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Abstract

The implementation of IT project governance (ITPG) is a response to the increased regulatory pressure and the high failure rate of IT projects. Although ITPG is common, there is little research on this phenomenon, and very little is known about the forces that drive ITPG or the process by which such governance is implemented in organizations. This paper presents a process theory of ITPG implementation developed from case studies of five large companies in the financial services industry, using the grounded theory method. The model proposes three phases of ITPG implementation: standardization, centralization, and professionalization, and key drivers of each phase. The paper also shows how the proposed process theory is consistent with and can be integrated with institutional theory to demonstrate ITPG as an institutional process.

Keywords: IT Project Governance, Institutional Theory, Case-Study research, Process Theory, Grounded Theory

1 Introduction

Information technology (IT) projects are known and feared for their high project risk and low success rate. For instance, in 1996, a failed enterprise resource planning project forced FoxMeyer Corp, a $5 billion drug distributor, into bankruptcy. In 1993, the London Stock Exchange abandoned its Taurus paperless share settlement system after spending 11 years of development effort and £400 million on the failed system. In 2005, the United States Federal Bureau of Investigation scrapped its Virtual Case File project after spending four years and $500 million on the failed project (Reynolds 2009). Examples such as these point to the need of not only managing large IT projects better, but also understanding better the process by which such projects should be governed.

The Standish Group (2009) estimates that only about 32% of IT projects are successful in meeting their estimated cost and schedule, and delivering all critical requirements. Another 44% of these projects are challenged (i.e., over budget, late, or missing critical requirements) and the remaining 24% are simply abandoned due to huge cost or schedule overruns or major deficiencies. Given that IT projects are typically the dominant part of the capital expenditure budget in many industries (Balasubramanian et al. 2000), it is not surprising that the success or failure of IT projects can have a significant impact on a company's bottom-line (Soh & Markus 1995). More interestingly, organizations that are successful are unable to replicate that success in future IT projects, and companies that have failed projects are unable to learn from those failures due to the lack of a formal process for IT project governance (ITPG). As an example, after building Sabre, the world's first airline reservation system in the 1980s, AMR Corp. abandoned the Confirm project, a hotel and rental car reservation system, in 1992 after spending four years and $125 million on a failed development effort (Oz 1994).

While project management examines the tools and techniques to successfully manage single projects, project governance can be defined as the management, decision-making, and communication regarding an organization's entire suite of IT projects over time. ITPG has received sparse attention in the project management literature (Henry et al. 2003). In particular, the antecedents, evolution, and outcomes of ITPG still remain to be explored. Furthermore, though many large organizations have some form of in-house ITPG process, very little is known in the form of best practices or "rules of thumb", and to the best of our knowledge, such knowledge has not yet been formalized in the practice literature,

This paper presents a process theory of ITPG implementation in an attempt to add to our nascent body of knowledge in this area. We also try to elucidate the driving forces of such an implementation effort and its organizational outcomes. Our research focuses on the following question: Why and how is ITPG implemented in organizations? In light of the sparse literature on this topic, the inherent dynamic nature of the phenomenon, and a lack of an existing theory base, we opted for a grounded theory approach to answer our research question (Glaser & Strauss 1967). In the next section, we set the stage of our research by clarifying key concepts and summarizing the extant literature on IT governance and ITPG. In the third section, we outline our research design and methodology. In the fourth section, we discuss our findings and the resulting process theory. The fifth section compares and integrates our process model with institutional theory. The last section concludes with our study's limitations and contributions for theory and practice.

2 Conceptual Foundations

Accounting scandals at major corporations like Enron and WorldCom, and the current financial crisis have not only spurred public outrage and increased the regulatory pressure on businesses, but have also intensified scholarly interest in corporate governance as an instrument to avert such crises and comply with new legislation. IT governance is widely regarded as a part or contextual application of

corporate governance (van Grembergen 2004). Although there is an abundant body of scientific literature on IT project management, and a small but growing body of research on IT governance at the organizational level, research on ITPG has remained almost non-existent.

ITPG can be defined as the introduction of decision-making rights, alignment processes, and communication approaches in a multi-project environment (Weill & Ross 2004). This definition should be distinguished from that of IT project management. IT project management is "project-centric" (Mähring 2002), its context and scope are usually the same as that of an individual project. It is concerned with how a project manager should manage a project to make it successful. The focus lies on management methodologies and structuring of a project's temporary organization. On the other hand, ITPG operates on a meta-level which is less concerned with the particular methodologies and techniques employed but rather with how these methodologies and techniques are introduced to the organization and communicated among people expected to use them, how they are reflected in the organizational structures, and how their appropriate use is institutionalized in the form of well-defined decision-rights and controls. Hence, the scope of ITPG is not individual projects, but rather a multi-project environment, for example, a business unit or the entire company (Mähring 2002).

Prior ITPG research has mostly focused on topics such as the role of knowledge (Henry et al. 2003) or top management support and involvement (Mähring 2002) in ITPG. However, the overall picture of why and how ITPG is implemented in organizations remains rather sketchy. As far as we know, the process of ITPG introduction or implementation in an organization has not yet been the subject of scientific inquiry. It is the goal of this study to portray a comprehensive picture of ITPG in organizations, including the determinants and outcomes of ITPG and the process via which such outcomes are realized.

3 Research Method

Mohr (1982) distinguishes between two types of theories: variance and process theories. Process theories are used for the analysis of diachronic concepts, such as an implementation process (Sabherwal & Robey 1993), and they have already been used to analyze organizational change, technology implementations, and even IT governance (De Haes & Van Grembergen 2009). Over decades of research, a substantial body of methodological advice has been formulated to guide researchers interested in building process theories (Langley 1999, Pentland 1999). We relied on the more formalized version of grounded theory as developed by Strauss and Corbin (Strauss & Corbin 1990). For our data collection, we chose a multiple-case study approach using Yin's (Yin 2008) replication logic to generate in-depth understanding of phenomenon of interest and its context for theory building (Eisenhardt 1989). In addition, the temporal order of described events helped us create a process theory of ITPG (Robey & Newman 1996).

3.1 Data Collection

Consistent with the grounded theory method, we performed theoretical sampling to achieve a theoretical replication of the results (Yin 2008). Following this logic, we selected our cases "for their similarities as well as their differences" (Orlikowski 1993). The unit of analysis is the organization in which IT project management occurs (see Table 1).

Similarities: We limited the cases to financial services firms in German-speaking countries which were of sufficient size to ensure an implemented ITPG structure (Sambamurthy & Zmud 1999). We chose the financial industry because of its strategic reliance on information technology (McFarlan et al. 1983), high IT expenditure (Roy & Aubert 2002), and high regulatory pressure (Goodhart 1998). All three factors have been identified as drivers of IT governance (Damianides 2004) and should therefore increase the likelihood of finding mature ITPG practices at these firms.

Differences: Within the financial industry, we selected companies with four different business models (insurance, stock exchange, banking, and asset management) and of different sizes (ranging in revenue from € 560 million to € 10.7 billion). This was done to ensure that the resultant theory did not depend on a specific type or size of firm. Even more important for our goal of building a process theory was the selection of organizations at different stages within the ITPG implementation process. The average duration of IT projects in these companies ranged from 8 months to 1.6 years.

	Case 1	**Case 2**	**Case 3**	**Case 4**	**Case 5**
Industry	Insurance	Insurance	Stock exchange	Banking	Asset management
Employees	4,000	3,500	3,500	1,150	2,300
Revenue	€ 2.3b	€ 663m	€ 2.4b	€ 560m	€ 10.7b
Project budget (p.a.)	€ 21m	€ 35m	-	€ 25m	€ 35m
Project portfolio size	40	130	-	25	75
Avg. project duration	1.1 years	1.6 years	ca. 1 year	ca. 8 months	ca. 1 year
Interviewees	2	3	3	2	5

Table 1: Case company profiles

Data collection was done from January to June 2009. At every case site, we interviewed project portfolio managers and project managers and collected documents pertinent to ITPG and its implementation. In total, we conducted in-depth semi-structured interviews with 15 people. Each interview lasted between 1 and 3.5 hours. The interviewees were sent the interview guide prior to the scheduled interview, along with the purpose of the study, and informed consent form (Myers & Newman 2007). Interviewees were assured anonymity of their responses. Two interviewers were present at each interview, with one person responsible for asking questions and the other person taking notes on interviewee responses. All interviews were recorded and transcribed. In addition, documentary evidence was collected at each site. These documents included governance handbooks, project management guidelines, reporting templates, and organization charts. The interview transcripts, documents, and interviewer notes were analyzed and interpreted in conjunction with the data collection process (see next section for details), which enabled us to focus on issues that we felt needed further clarification or corroboration during the following interviews. Overall, our data collection process resulted in about 350 pages of interview transcripts and an additional 250 pages of documents and field notes.

Although two of the case organizations were still in the process of implementing their ITPG at the time we collected our data, the remaining companies had completed their governance process a while ago, in which case, interviewee responses were retrospective in nature. To overcome the problems of retrospective data collection, such as selective recall (Golden 1997), we employed data for triangulation techniques to corroborate evidence from different respondents or documents (Eisenhardt 1989). In particular, our annotated document version histories proved valuable in reconstructing and validating the sequence of events that unfolded as the ITPG process evolved in our case sites. We organized and structured all case material in a case database (Yin 2008), that was coded and analyzed using the grounded theory approach.

3.2 Data Analysis

Interview transcripts were coded using Strauss and Corbin's (Strauss & Corbin 1990) grounded theory technique. This technique employs three types of coding: open, axial, and selective. The *open coding* process focuses on identifying, uncovering, and labelling key concepts hidden within qualitative data that can potentially be relevant to understanding a phenomenon of interest. These codes are then grouped into categories or "constructs" for grounded theory building. In *axial coding* process, the identified constructs are grouped into three "synthesizing categories" : *antecedents*, *events*, and *consequences* (van de Ven & Poole 1990). Such grouping allows researchers to identify patterns of

causality that can then be integrated into a preliminary theory. Subsequent coding employ the *selective coding* approach, whereby a "theoretical sampling" procedure is used to selectively sample new data and reconcile emergent codes with the preliminary theory. This allows coding to move faster by consolidating analogous codes, while still allowing new codes to emerge from subsequent data analysis, which may be integrated into the preliminary theory as the theory is iteratively refined and modified. The data analysis is complete when "theoretical saturation" is reached, i.e., no new codes emerge from further analysis and the target theory has stabilized following multiple rounds of iterative refinements.

Our coding process was conducted by two researchers trained in qualitative research methods using the qualitative data analysis software ATLAS.ti (version 6), which also served as the case material database. In all, a total of 469 codes emerged from our analysis. All coding mismatches between the two coders were reconciled through further discussion. ATLAS.ti's graphical display functions ("network views") were used to identify and group similar codes within the three synthetic categories. Groups of codes were then classified into categories (i.e. merged into ATLAS.ti "supercodes"), which were arranged on a visual map (Miles & Huberman 1994). This process was repeated twice resulting in a high level, aggregated process theory of ITPG, as shown in Figure 1. The visual mapping not only allowed the coded concepts to be easily categorized, but the codes could also be arranged in a way which represented the sequential order of the events as they emerged from the source material. This visual representation also helped us identify patterns of sequences which were consistent across cases versus those that were not, and thereby helped us derive the eventual process theory of ITPG.

4 Findings

Our analysis indicates that the ITPG process proceeds through three sequential phases: *standardization*, *centralization*, and *professionalization*. Although each phase is characterized by a unique set of events, there is no stable pattern concerning the temporal relations of events within these phases. In other words, during the process model stage, we have no indication of when exactly the individual events will happen. The predictive power of the process theory thus only extends to a sequence of the phases. Figure 1 shows our coding results as a network view, each box representing a second level category. Code categories above the three phases represent antecedents, the categories within the phases are constituting events, categories below the phase boxes are consequences of the individual phases. The code categories are not discussed here in detail due to lack of space, but are available from the authors upon request.

Standardization: This is the first phase of ITPG implementation, during which organizations strive to standardize how they manage their IT projects. The main drivers of this phase are an inadequate project methodology and organization, unaddressed ethical conflicts of interest, and a communication deficit between the business and IT departments due to a lack of common terminology in the project management realm (Bowen et al. 2007). The project change request process is an example of the latter issue which was commonly cited in our interviews: There is widespread disagreement between the business and IT organizations on the meaning, appropriateness, and procedures of project changes, which often lead to misunderstandings and tensions between project stakeholders. In order to cope with these problems, our case companies made efforts to establish an organization-wide consensus regarding the project governance standards. Interestingly, none of our case sites adopted project management and governance standards available from bodies like the Project Management Institute (Project Management Institute 2008). While these standards may be used as templates, all eventual standards would likely be firm-specific. Hence, consensus-building is the critical activity in this phase (Markus et al. 2006).

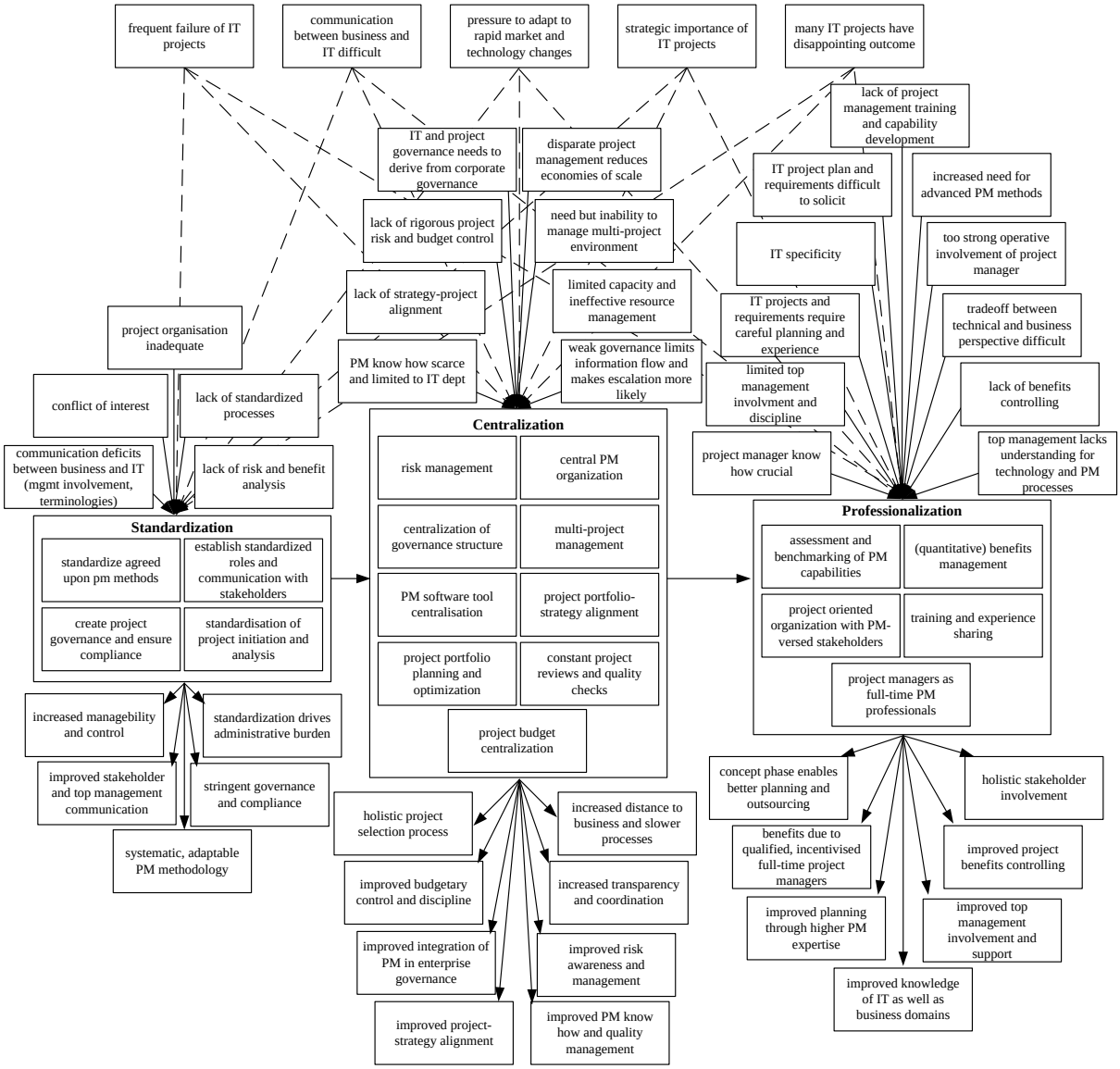

Figure 1: Coding results

This process of negotiation during the standardization phase also serves as (at least a partial) solution to the persistent problem of deficient communication between a project's most important stakeholders: IT and user organizations. Involving all parties early fosters a common understanding of the project management terminology and concepts. Besides general project management methodology, standardization extends to communication channels between stakeholders (i.e. reporting and escalation rules), project initiation (i.e. project proposal process, benefits and risk analysis), financial appraisal (i.e. budgeting, business cases), and ethical guidelines (i.e. code of conduct). The outcomes of this phase are a project management methodology can be adapted to both the business and IT organization's needs. This includes clear guidance regarding the processes and rules that apply to different project sizes. In all of our cases, there was a light-weight process for small projects, which eased the project managers and initiators' administrative burden, caused by standardized project management practices.

Centralization: After a high level of standardization being reached, organizations seek to create a central project management unit, often called the project management office, project portfolio management, or project controlling. This unit takes over some or all of the following tasks: collection of project proposals; management, optimization, and reporting of the project portfolio; administrative

and tool support for project managers; reviews of the running and finalized projects; and global project risk management. Centralization also encompasses important project resources, such as the establishment of a central project manager pool and a central project budget, which our respondents described as an appropriate way to increase the project portfolio's efficiency and effectiveness by fostering competition for financial resources at an organization level. An important aspect of these efforts is the project portfolio's improved alignment with the corporate strategy.

The centralization of information systems, reporting, and controlling structures not only provides improved administrative oversight of risky IT projects but also helps improve risk management in projects. The consolidation of risk assessments in project proposals enables the project risk managers to mitigate the overall portfolio risk and to minimize the number of high-risk projects running concurrently. The generation of status reports at regular intervals (weekly in two of our five case sites, and monthly in the remaining three cases) helps uncover and assess project problems early and provides higher project transparency. However, our respondents also noted several negative consequences of centralization, such as an increased distance between the project organization, project managers, and the business. Project managers from a global pool sometimes lack the specialized knowledge to fully understand the project content. Centralization may also slow down processes (since project approvals only occur at fixed intervals) and reduce flexibility (e.g., by enforcing the use of a certain project management toolset).

Professionalization: Professionalization refers to the development of mature organizational structures capable of initiating and coordinating IT projects. This is the phase when project governance is institutionalized from a conscious corporate activity to a subconscious project-level activity. Professionalization requires prior completion of the centralization phase since experienced full-time project managers can be hired efficiently only if there is a central project manager pool from which they can be deployed to the most demanding organizational IT project. Professionalization is characterized by a thorough assessment and improvement of the organizational project execution capabilities and moving the entire organization from ad hoc management of IT projects towards a project orientation. The assessment includes benchmarking initiatives and consistent cost-benefit analysis of individual projects. The organization also builds the capability to manage large-scale IT projects through extensive training and human resource development, not only for project managers but also for other stakeholders (e.g., sponsors, project team members, top management). Several interviewees emphasized the importance of qualifying project sponsors to accept and fulfill their responsibilities in an IT project. The organization may also implement a dedicated project management career path and encourage employee participation in certification programs. During this phase, the standards established in the first phase may be reviewed and revised, which in two of our case sites, led to a reduction and loosening of procedural standards. The reason given for this is that in an organization with highly professionalized structures and staff, the need for strict guidance and control is reduced, allowing project stakeholders to rely on their extensive experience and training to autonomously perform their project management activities.

5 Theoretical Integration

To examine the validity of our proposed process theory, we follow Eisenhardt's (1989) approach of comparing our theory with similar theories in the extant literature. This is also in line with Urquhart et al.'s (2009) recommendation of contextualizing a new theory using "theoretical integration." Because there were no prior project governance process theories in the literature, we used institutional theory as the theoretical lens for evaluating our process theory of ITPG.

5.1 Institutional Theory and IT Project Governance

We chose institutional theory (Scott 1987) as a theoretical perspective for comparing our proposed theory because the unfolding of ITPG in organizations can indeed be viewed as an institutionalization

process. Institutions are comprised of "the set of working rules that can help determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions" (Ostrom 1990).

Institutional theory lends itself as adequate means to analyze our findings for three reasons. Firstly, institutions are predominantly shaped by imposition (coercive laws and regulations), authorization (norms provided by authorities, such as industry standards or codes of conduct), and inducement (motivation by incentives) (Scott 1987). Since these three factors are also the main shaping forces for governance regimes (the first two in particular), the governance process seems to have a distinct institutional character (Williamson 1996). Furthermore, the institutional perspective has previously been used to study the institutionalization of general IT governance (e.g., Currie 2008).

Secondly, the close resemblance of governance regimes across our case firms reflects the isomorphic tendencies of institutions. Isomorphism, a major tenet of modern institutional theories, means that institutions in different organizations subject to the same environmental pressures become increasingly similar (i.e., assume similar forms) over time (DiMaggio & Powell 1983). Analyzing various organizations exposed to the same environmental forces for similar structures and patterns of behavior is therefore the best way to find institutional structures (Tolbert & Zucker 1999). Despite the fact that the firms in our sample were in different stages of implementing their ITPG process and used different nomenclature, their similar organizational structures and patterns of events as the unfolded during the governance process suggested that institutional theory was indeed an appropriate theoretical lens for studying ITPG.

Thirdly, institutionalism acknowledges the importance of institutionalization as a process and therefore suggests adopting a process-centric view for the study of organizations (Barley & Tolbert 1997). As explained in the next section, the ITPG process that emerged from our analysis is similar to that of the institutionalization process.

5.2 ITPG Implementation as an Institutionalization Process

Of the several institutionalization process models proposed in the literature, we chose Tolbert and Zucker's (1999) model as it was conceptually and terminologically close to the governance model proposed in this paper. This model describes the institutionalization process as encompassing three sequential stages: *habitualization*, *objectification*, and *sedimentation.* The institutionalization process is triggered by an *innovation*, which is broadly conceptualized as new response to external factors (technological change, legislation, market forces) that may be mediated by internal problems (low efficiency, bad quality, etc.). Whether a particular structure is promoted from one process stage to the next depends on several additional influences: the ability to rationalize and theorize the structure, whether it was adopted by other organizations, the support of the stakeholders and, of course, whether it is deemed successful (Tolbert & Zucker 1999). Figure 2 shows a mapping between Tolbert and Zucker's original institutionalization model and our ITPG process model.

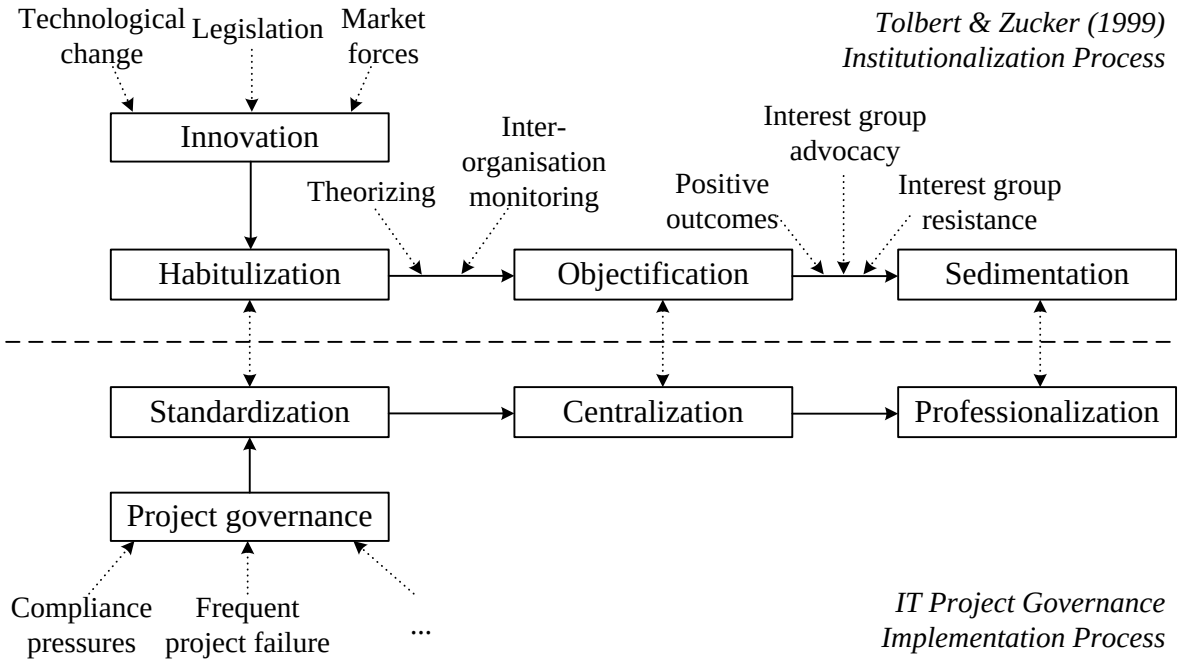

Figure 2: ITPG implementation process mapped to Tolbert & Zucker (1999) institutionalization model

The institutionalization process starts with the establishing of a new practice or organizational structure as a patterned response to certain stimuli (*habitualization*). The standards established during the standardization phase of ITPG can also be interpreted as these response patterns to the stimulus of a high failure rate and risk exposure. As DiMaggio and Powell (1983) note, imitation of practices found elsewhere is a common at this stage. Our cases show that companies commonly evaluate existing standards and practices in other firms to develop their own response patterns, viz. internal project management standards. If the organization considers the innovation successful, it is formalized and becomes obligatory inside the organization (*objectification*). The structural changes introduced during this phase are difficult to reverse and therefore solidify the institution. Companies create a project management unit, hire or reassign personnel and change organizational responsibilities. Project and project portfolio managers hired in these positions act as "champions" of the new project governance regime and propagate the changes pervasively. In the third phase of institutionalization, the innovation becomes entrenched and part of the organizational mind-set (*sedimentation*). Correspondingly, at this stage, the project governance regime becomes professionalized, surviving personnel turnover and the test of time. Our case companies have, at this point, developed into project-oriented organizations, actively involving many stakeholders into their project processes. Not only the members of the central project unit but also other participants in projects (e.g. project sponsors) may become well versed in project governance and their benefits.

Since ITPG implementation is consistent with institutional theory, we map high-level concepts in our process theory to the institutional literature for comparison. Seen as an expression of isomorphism, standardization has been repeatedly studied as a prerequisite or part of institutionalization processes (Brunsson 1999), and is regarded as having a reciprocal relationship with institutionalization. On one hand, institutions are responsible for imposing and driving standards in their sphere of influence. The initial standardization in the context of ITPG is indeed driven and imposed by its parent institutions, IT governance and corporate governance. At the same time, standardization is also a necessary condition for the formation of institutions (Brunsson 1999). Our findings are furthermore in line with the existing institutional research's ideas on centralization. According to Suchman's theory of institutional legitimacy (1995), institutions exhibiting a high degree of centralization are perceived as more legitimate than decentralized institutions. In light of the administrative burden and increased control imposed by a governance regime, legitimacy is required before organizational members will

accept such governance (Tyler 2005). In our specific case, successful institutionalization of ITPG requires its acceptance by both the IT and business units. Therefore, the need for legitimacy will also drive the centralization of ITPG as an institution. Lastly, professionalization is also regarded as driver of isomorphism. Institutionalists argue that the formation of professional associations and standards are a formative force responsible for institutions' evolution within a professional context (Lounsbury 2002). Our findings suggest that this also applies to multi-project environments within organizations.

6 Limitations and Contribution

In this paper, we present a grounded-theory-based process theory of ITPG implementation. The theory is based on a multiple case study and is corroborated by an extensive analysis of the literature on the topic. The theory has also developed a framework to interpret ITPG implementation as an institutionalization process.

As such, no empirical study is without limitations. Our first limitation is the limited generalizability of our findings given that they were drawn from only five case sites. However, having followed common prescriptions for the conduct of case study based on grounded theory research, we are confident that we have achieved a high level of analytical generalizability with our model (Eisenhardt 1989, Strauss & Corbin 1990, Yin 2008). Another limitation is the use of retrospectively collected data. We tried to compensate for this shortcoming by using data triangulation techniques. To overcome any potential retrospective bias, we are currently studying ongoing ITPG implementation at a large professional service firm that is not reported in this paper (Leonard-Barton 1990).

The results of our study have implications for theory and practice. From a theoretical perspective, we provide a well-grounded ITPG framework that not only helps us understand why certain common project governance practices work the way they do, but also provides the basis for guiding future research in this area. The structure of the process theory proposed here can help reconcile diverse findings reported in previous ITPG research. Our proposed process helps bridge the gap between IT governance and IT project management research. The integration with institutional theory supports our interpretation of governance as institutional structures and governance implementations as institutionalization processes. Departing from our theory, we see research potential in two major areas. Firstly, future research should examine the generalizability of our process phases to other industries and cultural settings by analyzing more cases and by elaborating its analytic generalizations. Secondly, it might be useful, to test the process model – *standardization*, *centralization*, and *professionalization* – against other types of governance implementations such as the governance of IT service delivery (van Grembergen 2004).

From a practical point of view, our process theory can help those responsible for driving ITPG implementation assess the current state of governance process in their organization and how much further they have to go towards a full institutionalization. The model can explain and rationalize governance implementation in two ways: Firstly, the antecedents of the entire process and the individual process phases provide a structure for motivating the implementation of ITPG beyond mandatory regulatory requirements. Secondly, the predictions of organizational outcomes can reduce the uncertainty of such an undertaking. While the process theory itself has not yet been associated with IT project success, we found ample indication in the literature that many of our process model's constituents are relevant for successful project outcomes and that institutionalized ITPG has a strong positive influence on project success (Khazanchi & Reich 2008). The process theory described here may serve as useful starting point for planning successful ITPG implementation in organizations.

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