Crafting Information Technology Governance

Ryan Peterson

CRAFTING INFORMATION TECHNOLOGY GOVERNANCE

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Information Technology (IT) governance has emerged as a fundamental business imperative, and rightfully so, because it is key to realizing IT business value. IT governance describes the distribution of IT decision-making rights and responsibilities among different stakeholders in the enterprise, and defines the procedures and mechanisms for making and monitoring strategic IT decisions. This article presents a holistic view of IT governance, in which structural, process, and relational capabilities are an integral part of an effective IT governance architecture. The article concludes with an IT Governance Assessment Process (ITGAP) model, with which business and IT executives can assess the effectiveness of their company's current IT governance architecture.

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INTRODUCTION

*T*HE *BLIND MEN AND THE ELEPHANT* (Saxe, 1872) retells an ancient Indian fable of six blind men who visit the palace of the Rajah and encounter an elephant for the first time. The first blind man put out his hand and touched the side of the elephant: "How smooth, an elephant is like a wall." The second blind man put out his hand and touched the trunk of the elephant: "How round, an elephant is like a snake." The third blind man put out his hand and touched the tusk of the elephant: "How sharp, an elephant is like a spear." The fourth blind man put out his hand and touched the leg of the elephant: "How tall, an elephant is like a tree." The fifth blind man reached out his hand and touched the ear of the elephant: "How wide, an elephant is like a fan." The sixth blind man put out his hand and touched the tail of the elephant: "How thin, an elephant is like a rope."

Although a well-known story, the moral of this ancient Indian fable applies equally well to IT governance, which has been the subject of much debate and speculation, yet remains an ephemeral and "messy" phenomenon, emerging in ever-new forms with increasing complexity (see case below).

Johnson & Johnson Case: The Alignment Challenges[2]

It was an early morning in 1997, when Ralph Larsen, former CEO of Johnson & Johnson, called his controller, JoAnn Heisen, into his office. Johnson & Johnson was about to embark on an enterprisewide cost-cutting crusade to help finance a strategic move into highly competitive and costly markets. That morning, Larsen wanted Johnson & Johnson's IT organization to be a bigger part of all that, and to get smarter about how the company was managing and using IT.

Johnson & Johnson was spending millions annually on IT, yet business executives and customers were not getting the business information they needed, and the business value they wanted. Heisen recalls, "Nobody was talking to each other. And why should they? Nobody asked the business units to talk with each other before, and no one had asked IT

how much we were spending on the business." Larsen wanted to cut IT costs dramatically, but he also wanted oversight reform. Johnson & Johnson required a complete "IT governance overhaul."

That morning Heisen left the office with a new job — as CIO — and a mission: standardize systems, cut IT costs, increase IT value, and align IT with the business, this within the global and decentralized culture of Johnson & Johnson.

Executives recognize that "getting IT right" this time will not be about technology, but about (shared) IT governance.

Much like an elephant, or any other large living organism, IT governance is a complex system, involving different business and IT stakeholders with specific perceptions, views, goals, and motivations. Similar to the blind men, these stakeholders have specific interests and stakes in IT, and although each constituency may be correct in pursuing its own strategic objectives, their "single blinded" focus impedes effective governance of IT. Rather than being just transparent, one of the key challenges in contemporary organizations is including certain "degrees of flexibility" within the design of IT governance.

This article presents a holistic view of IT governance, and discusses the requisite integration capabilities for effective IT governance architectures.[1] A single case (Johnson & Johnson) will be used to illustrate the challenges, problems, and processes associated with IT governance design in complex contemporary organizations.

THE IT GOVERNANCE PHENOMENON

It is a truism that chief executives have experienced many failures and disappointments with IT-enabled business transformations. Expecting strategic value from innovation, they have instead experienced project cancellations, business disruptions, rising customer churn, decreasing shareholder value, and many other disappointments, including losing their jobs. Corporate responsibility, business sustainability, and governance reform are currently high on the strategic agenda in many companies. The growing scrutiny over shareholder interests, lingering economic growth, and corporate performance have also prompted renewed soul-searching and interest into the "transparent" and effective governance of IT.

Boards and business executives have come to recognize that whereas traditionally they could delegate, avoid, or ignore IT decisions, today they cannot conduct production, marketing, or R&D without depending on IT

and the IT function at some point in time. As business models and IT become virtually inseparable, managing their integration and coevolution involves putting the right people in the right place to understand and take direct responsibility for making sure the organization meets its strategic goals, and that all efforts, including IT, are directed toward that end. Executives recognize that "getting IT right" this time will not be about technology, but about (shared) IT *governance*.

Nevertheless, how to govern IT for sustained value remains an enduring and challenging question. How can the IT function best support a complex organization, such as Johnson & Johnson, composed of diverse operating business units? What and how much should be standardized, while still being able to respond to the specific needs of the different lines of business and strategic divisions? How do we design a simultaneously transparent, efficient, and flexible model for IT governance? And more important, how do we make it function effectively? At the heart of Johnson & Johnson's quest, as in many other organizations, has been a need to find answers to tough, almost timeless, questions of governance: how to organize for diversity and differentiation while preserving integration and unity of direction? How to promote local innovation, yet reap the benefits of scale and scope? And how to control and empower?
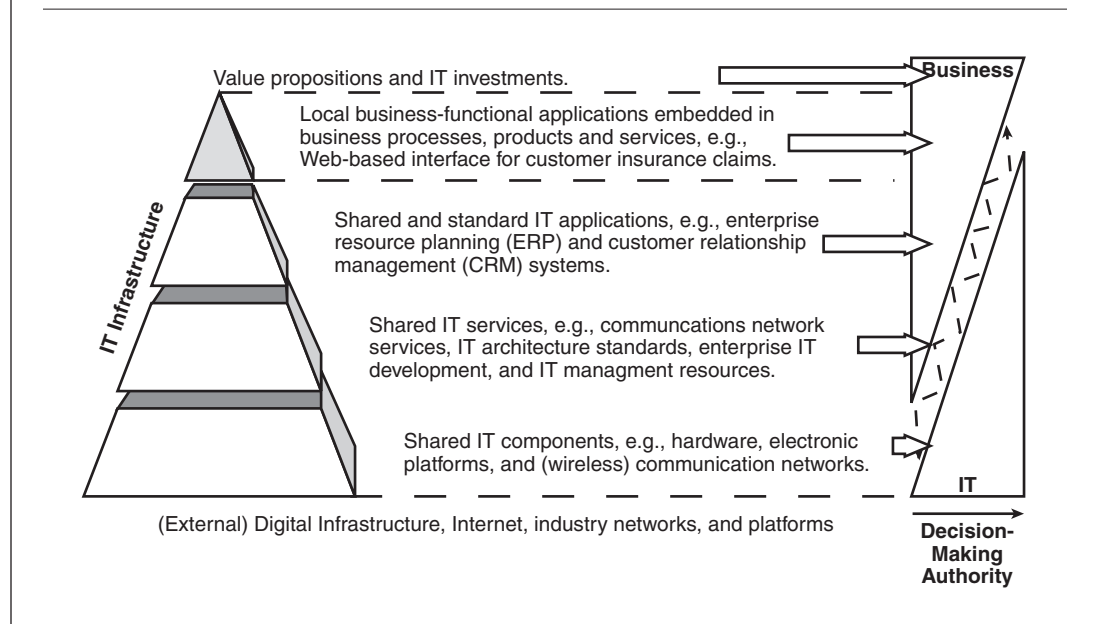
Beyond Centralization versus Decentralization

Similar to corporate governance, IT governance is a topic that has recently been rediscovered. The rich vocabulary emerging from the literature is like a terminological jungle in which any newcomer plants a seed. In line with our understanding of corporate governance and previous studies (Luftman and Brier, 1999; Sambamurthy and Zmud, 2000; Weill, 2004), IT governance is defined as:

> the distribution of IT decision-making rights and responsibilities among enterprise stakeholders, and the procedures and mechanisms for making and monitoring strategic decisions regarding IT.

IT governance is thus the enterprise management system through which an organization's portfolio of IT systems is directed and controlled. The foregoing interpretation alludes to several IT governance "myths" that exist — and still persist — which need to be dispelled if we are to move forward. One way

FIGURE 1. Allocation of IT Decision-Making Authority across Business and IT Management Functions (Weill and Broadbent, 1998)

Value propositions and IT investments.

Local business-functional applications embedded in business processes, products and services, e.g., Web-based interface for customer insurance claims.

Shared and standard IT applications, e.g., enterprise resource planning (ERP) and customer relationship management (CRM) systems.

Shared IT services, e.g., communcations network services, IT architecture standards, enterprise IT development, and IT managment resources.

Shared IT components, e.g., hardware, electronic platforms, and (wireless) communication networks.

(External) Digital Infrastructure, Internet, industry networks, and platforms

IT Infrastructure

Business

IT

Decision-Making Authority

of understanding what IT governance is, is to start by describing what it is not.

IT Governance Focuses on Specific IT Decisions. IT governance does not describe *what* specific IT decisions are made; rather, IT governance is the set of decisions about *who* makes IT decisions (Weill, 2004) and *how.* It specifies the structures and processes through which the organization's IT objectives are set, and the means of attaining those objectives and monitoring performance.
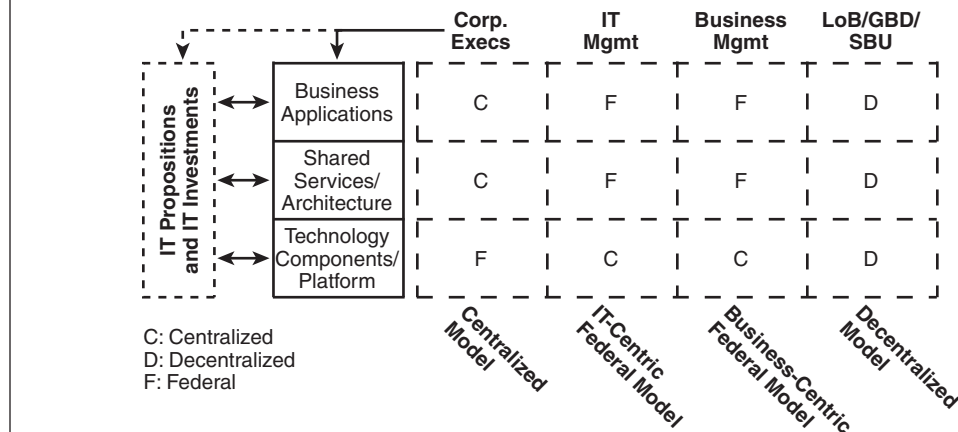
IT Governance Is the Responsibility of the CIO (Chief Information Officer). Although IT governance is certainly an essential element of a CIO's portfolio, the CIO is not the primary stakeholder. Too often, corporate executives and business managers assume that the CIO is taking care of IT governance affairs. Abdication of responsibility and accountability by the business, and "pointing the finger" at IT will not resolve the IT value paradox, nor the many misalignments between business and IT executives.

IT Governance Is Concerned with Organizing the IT Function. Traditionally, the IT function has been regarded as a single homogeneous function. However, given the widespread proliferation and infusion of IT, in organizations, involving electronic networks platforms, digital architectures, shared IT services, local business-embedded IT applications, and

so forth, the notion of a single homogeneous IT function is obsolete (see Figure 1).

IT Governance Is a New Form of "Old School" IT Management. Whereas the domain of IT management focuses on the efficient and effective supply of IT operations, services, and products, IT governance faces the dual demands of contributing to present business operations and simultaneously positioning the IT function for meeting future business demands. This does not undermine the importance or complexity of IT management, but serves to indicate that IT governance is both internally and externally oriented, spanning both present and future timeframes. One of the key challenges in IT governance, therefore, is how to meet the current demands of the business and its key stakeholders while transforming IT to be prepared to meet the emerging demands of the business and its key stakeholders.

IT Governance Focuses on the (De-) Centralization of IT. Acknowledging the rebuttal of the previous myths often leads to a fifth assumption: IT governance focuses on the locus of IT control, or where IT decision-making authority is allocated in the organization. Discussions on the formal allocation of IT decision making, as vested in organizational positions, has led to much rhetoric, speculation, and research on the "best way" to organize IT governance, and in the process has rekindled the

FIGURE 2. IT Governance Models (Peterson et al., 2000)

IT Propositions and IT Investments	Corp. Execs	IT Mgmt	Business Mgmt	LoB/GBD/ SBU
Business Applications	C	F	F	D
Shared Services/ Architecture	C	F	F	D
Technology Components/ Platform	F	C	C	D
	Centralized Model	IT-Centric Federal Model	Business-Centric Federal Model	Decentralized Model

C: Centralized
D: Decentralized
F: Federal

classical "centralization versus decentralization" debate.[2] Yet, IT governance is not (only) about centralization or decentralization.

IT Governance Models and Value Drivers

The terms centralization and decentralization provide a dichotomy that is meaningless when applied as a generality to IT and IT governance. Instead, as other researchers have pointed out, centralization and decentralization can be applied to each of the main elements in the portfolio of IT (i.e., IT investments, IT applications, IT services, IT components), yielding distinct patterns in the governance of IT (see Figure 2).

In a centralized IT governance model, corporate and senior-level executives have decision-making authority for IT investments, which include:

- *Business applications:* IT applications prioritization and planning, budgeting, and the delivery/maintenance of business-specific application services
- *Shared services/Architecture:* knowledge of business processes and functions with IT infrastructure capabilities along the complete IT systems development life cycle, and IT architecture standards for data, applications, and technology
- *Technology components/Platform:* hardware/software platforms, networks, and the standards for procurement and deployment of IT resources

When all IT decision-making authority is allocated to different lines of business (LoB), separate (global) business divisions (GBD), or strategic business units (SBU), the structure is described as a completely decentralized IT governance model.

In general, and all other factors being equal, centralization leads to greater specialization, economies of scale, consistency, and standardized controls, whereas decentralization enables business control, a sense of business ownership, and provides greater responsiveness and flexibility to business needs (see Table 1). However, excessive flexibility under decentralization may lead to variable standards, which may ultimately result in lower flexibility. On the other hand, specialization under centralization incurs specific strategic risks due to bounded rationality and information overload.

A political view of IT governance suggests, however, that the debate concerning centralization versus decentralization is used primarily to further the goals of specific stakeholders, in ways that might not help to meet enterprise goals (Simon and Barnard, 1961; Cyert and March, 1963). Recall the six blind men and the elephant: there are important differences among stakeholders within the enterprise, leading to the presence of conflict and disagreement over goals and the allocation of strategic resource (including IT).

These stakeholders represent different groups or individuals that influence, and are affected by, decisions regarding IT. Power struggles, political turbulence, and cultural clashes are endemic to the governance of IT, and the question is more often "whose way is it going to be," rather than "which way is the best." Although not always explicitly recognized, documented, and/or understood, conflict resolution

TABLE 1. Tradeoffs and the Best of Both

	Centralized IT Governance	Decentralized IT Governance	Federal IT Governance
IT synergy	+	−	+
IT standardization	+	−	+
IT specialization	+	−	+
Business responsiveness	−	+	+
Business ownership	−	+	+
Business flexibility	−	+	+

Source: Brown and Magill, 1998; Rockart et al., 1996.

and coalition building are key processes for the effective functioning of any type of IT governance model (Peterson, 2001).

In addition to politics, the potential risk in contemporary business environments is that either centralization or decentralization "fixes" (and fixates) the organization into a rigid posture. The challenge thus is to balance the benefits (and costs and risks) of centralized and decentralized IT governance. Over the past decade many, if not most, organizations have set out to achieve the "the best of both worlds" by adopting a federal IT governance model (Peterson, 2001; Sambamurthy and Zmud, 1999; Weill, 2004).

Under federal IT governance, IT infrastructure — technology supply — decisions are centralized, and IT application — technology usage — decisions are decentralized (Brown and Magill, 1998). The federal model, however, is not a monolithic structure. Different patterns of differentiation exist within the federal IT governance model: *IT-centric* federal models and business-centric federal models (as shown in Figure 2). In an IT-centric federal model, the corporate IT executive is responsible for IT networks and IT infrastructure development decisions, and (divisional) IT management (e.g., Division Information Officer) is responsible for business application service decisions. In a *business-centric* pattern, divisional business executives play a leading role in business application decisions. The key to understanding the difference between the IT-centric and business-centric federal models is the level of involvement and participation of business executives in IT decision making.

Although traditionally focused on either efficiency or flexibility, often in a sequential manner (sometimes leading to a continuous "pendulum swing" between centralization and decentralization), today IT governance faces the dual demands for flexibility and speed on the one hand, and efficiency and standardiza-

tion on the other. Business and IT executives have come to recognize that they need to meet the demands of customized, high-quality IT products and services, and they need to standardize and achieve cost- and time-compression in order to meet enterprisewide needs in an efficient, reliable, and effective manner (see Table 2).

The degree to which organizations can achieve these competing demands is a measure of an organization's strategic flexibility, that is, developing differentiated capabilities to proactively respond in an integrated manner to unanticipated changes (Hitt et al., 1998). Rather than being just efficient and transparent, one of the key challenges in contemporary organizations is the inclusion of certain "degrees of flexibility" within IT governance. Strategic flexibility for IT governance involves addressing multiple value drivers (Agarwal and Sambamurthy, 2003; Peterson et al., 2000), including:

- The provisioning and servicing of cost-effective, scalable IT infrastructures and IT operations that enable cycle time improvement and streamlined, enterprisewide business processes
- The development and delivery of integrated IT solutions that facilitate business responsiveness to customer demands in a rapid and efficient manner
- The realization of enterprise value in terms of operational, product, and customer excellence, and sustainable financial growth

Value-added IT governance focuses on excelling in a specific value dimension, yet maintains threshold standards on other dimensions (Peterson, 2001). Contemporary IT governance cannot afford to focus on service infrastructure at the expense of solution integration, or vice versa. Furthermore, strategic innovation is difficult, if not impossible, to achieve without some baseline performance in service infrastructure and solution integration.

TABLE 2. Three IT Governance Value Drivers

	Service Infrastructure	Solution Integration	Strategic Innovation
Description	Providing reliable IT operations and services, delivered with maximum reliability and availability.	Offering business leading-edge IT products and services that consistently enhance and integrate the business' use of products and services.	Targeting business value drivers, and tailoring offerings that supersede the demands of the business and its clients.
Focus and indicators	Provisioning of IT utilities	Strategic analysis of business needs for innovative IT solutions, deciding on new applications, and integrating IT with business processes, products, and /or services	Focus on ways IT leverages business competencies and relationships
	Provide reliable, cost effective, and secure IT services		Ensure IT has a business value focus on operational, product, and/or customer excellence (e.g., business process integration, reduced transaction costs, improved time-to-market, improved customer satisfaction and retention, revenue growth, improved ROA, profitability)
	Manage synergies across the corporation	Focus on ensuring timely and cost-effective delivery of IT applications	
	Manage IT infrastructure standards	IT business support and IT responsiveness	
	Implementation of enterprise IT architecture standards		
	IT infrastructure availability and reliability		
	Develop IT infrastructure flexibility and scalability		

Consider, for example, the case of Johnson & Johnson: the competing drivers toward improving cost efficiencies and IT standardization, yet also business responsiveness and IT innovation, led Johnson & Johnson to adopt a federal IT governance model. The complexity of this global business would dictate a decentralized model, which was the traditional IT governance approach. Yet, the need to cut costs, standardize IT, and improve IT performance led Johnson & Johnson to centralize IT infrastructure decisions (as described in more detail in the following case).

Johnson & Johnson Case: Evolving to Federal IT Governance[2]

Although the implementation of the federal IT governance model has paid off for Johnson & Johnson (e.g., cheaper maintenance costs, eliminated duplicate IT developments, enhanced pharmaceutical R&D, improved time-to-market for new products, and profit growth), and they have been able to develop unprecedented levels of cooperation among traditionally independent business units, it was a perilous and painstaking transformation. With over 200 operating units in 57 countries, and 109,000 employees providing services to more than 175 countries, the challenges for restructuring IT governance at Johnson & Johnson have been formidable.

Earlier attempts to (re-)centralize IT failed due to cultural barriers and business' resistance to change and relinquish IT control. According to the CIO, after designing the new federal IT governance structure, it was hard getting all of the business units to go along with some of even the simplest changes in policy. "I would get '190 land mines' in any given day. Some business units would try to convince me they could not adopt some corporate technology standards, or share the costs of upgrading the infrastructure." Originally, Johnson & Johnson hoped to create a single centralized strategy, but soon they realized that only a federal arrangement would work.

Johnson & Johnson has a clear and present IT governance challenge. The 100-year-old company consists of multiple distinctive business units. Each unit is led by a president or managing director, which gives each of these leaders operational autonomy. Yet at the same time, Johnson & Johnson needs to ensure that each of the units maintains the company's high standards and reputation. For IT and the CIO, this means "walking the tightrope" and precariously balancing and managing corporate control versus business autonomy.

The case of Johnson & Johnson illustrates how IT governance is subject to the pulls and pressures of multiple, rather than singular, strategic forces (Brown and Magill, 1998; Sambamurthy and Zmud, 1999), and why conflict resolution, negotiation, and coalition building are essential to IT governance (Peterson, 2001).

As this case illustrates, the federal IT governance model challenges managers in local business units to surrender control over certain business-specific IT domains for the well being of the enterprise, and to develop business-to-corporate and business-to-IT partnerships (Brown, 1999). The challenge is to control IT decision making, yet empower different stakeholders to take responsibility for IT decisions.

TABLE 3 Strategic Risks Associated with the Lack of Integration

Lack of business prioritization and wasted IT investments
IT management does not understand the business
Unresolved conflicts between business and IT management
Business executives take no responsibility for IT-enabled business change
IT organization fails to realize business value
Increasing customer churn
Loss of revenues and market share

This is a feat that many companies struggle with, especially considering their "cultural" IT governance legacy.

DESIGNING EFFECTIVE IT GOVERNANCE ARCHITECTURES

Confronted by multiple value drivers, then, organizations adopt a federal IT governance model, and develop a repertoire of competencies to respond to the needs of the business environment. The organizing logic is that IT governance should have a variety of competencies at least as great as the demands (and disturbances) in the strategic context. Yet continuous differentiation leads to fragmentation, unless a corresponding process of integration complements it (Lawrence and Lorsch, 1969). The problems encountered in practice and reported in research regarding the lack of, for example, IT prioritization, executive IT commitment, and IT value realization, are symptomatic of this fragmentation, and are typically encountered in differentiated, federal-like IT governance models (Peterson, 2001). These strategic risks associated

with the lack of IT integration are summarized in Table 3.

The uncertainty and complexity associated with multiple value drivers and differentiated IT governance models, then, create a basic and fundamental need for integration to achieve clarity of direction and unity of purpose in responding decisively and swiftly. In order to govern IT effectively, differentiation begets integration. Designing effective IT governance is thus dependent on both the differentiation and integration of IT decision making across business and IT stakeholder communities (Peterson et al., 2000).

The formal allocation of IT decision-making authority does not resolve the need for effective coordination (Brown, 1999; Peterson, 1998). If IT governance is to capture the realities of how complex organizations operate, it must address not only the division of responsibilities and differentiation of IT decision-making authority, but also the types of integration devices used as well as the (informal) information flows and decision-making/conflict-resolution processes.

An IT governance architecture describes the differentiation and integration of strategic decision making for IT, and specifies the strategic policies and management procedures that provide direction to strategic IT decision making (Peterson, 2001). As shown in Figure 3, this holistic view of IT governance emphasizes the need to address both the allocation of formal IT decision-making authority and the coordination of IT decision-making expertise and influence (informal authority).

CAPABILITIES FOR EFFECTIVE IT GOVERNANCE

As described earlier, IT governance traditionally relied on hierarchical (vertical) lines and standardization for coordination. The hierarchy achieves coordination by having an IT leader (CIO or DIO) take responsibility for the work of others, issuing instructions and monitoring actions. Standardization, or coordination by plan, on the other hand, describes the use of standard programs, formal rules and procedures, and the specification of outputs, goals, and targets. The adoption and use of service level agreements (SLAs) is a typical example of how contemporary organizations coordinate by plan.

Vertical coordination and standardization, however, only provide a limited ability to govern IT effectively (Galbraith, 1994; Peterson et
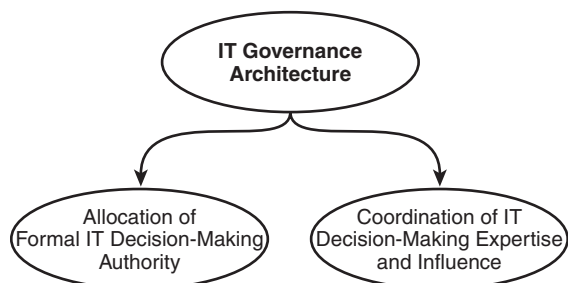
FIGURE 3. Key Dimensions of IT Governance Architectures (Peterson, 2001)

TABLE 4 Summary of IT Governance Capabilities

Structural Capability	Process Capability	Relational Capability
Key mechanisms:	Key mechanisms:	Key mechanisms:
Formal positions and roles	Strategic IT decision making	Business–IT partnerships
Committees and councils	Strategic IT monitoring	Shared learning
Examples:	Examples:	Examples:
CIO and DIO	Balanced scorecard analysis	Active participation by key stakeholders
IT program managers	Critical success factors analysis	Partnership rewards and incentives
IT relationship managers	Scenario analysis	Shared understanding of business/IT objectives
IT account managers	Cost/benefit/risk analysis	Active conflict resolution (nonavoidance)
IT project office	SWOT analysis	Cross-functional business/IT training and job rotation
IT executive councils	Service-level agreements	Business/IT colocation
IT steering committee	IT chargeback system	Business/IT "virtual connection" and "communities of practice"
IT project committees	IT delivery management	
E-commerce advisory board	IT benefits management	
E-CRM task force	IT performance tracking	
Centers of competence and excellence	Shared IT performance database	

Source: Peterson, 2001.

al., 2000). With the profusion of electronically enabled, globally operating organizations, characterized by a multiplicity of value drivers in dynamic business networks, the best CIOs and/or SLAs will not suffice in designing effective IT governance architectures.

Instead, IT governance needs to focus on Horizontal Integration Capabilities (HICs), which describe the ability to coordinate and integrate formal and informal IT decision-making authority across business and IT communities (Brown, 1999; Peterson et al., 2000). IT governance capabilities refer to the (cross-functional) managerial ability to direct and coordinate the multifaceted activities associated with the planning, organization, and control of IT.

Although traditionally described as simply a form of mutual adjustment, today HICs represent the most significant new development in IT governance practices (Hitt et al., 1998; Galbraith, 1994). HICs can be classified according to three distinct IT governance capabilities:[3]

❑ Structural capability (connection)
❑ Process capability (coordination)
❑ Relational capability (collaboration)

Structural, process, and relational IT governance capabilities describe a layered system of successively higher levels of horizontal integration capability (Peterson et al., 2000). HICs consist of a composite of connection, coordination, and collaboration mechanisms. Connection and coordination describe the formal structures and processes used for information exchange and communication, whereas collaboration describes a participative and collaborative element of integration, corresponding to

trust and a willingness to work together between business and IT stakeholders (Henderson, 1990). The above three capabilities are summarized in Table 4 and are described in some detail below.

1. Structural IT Governance Capability

This capability includes structural (formal) devices and mechanisms for connecting and enabling horizontal, or liaison, contacts between business and IT management (decision-making) functions (Brown, 1999; Peterson et al., 2000). In general, structural capability takes the shape of formal positions and (integrator) roles, and/or formal groups and (management) team arrangements (see Table 4). Formal positions and liaison roles refer to individuals who are formally appointed to manage the coordination within and between organizational functions. CIOs and DIOs are examples of formal positions that manage the IT function and its coordination with the business at both corporate and divisional levels. With increasing levels of IT outsourcing, many external IT managers/vendors are now also playing a key role in the coordination between business and IT.

Liaison roles focus explicitly on managing the integration of decision-making processes across business and IT units. Numerous roles fulfill this function, including IT relationship managers (from a business perspective), IT account managers (from an IT perspective), IT client managers (from an IT perspective), and IT vendor managers (from an external IT perspective). The use of liaison roles helps IT managers to develop an improved understanding of

business needs, and enables proactive behavior by business managers (Peterson et al., 2000; Ross et al., 1996).

Formal groups and managerial team arrangements describe horizontal integration structures for coordinating IT decision making across business and IT management functions. Committees and/or executive teams can take the form of temporary tasks or can alternatively be institutionalized as an overlay structure in the organization in the form of executive IT councils. Committees vary in the degree to which they have an advisory function or have formal decision-making authority. Steering committees are often referred to as advisory, review, or guidance committees, and may include external stakeholders, such as IT consultants and/or IT vendors. Contrary to specialized task forces, executive IT councils and advisory boards bring together different stakeholders on a relatively permanent basis.

The use of competence and expertise centers, such as centers of excellence, are an essential element of structural capability. Competence and expertise centers pool knowledge from different functional areas, and focus on developing organizationally valued skill sets (business and IT), including project management, system development, and E-commerce innovation. Expertise centers are also used for career-developing purposes, and reflect the structural need to develop competencies and economies of scope in areas pertinent to the governance of IT (Peterson, 2001).

2. Process IT Governance Capability

This capability is the formalization and institutionalization of strategic IT decision making or IT monitoring procedures (Peterson et al., 2002). Process capabilities vary with levels of comprehensiveness, that is, the degree to which IT decision-making/-monitoring activities are systematically and exhaustively addressed. This involves (a) the identification and formulation of the business case and/or business rationale for IT decisions; (b) the prioritization, justification, and authorization of IT investment decisions; and (c) the monitoring and evaluation of IT decision implementation and IT performance (Henderson and Lentz, 1996; Luftman and Brier, 1999; Weill and Broadbend, 1998).

Process capabilities describe the degree to which IT decision-making/-monitoring follows specified rules and standard procedures. These procedures are often embedded in for-

Although structural and process capabilities are necessary; they are insufficient for designing effective IT governance architectures in complex and dynamic environments.

malized decision-making methodologies and management frameworks, such as balanced scorecard tools, cost-benefit analysis, chargebacks, and service level agreements. An essential activity within process capabilities is the monitoring and tracking of IT performance in terms of service delivery and business benefits realization. These "ex-post" activities complement and complete the IT investment management process.

Process capabilities focus on the integration of business and IT decisions, or the alignment of strategic IT investments with the strategic goals and objectives of the firm. In terms of IT decision-making process integration, organizations differ in the degree to which business and IT decisions are integrated. In general, four levels of IT decision-making process integration are distinguished (Teo and King, 1999):

- *Administrative integration*, in which budgets and schedules are pooled between business and IT
- *Sequential integration*, in which business decisions provide directions for IT decision making
- *Reciprocal integration*, in which business and IT decisions are mutually influential
- *Full integration*, in which business and IT decisions are concurrently made in the same process

Structural and process IT governance capabilities tend to be mandatory, tangible, and often implemented in a top-down manner. However, research indicates that although structural and process capabilities are necessary, they are insufficient for designing effective IT governance architectures in complex and dynamic environments (Peterson et al., 2000). In contrast, relational capabilities are "voluntary" actions that cannot be "programmed"; they are often intangible and tacit.

3. Relational IT Governance Capability

This capability is the active participation of, and collaborative relationships among, corporate executives, IT management, and business management (Peterson et al., 2000). The key to relational capability is the voluntary and collaborative behavior of different stakeholders to clarify differences and solve problems, in order to find integrative solutions. Relational capability allows an organization to find broader solutions, and unleashes the creativity involved in

joint exploration of solutions that transcend functional boundaries.

Active stakeholder participation balances the involvement of business and IT communities in decision making and problem structuring/solving. Mechanisms that facilitate relational integration include direct (informal) contacts, lobbying, (informal) negotiation, joint performance incentives and rewards, colocation of business and IT managers, and the creation of "virtual meeting points" for business and IT managers.

Relational capabilities also describe the strategic dialogues and shared learning between principal business and IT stakeholders. Strategic dialogue involves exploring and debating ideas and issues before, or outside of, formal IT decision making. A strategic IT dialogue incorporates a wide range of initially unstructured business perspectives and IT views, and involves rich conversation and communication to resolve diverging perspectives and stakeholder conflicts.

The essence of relational capability is the integration of domain-specific expertise and tacit knowledge. Shared learning develops when people in close collaboration enact a "single memory," with differentiated competencies and responsibilities (Weick and Roberts, 1993). Identifying acceptable solutions to ambiguous problems in complex and dynamic environments requires the collaboration of different stakeholders, working with different reference models (mental models) and offering different insights. Shared learning is inherently dynamic, and results in coordinated decision making and collaborative relationships, which are particularly relevant and beneficial when the need for reliability is high and decision making is nonroutine (Weick and Roberts, 1993).

Research indicates that when business and IT managers understand each other's perspectives in IT decision making, they can accurately interpret and anticipate actions, and coordinate adaptively (Peterson, 2001). Within the context of IT governance, shared learning describes the mutual understanding of business and IT objectives and plans by business and IT executives (Reich and Benbasat, 1996). Mechanisms that support shared learning include strategic dialogues between business and IT executives, active conflict resolution, strategic coalition building, cross-functional business–IT training, and cross-functional business–IT job rotation or job transfers (Brown, 1999; Peterson et al., 2000).

In summary, IT governance capabilities describe the lateral structures, processes, and relational abilities to direct and coordinate the multifaceted activities associated with the planning, organization, and control of IT. Designing effective IT governance architectures involves both the differentiation and integration of IT decision making across business and IT stakeholder communities, and underscores the need to address both the allocation of formal IT decision-making authority and the coordination of IT decision-making expertise and influence. The case following summarizes how these IT capabilities have evolved at Johnson & Johnson.
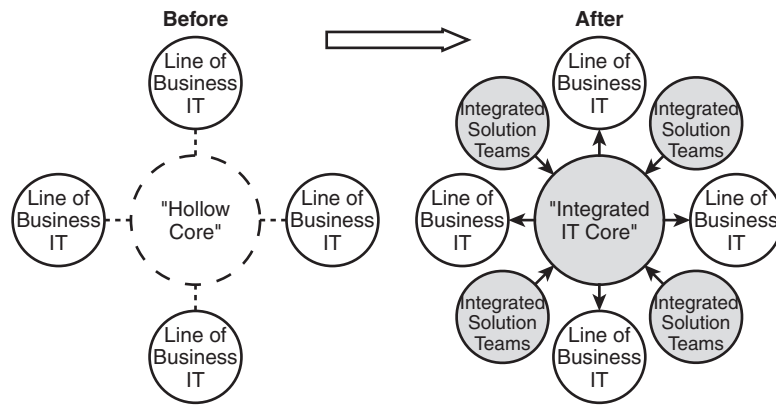
Johnson & Johnson Case: IT Governance Capabilities

Six years into its IT governance reform, Johnson & Johnson has made a significant turnaround in IT governance policies and practices. What was once a fragmented system of completely independent IT businesses has now — after many hard lessons — been turned into a loose but coupled IT governance system.

Johnson & Johnson still adheres to its philosophy of respecting diversity, but it is learning to acknowledge the benefits of sharing. Combining the maxims of differentiation and integration, Johnson & Johnson has improved its strategic flexibility for competing in a highly dynamic, knowledge-intensive, and globally competitive environment.

In the current IT governance model, IT infrastructure, network, and architecture decisions have been centralized. The corporate IT headquarters now makes strategic IT decisions with regard to, for example, enterprise IT services and standards, security, servers, and enterprise operating systems. Data standardization occurs per line of business or business group, in which a strategy council oversees business process applications and services. Consistent with its multi-level structure of executive and group operating committees, Johnson & Johnson has mirrored this structure in its (business-centric) federal IT governance model (see Figure 4).

The executive committee is the principal management group responsible for the operations and allocation of strategic resources. Members of the executive committee serve as chairmen of group operating committees (i.e., Consumer, Pharmaceutical, and Medical Devices & Diagnostics businesses), which are comprised of managers who represent key operations within the groups, as well as management expertise in other specialized functions. These committees oversee and coordinate the activities of domestic and international units. Each unit is headed by an executive who reports directly to a group's operating committee, thus creating a "linking-pin" structure (see Table 5).

*W*hat was once a fragmented system of completely independent IT businesses has now — after many hard lessons — been turned into a loose but coupled IT governance system.

FIGURE 4. Johnson & Johnson's Federal IT Governance Model

TABLE 5. "Linking-Pin" Structure

Structural Integration Mechanisms	Process Integration Mechanisms	Relational Integration Mechanisms
CIO with business acumen	Identification and formulation business and IT imperatives	Identify key (business) stakeholders and involve in IT decision-making
IT task forces and (advisory) committees	Procedures to handle exceptions	'Management by wandering around'
Strategy groups	IT investment management	Active involvement by key stakeholders
'Virtual' middle-management layer based on knowledge and expertise	IT performance management and benchmarking	Actively manage cultural resistance
IT solution teams	IT benefits management	Negotiation and active conflict resolution: tackle problems head-on.
IT relationship managers	SWOT analysis of groups and units	Incentives and rewards for collaboration
Centers of competence and excellence	Discuss different scenarios	Shared understanding of business/IT objectives
IT professionals as business partners	Shared IT performance database	Informal and formal business–IT relationships
Share expertise and create economies of scope		Replace corporate staff where necessary
		Appoint executive mentoring for IT staff
		Job promotion and rotation
		Performance system
		Business/IT 'virtual connection'
		Cross-functional business/IT leadership development

In transforming their IT governance model, Johnson & Johnson has instilled a philosophy of shared IT decision-making and collaboration. Taking a "think big, start small" approach, and learning by doing, Heisen has achieved enterprisewide support for IT governance reform. By developing IT governance integration capabilities, involving structural, process, and relational integration mechanisms, Johnson & Johnson has been able to improve its IT performance. However, six years into the transformation, Johnson & Johnson still needs to answer some tough questions, and its journey toward effective IT governance has only now begun.

ASSESSING IT GOVERNABILITY

Every organization has, implicitly or explicitly, an IT governance model. High-performing organizations, however, actively channel their attention and energy to designing and improving their IT governance architecture. Often, an organization's official IT governance model is not a complete reflection of the actual decision making for IT. That is, there are sometimes important differences between what we say about how we act (espoused theories) and what our actions actually reveal (theories in use), as argued many years ago by Argyris and Schon (1978).

FIGURE 5. Intended versus Realized IT Governance

TABLE 6. Examples of IT Governance Value Drivers and Complexity

Example 1: A company pursuing *service infrastructure* will adopt a centralized IT governance model to meet enterprise-wide demands.

Example 2: A company pursuing *service infrastructure and solution integration* will adopt an IT-centric federal model to meet both enterprise-wide and business-specific demands.

Example 3: A company pursuing *service infrastructure, solution integration, and strategic innovation* will adopt a business-centric federal model to meet both enterprise-wide and business-specific demands. The demand for strategic innovation (in terms of, for example, customer excellence) requires the allocation of IT decision-making authority over customer business applications to local business executives.
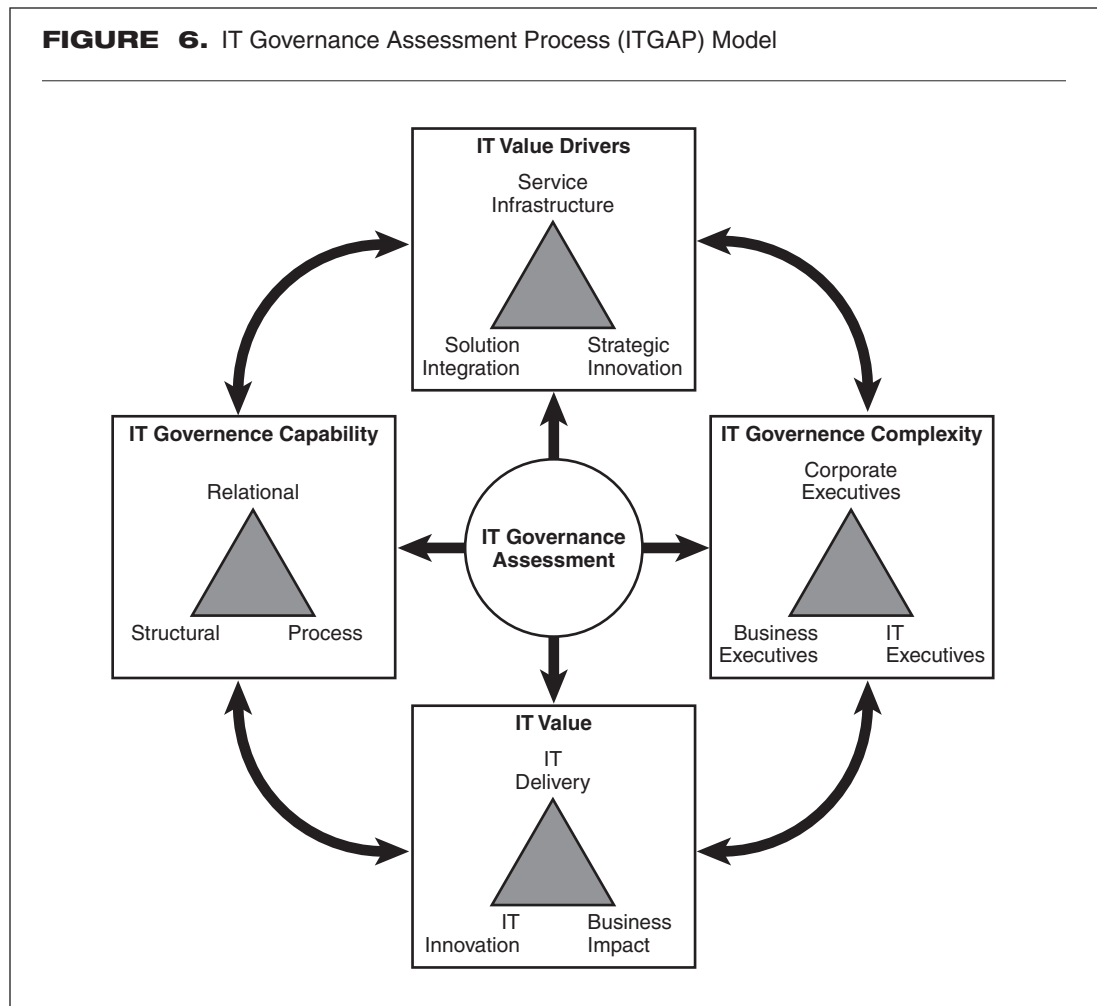
Note: These examples were developed and validated through in-depth case studies, and empirically validated in a field survey of 211 business and IT executives.

As shown in Figure 5, the formally intended allocation of IT decision making doesn't always coincide with the actual (realized) IT decision making. Some executives may delegate their IT decision rights (deviated IT governance), whereas others outside the official structure may actually influence IT decision making (emergent IT governance). IT governance is thus not only defined by formal organizational positions, but also by the power and expertise to influence and participate in IT decision making.

Over time, important gaps emerge between desirable and actual behaviors. Assessing and diagnosing IT governance can help close these gaps. Thus, a critical activity in designing effective IT governance architectures is devising a diagnostic system to assess the actual and intended IT governance model, and its effectiveness.

Assessing an organization's current and future ability to govern IT effectively — IT governability — involves understanding the context, complexity, and capabilities of IT governance, as described below.

In assessing the context, we need to identify and understand what the current and future value drivers are (see Table 2): are these directed toward service infrastructure, solution integration, or strategic innovation? Or does the strategic context reflect multiple value drivers? Within the strategic context, and supplementing the value drivers, are indicators of IT value realization: these value indicators describe the business value of IT in terms of service excellence, integration excellence, and innovation excellence (see Table 2). The objective here is to assess the consistency between current and future value drivers, value indicators, and the business impact of IT.

The nature and multiplicity of the value drivers determines the required complexity and set of capabilities for effective IT governance. As differentiation begets integration, so does multiplicity call for complexity. The complexity of the current (and desired) IT governance model depicts the state of differentiation of IT decision-making authority across business and IT executive functions (see Figure 2). Moreover, as companies pursue multiple value drivers, the required complexity (differentiation) of IT governance increases (see Table 6).

In tandem with the multiplicity of the strategic context and the complexity of the IT governance model, organizations must assess whether they have the requisite set of (horizontal) integration capabilities for IT governance. The ambiguity associated with multiple value drivers and the differentiation of IT decision-making authority across different business and IT executive levels, involves developing the requisite set of structural, process, and relational capabilities shown in Table 4.

At a minimum level, organizations need to have structural and process capabilities in place to coordinate their enterprise IT decision making and performance monitoring. As organizations pursue more innovation-oriented strategies, and different business executives

FIGURE 6. IT Governance Assessment Process (ITGAP) Model

IT Value Drivers
Service
Infrastructure
Solution
Integration
Strategic
Innovation

IT Governance Capability
Relational
Structural
Process

IT Governance
Assessment

IT Governence Complexity
Corporate
Executives
Business
Executives
IT
Executives

IT Value
IT
Delivery
IT
Innovation
Business
Impact

are involved in IT decision making, the need for relational capabilities becomes a *sine qua non* for IT governance effectiveness, as shown in the case of Johnson & Johnson. In other words, relational capabilities are of utmost importance and relevance in federal models of IT governance (Peterson, 2001).

IT GOVERNANCE ASSESSMENT PROCESS (ITGAP) MODEL

The foregoing process of IT governance assessment describes a stepwise approach to diagnosing IT governance effectiveness in terms of IT governance value drivers, IT governance complexity, and IT governance capabilities. The IT Governance Assessment Process Model (ITGAP model; Peterson, 2001) describes a holistic, high-level assessment model of IT governance architecture and effectiveness.[4] The ITGAP model is organized according to two axes, as shown in Figure 6.

☐ *Vertically (top-down)*, the ITGAP model distinguishes between the organization's IT

value drivers and the organization's IT value realization (i.e., to what extent these value drivers have been realized or the extent to which IT is contributing to business/financial performance).

☐ *Horizontally (right-to-left),* the ITGAP model depicts the IT governance architecture consisting of:
  – IT governance complexity and the differentiation of IT decision making; that is, who has what authority and responsibility to make decisions regarding the portfolio of key IT activities.
  – IT governance capabilities and the integration of IT decision making; that is, what structural, process, and relational integration mechanisms are used to coordinate IT governance.

Answering the first question (complexity and differentiation) provides a specific profile of the IT governance model in terms of the distribution and allocation of IT decision-making authority and responsibility. Answering the second question (integration capabilities) provides

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TABLE 7. IT Governance Assessment Process: A Roadmap

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1. Describe and assess IT governance value drivers (using Table 2 as a guide):
   – What are the principal business and IT strategies in your organization?
   – How do these strategies affect and reflect the IT governance value drivers?
   – What specific goals and targets, and initiatives and programs are under way that address the IT governance value drivers?
2. Describe and assess the differentiation of IT decision making authority for the portfolio of IT activities (using Figure 2 as a guide):
   – Who are the principal stakeholders involved in IT decision-making? What are their specific stakes in IT?
   – How are IT decision-making authority and responsibility distributed across the enterprise stakeholders?
   – How clearly are these responsibilities formulated, and transparent to the organization?
3. Describe and assess the capabilities of IT governance (using Table 4 as a guide):
   – What type of structures and processes are used in the governance and management of IT?
   – To what extent and how are business and IT executives involved in IT decisions and IT decision making?
   – How are conflicts resolved between business and IT executives in IT decision making?
   – What is the level of horizontal integration capability?
   – Are IT governance integration mechanisms in line with the type of value drivers and IT governance differentiation employed by the organization?
4. Describe and assess IT value realization (using Table 2 as a guide):
   – What is the contribution of IT to improved business performance?
   – What are the main business effects, and how do these relate to the business value drivers, goals, and measures?
   – How is IT governance performing in terms of service infrastructure, solution integration, and strategic innovation?

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a description of the horizontal integration mechanisms, and an assessment of the current level of horizontal integration capability (HICs).

The roadmap for assessing IT governance effectiveness follows a four-stage procedure (see Table 7). Following this roadmap for both the present and the future (desired state), provides a strategic assessment and audit of the suitability of the existing IT governance architecture, and identifies the strategic discrepancies, or gaps, with the future, desired position. Moreover, the results of the assessment provide a list of potential measures to redesign and improve the IT governance architecture (in terms of IT governance complexity and IT governance capabilities).

The assessment is important not just for the individual measures and/or solutions, but the process through which the stakeholders (business and IT) discuss and develop a shared view of the current and future IT governance architecture. Through this process, the early stages of a relational capability are developed, which will enable the development of future structural and process integration capabilities.

## CRAFTING IT GOVERNANCE FOR TODAY'S TURBULENT ENVIRONMENT

Approximately 3000 years ago, the Greeks redesigned their cargo and trading ships into flexible and fast biremes and triremes, consisting of two or three levels of oarsmen on both sides of the ship. Oversight was in the hands and eyes of the helmsman. However, the coordinated actions, determination, physical strength, and commitment of the oarsmen provided the power, speed, and flexibility that were required to survive in a hostile and turbulent environment.

Today's companies also need to craft their rigid IT governance arrangements into flexible IT governance architectures. IT governance is less about who is vertically positioned to be in control, and more about the complementary — business and IT — competencies an organization possesses, and how it can integrate these to develop the strategic flexibility required for realizing and sustaining business value from IT in a complex and dynamic environment (see Figure 7). Without integration, IT governance is sure to drift.

The organizing logic in the emerging IT governance paradigm is characterized by a collaborative network structure.

- Communication is more likely to be lateral.
- Task definitions are more fluid and flexible and related to competencies and skills, rather than being a function of organizational position.
- Business IT decision making is likely to be influenced by expertise rather than an individual's (or group's) position in the hierarchy.

FIGURE 7. Emerging IT Governance Paradigm
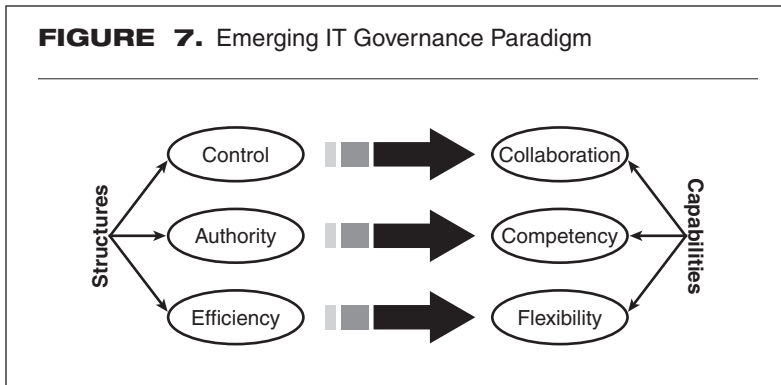
This emerging paradigm for IT governance is therefore based on collaboration, not control, where the need for distinct competencies is recognized, developed, and shared adaptively across functional, organizational, cultural, and geographic boundaries. For IT to be effective, IT governance needs to focus on horizontal integration capabilities, that is, the ability to coordinate and integrate formal and informal IT decision-making authority across business and IT stakeholder communities. ▲

Notes

1. The research reported in this article is based on a research program directed toward understanding the context, processes, and outcomes of different models and mechanisms of IT governance in large (multi-divisional/-multinational) firms. Over the past six years, senior executives and managers from different functions in multiple companies have participated in this longitudinal study, which has used both qualitative and quantitative research methods for data collection and analysis.

2. The Johnson & Johnson case examples were compiled from www.jnj.com, Alter (2001), Peterson (2004), Scheier (2001), and Spiro (2003).

3. Previous studies have sought an answer to the "best way" of designing IT governance, recognizing that this "best way" is contingent upon internal and external factors, including organization size, business strategy, business governance structure, and the IT competence of business managers.

4. These IT governance capabilities were developed based on prior literature and the author's in-depth case studies, and then empirically validated in a field survey of 211 business and IT executives.

5. The ITGAP model was inspired by the neocontingency model of organization and management, such as found in Galbraith 1994, Galbraith and Lawler 1993, Kaplan and Norton 1996, and Nadler and Tushman 1998. The assessment model has been used with more than 50 large multi-division companies.

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