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Layout Design: François Louis Nicolet
Composition: Jorge Liácer-Gil de Ramales

Editorial correspondence: Llorenç Pagés-Casas <pages@ati.es>
Advertising correspondence: <novatica@ati.es>

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Monograph: IT Governance (published jointly with Novática*)

Guest Editors: *Dídac López-Viñas, Antonio Valle-Salas, Aleix Palau-Escursell, and Willem-Joep Spauwen*

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This is NOT IT Governance

Jan van Bon

IT is a business like any other line of business, so why don't we run it as a business? If we look at other disciplines, we can find excellent examples of the application of governance principles. In the IT market, however, we seem to have forgotten to apply some of the most elementary business policies. Recent developments have shown the catastrophic effects that may follow from this. So let's have a closer look at this, and take the first elementary step by answering "What is IT Governance and what is it NOT?" The answer may come as a surprise. And IT Governance may be less difficult than it seemed.

Keywords: Decision Making, Executive, Frameworks, Information Management, IT, ITIL, IT Governance, Management, Model Enhanced, Organization, Planning and Control, Strategic Alignment.

1 Introduction

IT Governance is important to CEO's and to CIO's - but what is it, and what is it NOT? This article provides some insight into that question, using a number of modern management frameworks

2 What is IT Governance about?

With the ever growing role of information in the Business, it is hard to deny that this world has become totally dependent upon information management. Many organizations wouldn't even survive for more than a few days if their information systems would discontinue. This is the first and main reason for the existence of IT Governance; you need to be in control of your information supporting systems. But there are other significant reasons as well.

First of all: organizations need to make sure they comply to external regulatory requirements. We all know the examples of what happens if this is not taken care of. Enron and Worldcom have shown the consequences of bad governance and each country will have had its own local financial disasters as well. Sarbanes-Oxley¹, Basel II², IFRS³, and many local regulations were the answer to this. All these regulations are aimed at ensuring that organizations are in

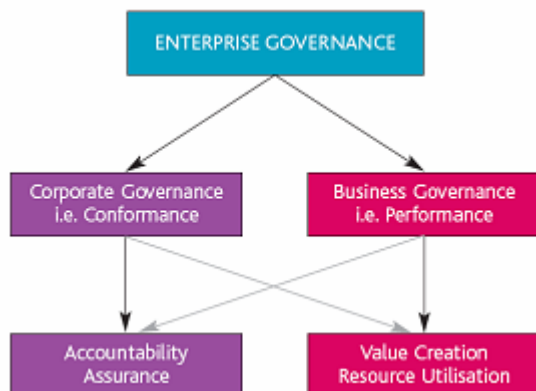


Figure 1: The CIMA Enterprise Governance Framework.

Author

Jan van Bon (Inform-IT.org) has been involved with the development and publication of a large number of IT Management frameworks. After a decade of academic research he started his work in IT in the late 1980's, in the Netherlands. He launched the Dutch itSMF (IT Service Management Forum) in 1994 and was involved in itSMF projects ever since. He has produced more than 50 books, in 14 languages, with expert authors from all over the world, on a broad range of IT management topics <j.van.bon@bhvb.nl>.

control of decision making processes and have transparent administrations.

A second crucial sponsor of IT Governance is the fact that organizations are more and more managed from the perspective of the shareholder and other stakeholders. Organizations need to provide added value in terms of financial revenues or other values. Hedge funds are taking over many companies and splitting them up for better financial returns. Individual shareholders are getting organized and their influence is growing. Other stakeholders like employees and society are gaining recognition and extending their influence on the decisions and performance of an organization.

These aspects illustrate some of the core elements of a generally accepted view on corporate governance, as illustrated in the CIMA (Chartered Institute of Management Accountants) Enterprise Governance Framework (see Figure 1). This framework emphasizes the role of two key issues in governance: "Conformance" and "Performance".

¹ "The Sarbanes-Oxley Act of 2002... is a United States federal law enacted on July 30, 2002 in response to a number of major corporate and accounting scandals including those affecting Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom". <<http://en.wikipedia.org/wiki/Sarbanes-oxley>>.

² "Basel II is the second of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. The purpose of Basel II, which was initially published in June 2004, is to create an international standard that banking regulators can use when creating regulations about how much capital banks need to put aside to guard against the types of financial and operational risks banks face" <http://en.wikipedia.org/wiki/Basel_ii>.

³ "International Financial Reporting Standards (IFRS) are standards and interpretations adopted by the International Accounting Standards Board (IASB)" <<http://en.wikipedia.org/wiki/Ifirs>>.

Researchers	IT Governance Definition
Brown and Magill (1994)	IT governance describes the locus of responsibility for IT functions.
Luftman (1996)	IT governance is the degree to which the authority for making IT decisions is defined and shared among management, and the processes managers in both IT and Business organizations apply in setting IT priorities and the allocation of IT resources.
Sambamurthy and Zmud (1999)	IT governance refers to the patterns of authority for key IT activities.
Van Grembergen (2002)	IT governance is the organizational capacity 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.
Weill and Vitale (2002)	IT governance describes a firm's overall process for sharing decision rights about IT and monitoring the performance of IT investments.
Schwarz and Hirschheim (2003)	IT governance consists of IT-related structures or architectures (and associated authority patterns), implemented to successfully accomplish (IT-imperative) activities in response to an enterprise's environment and strategic imperatives.
IT Governance Institute (2004)	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 strategies and objectives.
Weill and Ross (2004) [5]	IT governance is specifying the decision rights and accountability framework to encourage desirable behavior in using IT.
AS8015:2005	The system by which the current and future use of ICT is directed and controlled. It involves evaluating and directing the plans for the use of ICT to support the organisation and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organisation.

Table 1: Some Definitions of IT Governance (based on [1]).

3 Definition(s) of IT Governance

A Google search for the meaning of IT Governance will easily show over 50 different definitions. There still is no single authoritative source that has gained the power to set any of these as the universal and official definition. Table 1 presents some of the most familiar definitions.

Lately, experts in the field show some convergence towards common elements in the definitions they use. Key elements in the governance definitions are *the organization* and *the distribution of rights*. Governance tends to deal with organizational elements that are accountable for decision making, in a transparent way. This immediately points out the second important element, which always is about *decisions*.

However, governance is mostly restricted to only providing the infrastructure for making these decisions, and the decision making process itself is not included. Making

decisions is generally accepted to be an aspect of *management*, which is separated from governance. Sohal and Fitzpatrick [2] have illustrated that in their research on governance in Australian government (see Figure 2).

So there is a clear distinction between governance and management, suggesting that governance enables *the creation of a setting* in which others can manage their tasks effectively. Which makes IT Governance and IT Management two separated entities. Although many frameworks such as COBIT (*Control Objectives for Information and related Technology*) and ITIL (*Information Technology Infrastructure Library*) are characterized as "IT Governance frameworks", most of them are in fact *management frameworks*.

4 What Is Not IT Governance

To be able to understand what IT Governance is all about,

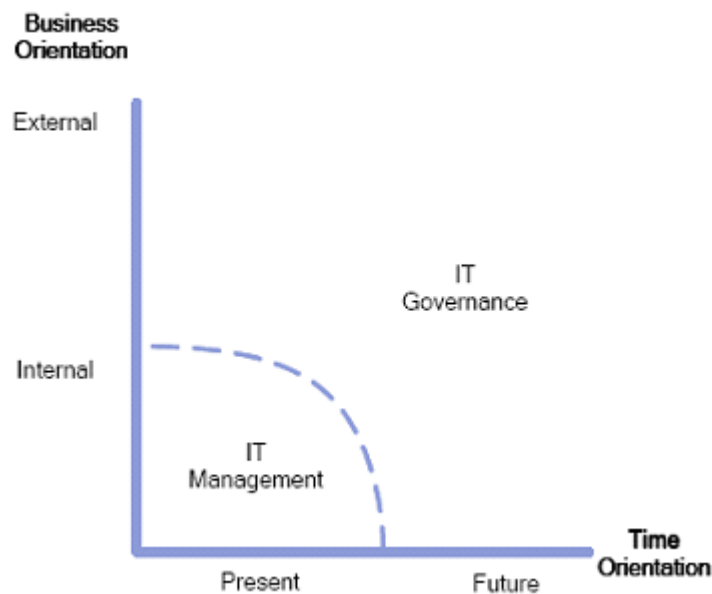


Figure 2: IT Governance versus IT Management (Sohal & Fitzpatrick [2]).

it would be very helpful to understand what it is *not*. E.g., as we saw in the previous paragraph, *management* is not governance. To be able to understand what is excluded from the field of IT Governance, it therefore is useful to understand what IT Management is.

We are discussing *IT* Governance and not *corporate* governance, which automatically means that we have to involve the discipline of Information Support in this. Information Support is widely recognized as a supporting discipline for the other Business processes.

The best way to manage a domain properly, according to the principle of *Separation of Concerns*, is by dividing that domain into a *control* subdomain and a *realization* subdomain. That way, the realization domain does not control itself. Once applied to Information Support, this provides us with two separate responsibility domains: Information Management (IM), where information support systems are *designed and controlled*, and Information Technology (IT), where the information systems are *built and run* (see Figure 3).

Two opposite forces make this interactive system work:

1) Pull. The organization controls the quality of the Information Support, based upon requirements that follow directly from the information demand of the primary Business activities. In addition, other supporting (Business) activities also influence the demand for information. The IM domain acts as the next link in the chain from the Business domain perspective.

2) Push. Based on both *possibilities* and *impossibilities*, and *problems* from the IT domain, the organization adjusts the set-up of the Information Support.

Another widely used management paradigm (Planning and Control) explains that in each domain we should al-

ways have Strategic, Tactical and Operational levels of management (see Figure 4).

This also supports an interactive system based upon two opposite forces:

1) Pull (top-down). Strategic plans and goals are specified at a tactical level and realized at an operational level. But plans and goals can be adjusted, market forces can require adjustments, new partnerships can lead to new goals, new ruling can require new preconditions, and each of these will have its effect downstream towards the operational level.

2) Push (bottom-up). The organization adjusts objectives and goals by evaluating the realization processes, adding operational experiences to the decision processes. Again this will show both the new *possibilities* as well as the *impossibilities and problems* that an organization will run into.

Combining the views described above results in a 3x3 model for managing Business, Information and Technology, as expressed in the SAME Model (see Figure 5).

The SAME model can be used as the "basic pattern" for managing Information Support issues in organizations. It still describes the responsibility and process elements, but once we understand the structure of this 3x3 matrix, we can use it to tackle organizational issues. Issues that can be addressed include:

- **The organization of the Information Support.** This deals with effectivity and efficiency:

- Setting up responsibilities, role descriptions and RACI (*Responsible, Accountable, Consulted, Informed*) matrices in the Information Management domain, and allocating these to the various cells of the 3x3 matrix.

- Decisions on outsourcing of one or more activities or functions, once they are understood and positioned in the 3x3 matrix.

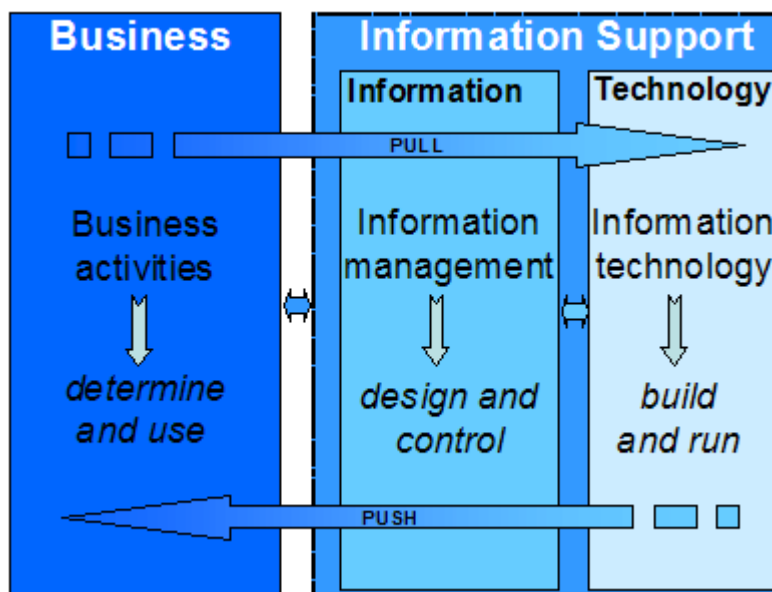


Figure 3: Separation of Concerns in the Information Support Discipline (Van Bon & Hoving [3]).

- Setting up the control organization for the management of outsourced activities or functions, managing external suppliers, setting up agreements, creating reporting policies.
 - Auditing the organization.
 - **Cross-references.** Positioning and scoping of existing management frameworks, finding white spots in the management system.
 - **Process models.** Allocating processes to specific management levels or domains, setting up process models based on the given interactions between cells in the 3x3 model, completing process models based on the 3x3 model interactions.
- Although the model can be used to tackle lots of *management* issues, it is quite useful as a base for discussing

governance issues. After all, if IT Governance is about the organization of rights and decisions, we could now focus on the allocation of these in the 3x3 matrix. The matrix provides us with a structured model of responsibilities and activities. Allocating these to a specific organization actually comes down to determining your IT Governance system.

Example 1: Organizing the IM Domain

Note that the dimension in the SAME Model is *process* (managing Information Support activities, responsibilities, tasks) and not *organization*. If we want to apply the common factors of the above definitions of IT Governance, we will thus have to allocate the process domains of the SAME



Figure 4: The Planning and Control Paradigm for Strategy, Tactics and Operations (Van Bon & Hoving [3]).

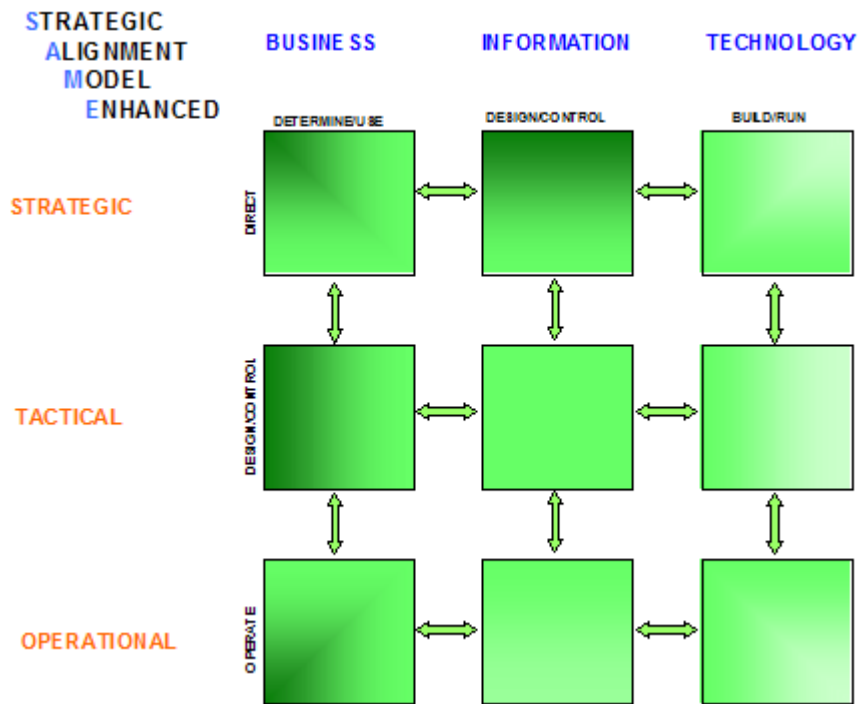


Figure 5: The Strategic Alignment Model Enhanced (Van Bon & Hoving [3]).

model to an organizational structure. We can do this by taking the organizational dimension as an overlay over the process dimension in the SAME model. And since organizations tend to differ in their organizational models, we can find many different solutions for that. A few simple examples for the organizational allocation of Information Support responsibilities are described in Figure 6.

This highlights the question of where the responsibility for IM and IT is positioned in the organization, which typically is an IT governance issue. Basically this comes down to a question of where the IM domain is positioned:

a) **Stuck-in-the-middle.** IM is positioned at equal distance from the Business and the IT domain, in many instances emblematic for organizations trying to implement IM as a liaison

function. The result is fairly often an IM function "stuck in the middle": missionaries talking to a brick wall at the Business side, renegades for the Technology side, and peacekeeping troops in the middle, missing a clear identity in their own mindset. In this scenario, IM will be an independent Demand Organization, loosely coupled with the Business.

b) **As an extension of the IT function.** The IM responsibilities of the organization have largely been delegated to the Technology domain, where the IT services are produced. Although still often found in practice, this approach is not recommended: management tends to be expressing itself in terms of technology, not in terms of Business values. And the information service provider is now controlling itself, which leaves the Business vulnerable in its relationships

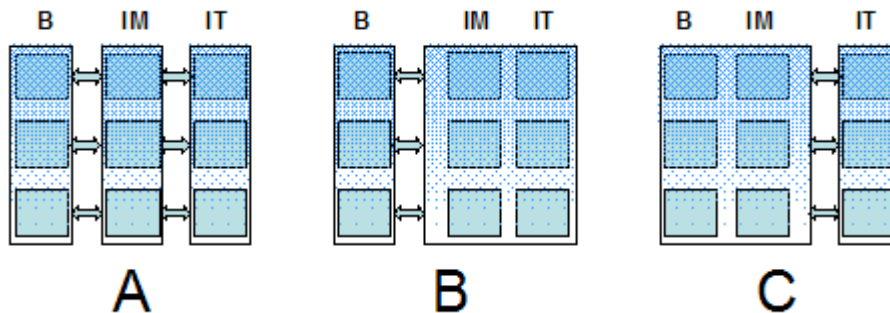


Figure 6: The Position of the Information Management Domain, between Business and Information Technology in the SAME Model (Akker [4]).

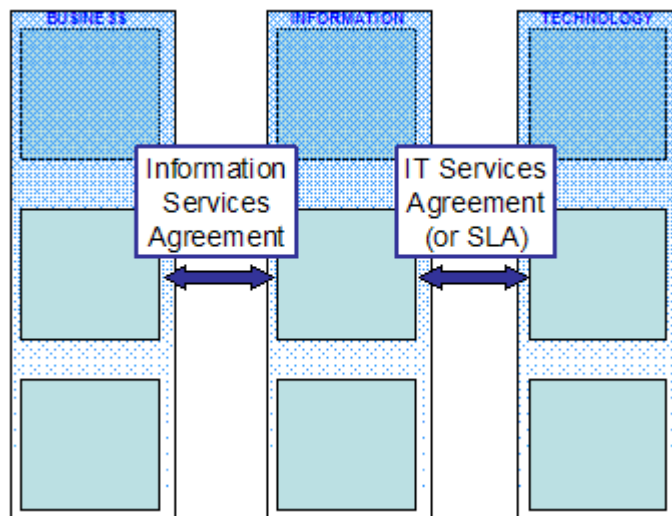


Figure 7: Service Contracting in the SAME Model.

with suppliers. The organization has set IM at a distance, making it highly vulnerable to misalignment between Technology and the Business.

c) **As an extension of the Business function.** Here, information is considered to be a Business asset, and the relationship with Technology can be a contractual one: IT is a supportive function, to be managed as such, and conceivably governed via outsourcing. Moreover, IM is a shared Business responsibility, while IM as a separate function is only accommodating and stimulating, but never leading. IM and Business responsibilities are tightly bound and IT can be regarded as a replaceable commodity, to be provided by any adequate supplier.

Example 2: Service Contracting

If the Business wants to contract specific information

support, it will contract the IM domain for the provision of *information services*. This agreement can be called an Information Services Agreement (ISA).

The IM domain will then have to contract an IT service providing function, to provide the technology elements of the information services. That agreement will be between IM and IT, and can be called an IT Services Agreement (ITSA), also known as the Service Level Agreement (SLA) in ITIL (see Figure 7).

Example 3: Organizing a Service Desk

The IM domain will have to provide operational support for the user in the Business domain. This refers to the functionality and the actual delivery of the agreed information services and is aimed at supporting the use of these information services by the Business. The IT domain will have to provide

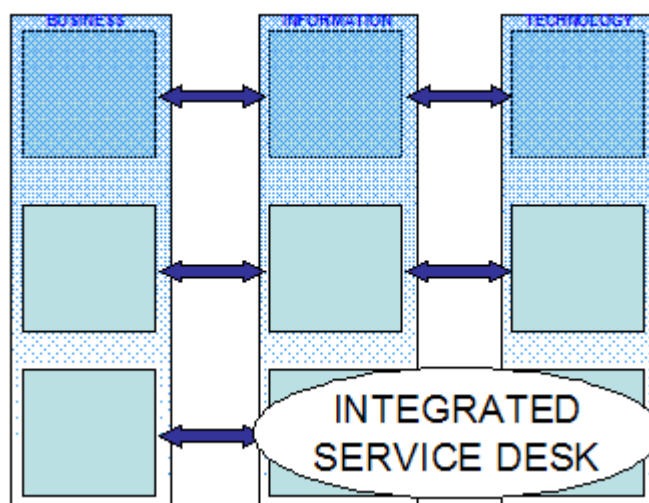


Figure 8: Example of an Integrated Service Desk, as an Organizational Layer over the SAME Framework.

Decision Making Roles, Groups	Description
Executive Board	Decision making board of managers
Executive Manager	Single decision making person
Business Board	Decision making board of managers, managing a single Business domain
Business Manager	Single decision making person, managing a single Business domain
Unit manager	Single decision making person, managing a single unit, e.g. of an expert domain
IT Board	Decision making board of IT involved managers, usually reinforced with experts
Committee	Permanent decision making board of experts, handling a single expertise, knowledge domain, area, process of shared interest
Advisory Board	Delivery of input to support decision making
Task force	Temporarily decision making board of experts, handling a single task usually of shared interest
Chief Information Officer	Highest ranking decision making manager in the Information Support domain
IT Manager	Highest ranking decision making manager in the IT domain
Service Manager	Decision making representative, managing a service or service domain on behalf of the IT department
Employee	Empowered employee that is authorized to take certain (usually process related) decisions

Table 2: Examples of Organizational Decision Making Structures (based on [1]).

the operational support for the user, under the control of the IM domain, but the IM domain itself will have to provide the support for functionality and specification issues.

For both types of support activities a Service Desk unit may be installed. Instead of creating two separate Service Desks, an organization may decide to create just one integrated Service Desk (see Figure 8). This Integrated Service Desk should then be prepared and educated to solve both information issues as well as IT service issues.

Example 4: Position of Frameworks

An organization wants to use widely accepted frameworks for its management approach. It already has ITIL V2 largely in place. The organization now considers the adoption of ITIL V3, and wonders whether this will cover the entire Information Support domain.

The answer is "no". Both ITIL V2 and V3 are largely

located in the Technology domain and cover only some minor aspects of the IM domain. The organization will have to adopt additional frameworks to cover the entire Information Support domain (see Figure 9).

5 So What Is IT Governance

Based on the previous considerations, a recommendable definition for IT Governance would be:

"**IT Governance** is the assigning of accountability and responsibility and the design of the IT organization, aimed at an efficient and effective use of IT within the Business processes, and conforming to internal and external rules."

This definition is built on the following terms:

- **Accountability:** the principle that individuals, organizations and the community are responsible for their actions

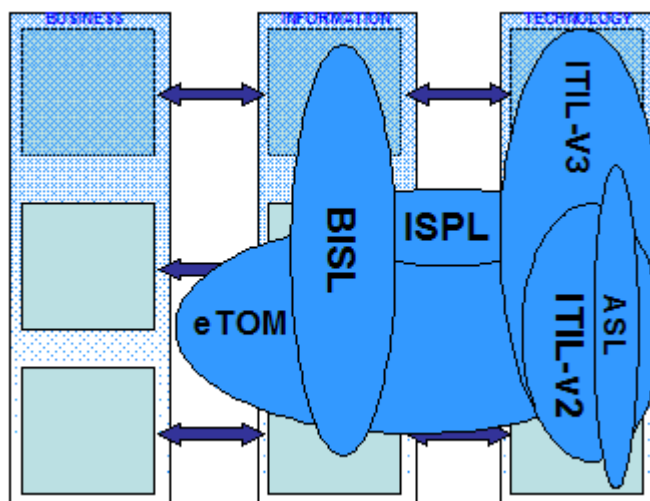


Figure 9: An Example of Positioning Management Frameworks in the SAME Framework.

and may be required to explain them to others.

■ **Responsibility:** to be entrusted with or assigned a duty or charge.

■ **Organizational design:** the structure and relations between departments, the grouping of tasks, and the flow of work in organizations.

■ **Business Processes:** the workflows within a company and the processes involved in inter-company transactions.

■ **Rules:** policies and principles guiding action.

And a recommendable definition of management would be:

"Management is making decisions within a set of assigned accountabilities and responsibilities and for a clearly defined organizational area."

Allocating the responsibilities and rights to an organizational management system, as explained in the above

examples, is typically the kind of issue that is handled in IT Governance. Other issues that IT Governance is concerned with could be:

■ **Ensure authority and responsibility in IT:** How do I stay in control? Which (in)formal planning and reporting shall be required? Who shall determine budgets? Shall we have a centralized or a distributed organization?

■ **Ensure IT complies with regulatory authorities:** Which body shall consider the relevant and required regulations and certifications? How shall risks be managed?

■ **Ensure IT is organized and ready for change:** How shall the IM and the IT organizations be organized? Hierarchy, project-based, flat, team-based, etc? Which remuneration policies shall be applied? Bonus rules, performance related salaries, variable salaries, annual raise, etc? How shall competences be managed and developed?

■ **Ensure IT is aligned to fit Business/organizational**

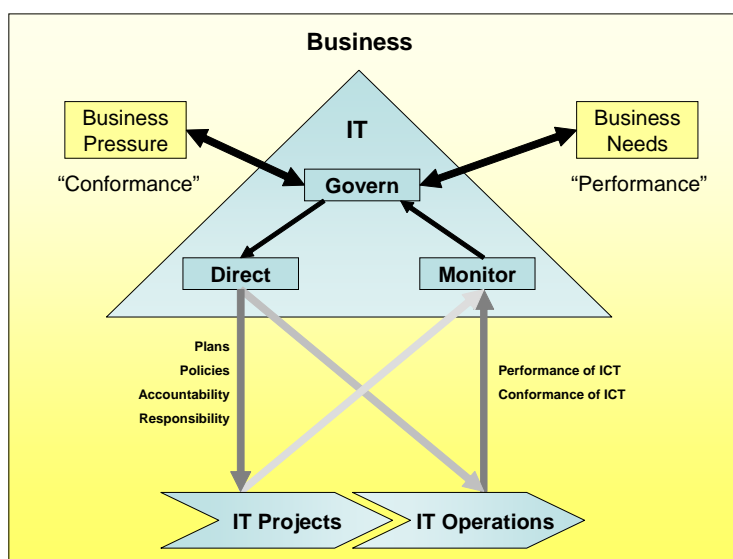


Figure 10: AS8015, Corporate Governance of Information and Communication Technology.

needs: How shall an optimal fit between IT and Business be realized? How do we deal with SLAs and service catalogues? Who decides on Service Levels?

■ **Ensure IT delivers value for money:** How shall performance be measured? Shall IT performance be benchmarked? Which cost model shall be applied?

IT Governance can also be concerned with issues like Leadership, Culture, Risk management, Policies and procedures, Financial management, IT architecture, Procurement and Sourcing.

6 The Organizational Aspects of IT Governance

If IT Governance is about organizing the decision making structures, and the Information Support activities should then be managed in these structures, the last question would be: "what organizational structures could be applied in IT Governance?"

These organizational structures can vary from organization to organization. Table 2 shows a number of possible decision making roles or groups:

The elements from Table 2 can now be used to build an organization's governance structure. A number of control loops should then be designed to make sure that the framework is a comprehensive system that controls itself. This means that reporting mechanisms should be added, as well as communication protocols, policies and standards. When building this governance framework for your organization, both aspects of good governance (conformance and performance) should continually be addressed, to make sure that the system will realize its primary goals. Once completed, the relevant regulations and standards can be used to test the system and continual improvement programs can be planned to enhance the organization's performance.

7 A Standard for IT Governance

As explained before, frameworks like COBIT and ITIL are management frameworks, not IT Governance frameworks. This also means that ISO/IEC 20000 also is a management standard and not a governance standard. There is only one standard available for IT Governance, which is the Australian standard AS8015 (see Figure 10). This standard is currently under investigation by the ISO organization to see whether it can be adopted or embedded in the ISO/IEC 20000 standard. If that would happen, the resulting standard would be a mix of governance and management elements.

The AS8015 indeed contains a number of control loops, as required. It also emphasizes the basic structures of Conformance and Performance. However, it is short on specifications of the organizational issues that IT Governance should be about, and instead it deals with quite a few straightforward management issues.

8 Conclusion

IT Governance basically comes down to the question "who rules what". Management should then work within the agreed space. If Management does that correctly, this

will create the desired result: *conformance* to internal and external regulations and standards, and optimized *performance* for adding value to the stakeholders of the organization. The frameworks that are available to support this are largely limited to the Management domain. Even the only available local standard for IT Governance is largely dealing with Management issues instead of IT Governance issues. It may take a while before a true IT Governance framework will become available.

References

- [1] ITGA. Work from the IT Governance Association, The Netherlands, not published, 2005.
- [2] A.S. Sohal, P. Fitzpatrick. IT governance and management in large Australian organizations. *International Journal of Production Economics*, 75, 94-112, 2002.
- [3] J. van Bon, W. Hoving. Strategic Alignment Model Enhanced. BHVB white paper, 2007.
- [4] R. Akker. In J. van Bon (ed.). *Frameworks for IT Management*, Van Haren Publishing for itSMF, 2006.
- [5] P. Weill, J. Ross. *IT Governance: How Top Performers Manage IT for Superior Results*, Harvard Business School Press, 2004. ISBN: 1591392535.