# Governance in IT and Architecture

## Recommendations for TOGAF™

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Governance in IT and Architecture: Recommendations for TOGAF™

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## Executive Summary

The purpose of this White Paper is to propose a set of changes to TOGAF 9 to include additional best practices, based on the latest industry experiences and insights as applied in governance of the IT domain. The target audience is business managers, IT managers, and enterprise architects. An overview of governance and the characteristics of its context are provided. The challenges for governance and its results are discussed, including what good governance looks like. The final result is a framework of components, which are used as a reference to address recommendations for architecture governance within TOGAF 9.

This document contributes to The Open Group vision of **Boundaryless Information Flow** because it gives business and IT managers a proven framework of governance practices for the IT domain. Enterprise architects may benefit from the insights in organizational processes that shape architecture development and maintenance.

# Preface

The Open Group vision of Boundaryless Information Flow is embodied in The Open Group's assets, TOGAF being one of the most significant. The authors of this White Paper believe that TOGAF's current governance of the IT domain can be improved and enhanced to meet today's business and IT challenges. We offer ten recommendations that we believe will significantly enhance the current IT governance model and bring it in line with today's best practice that produces "excellence in governance".

This Paper is formatted into seven sections. The Introduction introduces our concern with the current TOGAF assets and offers how we see IT governance in the context of an enterprise's overall business governance. Our view is that IT governance is a "slice" of the complete enterprise governance model. It must work in concert with the governance models of other domains.

The next section – What is Governance? – offers our thoughts on what governance is. There are several forms of governance that exist in the IT domain. We draw on both the standards bodies as well as academia to answer this vital question. We conclude with the basic concept that governance is giving and enforcing direction to activity in order to achieve a desired outcome.

Scope of IT Governance details the scope of IT governance so that the reader understands the context for which our recommendations are offered. Here we are offering our view of the management levels that an IT governance model must support. The evolution of the isolated centralized system into a collection of numerous and interdependent devices in a fragmented market and its implications for governance are highlighted in Challenges of IT Governance.

Results of Good IT Governance describes the results of good governance, and subsequently What Good Governance would Look Like details what good governance would look like. The Paper presents a governance framework, based on the latest governance practice in the industry, including academic and field research. A key difference with other frameworks is the attention to social processes. Recent research has demonstrated that focus on structure of governance only is not sufficient. Therefore, social processes have been included as a component. This section is finally used as a reference for deriving recommendations for TOGAF.

It is our hope that these specific recommendations are adopted by The Open Group so that TOGAF can address the specific challenges of IT governance in today's ever-changing enterprises.

# Introduction

TOGAF recognizes enterprise architecture governance and IT governance within a hierarchy, but there is limited description of IT governance within TOGAF. This White Paper recommends additional definition of IT governance within TOGAF to strengthen an organization's ability to effectively govern the architecture and make appropriate investment decisions.

The primary audiences for this Paper are business and IT managers who are responsible for the performance of operations. However, enterprise architects also play a key role in supporting IT governance, including architecture governance.

Governance is defined as giving direction to activities. In this Paper, the authors focus on governance of the IT domain and its alignment to business. Governance is viewed as a mechanism that influences the internal logic and decision-making of organizations. The internal logic is defined as a compromise between practically conflicting parameters. The mechanism that has to deal with these conflicting parameters consists of decision domains, governance structure, social processes between individuals and groups, and controls to ensure the proper functioning of IT governance. In the context of IT governance, enterprise architecture can be considered as a means for coordination of decision-making related to IT and business. Furthermore, it is recognized that enterprise architecture in its own right also needs to be governed.
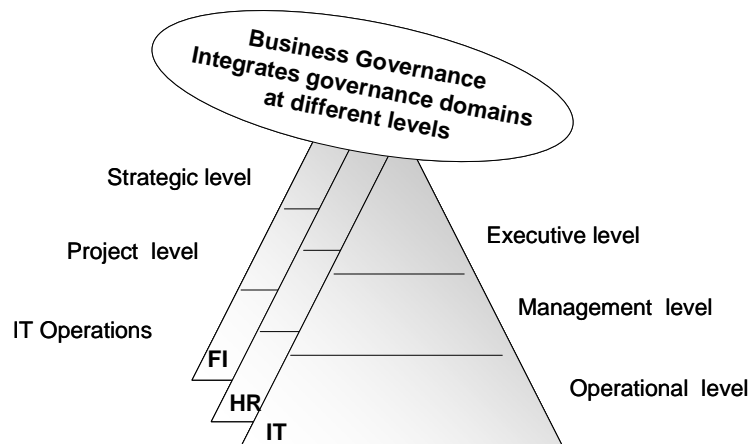


Figure 1: Scope of Business Governance

IT governance is a concept that needs clarification. IT governance is considered an aspect of business governance; e.g., similar to governance of other domains such as human resources or finance. Each functional domain needs governance arrangements at three management levels: executive, middle management, and operational. The functional domains cannot be treated as isolated areas, but should be considered as an integral part of the business. As such, each functional domain (e.g., finance or human resources) has to align at each management level with IT. For the IT domain, the management levels are congruent with the following tasks: strategic alignment, project development, and IT operations. At each level, IT manages its alignment with other functional domains. The governance challenge is to understand the internal logic between the domains and between the management levels.

Another challenge of governance is to get the right structure and also to understand the type of decisions that are needed for good governance. Once that is clear, the complexity of information technologies has to be managed. This is partly caused by the diversity in IT as well as the complexity due to the large number

of stakeholders. The first aspect can be governed by architecture practices; the second part by social processes. Social process governance navigates initiatives through the organization, whereas enterprise architecture is needed to communicate the requirements of the different stakeholders through that process.

What is considered good IT governance? Two domains are discussed: good governance of the IT function and good governance of the enterprise architecture. Good governance of the IT function contributes to the business goals, and manages the IT capabilities accordingly. Good governance of enterprise architecture ensures that the target architecture is developed and communicated, and processes are in place to ensure the best possible compliance to that architecture.

The outline of good IT governance contains five elements: governance principles, logic for prioritization, a structure, processes to ensure that the principles are adhered to, and adaptation to the prevailing maturity level of the different elements of governance. The presented framework is considered applicable either in IT governance or enterprise architecture governance.

# What is Governance?

Governance is giving direction to activities in order to achieve a desired outcome. The context of governance varies widely. Governance can be applied to a corporation, an enterprise, to a business domain, or to a small unit. It may be applied to business IT alignment, IT operations processes (ITIL), management of services lifecycle (SOA governance), compliance (COBIT) (see Appendix A: Governance in TOGAF 9 and Recommendations) to shareholder value (corporate governance), and enterprise architecture. In all cases, it is about influencing the course of activities in a beneficial way. Some refer to it as a process, and others refer to governance as a structure. Some clarification on what governance includes is needed to understand governance in the context of TOGAF.

To further clarify "what governance is" let's review some work in academia and research institutes. First, the results of the research executed by Weill & Ross will be discussed, because they have executed research since 1995 into aspects of IT governance. Their results are specifically of interest because they have been well tested with practitioners within the Gartner client context. Then, the results of research by Strikwerda will be presented. He is an authority as executive management consultant, professor, and director of the Nolan Norton Institute.

Weill & Ross from the MIT Centre of Information Systems Research (CISR) look at governance as a structure. They have defined a framework for understanding what decisions have to be made in the IT domain. In their view, IT governance is about how decision rights are assigned, what decisions should be taken, and which capabilities we need to have to ensure decisions are taken and the behavior (actions) follows the decisions. This framework takes a perspective of decisions and decision rights. Decisions in IT have to be taken with respect to IT principles, IT architecture, IT infrastructure, business application needs, and IT investment and prioritization. Weill & Ross show furthermore that decision rights can be organized in six governance styles:

- Business monarchy

- IT monarchy

- Federal monarchy

- IT duopoly

- Feudal structures

- Unorganized structures

And each decision domain has its own optimal style(s). Decisions as well as decision rights are complementary parts of IT governance. What Weill & Ross recognize but do not yet elaborate is that the key to making governance effective is social processes between the different decision domains.[1] For a better understanding of processes, Strikwerda[2] provides some useful insights.

Strikwerda made the distinction between corporate governance and internal governance. He argues that corporate governance is of a completely different nature than internal governance. Internal governance, such as giving direction to activities, has to be recognized as a process and managers should be

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[1] Peter Weill and Jeanne W. Ross, IT Governance: How Top Performers Manage IT Decision Rights for Superior Results, Harvard Business School Press, 2004.

[2] J. Strikwerda, From Business Unit Management to Multi-dimensional Organizations, Van Gorcum, Foundation for Management Studies, 2008.

knowledgeable about it. He provides ten criteria or steering mechanisms to assess whether the system for internal governance is adequate:

- Determine goals and strategy

- Shape the corporate culture

- Determine the operating logic

- Determine the scope of the operational units

- Determine the parameters and targets for the operational units

- Resource allocation: assign and dismiss managers

- Delegate decision rights and determine reserved power

- Monitoring process of results

- Monitor systems including financing, legal, administrative, strategic marketing research, and more

He described the importance of operating logic and also discussed briefly the importance of being explicit about it. He argues: "*It is not easy to determine a good operating logic. Several conflicting requirements have to be combined into one model: economies of scope, (global) economies of scale, one-face to the customer, and local responsiveness. Usually the production side of the value chain has a different dynamic to the marketing and sales side. The dynamics of the production side are determined by the capital accumulation for fixed assets and are often related to the development of production capacity. On the other hand, the dynamics of the marketing and sales side are related to the changes in distribution channels and distribution opportunities in the market, to consumer preferences, and purchasing behavior. An operating logic is what the term says – a logic, not a political compromise; actually it is a compromise between practically conflicting parameters for optimization. If an operating logic is a political compromise between two persons, it does not have any authority at lower levels in the organization – everybody is waiting to see one of the managers fail. And then the organization will be changed again.*" Strikwerda argues furthermore that*: "A good operating logic has authority because the stakeholders involved are convinced that the market and the characteristics of the business need it.*"[3]

The IT Governance Institute (ITGI)/ISACA defines IT governance as: "*… 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 strategies and objectives …*".[4] This definition describes governance as a black box and what its result is expected to be. The definition itself does not really explain the elements that are part of governance: leadership, organizational structure, and processes. This definition is supported by the control framework COBIT that has been developed. COBIT is a globally accepted control framework for IT governance based on industry standards and best practices. It contains control and management practices that are aligned to a defined set of domains and IT processes. Used with the TOGAF Architecture Development Method (ADM), it can ensure that the necessary IT governance controls are established based on industry standards. COBIT 4.1 contains a set of key activities and RACI charts for guidance of roles and responsibilities for effective IT governance. Per the research from Weill & Ross, the appropriate activities should be selected based on the decision-making style required.

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[3] These paragraphs on the argument of Strikwerda were copied from Harry H.M. Hendrickx, Governance in the Practice of Chief Information Officers.
[4] IT Governance Institute (ITGI) Board briefing on IT Governance, 2nd Edition.

The two other perspectives are complementary, and both contribute to a better understanding of the governance in the IT domain. Weill & Ross contribute by providing a framework which provides a transparent and comprehensive structure for IT governance, and Strikwerda contributes by providing a process perspective which addresses the explicit operating logic of IT governance within the context in which it is applied. It can be concluded that at least three aspects for successful governance should be included: clear distinction between the type of decisions that have to be taken, a suitable governance style for each domain, and social processes[5] that make the structure work.

## Enterprise Architecture

Enterprise architecture governance is defined by the US Bureau of Census as "*a critical component of enterprise architecture which provides for continuous improvement, migration, and measurement of business systems so that business and technology coalesce to meet the mission of the enterprise.*" Other authors[6] see architecture as a mechanism for governance of the complexity of digital organizations with focus on business IT alignment. Common to these two views is the importance of aligning business and technology in a dynamic environment. A key difference is that one view defines governance as a component of enterprise architecture and the other recognizes that enterprise architecture in turn is a tool for enterprise governance. Apparently, two different aspects of enterprise architecture have to be recognized: how it contributes to governance, and how it is governed in itself.

## Summary

In summary, governance is giving direction to activities. In this White Paper authors deal with governance of the IT domain and the alignment of technology and business. Governance is viewed as a mechanism that influences the internal logic of organizations. The internal logic is defined as a compromise between practically conflicting parameters. The mechanism that has to deal with these conflicting parameters consists of decision domains, different governance styles, and social processes. In the context of IT governance, enterprise architecture is the delivered structure that enables coordination of decision-making on IT and business solutions. On the other hand, it is recognized that enterprise architecture in its own right also needs to be governed as one of the business capabilities of an enterprise. The COBIT 4.1 framework gives guidance to management on which roles and activities should be in place for proper IT governance.

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[5] Field research into the governance practice of 12 CIOs in five different countries and of large organizations has demonstrated that 10 social processes are relevant in the context of IT governance; e.g., authority development, choice or commitment development, decision-making, and grow knowledgeability. Source: see 3.

[6] D. Rijsenbrij, J. Schekkerman, Harry H.M. Hendrickx et al, Architecture: Tool for the Governance of Adaptive Enterprises, Utrecht, Netherlands, 2002.

# Scope of IT Governance

As discussed in What is Governance?, we will not deal with corporate governance. Internal governance can be viewed by functional domain like human resources, marketing and sales, operations, or IT. Internal governance should consider three management levels: strategic, tactical, and operations .Internal governance is a profession in itself and is exposed to very different developments than corporate governance.[7] Internal governance, such as giving direction to activities, has to be recognized as a process, and managers should be knowledgeable about it. Internal governance also includes IT governance. In this Paper, the distinction has been made between governance of business – including all aspects of enterprise operations – and governance of IT. The notion of business governance is introduced to refer to business. Business may have two meanings when adopting an IT perspective: either another functional domain like finance or production, or the integration of all functions focused on performance. In this Paper, the meaning of business will be indicated in an unambiguous way.

Business governance is the set of responsibilities and practices exercised by the company's management with the goal of providing strategic business direction, ensuring that business objectives are achieved, ascertaining that risks are managed appropriately, and verifying that the enterprise's resources are used responsibly. The pervasive use of technology within the enterprise has created a critical dependency on IT that calls for a specific focus on the governance of IT in addition to business governance. Organizations specifically should focus their governance on cross-functional risks, one of the major concerns currently due to the need of exchange of information across functional domains. Business governance is considered in this Paper as the integration of all functions focused on performance.

From a governance perspective, the IT domain has three distinct areas: strategic alignment, project development, and IT operations. Each area has its own distinct set of characteristics with regard to stakeholders, dynamics, and capabilities.

The overall objectives of IT governance activities are therefore to understand the issues and the strategic importance of IT, to ensure that the expectations for IT are met, and IT risks are mitigated. The purpose of IT governance is to direct IT endeavors, and to ensure that IT's performance meets the following objectives:

• IT is aligned with the enterprise to realize the promised benefits.

• IT assets are used responsibly.

• IT-related – often cross-functional – risks are managed appropriately.

To meet these objectives, the scope of IT governance must involve several layers of the organization, from the executive level down through IT management and through to the IT operational level.

Business strategy, enterprise architecture, and large programs are aligned at the executive level. Decision-making has to be prepared by multi-disciplinary teams, and discussed in the highest board of decision-making in the enterprise.

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[7] There has been some debate about corporate governance and internal governance during the review of this White Paper. In this document, the distinction between corporate governance and internal governance has to be made, because the document deals with internal governance only. Corporate governance is considered as an external factor that may influence the internal governance. However, it is not included in the framework that is presented in What Good Governance would Look Like.
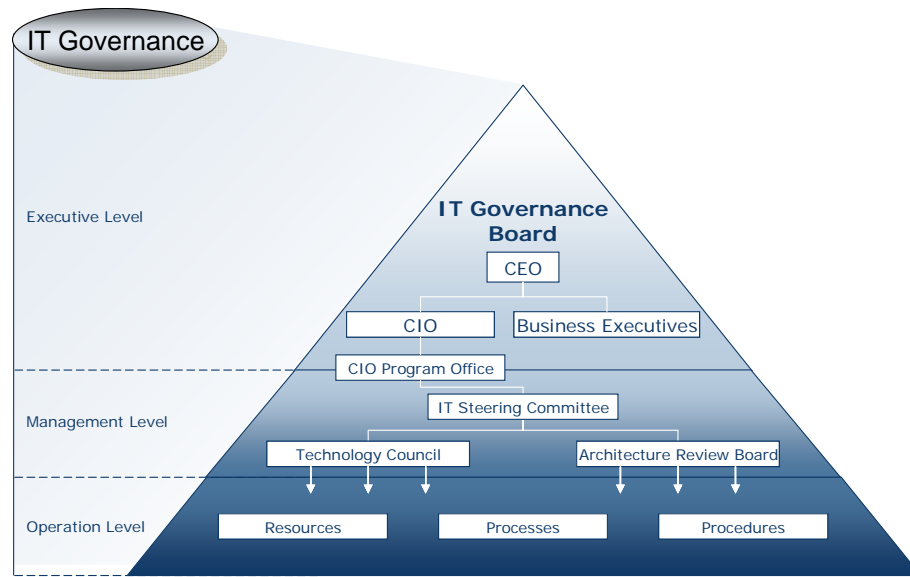
[Source: EDS IT Governance Consulting Practice]

Figure 2: IT Governance Structure

The IT Governance Board is the decision-making body at the executive level and its functions include:

• Alignment of IT to business goals and objectives

• Integration of IT into the overall enterprise financial plan

• Prioritization and approval of IT investments

• Executive oversight during IT implementation

• Sponsorship and leadership of change

At the IT management level, the various committees support the company executives in defining architecture and technology guidelines, ensuring adherence to guidelines, and reviewing technology decisions.

At the operational level, the project teams and technology support teams use prescribed standards, guidelines, and architectures in implementing projects and technology environment changes.

## Summary

In summary, IT governance is considered an aspect of business governance (like human resources or finance), which can be applied to the three IT domains (strategic alignment, project development, IT operations) and should include strategic, tactical, as well operational levels. Therefore, IT has to manage the alignment with other functional domains as well as alignment between the IT sub-domains. The challenge is to understand the internal logic between these domains.

# Challenges of IT Governance

As stated in Scope of IT Governance, the purpose of IT governance is to direct IT endeavors, and to ensure that the IT department's performance is aligned with the enterprise to enable benefit realization, responsible use of IT assets, and the management of IT-related risks.

Since organizations are social systems, it is imperative to also include the governance of relationships between people and between different organizations.

Originally, the management of IT-related activities was easy as the initiatives were contained within single departments with little interaction with business units. The introduction of personal computers and the decentralization of IT departments meant that they had to establish service-level agreements with different stakeholders to manage activities like equipment and software maintenance, budgeting, and software and hardware standardization. Consequently, the management of IT needed a service department and a centralized unit that had a relationship with the executive management.

As a consequence of the continued evolution of systems and software, business units started to focus on core processes and automated more functions without taking other business units into account, and thus the IT department received conflicting requirements for applications uptime. Since these technological changes happened very quickly, the IT sector could add a major challenge: managing change in a highly dynamic market. The result was a fragmented landscape with silos of technology and subsequently a continuous increase of the IT budget that could not be contained.

## Managing Change

Gartner and other leading IT research firms proposed several approaches to solving the cost issue through the use of strategic outsourcing. Companies should use their expertise and proprietary internal processes and procedures to ensure that the cost of running the IT environment is more integrated, sustained, and cheaper than the company can manage it internally.

The Gartner IS Lite model (shown in Figure 3) is one of the more popular approaches to outsourcing and is focused on moving the IT responsibility to the part of the business where it makes most sense. Thus, the supporting infrastructure is outsourced to a strategic partner, while the development and project management of individual systems are embedded into business units within the organization. The result is a lean IT department with key roles in coordinating and managing relationships and ensuring that there is strategic alignment between business and IT. Innovation is assigned to the business unit as well as the outsource partner.
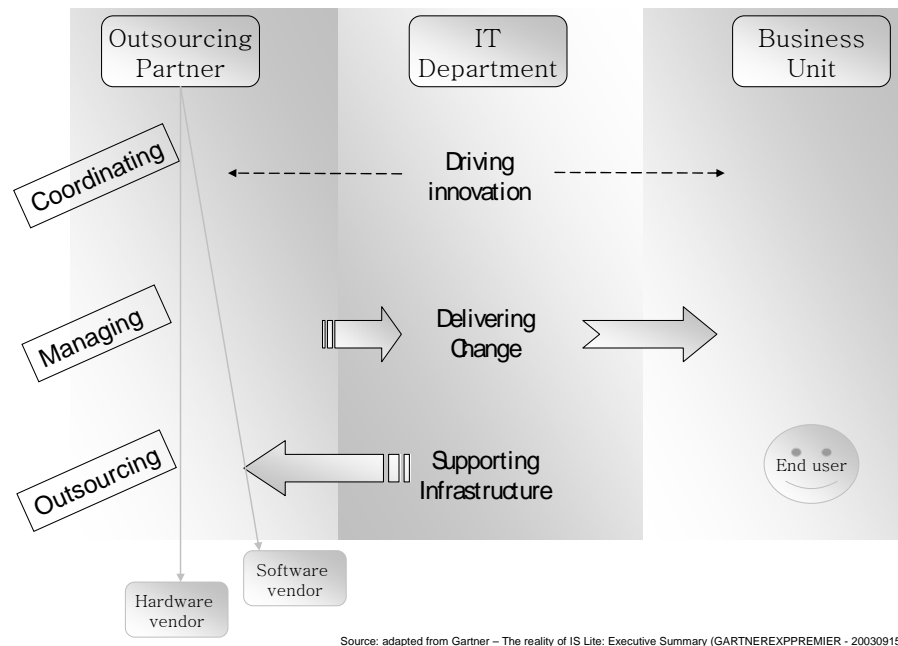
Figure 3: Adapted GARTNER IS Lite Model

Key stakeholders in the model include:

• End users

• Business unit

• Software and hardware vendor

• Governance department outsourcing

• Outsourcing department

There are formal and informal relationships that have to be managed as part of the governance domain. Governance is expressed in a formal relationship, which is based on the business relationship. However, governance is not limited to formal relationships. A relationship is also a more informal connection based on the people involved and the governance structure in place. The challenge is to ensure that the relationships are properly managed from both an informal and formal perspective.

Although service-level agreements (operational agreements about uptime between the business unit and the IT department) can be used to manage formal relationships between service provider (outsource partner or vendor) and the IT department, this type of agreement between the business unit and the IT department is often missing. This broader agreement should be made to ensure that business and IT are aligned. (Note that an agreement between end users and business units is not applicable as end users are members of a business unit. However, there is a governance model required between the end users and the representatives of the business unit. A formal agreement does not make sense, as the representatives are most of the time managers of the end user. Their responsibility is to ensure that the end user can perform his duties. In formal team meetings they should gather the information that is necessary to fulfill the end user's wishes and demands.)

### Relationship between Individuals

Another major challenge within the IT governance domain is the effect of individual relationships in the effectiveness of processes that deliver the contractual obligations of the service-level agreements defined. This needs careful management of social processes through different contractual domains. The social processes[8] are the flow along all elements that contribute to the outcome as defined by the service-level agreement. These social processes cross boundaries between different decision-making domains or between different management levels (strategic, tactical, operational), and may span very long periods. Governing these processes in fact means supervising that the right decisions are made at the right time and by the right roles.

The social process of learning and decision-making for minor changes to IT systems starts at a tactical level and results in smaller investments. The social process for major changes starts, for example, at the tactical level, is brought to the strategic level of decision-making, and will be carried forward to the tactical level again for implementation. Social process management binds the decision-making and learning aspects related to IT developments. The elements that can be governed during social processes that produce the right outcome of IT operations are further elaborated in What Good Governance would Look Like. Also, the decision-making domains that have been identified by Weill & Ross are discussed in that section.

### Summary

In summary, the challenge of IT has been to keep up with the evolution of new organizational units, or relationships between units. On the other hand, the speed in adopting new technologies has fragmented expertise as well as management of IT services and requires the management of relationships between growing numbers of stakeholders.

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[8] These produce outcomes that are related to the individual choice of stakeholders and relate to authority acceptance, communication, multi-stakeholder decision-making, and learning on-the-job.

# Results of Good IT Governance

The key results from a good governance program are:

- IT projects that are aligned with the business strategy

- IT projects that deliver the required business value

- Alignment of IT and organizational capabilities with business strategy

## IT Projects that are Aligned with the Business Strategy

Every business has key strategic tenets and/or thrusts around which the business goals are structured. These may be to improve competitive position, develop new markets, grow existing markets, improve operational efficiency, etc. Through a governance program that aligns IT investments to those business strategies and integrates IT into the overall enterprise plan, the IT investments are focused on supporting the business goals and objectives. In this manner, the IT investments become as important as any other capital investment in advancing the enterprise's strategy. As a result of a good governance program, these IT investments then will deliver against the business strategy, be balanced to match the various strategies (e.g., transform the enterprise or create an infrastructure that enables the business to grow and compete in new arenas), and be focused on the right areas to support the business (break into new markets, drive competitive strategies, increase overall revenue generation, improve customer satisfaction, ensure customer retention, etc.).

## IT Projects that Deliver the Required Business Value

IT investments can be aligned with the business strategy and still not deliver the required business value unless a good governance program ensures this. The business has expectations relative to the outputs of the IT project including fit-for-purpose; meeting business requirements; flexibility to adopt future requirements; throughput and response times; ease-of-use, resiliency and security; and integrity, accuracy, and currency of information. As a result of a good governance program, IT investments and projects deliver value by delivering on time, with appropriate functionality, and the intended benefits.

## Alignment of IT and Organizational Capabilities with Business Strategy

An IT capability is a specific set of activities, people, technology, and management practices that contributes value to the enterprise. Examples of IT capabilities are large program development, strategic alignment, IT operations, or project development capabilities. IT assets may result from investments in applications, infrastructure, processes, and people. The optimum use of IT investments must consider the alignment of business and IT objectives, cost efficiencies realized by IT, capabilities and competencies generated, and risks and opportunities addressed. At the strategic level, good governance ensures a good understanding of the implications of the business strategy on the IT domain. This gives guidance for compliance with business priorities, and for the organization of decision-making. Also, the processes of decision-making are well articulated and a *target architecture* exists for guidance on how to resolve structural issues during the project lifecycle. Target architectures may be developed at enterprise level, and translated into project architectures. These aspects ensure the execution of good projects at the required quality level, on time, and within budget. As a result of good governance, there will be enhanced cost management, measurable contribution from IT to business objectives, and optimum allocation of budget to the portfolio of IT initiatives.

### Summary

In summary, business governance integrates the different domains of the operations with a focus on the overall performance; IT governance ensures the contribution to the business mission and strategy; and architecture governance ensures that the development, deployment, and change of architectures are executed in accordance with the business strategy.

# What Good Governance would Look Like

The number of relationships and the fragmentation of IT disciplines have implications for good governance. Good governance has five characteristics:

- Principles are explicit and derived from the IT strategy.

- The operating logic is explicitly shared between stakeholders.

- Structure, social processes, and control are explicitly managed.

- Sufficient attention to the social aspects of governance[9] is required; social processes are the weakest link of governance.

- Governance is differentiated by IT sub-domains.

## Principles of Good Governance

Principles are statements that shape the governance operations in the IT domain. The governance of enterprise architecture is considered a critical part of the overall governance structure.

Once principles have been agreed and are part of the IT vision and strategy, the elements of governance can be developed accordingly:

- The internal logic of governance of the IT domain

- Decision-making structure

- Styles for decision-making by domain

- Set of core capabilities

- Set of social processes

- Control framework

- Supportive means and tools

## Operating Logic

IT is by definition related to any other business domain like manufacturing, finance, or human resources. The internal logic expresses how IT is related to these domains. Is IT leading, is business leading, or does the strategy demand close collaboration? Should informal relationships prevail, or should interaction be based on formal processes and structures? Governance is shaped by the relationship type. The Venkatraman model might give some direction. This model recognizes that an organization should be active in four domains: business strategy, business operations, IT strategy, and IT operations. Business has the meaning of everything that is not IT. Then it is argued that different routes exist to align the business and IT. Business might be given the primate, IT might be given the primate, or business and IT should collaborate for alignment. The process for alignment has different shapes accordingly. Also models are available to derive budgetary implications from strategy by differentiating procedures by area; e.g.,

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[9] This principle is based on two sources: Peter Weill and Jeanne W. Ross, IT Governance: How Top Performers Manage IT Decision Rights for Superior Results; and Harry H.M. Hendrickx, Governance in the Practice of Chief Information Officers.

innovation, maintenance, or large programs. The IT vision and strategy give priorities and determine which governance capabilities are critical.

## Decision-Making Structures and Roles

Weill & Ross have investigated IT governance since the mid-1990s and proposed a practical decision-making structure that gives insight into effectiveness of styles and roles. This includes, for example, responsibilities for establishing IT governance principles and the prioritization methodology that will be used to enforce those principles. Table 1 summarizes the five key domains of decision-making in IT. Top performing companies have applied different governance mechanisms per decision-making domain.

Table 1: Areas of Decision-Making Related to the IT Domain

| IT Principles | High-level statements about how IT is used. |
|---|---|
| Enterprise Architecture | The organizing logic for a firm's data, applications, and infrastructure, captured in a set of policies and technical choices to achieve desired business and technical standardization and integration. |
| IT Infrastructure Strategies | Centrally coordinated, shared IT services that provide the foundation for an enterprise's IT capability. |
| Business Applications Needs | Specifying the business need for purchased or internally developed applications. |
| IT Investment and Prioritization | Decisions about how much and where to invest in IT, including project approval and justification techniques. |

## Styles for Decision-Making by Domain

One of the mechanisms available to differentiate per decision-making domain is the variation in governance style. Weill & Ross found during their research that top performers had applied different styles of governance by domain. They have also shown that different styles may be applied by decision-making domain depending on the local situation. There is no one size fits all.

Table 2: Governance Styles

| Business Monarchy | Business executives; includes committees comprised of senior business executives (may include CIO). |
|---|---|
| IT Monarchy | Individuals or groups of IT executives. |
| Federal Monarchy | Shared by C-level executives and at least one other business group (e.g., CxO and BU leaders). Equivalent to the center and states working together. |
| IT Duoploy | IT executives and one other group (e.g., CxO or BU leader). |
| Feudal | BU leaders, key process owners, or their delegates. |
| Unorganized | Multiple structure; i.e., each individual user. |

[Source: Strikwerda]

## Social Processes in the IT Domain

As discussed in Scope of IT Governance, IT is people's business, and consequently needs careful governance of social processes in the IT domain. The social processes ensure that content, vision, and strategy flow through the different IT domains and the IT organization. These processes can be managed.

And once managed, they enhance performance. During an investigation in 2006, CIOs accounted for 10 social processes that have to be governed.[10] The list below is a reference for processes that, if successfully applied, will enhance performance. Social processes are not related to specific decision-making domains, but provide support for the performance of IT operations in general. Social processes and structures are equally important. The CIOs that were interviewed during the investigation raised a number of challenges. A few examples of these are:

- When the IT sector moved from a silo'ed structure to an integrated structure with business, some CIOs wondered how to enhance employee self-management in a much more complex structure of tasks and relationships.

- In an increasingly integrated environment, CIOs asked themselves how to ensure that authority is not only developed but also accepted. In a complex world, granting authority is not sufficient anymore.

- In an IT environment that resembles increasingly a professional network, CIOs ask themselves how to ensure that staff make the right choices.

Table 3: Social Process Examples

| 1. | Employee Self-Management | Knowledgeability of employees to cope with less transparency in job and goals. |
|----|--------------------------|-------------------------------------------------------------------------------|
| 2. | Staff Effectiveness | The performance of staff in accordance with the business strategy. |
| 3. | Authority | The decision right that may be exercised and accepted when decisions have to be taken. |
| 4. | Process | The combination of activities and interactions of actors to achieve a predefined output. |
| 5. | Coordination | The activity to align the relationship in which one actor cannot achieve his goal without the service of another actor. |
| 6. | Choice | The product of interaction between the emotional, political, and cultural dimension embodied in an individual. |
| 7. | Decision | The product of the process that analyzes premises and draws conclusions with regard to a business issue by two or more stakeholders. |
| 8. | Inter-dependence | The situation in which the existence of two or more events, assumptions, domains, or actors have complementary, constraining, or synergistic influence on each other. |
| 9. | Large Program | A multi-stakeholder activity that requires focused coordination for a longer period of time that cannot be met by current operations or one project. |
| 10. | Knowledgeability | The competence of an individual required to perform his tasks taking the social, content-related, and economic perspectives into account. |

[Source: Val IT Framework 2.0]

These ten processes give an overview of the major challenges recognized by CIOs. Each process implies specific interactions and relations among staff. Managing these interactions ensures a better performance. A way to apply interaction management is to understand the individual actors, manage the structural aspects, and/or manage the group and political aspects that come together embodied in the actors. Three interventions can be exercised to influence interactions: bringing in leadership, managing the structure, and/or managing the mode of learning during the interaction.

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[10] Harry H.M. Hendrickx, Governance in the Practice of Chief Information Officers, PhD Thesis, University of Tilburg, Tilburg, ISBN: 978-90-78886-07-5, December 2007.

## Capability Maturity

An example of a maturity model is the HP IT Governance Capability Model, which identifies seven governance core competencies that exist in organizations with world-class IT governance. Table 4 provides a short description and the key management objective for each.

Table 4: Governance Core Competencies

| Competency Domain | Description | Objective |
|---|---|---|
| IT Strategy Management | Assess business and IT capabilities and develop IT strategies and investment plans that fulfil the ROLE of IT. | Improve competitive, financial, and operational performance. |
| Portfolio Management | Manage the costs and capabilities embodied in the portfolio IT assets. | Build a low-cost, high-quality, secure, reliable, and agile business and IT service delivery infrastructure. |
| Enterprise Architecure Management | Define the policies, standards, and methods for describing the IT and business architecture and ensure compliance to firm-wide standards. | Ensure firm-wide leverage of IT, consistent with the ROLE of IT. |
| Financial Management | Plan and manage IT operating expenditures (opex) and capital expenditures (capex) to support the achievement of business and IT strategic and budget objectives. | Ensure IT operating (opex) and budget objectives are achieved and a proper alignment of IT costs to the business community. |
| Supply/Demand Management | Plan and manage the demands for IT services and the availability of assets and resources. | Reduce the fixed cost of IT and improve IT service delivery, scalability, and responsiveness. |
| Business Relationship Management | Manage key relationships with business stakeholders to develop an effective partnership between business and IT managers. | Improved customer satisfaction. Clear alignment of IT to prioritized business needs. |
| IT Operating Model | Implement the staffing, structure, skills, and performance culture to deliver IT services and fulfil the ROLE of IT. | Most efficient and effective execution of IT service delivery activities. |

[Source: HP]

The IT Governance Capability Model represents a number of different competency domains, each potentially having a different level of capability. The IT Governance Institute (ITGI) has described the following five levels of capability with respect to IT governance:

• Level 1 (Initial) – Some acknowledgement of governance issues, but no metrics for IT exist and issues are typically addressed on a case-by-case basis. Organizational relationships drive most investment decisions.

• Level 2 (Repeatable) – Governance processes begin to exist, though may not have been formalized. Some IT processes have measures and some technology standards have been established. The dominant responsibility model is the individual.

• Level 3 (Defined) – A good understanding of the need for governance exists; guidelines have been defined and are integrated into key governance processes. Repeatable governance procedures exist.

- Level 4 (Managed) – A full understanding of the value of governance exists. Service-level agreements are used widely and form the basis for performance monitoring. IT governance is an enterprise-wide discipline.

- Level 5 (Adaptive) – The role of IT is to create adaptive capabilities; there is an advanced understanding of IT governance which is integrated into the enterprise's corporate governance, risk, and compliance management process. IT investments are driven based on a clear understanding of risks, returns, and contribution to the enterprise business strategy.

## Control Framework

Organizations need a set of governance processes focused on IT governance with distinct relationships to architecture governance processes. The ITGI has developed two frameworks to support the practice of governance:[11]

- COBIT provides a comprehensive framework for the delivery of high-quality IT-based services. COBIT sets good practices for the *means* of contributing to the process of value creation.

- Val IT provides enterprises with the structure they require to measure, monitor, and optimize the realization of business value from investment in IT. Val IT sets good practices for the *ends* of the process of value creation.

Val IT is based on the COBIT framework. It contains three IT domains: Value Governance, Portfolio Management, and Investment Management. Briefly, these domains refer to leadership, decision-making with regard to the portfolio of initiatives, and the full cycle business case of initiatives. COBIT organizes IT governance processes into four areas:

- Plan and Organize

- Acquire and Implement

- Deliver and Support

- Monitor and Control

The COBIT framework represents the complete lifecycle of processes that are required for effective IT governance. It also strengthens the role of architecture governance within that system. COBIT includes a RACI Chart with the Chief Architect explicitly identified, along with responsibilities and activities assigned to this role, to ensure that architecture governance is addressed within the IT domain.

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[11] IT Governance Institute (ITGI), Enterprise Value: Governance of IT Investments, Val IT Framework 2.0, page 6.

Table 5: Example of Responsibility Division

| Activities | CEO | CFO | Business Executive | CIO | Business Process Owner | Head Operations | Chief Architect | Head Development | Head IT Administration | PMO | Compliance, Audit, Risk and Security |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Link business goals to IT goals. | C | I | A/R | R | C | | | | | | |
| Identify critical dependencies and current performance. | C | C | R | A/R | C | C | C | C | C | | C |
| Build an IT strategic plan. | A | C | C | R | I | C | C | C | C | I | C |
| Build IT tactical plans. | C | I | | A | C | C | C | C | C | R | I |
| Analyse programme portfolios and manage project and service portfolios. | C | I | I | A | R | R | C | R | C | C | I |

A **RACI** chart identifies who is **R**esponsible, **A**ccountable, **C**onsulted and/or **I**nformed.

[Source: COBIT]

RACI matrices are a means to summarize tasks and the key functions involved in executing activities. A indicates that a function is accountable; R means that it is responsible to do work; C indicates that this function may be consulted; I indicates that it should be informed. COBIT provides the relation between function and activities for all of its defined processes.

## Supportive Means, Skills, and Tools

As an organization's governance capability matures, software tools can be introduced to automate and formalize many of the decision-making processes.

Tooling is a real challenge. Also specialized skills – e.g., enterprise architecture or project management – are required to maintain and govern the complex processes in the IT domain. However, the complexity of their introduction is largely underestimated.

Tools are often seen as a solution, although it is not the tool itself that provides the solution but the way people deal with the content input, the handling of the content, and the discipline to maintain it. Since these tools contain information from many different domains and projects continuously change the aspects of IT or processes, much capacity is needed to maintain their effectiveness. Tool introduction and tool capability development is a venture of years rather than months. Major challenges in tool development are to get the right governance structure, and the right stakeholders involved. A governance model for the tool that might cross organizational boundaries is the next challenge. In summary, a tool implementation that is not approached as a process implementation is doomed to fail.

Enterprise architecture is an example discipline that is recognized only after years of evangelization. However, even once accepted as a discipline, it is not easily embedded in the fields of business IT alignment, project development, or IT operations. Three large IT suppliers – Capgemini, HP, and IBM – started independently certifying architects in the second half of the 1990s. Independent standards organizations have now leveraged their first experiences and The Open Group has a certification program for IT architects. The same applies for other disciplines in the fragmented IT landscape. An important governance task in IT is to understand and maintain the right level of skills and supportive tools to meet the challenges of complexity, risk mitigation, and cost reduction.

# Recommendations for TOGAF Enhancements

Good governance is described in the previous section: What Good Governance would Look Like. Comparison of the framework presented in the previous section with TOGAF 9 results in a number of recommendations. Preliminary recommendations have been included in Appendix A: Governance in TOGAF 9 and Recommendations.

## TOGAF Governance Hierarchy

To begin with, TOGAF does not include business governance in its hierarchy, and it should be added. To further strengthen IT governance, the existing architecture governance role must evolve and obtain more recognition of its support in IT governance. IT governance in turn contributes to technology governance, but technology governance is broader than IT governance. Technology governance contributes to business governance. Corporate governance is focused on the relation of the company with its national context. Business governance is referred to when the different elements of an enterprise are integrated and focused on contribution to its goals. It is the highest level of internal governance.

*Recommendation 1*: Add a layer of business governance between corporate and technology governance. This layer recognizes the governance of the integration of the different aspects of an enterprise or organization. This is based on Scope of IT Governance.

The following structure would then be created:

- Corporate governance: System by which business corporations are directed and controlled. Characteristics of discipline: transparency, independence, accountability, responsibility, fairness.

- Business governance: Integrates the different elements of an enterprise with focus on the contribution to its mission and goals. Several aspects of integration have been considered; e.g., integration of domains; integration of social processes and structure.

- Technology governance: Controls how an organization utilizes technology in the research, development, and production of its goods and services – broader than IT, but could include IT. Technology governance is at the same level as human resources, processes, and management.

- IT governance: Framework and structure that links IT resources and information to enterprise goals and strategies. Institutionalizes best practices for planning, acquiring, implementing, and monitoring IT services, to ensure that the enterprise's IT assets support its business objectives.

- Architecture governance: Enables IT governance as a board-level responsibility. Architecture governance is a key enabler of the IT governance ability to align business and IT. It ensures business responsibilities associated with architecture activities and artifacts are elucidated, communicated, and managed effectively.

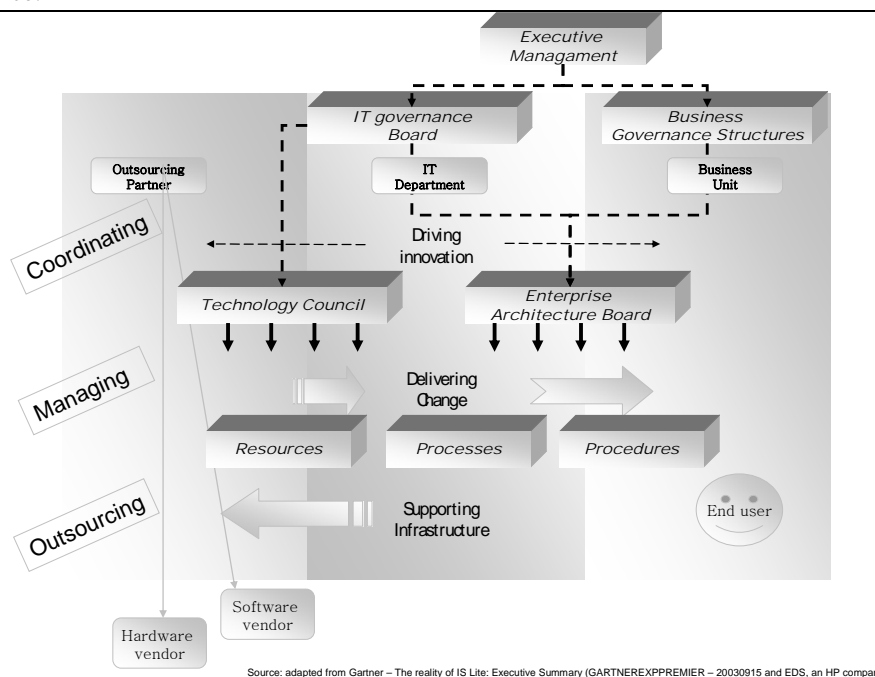## Business Governance and Implementation Governance

Architecture governance is tied to business governance (which includes IT governance) and implementation governance. *Business* governance requires an assessment of changes in business direction which results in updates to the target enterprise architecture. Business governance also refers to business IT alignment at the first half of the project lifecycle until the decision to build. *Implementation* governance is the mechanism to implement the enterprise architecture to realize the intended business direction. It is

related to control of compliance to architecture, as well as alignment of the project deployment requirements with the IT operations. Business governance as well as implementation governance are continuous processes.

Figure 4 shows an example of an integration of IT and enterprise architecture governance. It shows how enterprise architecture governance supports the IT governance board. This model could be enriched through a more detailed definition of decision rights and structure to show how the architecture roles and decisions rights complement the IT governance components.

> *Recommendation 2*: It is recommended that TOGAF 9 retain the distinction between business governance and implementation governance. Consequently, TOGAF 9 should be validated to ensure compliance with this distinction. Special attention should be given to the use of corporate governance *versus* business governance.



Source: adapted from Gartner – The reality of IS Lite: Executive Summary (GARTNEREXPPREMIER – 20030915 and EDS, an HP company

[Source: Adapted based on Gartner]

Figure 4: Example Governance Structure

## Elements of Architecture Governance

Today, TOGAF describes elements of architecture governance as:

1. Cross-organization Architecture Board, which supports an IT governance strategy

2. Comprehensive set of architecture principles to guide, inform, and support the way in which an organization sets about fulfilling its mission and use of IT

3. An architecture compliance strategy, which includes project impact assessments, formal architecture compliance reviews, and product procurement involvement

It is recommended that architecture governance change the list of required elements to specify:

4. A decision-making structure

5. Five principles related to the core elements of governance (as described in What Good Governance would Look Like)

6. A control framework

The first element refers to the Architecture Board. This is only one element of the organizational structure that is recommended for architecture governance. Therefore, a change is recommended to substitute it with a more comprehensive element to which the Architecture Board belongs; i.e., the decision-making structure.

*Recommendation 3*: Substitute the first element – cross-organization board of architecture – of the list with the "decision-making structure" as described in What Good Governance would Look Like.

The second element refers to principles of architecture, which is a different aspect than principles of governance. Since this section deals with architecture governance, the set of architecture principles can be substituted with "governance principles".

*Recommendation 4A*: Bullet point "comprehensive set of architecture principles" can be substituted with "set of governance principles" because it refers to governance, not to architecture that should be shaped.

*Recommendation 4B*: Change the second bullet point into: "Good governance is based on five principles. Architecture governance is similarly based on at least five principles that refer to the following five domains: 1. Principles derived from the IT strategy shape the governance system. 2. The internal logic is identified and explicitly shared between stakeholders. 3. Structure, social processes, as well as control are explicitly managed. 4. Sufficient attention is paid to the social aspects of governance.[12] 5. Different domains need different governance; this includes different IT sub-domains. (This recommendation is based on What Good Governance would Look Like.)

The third element refers to compliance with architecture. In What Good Governance would Look Like, COBIT has been discussed as a general control framework. This framework also contains architecture controls – especially the Plan & Organization phase – but almost all COBIT 4.1 processes have some type of relationship with architecture governance.

Today, architecture governance processes in TOGAF are described as:

• Policy Management and Take-On – registration, validation, ratification, management, and publishing of architecture changes and contracts

• Confirmation of architecture change business case

• Confirmation of total cost of ownership (TCO) for business change

• Compliance – assessments against service-level agreements, operational-level agreements, standards, and regulatory requirements

• Dispensation – compliance assessment outcome, interim conformance criteria, and timeframe in advance of compliance

• Monitoring and Reporting – operational and service elements are managed to a set of criteria

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[12] This principle is based on two sources: Peter Weill and Jeanne W. Ross, IT Governance: How Top Performers Manage IT Decision Rights for Superior Results; and Harry H.M. Hendrickx, Governance in the Practice of Chief Information Officers.

- Business Control – compliance with business policies

- Environment Management – ensures architecture repository environment is effective and efficient

These control processes could be compared with the COBIT 4.1 framework. The COBIT 4.1 framework could be extended with these control processes if not yet included. Also, TOGAF 9 may be enhanced with the COBIT 4.1 approach.

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*Recommendation 5A*: The Val IT framework is a valuable framework for governance of effectiveness of IT investments. Since a characteristic of good governance is also the contribution of IT initiatives to business value, it is recommended to embed Val IT in the TOGAF framework.

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*Recommendation 5B*: COBIT 4.1 and its comparison with TOGAF 8.1.1 can be re-used to align Chapter 48 of TOGAF 9.

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*Recommendation 6*: Substitute the third element as described currently in TOGAF 9 into a more generic element: control framework instead of compliance strategy only. The control framework contains control objectives for IT governance as well as architecture governance. It is recommended that TOGAF 9 be explicitly aware of the IT domains and processes and the related architecture objectives and controls.

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Principles 1, 2, and 6 as described in What Good Governance would Look Like are already included in TOGAF 9, and related recommendations are now included in this chapter. Principles 3, 4, and 5 have not yet been included in the Architecture Governance chapter of TOGAF 9. This leads to another recommendation.

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*Recommendation 7*: TOGAF 9 has not included styles for decision-making. It is recommended to include in TOGAF 9 the text of What Good Governance would Look Like related to styles of decision-making structure. The styles are based on Weill & Ross on IT Governance.

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Recognizing the role of maturity assessments in the definition of IT and architecture governance will improve the business value of TOGAF. Today, TOGAF points readers to various process maturity frameworks. Establishing an IT governance or architecture capability requires not only an assessment of the IT process maturity, but also an assessment of the maturity of the enterprise and its decision-making style.

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*Recommendation 8*: TOGAF 9 has not included core capabilities. It is recommended to include in TOGAF 9 the text of What Good Governance would Look Like related to core capabilities for governance.

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*Recommendation 9*: TOGAF 9 has not included social processes. It is recommended to include in TOGAF 9 the text of What Good Governance would Look Like related to social processes.

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## Tools and Supporting Means

The Enterprise Continuum within TOGAF can be used to assess the information needs for IT governance which should be stored in a repository created by architecture tools. Identifying which artifacts produced by the architecture capability support IT governance will assist this analysis. Tools and certification of architects are critical means for architecture governance.

*Recommendation 10*: TOGAF 9 has extended parts devoted to tools and the architecture profession. No specific recommendation arises from this White Paper.

# Appendix A: Governance in TOGAF 9 and Recommendations

To derive the set of recommendations, TOGAF 9 has been investigated on the key word "governance" in the Contents and Figures tables. The following table captures the results. This list is a starter to further check the compliance of TOGAF with best practices and insights as compiled in this White Paper. When identified during the search, a recommendation has been included in the third column.

| Section | Title | Comment/Recommendation |
|---|---|---|
| 15 | Phase G: Implementation Governance Model | (See Section 36.2.15) High-level indication of the purpose and need for implementation governance.<br>***Recommendation***: Elaborate an implementation governance model according to the best practices and insights of the governance framework as presented in What Good Governance would Look Like of this White Paper. |
| 15.2 | Phase G: Implementation Governance Model | (Approach)<br>***Recommendation***: Include all aspects of the governance framework in the implementation model as described in What Good Governance would Look Like of this White Paper. Add one paragraph on the management of social processes, which are critical to successful implementation. |
| 16.1 | Phase H: Architecture Change Management | This phase is a process that is closely related to architecture governance processes.<br>***Recommendation***: There are two types of projects: compliant with target architecture and implying change of target architecture. Projects compliant with target architecture can skip this phase because the process of implementation governance takes care of it. Projects that need a change in architecture (e.g., SOA approach) need a careful change process, which implies change in governance frameworks. The recommendation is to include the aspects of social processes because these are critical to innovations and large programs that change the architecture. |
| 19.3 | Iteration Cycles | ***Recommendation***: Include in the tables the architecture governance framework as core in architecture context/implementation governance and architecture context/change management. |
| 22.7 | Benefits of TOGAF to SOA Development | ***Recommendation***: Emphasize the dramatic change in governance bodies when embarking on an SOA approach with reference to the IT governance framework of What Good Governance would Look Like of this White Paper.<br>***Recommendation***: Include the internal governance logic for SOA as compared to a non-SOA environment. Use the Governance Reference Framework of What Good Governance would Look Like. |
| 22.9 | Contract and Structure of a Service Contract | (See Section 22.7) |
| 23.3 | Architecture Principles | ***Recommendation***: What Good Governance would Look Like of this White Paper should include the template as provided for principle description. |
| 24 | Stakeholder Management | ***Recommendation***: Add "identification of social processes and how to manage them" as one of the deliverables. |

| Section | Title | Comment/Recommendation |
|---|---|---|
| 30.3 – 30.4 | Readiness Factors | ***Recommendation***: Include a maturity model for assessment of readiness of the governance organization. |
| 32.3.1 | Capability Management | ***Recommendation***: Add to Figure 32.2 social processes as a process dimension. Social processes refer specifically to horizontal processes. |
| 36.1 | Architecture Deliverables | ***Recommendation***: Add to Implementation Governance Model outline as output of preliminary governance. |
| 36.2 | Implementation Governance Model | ***Recommendation***: Add the missing elements which are discussed in What Good Governance would Look Like of this White Paper. |
| 41.1 | Architecture Repository | ***Recommendation***: Align the governance log in the picture of the repository with the governance elements of the Governance Reference Framework of What Good Governance would Look Like of this White Paper. |
| 41.5.2 | Architecture Repository – Governance log | (See Section 41.1) |
| 48 | Architecture Compliance | ***Recommendation***: Align with the COBIT Control Framework. |
| 50.1.1 | Architecture Governance | ***Recommendation***: Add another level between corporate governance and technology governance; i.e., business governance, as proposed in What Good Governance would Look Like of this White Paper.<br><br>***Recommendation***: Align Chapter 50 with the framework as proposed in What Good Governance would Look Like of this White Paper.<br><br>***Recommendation***: Reconsider Figure 50-1. Include structure, social processes, and content. Content should flow through social processes and contribute to decision-making. |

## About the Editor

Harry Hendrickx has been a consultant for more than 15 years. During his consulting practice from 1992 onwards, he has had a special interest and focus on governance practice. He has been certified at Capgemini as a business architect since 1997, and finally as a global enterprise architect at Capgemini's internal certification program. Between 2002 and 2007 he investigated governance practice as part of the completion of his Philosopher's Degree in the Netherlands at the University of Tilburg in 2007. In 2007 he joined EDS, now an HP company, as Chief Technology Officer. At The Open Group he has been involved in several working groups: SOA, co-initiating the Business Architecture working group, and co-initiating and co-chair of the TOG-TMF liaison working group.

## About the Working Group

Following a proposal by HP to The Open Group Architecture Forum to extend the governance aspects of the TOGAF Architecture Development Method (ADM), a team from the HP TOGAF community started to develop an outline document and created the first draft of this White Paper. The team was joined by a group from South Africa, and together they arrived at a series of recommendations for enhancements to TOGAF with regard to governance.

Several specialists from HP have contributed content and reviewed Version 1 and 2 of this White Paper: Cindy de la Cruz, Walt Lammert, Ruud Pieterse, and Andrew Pugsley. A group from South Africa coordinated by Louw Labuschagne contributed to Version 2: Ken Hales (ESKOM), Chris Kleb (Ovations Group), and Sarina Viljoen (RealIRM). The following participants from HP have contributed by critically reviewing the contents and providing builds: William Bejcek, Charlie Bess, Fred Cummins, Draighton Green, Ed Kettler III, Paul Robinson, Larry Schmidt, and Robert Wende.

## About The Open Group

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