the success the project (Kirsch 1996). These two domains of knowledge, IT and business process knowledge, while both important, are not necessarily evenly distributed or collocated. The extent to which business units have knowledge of IT and the extent to which IT units have knowledge of the business processes being supported directly impact the utility of placing more or less governance with a particular unit.

Business Unit Knowledge of IT

The need to have technology-competent managers has been stressed as an important component of effective IT within organizations (Keen 1991; Sambamurthy and Zmud 1992, 1994). Knowledge of IT by business managers has been related to alignment (Reich and Benbasat 2000) and IS group performance (Nelson and Cooprider 1996).

Knowledge of IT encompasses the ability to both evaluate and implement technologies (Bassellier et al. 2001). This included an understanding of strategic impacts, technologies, methodologies, and systems within the organization. For IT projects, there is an understanding of IT that is inherent in many aspects of the development process. Lack of IT knowledge within a business

unit makes it difficult or impossible for the business unit to accept responsibility or authority for the project. Lack of knowledge would also limit the extent to which the business unit can participate in project decisions. Conversely, higher levels of knowledge will allow, and possibly even encourage, the business unit to accept responsibility and authority, as well as increase levels of participation. This suggests

Hypothesis 1: *Higher levels of business unit knowledge of IT will be associated with greater business unit governance of the projects.*

IT Knowledge of Business Processes

Since IT must support business processes, knowledge of those underlying processes must be included in actions and decisions. While knowledge of IT by business unit managers has been emphasized in the literature, significantly less attention has been paid to IT professionals' knowledge of business processes (Avital and Vandenbosch 2002; Keen 1991; Sambamurthy and Zmud 1992, 1994). This knowledge includes knowledge of important tasks, procedures, and relationships with external entities. However, when an IT department has sufficient knowledge of relevant business processes, IT personnel can make more appropriate IT decisions.

In the context of IT projects, much of the need for end-user involvement and control relationships stems from IT's lack of knowledge about business processes. On the other hand, when IT personnel are knowledgeable about the business processes, they are more able to "take the ball and run with it," accepting higher levels of responsibility and authority. This suggests

Hypothesis 2: *Higher levels of IT unit knowledge of the business processes will be associated with greater IT governance of the projects.*

Shared Knowledge

Increasingly organizations are moving toward governance arrangements that distribute responsibility between the business unit and the IT department. In order for this relationship to work, both groups must have knowledge in the others' domain. This requires having shared knowledge or a common language (Nelson and Cooprider 1996). Research has found that shared knowledge leads to higher mutual understanding and commitment (Reich and Benbasat 2000) and higher IS group performance (Nelson and Cooprider 1996). When the business unit and IT share knowledge, governance can also be shared.

Hypothesis 3: *Higher levels of both business unit knowledge of IT and IT knowledge of business processes will be associated with shared IT project governance.*

In some circumstances, both business unit knowledge of IT and IT knowledge of business processes can be low. In this situation, IT decision-making must be shared to compensate for the lack of knowledge on both sides.

Hypothesis 4: *Lower levels of both business unit knowledge of IT and IT knowledge of business processes will be associated with shared IT project governance.*

Table 1 summarizes the above hypotheses.

Table 2. Relationship between Knowledge and IT Project Governance

	IT Knowledge of Business Processes	
Business Unit Knowledge of IT	**High/High*** *Shared***	**High/Low** *Business Unit*
	Low/High *IT*	**Low/Low** *Shared*

*The first term indicates level of business unit knowledge of IT; the second term indicates level of IT unit knowledge of business processes.
**The italicized term indicates the predicted governance location.

Project Performance

It is widely accepted that the management of IT projects is a difficult task and that the ability of an organization to meet the IT needs of organizational stakeholders is important. While no project governance structure is inherently better than another, prior arguments suggest that an organization's knowledge would make some structures more appropriate based on how that knowledge is distributed (Table 1). Matching authority, responsibility, and participation with the location of knowledge, or allowing for some form of shared governance when knowledge is collocated or low, would create appropriate governance arrangements. When decision-making processes include knowledge of IT and business processes through appropriate governance, the ability to make appropriate decisions, drawing on knowledge from both domains, increases. When decision-makers do not have this knowledge, this will not be the case. Performance will suffer when governance is not associated with higher levels of knowledge, since either technical or business considerations will be underrepresented. Therefore,

Hypothesis 5a: *Shared governance will result in higher project performance success when business units possess greater IT knowledge and IT units possess greater business process knowledge.*

Hypothesis 5b: *Shared governance will result in higher project performance success when business units possess low IT knowledge and IT units possess low business process knowledge.*

Hypothesis 5c: *Business unit governance will result in higher project performance success when business units possess greater IT knowledge and IT units possess low business process knowledge.*

Hypothesis 5d: *IT governance will result in higher project performance success when business units possess low IT knowledge and IT units possess greater business process knowledge.*

Knowledge Transferability

Both business and IT units have knowledge related to specific contexts within the organization that includes specific business process knowledge and specific knowledge of the IT environment within the organization. The ability to transfer this knowledge between IT and the business unit represents an important consideration in IT project governance. When knowledge necessary for making project decisions is easily transferred, the necessity of aligning knowledge and project governance is decreased. This can occur in scenarios where the IT environment is relatively stable, noncomplex, easily codified, and the knowledge is not specific to a particular system or set of experiences. A similar situation could occur with knowledge needed to make decisions regarding the business processes within a business unit. When IT personnel can easily obtain knowledge about the business processes, it is possible for effective decision-making to occur within the IT unit that still meets the specific needs of the business unit. This suggests

Hypothesis 6: *The relationship between project governance and performance will be moderated by knowledge transferability.*

Methodology

This research utilizes matched survey responses from the lead business unit and IT managers associated with IT projects. These individuals are first identified by senior IT management and then sent surveys pertaining to specifically identified projects. Senior IT executives are asked to identify projects that meet the following criteria: (1) recently completed or ongoing with at least one major deliverable completed, (2) strategic or business application projects, and (3) internal development efforts or involved substantial internal customization. The executives were also asked to identify the primary business unit and IT manager associated with each project.

The use of matched responses allows governance issues to be examined from both the IT and business unit perspective. Business unit knowledge of IT and IT knowledge of business processes are included on both sets of surveys to examine perceptions of knowledge from both sides. IT managers are asked to indicate levels of authority, responsibility, and participation for the IT unit across various project decisions and activities. Business unit managers indicate these levels for the business unit. Together these two perspectives will be used to assess the governance structure for the project. Knowledge transferability is measured using two

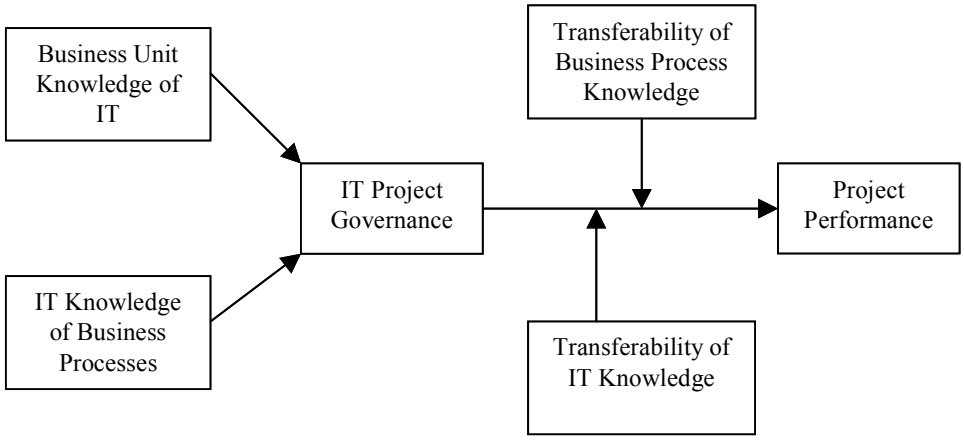

Figure 1. Knowledge, IT Project Governance, and Project Performance

separate scales, one for the transferability of IT knowledge (on the IS survey) and one for the transferability of business process knowledge (on the business unit survey). Both scales measure the transferability of knowledge related to the project using four sub-constructs: complexity, specificity, stability, and codifiability. These constructs were identified from the knowledge transfer literature (Kogut and Zander 1996; Rivkin 2001; Szulanski 1996; von Hippel 1998). Whenever possible, items were adapted from previously developed instruments. Specific items are shown in the Appendix.

Project performance is also measured from both IT and business unit perspectives. Items were adapted from previously developed instruments (Aladwani 2002; Nidumolu 1995) and measure performance of both project processes and the completed deliverables. Additional items are also included as control variables including measures of project size, importance of the project, and fit with organizational and business unit strategy. Because of space limitations, these items were not reproduced here.

Table 2 summarizes constructs in the model and the respondents for each.

Table 2. Model Constructs and Survey Respondents

Construct	Respondent
IT Project Governance	Business Unit and IT Managers
Business Unit Knowledge of IT	Business Unit and IT Managers
IT Knowledge of Business Processes	Business Unit and IT Managers
Transferability of Business Process Knowledge	Business Unit Managers
Transferability of IT Knowledge	IT Managers
Performance	Business Unit and IT Managers

Current Status and Expected Contribution

As of this submission,the instruments have been developed and pretested and data collection is underway. By the time of the conference, the data collection and analysis will be complete.

This research offers many contributions to the information systems literature dealing with the relationship between IT and business units in the development and implementation of IT within organizations. First, it develops a project level conceptualization of IT governance, the project being the context where many IT decisions are made. It expands on research from both the traditional IT governance literature, which looks at relationships at the organizational or business unit level, and the project management literature. Views of governance for the project are expanded to include not only authority, but also the extent of responsibility and participation in project decisions. Second, this research proposes a model of how IT project governance arrangements are influenced by the distribution of both IT and business process knowledge. The research also looks at knowledge transferability,

as an additional factor on the impact of project governance arrangements. Another contribution can be found in examining the impact of the governance structure on IT project performance. This research could help us to understand how the nature of IT and business knowledge impacts project performance, allowing for a better understanding of steps that could be taken to increase the success of IT projects.

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Appendix: Survey Items

Knowledge (1 – to a great extent, 7 – none at all)

Business Unit Knowledge of IT	**IT Knowledge of Business Processes**
Information systems in general	Industry business practices
Information systems within this organization	Your firm's competitors
Strategic uses of IT	Business processes within this business unit
Relevant emerging technologies	Strategies employed by this business unit
Competitors use of IT	Operations within this business unit
Systems development processes	This business unit's present and future products
Difficulties of developing information systems	Important outcomes for this project
Costs associated with information systems	Important performance measures for this business unit
How IT fits into this business unit's overall strategy	Business processes supported by this project
Relationship between IS in this business unit and information systems in other areas of the organization	Relationship between this business unit and other areas of the organization
Information systems support of the business processes within this business unit	Strategic impact of this project
Technologies used in this project	
Development methodologies used on this project	

IT Project Governance

For this project to what extent did members of the [business unit/IT unit] [participate in/have responsibility for/have authority over] (1 – none at all, 7 – to a great extent)

System features, System requirements, Technical specifications, Project schedule, Project budget, Project plan

Transferability of Knowledge (1 – strongly disagree, 7 – strongly agree)

Business Process Knowledge	**IT Knowledge**
The business processes are unique to this business unit.	The technologies used were unique to this project.
Understanding the business processes requires specialized knowledge.	Words, expressions, and terminology describing the technologies were unique to this project.
Understanding the business processes requires specialized training.	Development processes were typical of projects in this company.
The business processes are different from processes in other areas of the organization.	Knowledge learned during this project would not be useful for other projects.
Words, terminology, expressions used to describe the business processes are unique to this business unit.	This project required understanding the interaction of many components.
The business processes involve many interrelated techniques, processes, and individuals.	This project required an understanding of many technologies.
Understanding part of the business process is difficult without understanding the entire process.	This project required an understanding of multiple development methodologies.
It is well known how parts of the business processes interact to produce the output.	The system implemented in this project had to interface with many other systems.
It is difficult to identify all the outcomes of the business processes.	This was a complex project.

The business processes are complex.

The strategies surrounding the business processes frequently change.

The goals of the business processes frequently change.

What people need to know about the business processes is always changing.

The business processes are frequently subject to change.

The business processes are stable over time.

The business processes are easy to describe.

The business processes can clearly be expressed in writing.

A precise list of skills needed to perform the business processes can be created.

A useful manual describing the business process can be created.

The business processes are well defined.

The technical requirements for this project were always changing.

It was hard to keep up with the changes in technology that affected this project.

This project dealt with stable and proven technologies.

The IT environment in the organization is constantly changing.

This project dealt with technologies that were new to this organization.

Technical specifications could be easily documented for anyone to understand.

Methodologies necessary to implement this project could be easily explained.

A useful manual describing the development activities used on this project could easily be written.

It would be difficult to describe activities associated the development of this project to someone not knowledgeable about IT.

It would be difficult to describe activities associated with this project to someone who had not worked on the project.