

## Examining the Relationship between IT Governance Software and Business Value of IT: Evidence from Four Case Studies

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### Abstract

*What is the impact of information technology (IT) governance software on IT governance processes and through that on realizing business value from IT? This question has recently gained importance, as IT budgets continue to be under pressure, as IT governance is high on the corporate agenda, and as software applications have become available that promise to enforce and streamline IT governance processes. This article examines the underlying conceptual foundations, develops a comprehensive research framework that is subsequently applied using a multiple case design, and concludes with insights from four international implementation sites. The results indicate a positive impact on IT-related business value outcomes in three areas: portfolio management optimization, project visibility and control, and IT services efficiency.\**

### 1. Introduction and Research Question

This article examines the theoretical perspectives and available evidence regarding the impact of information technology (IT) governance software on the effectiveness of IT governance processes and subsequently on realizing business value from IT. Top executives and researchers alike agree that IT governance plays a vital role for corporate success and that its importance will further increase in the future - citing a set of widely-acknowledged drivers:

- a) *Increasing IT pervasiveness*: Executives find it increasingly difficult to avoid or delegate IT decision making [1, 2]. A mounting number of strategic IT issues requires cross-functional perspectives and business input for resolution.
- b) *Compliance requirements*: IT must accommodate audit trails and legislative compliance. Organizational disasters like the failure and demise of Enron and the related Sarbanes-Oxley Act of

2002 introduced legislation and business policies imposing new (IT) governance requirements. Sarbanes-Oxley focuses on enhanced corporate governance through augmenting internal balances and checks - emphasizing IT accountability [3].

- c) *ROI pressure*: The so-called IT productivity paradox, i.e. IT investments failing to provide measurable value to business, relates to unclear roles and responsibilities and once again demonstrates that IT demand and delivery are often not driven by corporate priorities.
- d) *Strategic IT sourcing*: Executives are required to prepare for governing complex offshoring and outsourcing arrangements.
- e) *Cost control*: Mounting human and financial consequences of IT put forward strong arguments for improved control processes [4]. Nolan and McFarlan [5] estimate that corporate information assets can make up more than 50% of capital investment budgets - given constantly changing technologies, as well as an increasingly complex business environment.

Earlier research also suggests that the contribution of IT governance varies in terms of effectiveness [6]. This is often attributed to weak corporate IT management processes and inconsistent IT policies. The concept of IT effectiveness - business value creation - remains also ill-defined and non-conceptualized. IT's capability for achieving a competitive positioning, building a more responsive organization, and increasing productivity has fueled industry change [7]; vice versa, all changes generate pressure for improving IT performance by constantly demonstrating and measuring IT's business value [8].

Though Fairchild [9] claims that "an important issue in understanding the business value of information technology is expressing the benefits of IT [...] in a manner that senior executives (particularly financial executives) can relate to", a mere quantification through traditional financial calculations - e.g. net present value (NPV) - may not capture all outcomes relevant for consideration. The aim of this paper is to explore the impact of IT governance

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applications on effective IT governance processes and subsequently on business value creation through IT - from a quantitative as well as from a qualitative perspective.

In this paper we focus on process aspects rather than structural aspects of IT governance, a distinction commonly made in the research literature and discussed in more detail in the second section “research literature and framework”. Congruent with Korac-Kakabadse and Kakabadse [10] we define IT governance as the set of enabling mechanisms to request, prioritize, sponsor, fund, monitor, and enforce IT investment decisions.

This broad definition addresses the full range of organizational IT governance decisions: What is the process of IT decision making and who is responsible for which decision area? How is IT demand prioritized and balanced with resource supply, as well as with operational and strategic priorities? Who assumes leadership for business and IT, who advocates new technology, and who authorizes investments? How do executives retain oversight and control - through defined accountabilities, authorities, or incentive systems? What is the strategic business context, how are IT governance designs updated and clarified?

The remainder of this paper is organized into five sections. In the following section “research literature and framework” publications relevant to the research question are assessed and the selection of research framework and approach is motivated. The elements of the research framework are addressed in more detail in the third and fourth sections “IT governance processes and tools” and “measuring business value outcomes”. All measurements have been compiled from document studies and consulting project cost/benefit analyses. The fifth section “case studies and discussion” presents initial results from four international sites which have implemented IT governance applications. The paper closes with an overview of the next research steps in the final section “conclusion and further research”.

## 2. Research Literature and Framework

The evolving field of IT governance research can be conceptualized as consisting of two distinct but interrelated streams [11], respectively with a “structure” and a “process” perspective. The “structure” research stream covers IT governance strategies and structures; it explores and addresses factors influencing the choice between a centralized, decentralized, or federal IT governance arrangements. IT governance is seen as an organizational capability - exercised by business and IT executives [5, 12] - and

requires an appropriate allocation of responsibilities. Those are often split between IT domains, e.g. business applications, shared services, IT architecture, and technology platforms [1, 13].

Centralized IT governance structures allocate decision-making responsibilities to corporate IT managers or to a centralized IT function. A shared services IT vision benefits from increased coordination and control, but is offset by more bureaucracy and less responsiveness to business demands. Decentralized IT governance structures delegate most decision authorities to business unit managers; however, the flexibility suited for turbulent environments must be balanced with standardization tradeoffs. A federal IT governance structures maintains central control of some IT domains - typically shared services and architectural standards - while individual business units can deploy applications at their discretion [14].

Ribbers et al. [15] argue that traditional structural IT governance designs are obsolete and inadequate in dealing with current coordination and information processing demands. IT coordination and control should rather be lateral processes running across business units and IT departments. Today, structural IT governance decisions need to take into account a wide range of environmental contingencies, including organizational culture diversity, mergers and alliances, intensifying competition, fluctuating economic conditions, new sourcing opportunities, business transformations, and rapid technological progress [12, 16-18]. As a result, prescriptive structural frameworks must become increasingly complex [19, 20].

The “process” research stream focuses on IT governance processes and competencies associated with implementation success and use [comp. 21, 22]. This area is directly addressed by IT governance applications since they aim for streamlining and enforcing better IT governance processes - a critical claim for our study. Though anecdotes suggest that the design of effective IT governance processes can create business value, much of this research is currently based on incomplete empirical evidence, has limited methodological rigor, and is prescriptive by nature. The empirical literature “has only recently begun to move from supposition and casual empirism” [22].

In one of the few academic studies available in the “process” research stream, Weill [23] argues that firms with above average IT governance performance collect superior profits, measured by return on assets (ROA). Our study builds on this and our research framework, depicted in Figure 1, highlights our focus on the link between the application of IT governance software through IT governance processes on IT governance outcomes with regard to business value creation.

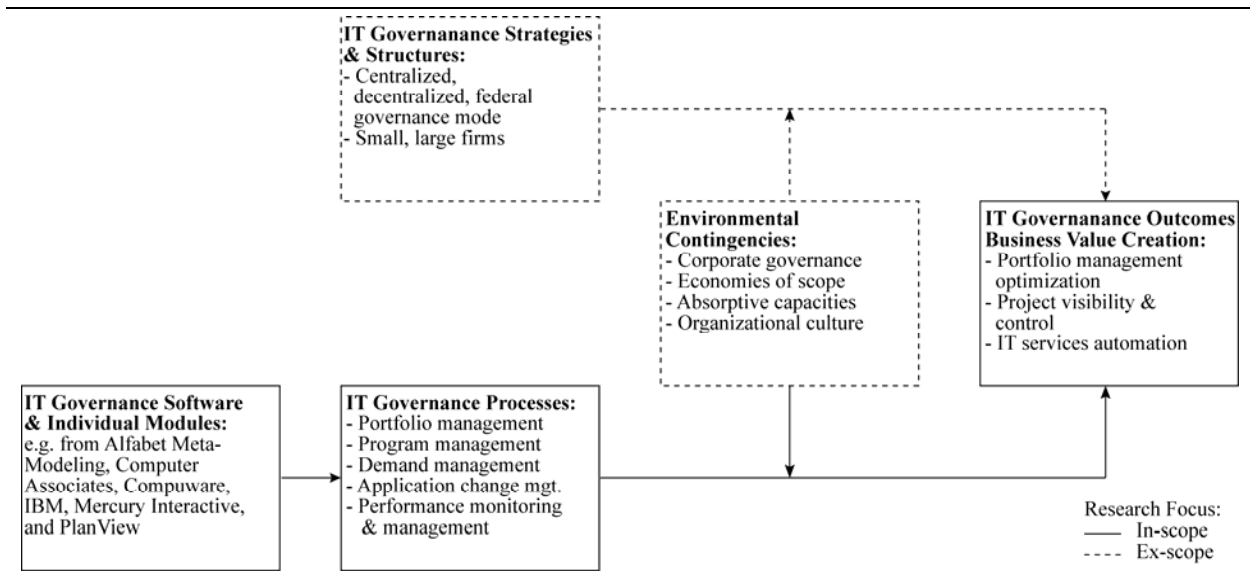


Figure 1. Research Framework

Before addressing each of these three “boxes” from Figure 1 in more detail, it is imported to discuss the two “boxes” with context factors which are relevant for our research question but out of scope for this study.

- *IT governance strategies and structures:* Although choices made in this area are of course relevant for the overall result of the IT governance processes, for the purpose of exploring the impact of IT governance applications they can be seen as separate and can be assumed as a given - a choice made by the organization prior to implementing an IT governance application.
- *Environmental contingencies:* Factors that potentially impact the link between IT governance processes and their outcomes in terms of business value creation. These factors are external and therefore (by definition) beyond the control of IT stakeholders designing IT governance setups. For example, top management and supervisory boards decide on corporate governance policies and diversification approaches. IT governance commonly reflects these arrangements in order to lower organizational coordination/ transaction costs [20]. For organizational culture - and to some extent for line management’s IT learning-orientation or absorptive capacity - it is unclear whether and how fast they can be altered [comp. 24, 25].

Although these factors are external this naturally does not imply that they have no impact and can safely be ignored. As Ryan et al. [26] caution correctly, corporate and social subsystems cannot be neglected for total implementation cost/benefit considerations.

However, as these are typically (very) slowly changing factors that typically remain constant throughout IT governance implementation projects we will identify them but not explicitly address their dynamic impact on their relationship between IT governance processes and their outcomes. For a more longitudinal study, beyond the explorative stage of our current research, we would argue that these factors should be included.

Consequently, our case studies focus on factors which are under IT stakeholder control and which can potentially be changed during the timeframe of a tool rollout (9-18 months). Even if we can accept the limited existing empirical evidence for the link between better IT governance processes and increased business value of IT (and we argue that Weill’s [23] claim warrants additional research covering more business value measurements and a wider range of organizations that differ in size, industry sector, and geographic area) we still need to investigate the link between the implementation and utilization of IT governance applications and IT governance processes. In other words: does the adoption of IT governance applications lead to better IT governance processes?

Our exploratory research aims at investigating both links through a series of case studies - expanding on the “process” research stream. We agree with Larsen et al.’s [27] call for further research, where they conclude “that research into in-depth case studies as well as providing an overview of IT [g]overnance tools are needed”. Congruent with Peterson [1], our hypothesis is that IT governance processes have significant impact on realizing value from IT and turning decisions into action. Alike, Weill and Ross [28] claim “[w]hen

senior managers take time to design, implement, and communicate IT governance processes, companies get more value from IT.”

To introduce the research framework - depicted in Figure 1 - the following sections will present IT governance applications with supported IT governance processes, as well as proposed outcomes in terms of business value. Using the above IT governance definition, we focus only on the four key processes which are currently well-supported by applications, i.e. requesting, prioritizing, funding, and monitoring of IT investment decisions. We postulate that IT governance tools have an immediate influence on IT governance processes (since their main purpose is to digitize, automate, and enforce these) but only an intermediate influence on business value creation.

The literature review and findings from secondary data - provided by consulting project cost/benefit analyses and application vendor white papers - allowed us to build a research framework [29] and state the exploratory study’s purpose, as well as criteria to judge a successful exploration [30]. Given the complex and contextual nature of IT governance processes - e.g. its integration with environmental contingencies such as organizational culture and corporate governance policies [33] - and the contemporary nature of IT governance software, we argue that case studies are a suitable research approach.

As Yin [30] states, “[a] case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” This clearly applies to our research question, since research in this area is in its early, formative stages, and we are dealing with practice-based problems where the actor’s experiences and the action context are critical [31, 32]. From early 2005 until mid 2006, we have conducted four in-depth case studies in Europe and the U.S. to gather data - through document analysis (e.g., financial reports, budgets and project data), semi-structured interviews, and direct observation. The triangulation has allowed to cross-check for emerging concepts [33].

### 3. IT Governance Processes and Tools

Gerrard [34] claims that a lack of clearly defined IT governance processes is among the main failure points of effective IT governance: “there must be clear, practical IT governance processes that recognize the decision-making style, culture, and practices of the enterprise and identify action steps, roles, responsibilities, and final and intermediate

deliverables.” Based on the earlier cited sources, we hypothesize that applications can enable and enforce IT governance processes. Well-designed - and tool-supported - IT governance processes ensure that IT equipment, people, and money work together toward strategic objectives: productive behaviors, controlled costs, and judicious investments [25].

IT governance applications emerged over the last ten years with Alfabet Meta-Modeling, Computer Associates, Compuware, IBM, Mercury Interactive, and PlanView as dominant market players [34]. Most application packages cover the entire IT investment lifecycle from IT solution requests to retirements. Vendors promise that the tools will drive out costs in “keep-the-lights-on” IT activities while at the same time ensure the delivery of strategic innovations. On their own, applications and processes are no strong form of IT governance; however, within an encompassing organizational system (also taking into account organizational culture and reward systems), they might be the missing puzzle pieces [25].

IT governance applications offer workflow functionality to automate and digitize IT governance processes, as well as monitoring features to ensure that agreed-upon steps are followed. Workflows automatically route decisions and needed input to process participants; exceptions and delays are escalated when reaching a certain threshold [35]. While application change management, demand management, performance monitoring and management, portfolio management, and program management are good process candidates for automation and digitization, we expect that top management sponsorship and decision enforcement are less well supported by applications.

As strategic capabilities, IT governance software modules offer portfolio management and program management functionalities. Since IT organizations must manage interdependent initiatives simultaneously, they are dealing with a portfolio of projects competing for limited resources [36-38]. Portfolio management is concerned with project evaluations and the way in which investment decisions are made - picking between “must-have” and “nice-to-have” [39]. Common goals are to maximize the IT portfolio’s value, to align business and IT strategies, as well as to mediate risk. IT governance tools support prioritization processes through clear responsibilities for consolidating, evaluating, and approving collected requests [40].

The application modules formalize proven portfolio management processes and offer a range of selection criteria. Quantitative information, i.e. financial budgets, estimated benefits, and estimated costs are

taken into account for the selection of promising IT initiatives - matched with qualitative information, i.e. architectural, methodological, and fiscal compliance, business objectives, program complexity, and overall risk. IT services and strategic projects can be shifted in portfolios based on scenario analyses of projected benefits and risks. Those projections can be continuously revisited [36, 41].

Program management modules take over when the prioritization has been checked and approved. They support IT professionals in managing a set of projects by supporting funding decisions, by creating delivery schedules, as well as by analyzing, controlling, and aligning individual project tasks with business objectives. IT governance applications mandate the creation of program schedules, budgets, and resource plans. Individual projects are then tied to programs for day-to-day task management and tracking. The authorization of funds is tied to specific lifecycle stages and checkpoints to regulate which stakeholders pay for what and when [19, 42].

As operational capabilities, demand management and application change management modules ensure that the development of strategic initiatives is balanced with efficient day-to-day IT service delivery and routine application changes. Serving as a single point of contact (SPOC) for all IT needs, demand management modules define how the IT organization receives work requests, categorizes them into projects, enhancements, or ad-hoc changes, and subsequently manages the queue [37, 43]. Consolidated information from web-based request forms is routed through review, evaluation, and prioritization processes - allowing for the tracking of demand statuses [44].

When projects are successfully completed, deployment teams are notified to schedule template distribution through application change processes. Application change management modules enable the automatic deployment and migration of software changes across a firm's systems landscape: configuration, content, and code changes can be automatically integrated into the production environments of enterprise applications, legacy systems, network components, and web-based applications [35].

The ex-post activity of performance monitoring and management complements strategic and operational capabilities. Monitoring systems should include both outcome and process control features, as well as monitor key performance indicators (KPIs) [1, 13, 21]. Congruent with Debrecey [22] we posit that applications are central to information gathering, monitoring, and communication - a key IT governance process. The use of dashboards focuses management

attention on the outcomes of past decisions and prevents opportunistic behavior through transparency [45, 46]. Many tool implementations start with dashboards for role-based, real-time monitoring of service delivery and IT projects.

#### 4. Measuring Business Value Outcomes

IT's prominent role in business value creation has made IT governance an executive priority [3]. The key processes addressed by our IT governance definition must ensure that IT expectations are met and that risks are mitigated [47]. "IT professionals and researchers continue to seek guidance on how best to derive sustainable business value from investments in information systems, and to identify specific governance [processes] which can be employed to ensure positive results" [21]. As stated above, the purpose of this paper is to analyze the immediate impact of IT governance applications on IT governance processes and subsequently the proposed impact of processes on operational and strategic business value outcomes [48, 49].

Operationally, we look at providing cost-effective, scalable IT infrastructures and operations to speed up enterprise-wide business processes. At strategic level, we look at developing and delivering new IT solutions for enhanced responsiveness to customer demands and market changes [1, 50]. Based on literature research and secondary data analysis - compiled from various academic papers, practitioner articles, consulting project cost/benefits analyses, and application vendor white papers - we distinguish between three categories of possible benefits from IT-enabled governance processes (see Table 1). The benefits discussions in sections five and six of this paper explicitly employ these measurements:

- a) *Portfolio management optimization*: Measurements in this category can provide evidence that IT-enabled portfolio management processes lead to improved alignment between business and IT, as well as to better executive communication and decision-making. Besides those qualitative benefits, we expect monetary savings through revised investment decisions and repurposed capital investments. IT governance applications bring the same set of IT evaluation metrics and methods to each proposed initiative. Repurposed capital investments can free-up cash for other strategic initiatives.
- b) *Project visibility and control*: Qualitative outcomes in this area include a higher capability maturity level (CMM) and increased project sponsor

<b>Portfolio Management Optimization</b>	<p>Qualitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Improved alignment between business and IT strategies</li> <li>▪ Improved executive communication and decision making (real-time)</li> </ul> <p>Quantitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Monetary savings through avoiding investments in non-viable IT projects</li> <li>▪ Monetary savings through repurposed capital investments</li> </ul>
<b>Project Visibility and Control</b>	<p>Qualitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Improved capability maturity level (CMM)</li> </ul> <p>Quantitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Percentage increase in healthy IT projects (i.e. fulfilling performance criteria, on budget, on time)</li> <li>▪ Percentage increase in milestone delivery</li> <li>▪ Percentage decrease in project management costs (percentage of total project costs)</li> </ul>
<b>IT Services Efficiency</b>	<p>Qualitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Improved audit and regulatory compliance</li> </ul> <p>Quantitative outcomes:</p> <ul style="list-style-type: none"> <li>▪ Percentage decrease in operational IT spending (percentage of revenues), e.g. savings through increased IT productivity and lower IT staffing costs</li> <li>▪ Percentage reduction in incident resolution times</li> <li>▪ Time savings in deploying application changes (from change request to production)</li> </ul>

**Table 1. Business Value Through IT Governance**

satisfaction. These qualitative project performance data are subjective and must be gathered through interviews with key executives. Quantitative outcomes include a percentage increase in healthy projects, better “on-budget” and “on-time” performance and reduced project management costs as a percentage of costs.

- c) *IT services efficiency*: Outcomes in this category are linked to improvements in the quality of audit and regulatory compliance and the reduction of overall operational IT spending as a percentage of revenues. Higher productivity and lower IT personnel costs might go hand-in-hand with working time reductions though faster incident handling and deployment of application changes. In addition, compliance with architectural standards is enforced. Preconfigured reports make it easier to act on stakeholder feedback.

**5. Case Studies and Discussion**

Our main research objective is to shed light onto the relationship between IT governance applications, IT governance processes, and business value creation through IT. We have completed the exploratory research and conducted four case studies in diverse geographies and industries, with different IT strategies and IT governance designs. As shown in Table 2, a total of 20 semi-structured interviews has been conducted with key IT governance stakeholders, lasting for 1.5 hours on average. In addition we studied documents such as budgets, reports, internal presentations, and meeting minutes and had many informal conversations during the company visits.

Results have been compiled in case reports, cross-checked for common patterns and inconsistencies. Most of the qualitative and quantitative benefits summarized in Table 1 have been consistently observed at the four implementation sites. We have gathered inconclusive results for portfolio management-related benefits since the module was only rolled out at one research site. There were multiple instances of demand management, program management, and performance monitoring & management modules which have greater impact on the operational capabilities program/project control and service efficiency.

*Case 1 - Gas and Other Services Company.* The international technology group was globally active in the business segments medical and industrial gas, as well as in material handling. The IT function and its 400 employees had always been important to translate the corporate values of innovation, international orientation, and performance into daily operations. To counter decentralized IT decision-making - resulting in an “application and hardware zoo” - and to comply with medical regulatory requirements, the organization launched a corporate-wide restructuring project in 2004. The initiative aimed for business process integration and efficiency gains - milestones towards a centralized one-client systems landscape.

In mid 2004, the gas and other services company selected an IT governance application to get a full picture of IT operations and to manage all application changes triggered by the restructuring project. Formerly manual request processes for routine, release, and emergency changes ought to be automated and integrated through the implementation of demand management and application change management

Company:	Organization Size:	Application Modules:	Interviewees:
Gas and Other Services Combined SIC 4932 (Germany)	<ul style="list-style-type: none"> <li>▪ Revenue: \$10bn</li> <li>▪ Employees: 41,000</li> </ul>	<ul style="list-style-type: none"> <li>▪ Demand management</li> <li>▪ Application change management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Manager change management data center</li> <li>▪ Project manager IT governance</li> <li>▪ Senior manager customer center SAP</li> <li>▪ Head of global applications</li> </ul>
Health and Allied Services SIC 8099 (U.S.)	<ul style="list-style-type: none"> <li>▪ Revenue: \$75bn</li> <li>▪ Employees: 55,000</li> </ul>	<ul style="list-style-type: none"> <li>▪ Portfolio management</li> <li>▪ Program management</li> <li>▪ Performance monitoring</li> </ul>	<ul style="list-style-type: none"> <li>▪ Senior VP business management</li> <li>▪ Directors IT pharmaceutical distr. 1 &amp; 2</li> <li>▪ Consulting senior executives 1 &amp; 2</li> <li>▪ Consulting executives 1 &amp; 2</li> </ul>
Management Services SIC 8741 (U.S.)	<ul style="list-style-type: none"> <li>▪ Revenue: \$16bn</li> <li>▪ Employees: 130,000</li> </ul>	<ul style="list-style-type: none"> <li>▪ Program management</li> <li>▪ Demand management</li> <li>▪ Application change management</li> <li>▪ Performance monitoring</li> </ul>	<ul style="list-style-type: none"> <li>▪ Service management lead</li> <li>▪ Support lead</li> <li>▪ Service delivery lead</li> <li>▪ Client relationship manager</li> <li>▪ Client unit lead</li> </ul>
Sporting and Athletic Goods SIC 3949 (Germany)	<ul style="list-style-type: none"> <li>▪ Revenue: \$7bn</li> <li>▪ Employees: 17,000</li> </ul>	<ul style="list-style-type: none"> <li>▪ Program management</li> <li>▪ Demand management</li> <li>▪ Performance monitoring</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business analyst IT strategy</li> <li>▪ Senior manager processes global IT</li> <li>▪ IT manager area central</li> <li>▪ Manager project office</li> </ul>

**Table 2. Overview Research Sites and Interviews**

modules. The firm targeted improved transparency to meet medical regulatory requirements and the strict enforcement of rather complex change approval processes - from initiation to closure.

All IT governance stakeholders agreed on a phased implementation approach - lasting until late 2005 - since a big bang approach was deemed to carry too much risk. Two IT staff members spent three months on process analysis, application configuration, and pilot preparation with the help of external consultants. The team invested more than a third of the implementation time on (process) design activities for the first user group, 65 IT customer contact center employees. Both modules went live in parallel without significant problems. The second user group of 55 data center employees benefited from a two-month design of ITIL-compliant application change processes and a related certification program. Three weeks of role-based training concluded a successful rollout.

Half a year after the last go-live, all user groups noted improvements in prioritizing IT change requests and in improved audit compliance. As the implementation project manager remarked, IT governance applications “cannot replace the proper introduction of processes, but what a tool can do is supporting the enforcement of the processes”. Quantitative benefits fall into the project controlling and services efficiency domains. The gas and other services firm estimated a 2% increase in healthy IT projects, a 5% increase in projects on budget, and a 10% improvement in the timing and scheduling of resources - increasing milestone delivery. Contact center and data center users both reported a 20-25% time reduction in processing change requests.

*Case 2 - Health and Allied Services Company.* The U.S.-based organization was a major international provider of health care products, services, and technologies - supporting 90 out of the 200 best-selling drugs with its capabilities. To integrate and consolidate multiple acquisitions, the firm embarked on an operational excellence initiative and consolidated four independent IT organizations. The merged IT function employed 1,700 specialists and maintained over 1,000 business applications. Narrowing the technology footprint to 300 applications in order to realize a 12-18% IT cost reduction (\$49.0m p.a.) was a strategic imperative.

To provide cost-efficient shared IT infrastructure services, to accommodate health care audit and regulatory compliance, and to grow IT innovation spending while shrinking maintenance costs, the CIO created the department “strategy and governance” in mid 2004. Its senior vice president set out to tackle inconsistent project, portfolio, and demand management processes through the implementation of an IT governance tool. The application should help to “manage [IT] like a business both financially and administratively” through transparent labor charges, budget processes, and IT spending analyses.

\$7.0m were earmarked for the twelve-month implementation. In a phased approach, project management and portfolio management modules were implemented with simple workflows, followed by a performance monitoring module. Conflicting IT processes with no stakeholders, limited design efforts, and external consultants without significant implementation experience had negative impact on customization. The pilot testing and end user training

for the first two modules resembled a rushed exercise but improved for the third module. The use of the IT governance application had not been made mandatory and interfaces to financial accounting applications were still lacking at the first research phase's end.

Up to that point in time, over \$4.0m were spent on automating and digitizing IT governance processes but interview partners failed to identify monetary benefits - and even considered a reimplementing of the first two modules with more attention to analysis and design. The only benefits mentioned - and documented in reports - were a central overview of all IT projects and a more accurate allocation of labor and non-labor charges. Due to the short operational timeframe and turbulent environmental contingencies (rapid growth through acquisitions and unclear corporate governance), research results remain inconclusive.

*Case 3 - Management Services Company.* In 1995, the subsidiary of a U.S.-based professional services organization was established to provide finance, accounting, and application outsourcing services for the North American energy industry. Since its foundation, the client base had expanded rapidly and the IT workforce grew to 200 professionals - focusing on application management, application service provision (ASP), as well as on design, build, run, and operate activities. With IT employees spread among the U.K., U.S., and India, as well as with outsourcing customers expecting mature processes with KPIs, the management services company needed to gain better visibility into IT request and development processes. and to streamline development steps.

Though IT governance applications were no mature solutions in mid 2001, the organization was one of the early adopters and drove further development. Due to their day-to-day involvement in application design and customization, all employees understood the importance of workflow design - to decide "how [they] want to do the work." The three-month process designs for the demand management and application change management modules were considered painful but ensured that shadow processes and workarounds were eliminated from the beginning. It was vital to correctly categorize requests and to match the priority levels codified in service level agreements (SLAs).

Users (150 clients and 180 employees) were split into three groups for a three-month training phase: clients and programmers received a "light" training and job aids, while the customer service managers enrolled into extensive user champion courses. During the six-month deployment phase, the need to monitor processes and working times forced the application vendor to develop a performance monitoring and program management module; the outsourcing

subsidiary doubled as beta tester. Interfaces to the help desk application were established to provide for a seamless client interface. Since early 2004, all four application modules have been productive - making the management services company a frontrunner in the use of IT governance applications.

Operational IT spending decreased since the workforce was reduced by 20% (due to automated and standardized IT request lifecycles) while another 35% were relocated to low-cost countries. Our interview partners were convinced that the enhanced responsiveness attracted new customers, while auditors were excited about the tracking of activities and real-time documentation. Overall, the number of healthy IT projects (on budget) increased by 10%, milestone delivery increased by 20%, and 15% of average project costs were saved due to more efficient project management and automated reporting. Managers only needed half a day to prepare a client report which had taken more than a week before.

*Case 4 - Sporting and Athletic Goods Company.* The research site ranked among the largest international sporting goods companies with representations in all major global markets. It adopted a centralized IT strategy by consolidating a high number of best-of-breed solutions into an SAP environment and pursuing a medium degree of outsourcing. The IT department employed over 300 people with a budget of 2.5% of revenues. IT was historically viewed as a "necessary evil" by the business, fulfilling the business demands but on a single project basis without an overall demand perspective, resulting in a heterogeneous systems landscape and a reactive role in strategy formulation.

To address these challenges, an IT governance offensive was started - including corporate governance policy and process changes, as well as the implementation of IT governance application modules. The dual focus was on managing IT requests/, as well as on the prioritization and funding of this demand. The rollout included dashboard functionality to monitor and enforce decisions. The overall implementation was swift and smooth, taking from December 2003 to August 2004 for the customization and rollout of the first three modules: demand management, program management, performance monitoring.

The implementation sequence was based solely on the sporting goods firm's urgent needs and resource availability, an approach which turned out to be problematic when issues surfaced during the attempted rollout of a portfolio management module. Unknown to the company, this module should have been implemented much earlier; a painful lesson which



highlights the need for clear role agreement between organization, vendor and possible other parties. In several areas process frameworks (such as ITIL) were used to adapt processes prior to tool implementation. In other cases processes were mapped “as-is” onto the applications.

By mid 2005, the implementation costs of \$1.5m were recovered. Almost 400 reported a 10-20% increase in healthy IT projects (meeting quality criteria), a 1-5% project management cost decrease, and a 5% decrease of operational IT spending. Moreover, at least \$2.0m investments in non-viable IT projects were saved and the time-to-market for deploying template changes declined by some 5%. Improved IT governance processes led to more transparent processes - that could be better managed - and to enhanced audit and regulatory compliance. However, the piloting of financial controlling functionality failed due to unclear processes.

## 6. Conclusion and Further Research

What is the impact of information technology (IT) governance software on IT governance processes and through that on realizing business value from IT? The four case studies show organizations that have implemented IT governance software for different reasons and to a different extent; comparisons across the four cases are therefore difficult to make. Case 1, the gas and other services company, had intended business value outcomes across all three categories. The implemented modules (demand management and application change management) primarily supported *project visibility and control* and the most notable business outcomes were also in this category - though some *IT services efficiency* and *portfolio management optimization* measurements also improved.

For case 2, the health and allied services company, the implementation was in an early stage and in a rather turbulent environment with diverse stakeholder expectations. Although the case illustrates that successful implementation of IT governance applications requires clearly-designed IT governance processes, the case is at this stage inconclusive in terms of business outcomes. Case 3, the management services company, shows strong indications for positive business outcomes across at least two of the three categories. For *project visibility and control* as well as *IT services efficiency* measures, the benefits are clear and the tools have become an integral part of how the company runs its internal activities and interacts with its clients globally.

For outcomes in the area of *portfolio management optimization* the nature of outsourcing work requires us to look at benefits experienced by the clients rather than the management services firm itself. Since our case focused on a large oil company who used this outsourcing deal primarily for SAP R/3 maintenance and minor enhancements, it was difficult to judge portfolio management benefits. Case 4, the sporting and athletic goods company, has seen positive outcomes across all three categories and has changed the perception of the IT function by the business - allowing IT to take a more proactive role which may in turn lead to more business impact.

Though it is too early to assess the full impact of the IT governance application implementations in our four case studies, the overall results seem positive in terms of impact on IT governance processes and through that on business value outcomes. The cases also illustrate that this is not a simple process in which “screwing in a tool” (as some interviewees called it) will solve all IT problems and that this will, in turn, automatically lead to business value from IT. In order to realize benefits business needs to become engaged in IT governance to the point of owning and being accountable for many aspects of it, which requires largely an (organizational culture) change effort. Points such as *project visibility and control* are important change elements, but cannot force this change by themselves.

For the next research steps, a range of possibilities exists. A larger cross-sectional sample with contrasting case studies of companies of different sizes that either use or not use IT governance applications as part of their IT governance initiatives would certainly help us gain additional insight. In addition, a longitudinal design could be used to analyze the natural evolution of IT governance processes over time - neutralizing the influence of consulting advice in early project phases. This would also provide a better understanding of the (causal) relationship between IT governance software adoption and governance process improvements. Given the recent adoption of IT-enabled governance processes, such a research approach would be valuable to academic and practitioner communities.

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