

IT Governance and Its Mechanisms

By Steven De Haes and Wim Van Grembergen, Ph.D.

IT governance is a concept that has suddenly emerged and become an important issue in the information technology field. Precisely when this new challenge began surfacing is unknown, but it is now a discussion issue within most organizations. Some corporations and government agencies began with the implementation of IT governance to achieve a fusion between business and IT and to obtain needed IT involvement of senior management. In surveys, CIOs also indicate IT governance as an important management priority. For example, in Gartner's Top Ten CIO Management Priorities for 2003, "improving IT governance" is included for the first time and is ranked third, and the related issue "providing guidance for the board/executive" is ranked first.

This article defines what IT governance is and explains its relationship with enterprise governance. IT governance is defined as the leadership and organizational structures, processes and relational mechanisms that ensure that an organization's IT sustains and extends its strategy and objectives. The article also provides an IT governance framework containing supporting structures, processes and relational mechanisms. The main objective of this article is to contribute to the understanding of IT governance and how it can be achieved in practice.

IT Governance Defined

While numerous definitions exist for IT governance, the following two definitions will be used in this article.¹

IT governance is the responsibility of the Board of Directors and executive management.

It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategy and objectives.²

IT governance is the organizational capacity exercised by the Board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT.³

Although these definitions differ in some aspects, they focus on the same issues: achieving the link between business and IT, and the primary responsibility of the board of directors. Van Grembergen's definition also indicates that IT management must be involved in the IT governance processes. However, there is a clear difference between IT governance

and IT management. IT management is focused on the effective supply of IT services and products and the management of IT operations. IT governance in turn is much broader and concentrates on performing and transforming IT to meet present and future demands of the business and its customers.⁴

The definition from the IT Governance Institute states that IT governance is an integral part of enterprise or corporate governance. Indeed, to make sure that corporate governance matters are covered, IT first needs to be properly governed. This relationship can be made more eloquent by translating the corporate governance questions⁵ into specific IT governance questions (see **figure 1**).

Figure 1—IT Governance and Corporate Governance Questions	
Corporate Governance Questions	⇒ IT Governance Questions
How do suppliers of finance get managers to return some of the profits to them?	How does top management get the CIO and IT organization to return some business value to it?
How do suppliers of finance make sure that managers do not steal the capital they supply or invest it in bad projects?	⇒ How does top management make sure that the CIO and IT organizations do not steal the capital it supplies or invest it in bad projects?
How do suppliers of finance control managers?	⇒ How does top management control the CIO and IT organization?

Adapted from "A Survey on Corporate Governance," *Journal of Finance*, vol. 52, no.2

IT Governance Structures, Processes and Relational Mechanisms

The question is: how can enterprises pragmatically implement IT governance? IT governance can be deployed using a mixture of various structures, processes and relational mechanisms. When designing IT governance for an organization, it is important to recognize that it is contingent upon a variety of sometimes conflicting internal and external factors. Determining the right combination of mechanisms is, therefore, a complex endeavor and it should be recognized that what works for one company does not necessarily work for another. This means that different organizations may need a combination of different structures, processes and relational mechanisms.

To be able to place IT governance structures, processes and relational mechanisms in a comprehensible relationship to each other, the framework displayed in **figure 2** is proposed. **Figure 2** is based on Peterson's framework.⁶ Structures involve the existence of responsible functions such as IT executives and a diversity of IT committees. Processes refer to strategic decision-making and monitoring. The relational mechanisms include business/IT participation, strategic dialogue, shared learning and proper communication.

Figure 2—Structures, Processes and Relational Mechanisms for IT Governance

	Structures	Processes	Relational Mechanisms	
Tactics	IT executives and accounts Committees and councils	Strategic IT decision-making Strategic IT monitoring	Stakeholder participation Business/IT partnerships	Strategic dialog Shared learning
Mechanisms	<ul style="list-style-type: none"> - Roles and responsibilities - IT organization structure - CIO on board - IT strategy committee - IT steering committee(s) 	<ul style="list-style-type: none"> - Strategic information systems planning - Balanced (IT) scorecards - Information economics - Service level agreements - CobiT and ITIL - IT alignment/governance maturity models 	<ul style="list-style-type: none"> - Active participation by principal stakeholders - Collaboration between principal stakeholders - Partnership rewards and incentives - Business/IT colocation 	<ul style="list-style-type: none"> - Shared understanding of business/IT objectives - Active conflict resolution (nonavoidance) - Cross-functional business/IT training - Cross-functional business/IT job rotation

Based on: "Information Strategies and Tactics for Information Technology Governance," *Strategies for Information Technology Governance*, Idea Group Publishing, Pennsylvania, USA, 2003

Roles and Responsibilities

Clear and unambiguous definitions of the roles and responsibilities of the involved parties are crucial and prerequisites for an effective IT governance framework. It is the role of the board and executive management to communicate these roles and responsibilities and to make sure that they are clearly understood throughout the whole organization.

The board as well as the business and IT management have to play an important role in assuring the governance of IT. The CIO is an important, but certainly not the only, stakeholder in the IT governance process. The CEO has singular responsibility for carrying out the strategic plans and policies that have been established by the board, and he/she should ensure that the CIO is part of, and accepted in, the senior-level decision-making process. The CIO and the CEO should report on a regular basis to the board, which is the independent overseer of business performance and compliance. The board members should keep their knowledge of current business models, management techniques, technologies and the potential risks and benefits associated with each of them up-to-date.⁷

IT Organization Structure

Effective IT governance is also determined by the way the IT function is organized and where the IT decision-making authority is located within the organization. In the past, several models were developed and implemented, such as centralized, decentralized and federal IT organizations. A dominant model in many contemporary enterprises is the federal structure that is often a hybrid design of centralized infrastructure control and decentralized application control. This model tries to achieve both efficiency and standardization for the infrastructure, and effectiveness and flexibility for the development of applications.

IT Strategy Committee and IT Steering Committee

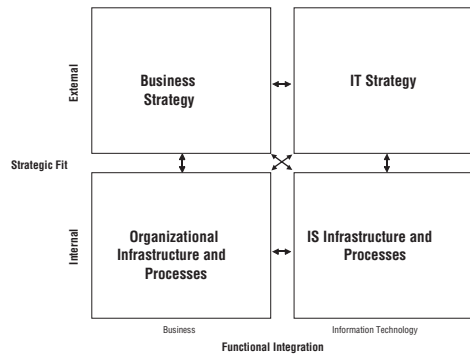
IT governance should be an integral part of enterprise governance and, in this respect, a primary concern of the board of directors that is responsible for governing the enterprises. Boards may carry out their governance duties through committees and by considering the criticality of IT through an IT strategy committee. The IT strategy committee, composed of board and nonboard members, should assist the board in governing and overseeing the enterprise's IT-related matters. This committee should ensure that IT is a regular item on the board's agenda and that it is addressed in a structured manner.

The IT strategy committee should of course work in close partnership with the other board committees and management committees to guide, review and amend the aligned enterprise and IT strategies.⁸ The implementation of the IT strategy is the responsibility of executive management, assisted by one or more IT steering committees. Typically, such a steering committee has the specific responsibility for overseeing major projects and managing IT priorities, IT costs and IT resource allocation. While the IT strategy committee operates at the board level, the IT steering committee is situated at the executive level, which implies that it has different membership and authority.

Strategic Information Systems Planning

An important element of IT governance is the alignment of IT with the business. J. Henderson and N. Venkatraman developed their strategic alignment model (SAM) to conceptualize and direct the area of strategic management of IT.⁹ They were the first to describe in a clear way the interrelationship between business strategies and IT. The model is based on two building blocks: strategic fit and functional integration (**figure 3**). Strategic fit recognizes that the IT strategy should be articulated in terms of an external domain (how the firm is positioned in the IT marketplace) and an internal domain (how the IT infrastructure should be configured and managed). Strategic fit is equally relevant in the business domain, with similar attributes but focused to the business. Two types of functional integration exist: strategic and operational. Strategic integration is the link between business strategy and IT strategy, reflecting the external components, which is important because, for many companies, IT has emerged as a source of strategic advantage. Operational integration covers the internal domain and deals with the link between organizational infrastructure and processes and IT infrastructure and processes.

Figure 3—Strategic Alignment Model



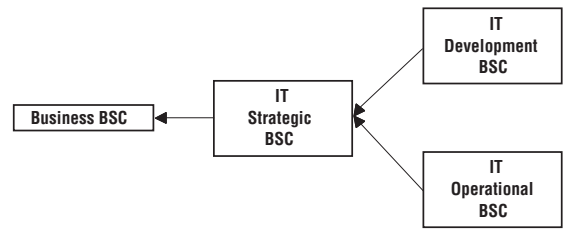
Source: Henderson, J.; N. Venkatraman; "Strategic Alignment: Leveraging Information Technology for Transforming Organizations," *IBM Systems Journal*, 1993

Although the SAM model clearly recognizes the need for continual alignment, it does not provide a practical framework to implement this. However, over the years, many alignment mechanisms have been developed and are used in organizations to achieve the business/IT fusion: business systems planning, critical success factors, the competitive forces model and the value chain of M.E. Porter, and business process reengineering. Recently, Porter adapted his models to the e-business (e-commerce) phenomenon concluding that "the Internet *per se* will rarely be a competitive advantage" and "many of the companies that succeed will be ones that use the Internet as a complement to traditional ways of competing, not those that set their Internet initiatives apart from their established operations."¹⁰

Balanced Scorecard

Another approach for the practical implementation of strategic alignment is the balanced scorecard (BSC). Robert Kaplan and David Norton introduced the BSC at the enterprise level.¹¹ Their fundamental premise is that the evaluation of a firm should not be restricted to a traditional evaluation but should be supplemented with measures concerning customer satisfaction, internal processes and the ability to innovate. Results achieved within these additional perspective areas should assure future financial results and drive the organization toward its strategic goals while keeping all four perspectives in balance. This concept has been applied to the IT function and its processes. Recognizing that IT is an internal service provider, the proposed perspectives of the balanced scorecard should be changed accordingly, with corporate contribution, user orientation, operational excellence and future orientation as perspectives. By using a cascade or waterfall of balanced scorecards, a method for business and IT fusion is provided to senior management. To achieve this, an IT development scorecard and an IT operational scorecard are defined as enablers for the strategic IT balanced scorecard that in turn is the enabler of a business balanced scorecard (figure 4). Linking the business BSC and the IT BSC is a supportive mechanism for IT governance.¹²

Figure 4—Cascade of Balanced Scorecards



Source: "Aligning Business and Information Technology Through the Balanced Scorecard at a Major Canadian Financial Group: Its Status Measured with an IT BSC Maturity Model," 34th Hawaii International Conference on System Sciences (HICCS), 2001¹³

Information Economics

The information economics method developed by Robert J. Benson and Marilyn Parker can be used as an alignment/governance technique, whereby both business and IT people score IT projects and in this way prioritize and select projects.¹⁴ It departs from the return on investment (ROI) of a project and different intangibles such as "strategic match of the project" (business evaluation) and "match with the strategic IT architecture" (IT evaluation). In essence, information economics is a scoring technique resulting in a weighted total score based on the scores for the ROI and the intangibles (see figure 5). Typically, scores from 0 to 5 are attributed, whereby 0 means no contribution and 5 refers to a high contribution. The values obtain a positive score and the risks a negative score.

Figure 5—Information Economics

+ Value linking (+)		+ Value restructuring (+)	
+ Value acceleration (+)		+ Innovation (+)	
	<ul style="list-style-type: none"> ■ Strategic match (+) ■ Competitive advantage (+) ■ Competitive response (+) ■ Management information (+) ■ Service and quality (+) ■ Environmental quality (+) ■ Empowerment (+) ■ Cycle time (+) ■ Mass customization (+) 		<ul style="list-style-type: none"> ■ Strategic IT architecture (+)
	<ul style="list-style-type: none"> ■ Business strategy risk (-) ■ Business organization risk (-) 		<ul style="list-style-type: none"> ■ IT strategy risk (-) ■ Definitional uncertainty (-) ■ Technical risk (-) ■ IT service delivery risk (-)

Source: "Measuring and Improving Corporate Information Technology Through the Balanced Scorecard Technique," European Conference on the Evaluation of Information Technology, Delft, The Netherlands, 1997¹⁵

Service Level Agreements

In a maturing IT governance environment, service level agreements (SLAs) and their supporting service level management (SLM) process need to play an important role.

The functions of SLAs are:

- To define what levels of service are acceptable by users and attainable by the service provider
- To define the mutually acceptable and agreed-upon set of indicators of the quality of service

The SLM process includes defining an SLA framework, establishing SLAs including level of service and their corresponding metrics, monitoring and reporting on the achieved services and problems encountered, reviewing SLAs

and establishing improvement programs. The major governance challenges are that the service levels are to be expressed in business terms and the right SLM/SLA process has to be put in place.¹⁶

CobIT and ITIL

*Control Objectives for Information and related Technology (COBIT)*¹⁷ provides for 34 identified IT processes their corresponding high-level control objectives and management

Figure 6—Strategic Alignment Maturity Levels

Criteria	Attribute	Characteristics level 1	Characteristics level 5
Communications	Understanding of business by IT	Minimum	Pervasive
	Understanding of IT by business	Minimum	Pervasive
	Inter/intraorganizational learning	Casual, <i>ad hoc</i>	Strong and structured
	Protocol rigidity	Command and control	Informal
	Knowledge sharing	<i>Ad hoc</i>	Extraenterprise
	Liaison(s) breadth/effectiveness	None or <i>ad hoc</i>	Extraenterprise
Competency/value measurement	IT metrics	Technical, not related to business	Extended to external partners
	Business metrics	<i>Ad hoc</i> , not related to IT	Extended to external partners
	Balanced metrics	<i>Ad hoc</i> unlinked	Business, partner and IT metrics
	Service level agreements	Sporadically present	Extended to external partners
	Benchmarking	Not generally practiced	Routinely performed with partners
	Formal assessments/reviews	None	Routinely performed
	Continuous improvement	None	Routinely performed
Governance	Business strategic planning	<i>Ad hoc</i>	Integrated across, external
	IT strategic planning	<i>Ad hoc</i>	Integrated across, external
	Reporting/organization structure	Central/decentral, CIO report to CFO	CIO reports to CEO, federated
	Budgetary control	Cost center, erratic spending	Investment center, profit center
	IT investment management	Cost-based, erratic spending	Business value
	Steering committee(s)	Not formal/regular	Partnership
	Prioritization process	Reactive	Value-added partner
Partnership	Business perception of IT value	IT perceived as a cost of business	IT coadapts with business
	Role of IT in strategic business planning	No seat at the business table	Coadaptive with business
	Shared goals, risks, rewards/penalties	IT takes risk with little reward	Risks and rewards shared
	IT program management	<i>Ad hoc</i>	Continuous improvement
	Relationship/trust style	Conflict/minimum	Valued partnership
	Business sponsor/champion	None	At the CEO level
Scope and architecture	Traditional enabler/driver, external	Traditional (e.g. accounting, email)	External scope, business strategy driver/enabler
	Standards articulation	None or <i>ad hoc</i>	Interenterprise standards
	Architectural integration <ul style="list-style-type: none"> • Functional organization • Enterprise • Interenterprise 	No formal integration	Evolve with partners <ul style="list-style-type: none"> • Integrated • Standard enterprise architecture • With all partners
	Architectural transparency, flexibility	None	Across the infrastructure
Skills	Innovation, entrepreneurship	Discouraged	The norm
	Focus of power	In the business	All executives, including CIO
	Management style	Command and control	Relationship-based
	Change readiness	Resistant to change	High, focused
	Career crossover	None	Across the enterprise
	Education, cross-training	None	Across the enterprise
	Attraction and retention of best talent	No program	Effective program for hiring and retaining

Source: Luftman, J.; "Assessing Business-IT Alignment Maturity," Communications of AIS, vol. 4, 2000

guidelines (see www.isaca.org). COBIT's *Management Guidelines* includes the processes' maturity models and their scorecards in the form of key goal indicators and key performance indicators. As illustrated in other paragraphs of this article, maturity models and scorecards can assist organizations in achieving IT governance. The control objectives can help support IT governance within an enterprise. The control

objectives of the "assist and advise IT customers" process, for example, consist of establishing a help desk, registering customer queries, escalating customer query, monitoring clearance, and analyzing and reporting trends. These high-level control objectives can be implemented through the use of the IT Infrastructure Library (ITIL) of the Central Computer and Telecommunications Agency (UK). Its help desk module, for

Figure 7—IT Governance Maturity Model

0 Nonexistent

There is a complete lack of any recognizable IT governance process. The organization has not even recognized that there is an issue to be addressed and hence there is no communication about the issue.

Governance, such as it is, is predominantly centralized within the IT organization, and IT budgets and decisions are made centrally. Business unit input is informal and done on a project basis. In some cases, a steering committee may be in place to help make resource decisions.

1 Initial/Ad Hoc

The organization has recognized that IT governance issues exist and need to be addressed. There are, however, no standardized review processes, but instead management considers IT management issues on an individual or case-by-case basis. Management's approach is unstructured and there is inconsistent communication on issues and approaches to address the problems that arise. Although it is recognized that the performance of the IT function ought to be measured, there are no proper metrics in place—reviews are based on individual managers' requests. IT monitoring is implemented only reactively to an incident that has caused some loss or embarrassment to the organization.

Governance is difficult to initiate and the central IT organization and business units may even have an adversarial relationship. The organization is trying to increase trust between IT and the business and there are normally periodic joint meetings to review operational issues and new projects. Upper management is involved only when there are major problems or successes.

2 Repeatable, but Intuitive

There is awareness of IT governance objectives, and practices are developed and applied by individual managers. IT governance activities are becoming established within the organization's change management process, with active senior management involvement and oversight. Selected IT processes have been identified for improvement that would impact key business processes. IT management is beginning to define standards for processes and technical architectures. Management has identified basic IT governance measurements, assessment methods and techniques, but the process has not been adopted across the organization. There is no formal training and communication on governance standards, and responsibilities are left to the individual.

An IT steering committee has begun to formalize and establish its roles and responsibilities. There is a draft governance charter (e.g., participants, roles, responsibilities, delegated powers, retained powers, shared resources and policy). Small and pilot governance projects are initiated to see what works and what does not. General guidelines are emerging for standards and architecture that make sense for the enterprise and a dialog has started to sell the reasons for their need in the enterprise.

3 Defined Process

The need to act with respect to IT governance is understood and accepted. A baseline set of IT governance indicators is developed, where linkages between outcome measures and performance drivers are defined, documented and integrated into strategic and operational planning and monitoring processes. Procedures have been standardized, documented and implemented. Management has communicated standardized procedures and informal training is established. Performance indicators over all IT governance activities are being recorded and tracked, leading to enterprisewide improvements. Although measurable, procedures are not sophisticated, but are the formalization of existing practices. Tools are standardized, using currently available techniques. IT balanced business scorecard ideas are being adopted by the organization. It is, however, left to

the individual to get training, to follow the standards and to apply them. Root cause analysis is only occasionally applied. Most processes are monitored against some (baseline) metrics, but any deviation, while mostly being acted upon by individual initiative, would unlikely be detected by management. Nevertheless, overall accountability of key process performance is clear and management is rewarded based on key performance measures.

The IT steering committee is formalized and operational, with defined participation and responsibilities agreed to by all stakeholders. The governance charter and policy is also formalized and documented. The governance organization beyond the IT steering committee is established and staffed.

4 Managed and Measurable

There is full understanding of IT governance issues at all levels, supported by formal training. There is a clear understanding of who the customer is and responsibilities are defined and monitored through service level agreements. Responsibilities are clear and process ownership is established. IT processes are aligned with the enterprise and with the IT strategy. Improvement in IT processes is based primarily upon a quantitative understanding and it is possible to monitor and measure compliance with procedures and process metrics. All process stakeholders are aware of risks, the importance of IT and the opportunities it can offer. Management has defined tolerances under which processes must operate. Action is taken in many, but not all, cases where processes appear not to be working effectively or efficiently. Processes are occasionally improved and best internal practices are enforced. Root cause analysis is being standardized. Continuous improvement is beginning to be addressed. There is limited, primarily tactical, use of technology, based on mature techniques and enforced standard tools. There is involvement of all required internal domain experts. IT governance is evolving into an enterprisewide process. IT governance activities are becoming integrated with the enterprise governance process.

There is a fully operational governance structure that addresses a consistent architecture for reengineering and interoperation of business processes across the enterprise, and ensures competition for enterprise resources and ongoing incremental investments in the IT infrastructure. IT is not solely an IT organizational responsibility but is shared with the business units.

5 Optimized

There is advanced and forward-looking understanding of IT governance issues and solutions. Training and communication are supported by leading-edge concepts and techniques. Processes have been refined to a level of external best practice, based on results of continuous improvement and maturity modeling with other organizations. The implementation of these policies has led to an organization, people and processes that are quick to adapt and fully support IT governance requirements. All problems and deviations are root cause analyzed and efficient action is expeditiously identified and initiated. IT is used in an extensive, integrated and optimized manner to automate the workflow and provide tools to improve quality and effectiveness. The risks and returns of the IT processes are defined, balanced and communicated across the enterprise. External experts are leveraged and benchmarks are used for guidance. Monitoring, self-assessment and communication about governance expectations are pervasive within the organization and there is optimal use of technology to support measurement, analysis, communication and training. Enterprise governance and IT governance are strategically linked, leveraging technology and human and financial resources to increase the competitive advantage of the enterprise.

The governance concept and structure form the core of the enterprise IT governing body including provisions for amending the structure for changes in enterprise strategy, organization or new technologies.

Source: "Control and Governance Maturity Survey: Establishing a Reference Benchmark and a Self-assessment Tool," *Information Systems Control Journal*, vol. 6, 2002

example, complements and provides details on the help desk process including the planning, implementation, post-implementation, benefits and costs, and tools.¹⁸ So, COBIT's control objectives tell what to do and ITIL explains how to do it.

IT Alignment/Governance Maturity Models

To be able to measure alignment and governance maturity, organizations can use a maturity model. This is a method of scoring that enables the organization to grade its maturity level from nonexistent (0) to optimized (5). This tool offers an easy-to-understand way to determine the "as is" and the "to be" positions and enables the organization to benchmark itself against best practices and standard guidelines. In this way, gaps can be identified and specific actions can be defined to move toward the desired level of strategic alignment/governance maturity.¹⁹ Good examples of IT maturity models are developed by Luftman²⁰ and the IT Governance Institute (www.itgi.org). Both models use criteria composed of a variety of attributes to build different levels of maturity. Luftman defines five maturity levels using the criteria and attributes described in the first two columns of **figure 6**. The last two columns indicate the characteristics or values of each attribute to obtain a level 1 or level 5. When performing a maturity assessment, it is important to comply with the basic principles of maturity measurement. One can move to a higher maturity only when all conditions described in a certain maturity level are fulfilled. This implies that to obtain maturity level 5, all attributes must have the values described in the last column of **figure 6**.

COBIT's *Management Guidelines* includes the maturity models for each of the 34 IT processes. The first process identified by COBIT is "define a strategic information technology plan." This process plays a very important role in the strategic alignment. Maturity level 1 entails that the need for IT strategic planning is known by IT management, but there is no structured decision process in place. To achieve the highest level of 5, IT strategic planning should at least be a documented and living process, continuously considered in business goal setting, and resulting in discernable business value through investments in IT.

To benchmark against other organizations, a maturity survey was conducted in 2002 asking the respondents to assign a maturity score for 15 of the 34 IT processes.²¹ The main result of this survey was that, on the average, the self-assessed maturity for these processes fluctuated between 2.0 and 2.5. The average for IT strategic planning was also in this range.

The IT Governance Institute recently developed a specific IT governance maturity model (**figure 7**). According to this model, enterprises assessed at level 0 are characterized by a complete lack of any recognizable IT governance process. To move up to level 1, the organization at least needs to recognize the importance of addressing IT governance issues. Maturity 5 implies an advanced and forward-looking understanding of IT governance issues and solutions, supported by an established framework and best practices of structures, processes and relational mechanisms. It should be noted that the desired "to be" position should be identified in function of the context where one operates (industry, geography, size, etc.) and of the enterprise strategy. When the "as is" and "to be" positions are

known, gaps can be determined, projects defined and specific actions taken.

Relational Mechanisms

Relational mechanisms are very important. It is possible that an organization has all the IT governance structures and processes in place, but it does not work out because business and IT do not understand each other and/or are not working together. Or, it may be that there is little business awareness on the part of IT or little IT appreciation from the business. So, to reach effective IT governance, two-way communication and a good participation/collaboration relationship between the business and IT people are needed. Ensuring ongoing knowledge sharing across departments and organizations is paramount for attaining and sustaining business/IT alignment. It is crucial to facilitate the sharing and the management of knowledge by using mechanisms such as career crossover (IT staff working in the business units and business people working in IT), continuous education, cross-training, etc.

Conclusion

The key element in IT governance is the alignment of the business and IT to lead to the achievement of business value. This high-level goal can be achieved by acknowledging IT governance as a part of enterprise governance and by setting up an IT governance framework with best practices. Such a framework and practices should be composed of a variety of structures, processes and relational mechanisms. What works for one organization may not work for other organizations (e.g., the balanced scorecard method can be successful in some organizations and not in others).

Endnotes

- ¹ See also Van Grembergen, W.; S. De Haes; E. Guldentops; "Structures, Processes and Relational Mechanisms for Information Technology Governance: Theories and Practices," *Strategies for Information Technology Governance*, Idea Group Publishing, Pennsylvania, USA, 2003
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